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ABD-EL-NABY, Yasser Kamal El-Sayed.

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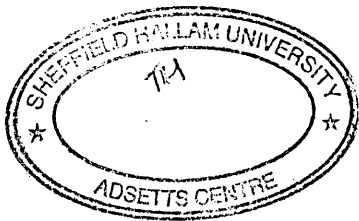
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**Accounting Information System in the Water Industry: The  
Case of Cost Management**

**Yasser Kamal El-Sayed Abd-El-Naby**

**A thesis submitted in partial fulfilment of the requirements of  
Sheffield Hallam University  
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## **Abstract**

Water is a primary human need. The supply of water has not increased in the face of population growth. At present severe pressure exists on water supplies in California and along the river system both in the developed and developing world (especially in the case of the Nile in Egypt). Whatever our policy stance towards the economics of water supply (the liberal market, social democracy and democratic socialism), cost management and processes are central to the water sector.

The control or governing ideas within which cost management takes place are the two major concerns of this thesis. These two issues were explored in a case study of the General Organisation for the Greater Cairo Water Supply, focusing specifically upon government policy, administrative controls, the influence of public sector bodies and other customers. Control procedures, the perceptions and experiences of managers (regarding policy choice), cost management policies and practices, environmental demands (both market and physical), were all sought. Data was collected from multiple sources (triangulation) involving interviews, questionnaires, documentation, direct observation and participant observation.

The research findings showed that the practice of cost management has developed. Reasons were multi-fold: (a) To keep costs well above revenue (b) To engender a factor-resources cost and technical approach to cost management (for efficiency and optimisation) (c) To deflect any attention away from strategic cost management (d) To engender an organisational belief that ambiguity and unpredictability in the environmental market is impossible to handle (e) To deny the relevance of customer cost/usage efficiency as a matter of systemic significance.

This 'evolution of control' is explained through the theoretical context of institutional theory; demonstrating how values, beliefs and modes of regulation have produced a technical and passive non-reactive control system.

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## **List of Abbreviations**

<b>ABC</b>	Activity-Based Costing
<b>ABM</b>	Activity-Based Management
<b>AHD</b>	Aswan High Dam
<b>BPR</b>	Business Process Re-engineering
<b>CVF</b>	Causal Variability Factors
<b>CIGS</b>	Central Institution for General Statistical
<b>CMS</b>	Cost Management System
<b>DTI</b>	Department of Trade and Industry
<b>E. P.</b>	Egyptian Pound
<b>FAC or AC</b>	Full Absorption Costing
<b>FDCi</b>	Fully Distributed Cost of Service I
<b>GOA</b>	Government of Egypt
<b>GOGAWS</b>	The General Organisation for the Greater Alexandria Water Supply
<b>GOGCWS</b>	The General Organisation for the Greater Cairo water Supply
<b>IBRD</b>	International Bank for Reconstruction and Development
<b>ICWP</b>	Inter-Ministerial Committee on Water Planning
<b>JIT</b>	Just In Time
<b>MACS</b>	Management Accounting Control System
<b>MAS</b>	Management Accounting System
<b>MHPU</b>	Ministry of Housing and Public Utilities
<b>MPWWR</b>	The Ministry of Public Works and Water Resources
<b>MTSS</b>	Management and a Training and System Strengthening
<b>OFWAT</b>	Office of Water Service
<b>OIE</b>	Old Institutional Economic theory
<b>P (CI)</b>	Perception of Competitive Intensity
<b>P (Un)</b>	Perception of Unpredictability
<b>PA</b>	Principal-Agent Theory
<b>SBU</b>	Strategic Business Unit
<b>SCM</b>	Strategic Cost Management
<b>SMA</b>	Strategic Management Accounting
<b>TA</b>	Throughput Accounting

<b>TFA</b>	Total Factor Cost
<b>TQM</b>	Total Quality Management
<b>UAS</b>	The Unified Accounting System
<b>USAID</b>	The U.S. Agency for International Development
<b>V C</b>	Value Chain
<b>V. E.</b>	Value Engineering
<b>ZBB</b>	Zero-Based Budgeting

# **Chapter 1**

## **Introduction**

### **1.0 Introduction**

This thesis offers an explanation for the role of cost management in the Egyptian water industry. Chapter one outlines the contributory value of this thesis and links it to wider research in this area (see sections 1.1 and 1.2). It also explains reasons for the author's interest in this topic, and the rationale for choosing it (see section 1.3).

The chapter outlines the theoretical framework (see section 1.4) and the research methodology and method (see section 1.5) used in the research. It gives a brief synopsis of the contents of chapters in this thesis (see section 1.6).

### **1.1 Background**

This research investigates the role of cost management in the water industry. There are several definitions of cost management. Brimson (1996: 104) argues that cost management is the “management and control of activities to determine an accurate product cost, improve business processes, eliminate waste, identify cost drivers, plan operations, and set business strategies”. Horngren, et al., (1999: 875) argue that cost management is the “actions of managers undertaken to satisfy customers while continuously reducing and controlling costs”. The Chartered Institute of Management Accountants defines cost management as follows: “Cost management is the application of management accounting concepts, methods of data allocation, analysis and presentation, in order to provide the information required to enable costs to be planned, monitored and controlled” (CIMA, 2000: 27).

Scapens (1991) notes that whilst there is a large and ever-growing ‘tool-chest’ of modern management accounting techniques, (including cost-volume-profit analysis, activity-based costing etc) "little can be said at the theoretical level about the techniques (tools) which should generally be used in practice" (p. 219). He goes on to argue that before the gap between theory and practice can be closed, "researchers must examine the various roles which management accounting fulfils within the organisation" (p.

221). He goes on to argue that there is little<sup>1</sup> evidence of how different costing methods are being used. There is much less research on why only one method is used and why one method is preferred over another. Similarly there is a dearth of research on how accounting practices have developed over time and on the sources (institutions) that have influenced that development. In addition Simons (1992: 44) raised the question "What role can accounting play in stimulating emergent strategies?" Scapens (1991: 10) contends that "the terms 'cost accounting' and 'management accounting' now tend to be used synonymously in textbook titles".

In cost management literature, evidence of renewed interest was witnessed from the reaction to Johnson and Kaplan (1987) who argued that the systematic structures of cost accounting did not make much of a connection with the systematic problems of managing an enterprise. They also contend that the cost management accounting systems (which do support financial reporting requirements) are difficult to justify economically. A great deal of recent cost management literature has centred around activity-based costing (Banker and Hughes, 1994; Cooper and Kaplan, 1992; and Datar and Gupta, 1994). However other modern cost management tools such as 'benchmarking' (Elnathan and Kim, 1995) and just-in-time inventory systems (Alles, et al., 1995) have also recently been examined.

Cost management has three dimensions to it: Efficiency, optimisation and strategy (Al-Hazami, 1995). Most researchers concentrate on efficiency (Thompson, 1967; Miller, 1989; Williams and Giardina, 1993; Ezzamel, et al., 1994; Dugdale, et al., 1996; Horngren, et al., 1999)<sup>2</sup>. Others focus on optimisation<sup>3</sup> (Turney, 1991b; Anotos, 1992; Cooper, et al., 1992; Harmmer and Champy, 1993; Brimson, 1996; Smith, 1997; Trussel and Binter, 1998; 1998; Rouse and Putterill, 2000) and strategy<sup>4</sup> (Ansoff, 1965; Anthony, 1965; Mintzberg, 1978; Miles and Snow, 1978; Simmonds, 1981; 1982; 1985; 1986; Simons, 1987; 1990; 1995; Bromwich, 1988; 1990; Dent, 1990 and Johnson and Scholes, 1993).

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<sup>1</sup> With the exception of a few studies (Ask and Ax, 1992; Drury and Tayles, 1994; 2000; Innes and Mitchell, 1995).

<sup>2</sup> See section 4.1.

<sup>3</sup> See section 4.4.

<sup>4</sup> See section 5.2.

Strategic management accounting has attracted attention from numerous authors to its different aspects. For instance, Johnson and Kaplan, 1987; Simmonds, 1981; 1982; 1985; 1986; Bromwich, 1988; Allen, 1985; and Taylor and Graham, 1992; all emphasise the extension beyond management accounting's internal focus to include, for example external information about competitors, see section 5.2.1). There has been extensive and rapidly growing literature on strategic management accounting (Simmonds, 1981; Shank, 1989; Bromwich, 1990; Dent, 1990; Wilson, 1991; Hartman, 1993).

Some researchers focused on business strategy, - identifying the relationship between the strategic position chosen by a firm and the expected emphasis on management accounting<sup>5</sup> (see section 5.2.2). Others advocate an analysis of ways to decrease costs and/or enhance differentiation of firm products, through exploiting linkages in the value chain and optimising cost drivers<sup>6</sup> (see section 5.2.3).

## **1.2 Objectives and research questions**

The main objectives of this study are to understand, describe and explain the role of cost management in the water industry. The focus of this study is the service water industry in Egypt. This research will study the problems of cost management which have arisen in the Egyptian water system. Cost management will be examined as a whole system, from different viewpoints, including accounting (managerial and economic perspective), and Government policy (social and political perspective).

Taking the main objective and the meaning of the term 'cost management', questions to be addressed in this research include:

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<sup>5</sup> Ansoff, 1965; Anthony, 1965; Miles and Snow, 1978; Andrew, 1971; Kaplan and Norton, 1992; 1996; Mintzberg, 1973; Dent, 1990; Goold and Quinn, 1990; Govindarajan and Gupta, 1985; Simons, 1987; Shank, 1989; Shank and Govindarajan, 1989; Porter, 1980; 1985; 1990; Gray, 1990; and Hartmann, 1999.

<sup>6</sup> Hargert and Morris, 1989; Shank and Govindarajan, 1992b; Nanni, et al., 1992; Harland, 1996; Ellram, 1991; Williamson, 1985; Berry, et al., 1997; Seal, et al., 1999; Slack, et al., 1998; and Rajagopal and Bernard, 1993.

- What is the current cost structure for the provision of Egyptian water services? (descriptive and illustrative)<sup>7</sup>
- What is the rationale of the companies for the cost structure? (explanatory)<sup>6</sup>
- What methods of cost accounting were/are used in the Egyptian water industry? (descriptive and illustrative)<sup>6</sup>
- What is the role of the accounting (its nature and function) in controlling the water industry? (descriptive and explanatory)<sup>6</sup>

### **1.3 The motivation of the study**

The motivation to research this area of study arose from a desire to understand the contribution of cost management to the complex task of decision-making. Many researchers draw attention to the importance of cost management. Rajaopal and Bernard (1993) claim that cost management draws on a number of functions but concentrates on total quality management, negotiating, and supplier alliances. Horngren (1995) argues that the focus of cost management should be on decision making, while Cooper (1996) argues that the growing importance of cost management is significantly changing the practice of management accounting. Seal, et al., (1999) argue that cost information not only plays a role in the strategic sourcing decision but will also influence the ongoing management of partnerships. In a strategic approach, the ongoing management of a strategic partnership should be on cost rather than a price basis. This thesis explains cost management in the Egyptian Water industry.

Young and Selto (1991: 288) in their review of research in new manufacturing practices and cost management stated that "In order to have a significant impact on either the academic or practitioner community, cost management research will have to assess the economic, behavioural and social consequences of new manufacturing practices and new cost management methods". Durden and Mak (1999) argue that the focus of a contemporary costing system should be on cost management, not extended reporting. They argue that if cost management is the primary purpose of a costing system, then it is appropriate to report overhead variances as a period cost, rather than pro-rating these variances to various accounts. The researcher's view is that the future of the water

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<sup>7</sup> A term identified by Scapens (1990).

industry in Egypt will potentially change focus from cost management of supply to cost management of demand.

A second motivation was that the future looks bleak if Egypt does not succeed in formulating and implementing a water management policy which can match limited fresh supply with increasing demand. Per capita water resources were expected to drop from about 922  $m^3$  per year (in 1990) to about 337  $m^3$  per year in the year 2025. This will help change the focus from cost management of supply to cost management of demand. Hvidt (1998) in his research identified eight characteristics from his analysis of water resource planning in Egypt. They were: (a) a shift from water abundance to water deficit, (b) the importance of international co-operation (c) supply bias (d) environmental concern (e) lack of data (f) established priority to non-agricultural uses of water (g) delayed implementation and (h) an uncertain administrative framework in water resource planning.

## **1.4 Theoretical framework**

Institutional theory is adopted as a framework for explaining the role of cost management in the Egyptian Water Industry. There are differing views of institutional theory; from the economic, political and sociological perspectives. Each of these dimensions has been used by previous studies to examine different management accounting issues. The core idea of each view is discussed later in the thesis (see section 2.2).

This thesis uses neo-institutional economic theory to explain the operation of cost management in the GOGCWS (see section 11.2). The study examines how government policy (a coercive institutional pressure) influenced the choice of accounting system in the GOGCWS. The justification for the choice of neo-institutional economic theory is fully discussed later in the thesis. However, the theory offers a better explanation for cost management practices in the GOGCWS, which operated in an unchanging and relatively static environment. The thesis also offers alternative governance structures for the water industry in different countries from a neo-institutional economic<sup>8</sup> theory perspective (such as the UK where water is provided by a highly regulated market,

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<sup>8</sup> According to neo-institutional economic theory (transaction cost), there are three models of governance: (1) markets (2) hybrids and (3) hierarchies or internalisation (Williamson, 1996).

France where water services are a hybrid structure and Egypt where water services are a hierarchical (see sections 7.2.5 and 10.1.1).

There are significant differences between the neo-classical economic theory<sup>9</sup> and the neo-institutional economic theory. Perhaps the most significant differences for this research is related to the first element of cost management (efficiency). Neo-classical economic theory defines cost management in three ways: allocative efficiency or pareto efficiency, productive or technical efficiency and dynamic or intertemporal efficiency. In contrast, neo-institutional economic theorists have expressed strong reservations about using the pareto efficiency criterion to justify government intervention. They also argue that by comparing real-world arrangements against the ideal of allocative efficiency rather than feasible institutional alternatives, policy-makers have become far too inclined to prescribe government intervention.

There are two views of management accounting within institutional research. The first view sees management accounting as an institution within the organisation (Burns and Scapens, 1998; 2000). The second view shows accounting as primarily concerned with the effects of the external or macro-institutional, (i.e. effect of the social, economic and political on accounting practices of organisations, Covalski, et al., 1993; 1996; Carruthers, 1995).

This research takes into consideration the two views of management accounting within institutional research (see sections 11.2.2 and 11.2.3). Thus the accounting system (the unified accounting system) is an institution within the GOGCWS (see section 8.5) and also institutional pressures exerted by the Egyptian government shapes accounting practice (the UAS) in the GOGCWS (see chapters 9, 10 and 11).

The explanations of this research are centred around two propositions: (a) Government policy (coercive isomorphism) shapes the limited use of cost management for efficiency, optimisation and strategy (b) Organisations are the 'theatre' in which institutions are visible. In other words, the explanation of this research takes into consideration the institutional functionalist view (first proposition) and the institutional interpretive view (second proposition)

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<sup>9</sup> For the criticism of neo-classical economic theory (see sections 3.1 and 3.3.1).

Institutional theory adds a broader (extra-organisational) institutional dimension to the analysis and discussion of this thesis. Burns and Scapens (2000) argue that in order to understand micro-processes it is necessary to recognise the institutional context both within the organisation itself, (i.e. the organisation's rules, routines and institutions) and outside, (i.e. the broader social, economic and political institutions of the organisational field and the society in which the organisation operates).

As mentioned in section 1.1, cost management has three elements to it: efficiency, optimisation and strategy (Al-Hazami, 1995). Most researchers concentrate on efficiency (see sections 4.1, 4.2 and 4.3). Others focus on optimisation (see section 4.4) and strategy (see section 5.2). This research incorporates all three elements of cost management. Pfeffer and Salancik (1978) argue that a good deal of organisational behaviour can be understood by knowing something about the organisation's environment<sup>10</sup> and the problems it faces in obtaining resources. What happens in an organisation is not only a function of its internal structure, leadership, procedures, or goals, it is also a consequence of the environment, and the particular contingencies and constraints from that environment. Therefore, this research focuses on institutional context within and outside the GOGCWS.

## **1.5 Research Methodology and Method**

Methodology refers to the methods and ways used to conduct research. Blaikie (1995) states that methodology is essentially epistemology. He argues that epistemology is a theory of knowledge. It presents a view and justification for what should be regarded as 'knowledge' - (i.e. what can be known, and what criteria such knowledge must satisfy in order to be termed 'knowledge' rather than 'beliefs'). In short, epistemology is concerned with the nature and forms of knowledge; how knowledge is acquired and the relationship between ideas about the world and the world itself. Epistemological debates are concerned with the appropriateness of procedures and methods in the process of knowledge acquisition. A typical epistemological debate would focus on induction and deduction<sup>11</sup>.

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<sup>10</sup> This research argues that the environment of the GOGCWS could explain three main factors: product market, factor market and legislation.

<sup>11</sup> For definitions of 'deductive' and 'inductive' approach, see section 6.1.1.

This study adopts a hybrid approach, focusing more on the inductive strand. The rationale for choosing a hybrid approach is because the objectives of this research are to describe what is going on (i.e. to describe the current cost structure for the provision of water in Egypt); and to understand and explain why it has been put into effect, (i.e. the companies rationale for choice of cost structure). Explanation therefore involves induction and deduction. DeVaus (1996: 11) claims that inductive and deductive approaches are not alternative ways of arriving at good theories; rather they represent two stages with different starting points. The research also takes a 'voluntaristic'<sup>12</sup> view of human behaviour rather than one which guides contingency research (Child, 1972; Schreyogg, 1980). The voluntaristic view is noticeably absent in early neo-institutional research (DiMaggio, 1988 and Oliver, 1991). This approach followed from more recent advances in institutional theory which call for more-in-depth, interpretive analyses of the dialectic between stability and change (Czarniawska and Servon, 1996).

A case study method is used in this research. Strengths and weaknesses of the case study method (see Miles, 1979) have been addressed since the late 1970s. There is an increasing body of literature on how to conduct and analyse case-study data (Campbell, 1975; McClintock, et al., 1979; Yin, 1981; 1989; Eisenhardt, 1989; Scapens, 1990; Gummesson, 1991; Rose, 1991; Ryan, et al., 1992; Otley and Berry, 1994; Hartely, 1995).

This case study research will focus on three objectives: descriptive, illustrative, and explanatory (Scapens, 1990). These objectives will assist the researcher in answering his research questions (see section 1.2).

This research will be based on a case study of one company in Cairo, - the General Organisation for the Greater Cairo Water Supply. Reasons for choosing this company were several. Firstly, it was the first company to be established in the water industry in Egypt. It therefore helps describe and explain the role of cost management in the Egyptian Water Industry (because it represents the past, present and future experience of Water Service in Egypt). Secondly it provides water for 25% of the population in

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<sup>12</sup> 'Voluntaristic' view assumes that human beings are free-willed, act independently of external stimuli and exercise freedom of choice (Burrell and Morgan, 1979).

Egypt. It also has a unique<sup>13</sup> laboratory for analysing water in the Middle East (The cost of this laboratory was 25 million Egyptian pounds<sup>14</sup>).

Thirdly there are discrepancies between the expenses of the GOGCWS and its income. The cost per  $m^3 = 0.46$  pence (wages 8.03 + Power and electricity 6.99 + raw materials 4.47 + other current expenses 7.00 + interest "local and international" 11.29 + Depreciation 8.19)<sup>15</sup>. By contrast, average income was per  $m^3 = 0.16$  pence, so this price does not encourage efficiency. Finally it is estimated that the General Organisation for the Greater Cairo Water Supply loses 40% of water through leakages each year. This results in an estimated wasteful expenditure of 250 million Egyptian pounds every year. Efficiency in the company is therefore low.

Data will be collected from multiple sources (triangulation) including interviews (qualitative), questionnaires (quantitative) and company documentation. The rationale behind this integration is that any limitations of one method will be counter-balanced by the strength of another (Hoque and Hopper, 1994).

## 1.6 Structure of the thesis

This thesis has eleven chapters. The aim of chapter two is to outline neo-institutional economic theory as the theoretical basis of the research. The chapter argues that both contingency theory and institutional theory are important for explaining the design and use of cost accounting systems. It also argues that while technical (or contingent) explanations of cost management are not rejected, they are clearly viewed as incomplete (Scott, 1987). Institutional theory adds the social and political elements, which are typically absent or de-emphasised in the rational instrumental approach (which guides most of the recent research on cost management). The chapter examines the theories used in accounting research, and offers an overview of management accounting. The

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<sup>13</sup> The GOGCWS, (no date source given, c) - "Greater Cairo Water", The Administration of Public Relations.

<sup>14</sup> N.B: English pound £ = 6.00 Egyptian pounds.  
American Dollar \$ = 5.00 Egyptian pounds.

<sup>15</sup> The GOGCWS (no date source given, c) - "Greater Cairo Water", The Administration of Public Relations.

chapter also clarifies the level (organisation level) and approach (a process approach) which this study has adopted.

Chapter three aims to explain the role of management accounting by examining the theory behind it. It discusses the role accounting has come to occupy in micro-level (organisations) and macro-level (societies). This chapter gives an overview of management accounting theory. It criticises and shows the limitations of management accounting from a neo-classical economic stance. The chapter outlines some alternative approaches to management accounting, (namely neo-institutional economic theory, old institutional economic theory and neo-institutional sociology theory). Furthermore it has argued that the institutional theory approach has the potential to provide a useful theoretical framework for understanding management accounting (cost management) practices. The chapter argues that institutional theory offers a useful theoretical framework for understanding management accounting (and cost management) practice.

Chapters four and five focus on the model of cost management which this research has adopted. This research is based on a model of cost management which has three elements: efficiency, optimisation and strategy. Chapter four focuses on the first two elements of cost management: efficiency and optimisation. It outlines the problem and discusses the development of cost management. The chapter then identifies some models of cost management which indicate how to increase efficiency (i.e. throughput accounting, benchmarking, target costing and ABC) and others to increase optimisation (such as, ABM). The chapter identifies links between institutional theory, transaction cost and efficiency. It examines how the efficiency framework is favoured by transaction cost theories. Chapter five identifies strategic management accounting as one of the models of cost management which considers both the internal and external environment (the third element of cost management). The chapter focuses on cost accounting in service organisations and discusses how it can support corporate strategy.

The aim of chapter six is to outline the research design and methodology. The methodological position adopted in this research is a hybrid approach (i.e. between inductive and deductive), but mainly an inductive approach (for the rationale for choosing a hybrid approach, see section 6.1.1). The research also took a nominalist view (ontology - the rationale for which can be found in section 6.1.2). It also takes a

‘voluntaristic’ view of human behaviour rather than one which guides contingency research (Child, 1972; Schreyogg, 1980). The chapter also clarifies the methods of data collection and the rationale for choosing them. A case study approach is adopted in this research. The case study is both a process of induction and deduction. The methodological position led the researcher to use multiple sources for collecting data (including semi-structured interviews, questionnaires and company documents of the GOGCWS).

Chapter seven offers alternative governance structures from the neo-institutional economic perspective for the water industry in different countries (such as the UK where water is provided by a highly regulated market, France where water services are hybrid and Egypt where water services are hierarchical structure). The chapter discusses the importance of water in order to explore the phenomenon of privatisation in the water industry. It looks at its effect on the role of accounting in general, and cost management in particular. The chapter considers the pros and cons of public versus private ownership of water. Finally, the issue of costs in the water industry is explored (i.e. how do people pay for their water requirements, how is the cost of water calculated, is the current system fair or is a new system required?).

Chapters eight and nine focus wholly on the case study of the General Organisation for the Greater Cairo Water Supply (the GOGCWS). Chapter eight describes the accounting system used at the GOGCWS and examines its supervision and control. It explores the questions: “Which methods of cost accounting were used in the Egyptian water industry?” “What model of cost management was followed in the GOGCWS?” “Are there any similarities or differences between rules and routines<sup>16</sup> of the cost accounting system at the GOGCWS?” The chapter also discusses alternatives to cost management as suggested by consultants Black and Veatch International. It also discusses perceptions of the GOGCWS managers' towards the issue of cost management. Chapter nine explores the question: “Was there a relationship between cost management<sup>17</sup> and P (C.I)<sup>18</sup> and P (Un)<sup>19</sup> which relates to the three areas of the external environment

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<sup>16</sup> Rules and Routines used by Burns and Scapens (2000) see rules as comprising of accounting systems as set out in procedure manuals. ‘Routines’ are the actual accounting practices in use.

<sup>17</sup> The objectives of cost management are efficiency, optimisation and strategy

(product market, factor market and legislation) from the neo-institutional economic theory perspective?

Chapter ten aims to discuss the external and internal environment of the GOGCWS. It also examines the perceptions of the GOGCWS managers of the issue of privatisation in the water industry and cost management. The chapter highlights the importance of neo-institutional economic theory as theoretical framework for this research because it focuses on both the external (Covalesski, et al., 1993; 1996; Mezias, 1990) and internal environment (Burns and Scapens, 2000).

Chapter eleven aims to discuss the GOGCWS research findings in the light of the theoretical framework which was adopted. It also relates the findings back to the literature review. The chapter explains why there was no change in cost management at the GOGCWS by adopting two propositions from the neo-institutional perspective. Firstly, government policy (coercive isomorphism)<sup>20</sup> shaped the limited use of cost management for efficiency, optimisation and strategy. The second proposition assumed organisations are the 'theatre' in which institutions are visible. It examines the accounting system of the GOGCWS (the UAS) from an institutional perspective (the three pillars of institutional theory: cognitive, normative and regulative, Scott, 1995).

The final chapter aims to summarise the results of the research and identify its contributions to knowledge. Some contributions relate to cost management and management accounting while others relate to institutional theory and the case study approach. The chapter discusses the limitations of this study and offers suggestions for future research. It concludes with a discussion on the research process and the learning experience.

The structure of the thesis is shown in figure 1.1 as below:

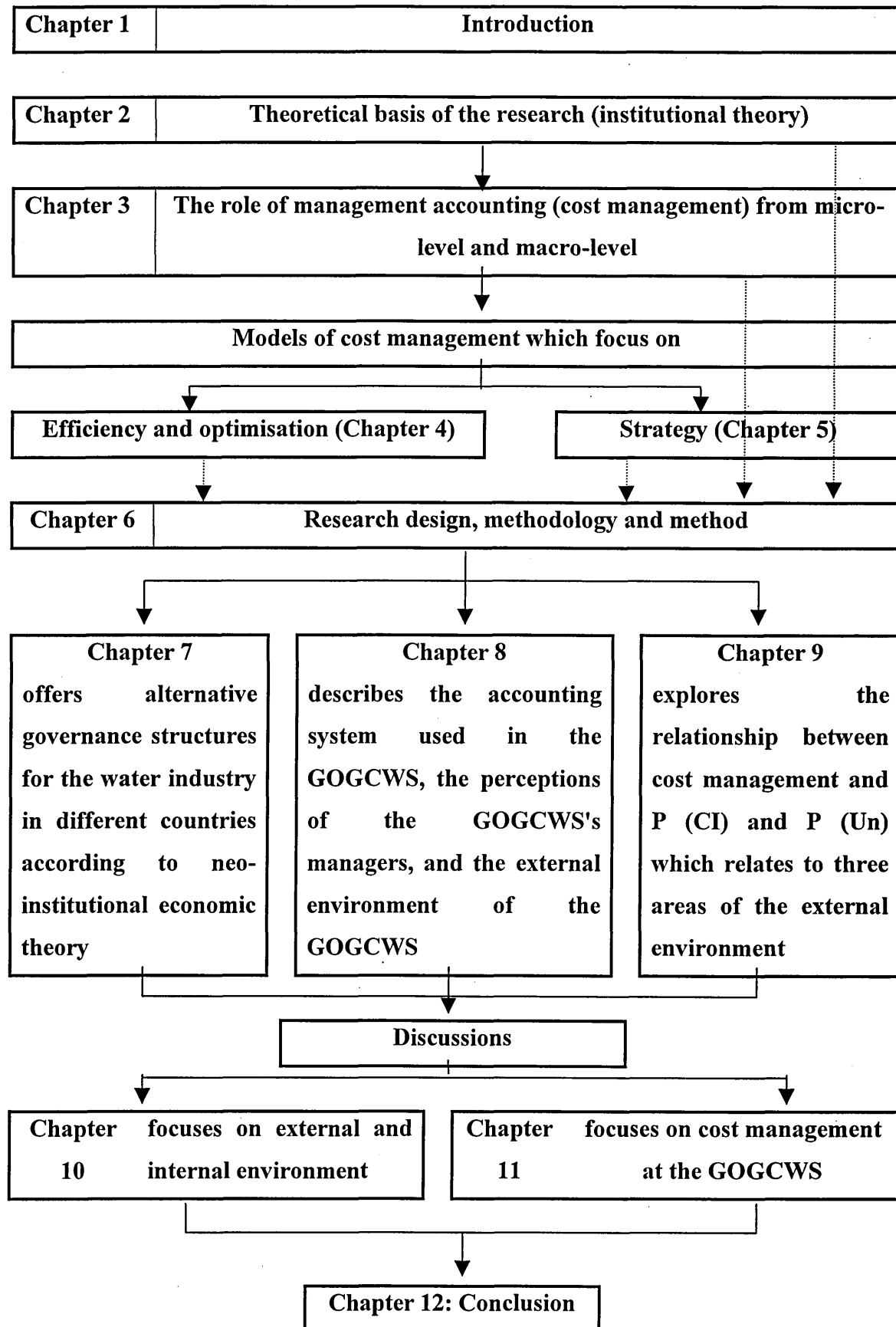
---

<sup>18</sup> P (C.I) refers to the perception of competitive intensity, (i.e. the general level of market conditions which make profitability difficult).

<sup>19</sup> P (Un) refers to the perception of unpredictability, (The overall degree of variability from period to period, which make forecasting and planning difficult).

<sup>20</sup> Although, the term isomorphism is generally associated with the neo-institutional economic sociology, it is equally applicable to any analysis of neo-institutional theory in general (such as neo-institutional economic theory).

**Figure1.1: Flowchart for The structure of the thesis**



## **Chapter 2**

### **Institutional theory**

#### **2.0 Introduction**

The aim of this chapter is to outline the theoretical basis of the research and the rationale for choosing it. For this purpose, the chapter is divided into four sections.

The first section gives the reasoning behind institutional theory as a choice of framework. It highlights the differences between contingency theory and institutional theory. It shows the different approaches to institutional theory and accounting research.

The second section introduces questions arising out of institutional theory. It outlines the core ideas of those schools and models which study institutions. It then gives a brief review of early institutionalist and neo-institutional theory in economic, political and sociology. It goes on to introduce the theories used in accounting research and offers an overview of management accounting within institutional theory.

The third section explains concepts which have been applied to institutions and isolates management accounting within these concepts. It highlights the similarity between structuration theory and institutional theory. It also illustrates levels of analysis in institutional theory (i.e. the two approaches in order to explain institutions). It then clarifies the level and approach which this study has adopted.

The final (fourth) section outlines the main conclusions of this chapter.

## 2.1 The rationale for choosing institutional theory

Why is a theoretical framework important? Coase<sup>21</sup> (1983: 230) argued that "without a theory there is nothing to pass on except a mass of descriptive material, waiting for a theory, or a fire". Institutions often play important roles in the diffusion of ideas (Bjornenak, 1996). In some cases they act as propagators, in others as moderators of change. It is therefore reasonable to expect cost practices to be influenced by those institutions involved in setting standards for the profession (e.g. professional bodies, academic institutions and major companies).

As part of the growing pluralism in the study of organisations, new sociological paradigms have emerged since the 1970s. Like economics, they offer explanations of organisational structure, - additional to those available in structural contingency theory - (Penning 1992; Davis and Powell 1992). These include the theories of 'resource dependence' (Pfeffer and Salancik 1977), 'Institutional' (Powell and DiMaggio, 1991), 'population ecology' (Hannan and Freeman, 1989), 'agency' (Jensen and Meckling, 1976) and 'transaction cost economics' (Williamson, 1985).

Subsequently, many new approaches have arisen including institutional theory in the US (Meyer and Scott 1983a) and action theory in the UK (Silverman 1970). Drury and Tayles (1995) called for different approaches and perspectives, rather than a wholly economic perspective of management accounting. They advocate "explaining observed practices by examining their role within the broader organisational, social, political and cultural dimensions in which accounting information is used" (p. 278). Brignal (1997) argues that service costing systems must be seen in their wider context (as part of management information systems which embrace non-financial information).

Geiger and Ittner (1996) claim that contingency and institutional theories can explain the design and use of cost accounting systems in government agencies. This research has adopted institutional theory as a framework for explaining the role of cost management in the Egyptian Water Industry. Despite the many advantages of

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<sup>21</sup> The 'godfather' of the new institutional economic theory.

contingency theory<sup>22</sup>, it was not adopted in this research. Reasons for this are two-fold: theoretical and practical. At the theoretical level, Bourgeois (1984) criticises contingency research for failing to consider reverse causation (where the presumed contingency factor results from the structure). The positive correlation between strategy and structure may have arisen through structure causing strategy.

Merchant (1984) contends that contingency theory can be criticised on the grounds that organisational context is often a construct of the researcher rather than a description of perceived reality as used by the organisations under study. Spekle (2001) claims that a contingency theory approach is more a vague idea than an actual theory. He contends that contingency theory has no a priori intuition of its own as to what the pertinent factors are and to their likely consequences. He goes on to argue that contingency modes tend to be partial, - focusing as they do on elements of the control system (e.g. budgeting systems), rather than directly addressing the full configuration of control devices.

At the practical level, under contingency theory the type of management accounting system (MAS) varies according to the specific circumstances or situation in which the organisation operates (see section 5.2.2). Hence, choice of MAS design is constrained by conditions and depends on the ability of management to find the best “fit”. This is not applicable to the General Organisation for the Greater Cairo Water Supply because the GOGCWS is an economic organisation within the public utilities sector. The GOGCWS must therefore apply the Unified Accounting System which includes a management accounting system. In other words, the GOGCWS has no alternative in its choice of management accounting system.

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<sup>22</sup> Otley (1995: 191) claim that "the design of any planning and control system is situationally specific. When designing a system, a distinction is made between controllable and non-controllable factors. Controllable factors of the organisation are not considered contingent variables, rather they are part of a package of organisational controls selected for use. The organisation is expected to adapt to the contingency it faces, by arranging these suitable factors. It controls appropriate configuration that it hopes will lead to an effective control system. Interdependence between accounting information systems and components of contingency elements are still possible".

Berry et al., (1995: 22) argue that "contingency theory provides a picture for the organisation through its environment. The environment is crucial in shaping the organisation, and the survival of an organisation depends on its 'fitness' for the changing environment". Donaldson (1995) argues that while organisational theories can supplement contingency theory, the latter nevertheless remains the core explanatory theory of organisational structure.

While technical (or contingent) explanations of cost management are not rejected, they are clearly viewed as incomplete (Scott, 1987). Institutional theory adds the social and political elements which are typically absent or de-emphasised in the rational instrumental approach (which guides most of the recent research on cost management). Bjornenak (1997) argues that there are several explanations underlying characteristics of cost practice, and that an institutional frame of reference may be important for understanding how and why changes in cost practice occur. Contribution to knowledge in the field of cost management (building on contingency theory) remains fragmented. However more inclusive approaches are required before we can fully understand cost management (Spekle, 2001).

In recent years there has been increasing interest in institutional theories within the social sciences (Scott, 1995). Three such theories have been used in accounting literature namely neo-institutional/transaction cost economics<sup>23</sup> (derived largely from the work Williamson, 1975), old institutional economics<sup>24</sup> (Scapens, 1994), and neo-institutional sociology (Miller, 1994). These will be discussed in detail in section 3.3).

Previous governmental accounting research (based on economic theory) generally ignores how institutional and organisational pressures constrain accounting choice (i.e. the method of cost management in the water industry, Carpenter and Feroz, 2001). This research argues that institutional theory offers the best explanation for the role of cost management in the Egyptian Water industry.

## **2.2 History of institutional theory**

Institutional theory has been used here as the framework for explaining the role of cost management. The theory has raised some contentious questions about organisational 'worlds' (Scott, 1995). These include:

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<sup>23</sup> New institutional economics focuses primarily on micro-analytic questions (e.g. the comparative efficacy with which alternative generic forms of governance-market, hybrids and hierarchies economise on transaction costs). It avoids the broader questions of origins and change in the "institutional rules of the game: customers, laws, politics" (Williamson, 1991: 269).

<sup>24</sup> There is similarity between Giddens' theory and old institutional economic theory (see figure 2.1). Burns and Scapens (2000) argue that structuration theory is not particularly helpful for exploring processes of change. Archer (1995) supports this view arguing that structuration theory does not incorporate historical time. She contends that "structure and agency can only be linked by explaining the interplay between them over time. Without the attention paid to the time factor, the problem of structure and agency can never be satisfactory resolved" (p. 65).

- (a) Why organisations of the same type, (located in scattered localities) closely resemble one another (e.g. schools and hospitals).
- (b) How should we regard behaviour in an organisational setting? Does it reflect the pursuit of rational interests and the exercising of conscious choice; or is behaviour primarily shaped by conventions, routines, and habits?
- (c) Why does observed behaviour of organisational participants often depart from the formal rules and stated goals of the organisation?
- (d) Why and how do laws, rules, and other types of regulative and normative systems arise? Do individuals voluntarily construct rule systems which then influences their own behaviour?
- (e) Where do interests come from? Do they stem from human nature, or are they culturally constructed?
- (f) Why do specific structures and practices diffuse through organisations in ways not predicted by the adopting organisations?
- (g) How do differences in cultural belief shape the nature and operation of organisations?
- (h) Why do organisations and individuals conform to institutions? Is it because they are rewarded for doing so, because they are morally obliged to obey, or because they can conceive of no other way of behaving?

There are several models which attempt to study institutional theory. These include The Columbia school, Parson's approach, The Carnegie school and The Cognitive school. It is useful here to highlight the key points of each model in turn.

In the Columbia school Merton (1936, 1957) and Selznick (1948) laid the groundwork for a process model of institutions. Merton described 'process-operating' in bureaucratic organisations as encouraging officials toward over-conformity. Selznick focused on processes within particular organisations as giving rise to a distinctive set of valued commitments. Stinchcombe (1968) claims the mechanisms used by powerful actors perpetuate their own interests and commitments. Stinchcombe<sup>25</sup> (1968: 107) adds that an institution can be defined as “a structure in which powerful people are committed to certain values or interest”.

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<sup>25</sup> Stinchcombe is a scholar of the Columbia school and a student of Selznick's.

Parsons (1960a: 20) develops his “cultural-institutional” argument by examining the relationship between an organisation and its environment. He looks at the ways in which the value system of the organisation is legitimated by its links to “main institutional patterns” in “different functional contexts”. Parsons (1960b) offers a different definition of the term 'institution'. He argues that organisations become vertically differentiated into three distinct levels or 'layers': (1) Technical (production activities) (2) the Managerial (concerned with control and co-ordination activities, the procurement of resources and the disposal of products) and (3) Institutional (relating the organisation to the norms and conventions of the wider community and society). Parsons concludes that every organisation is a subsystem of “a wider social system which is the source of meaning, legitimation, or higher-level support which makes implementation of the organisation’s goals possible” (pp. 63-64).

As a member of the Carnegie school Simon (1957) was one of the first theorists to link individual cognitive capacity with organisational structure. He notes how organisational structures work to simplify and support decision-making in organisations, - allowing them to achieve higher levels of consistent “boundedly rational” behaviour.

March and Simon (1958: 141-142) argued that in many circumstances, “search and choice processes are very much abridged. Much of the behaviour in organisations is governed by performance programs”. Hence value assumptions, cognitive frames, rules and routines are all ingredients conducive to individuals behaving 'rationally'. The "rational individual is organised and institutionalised" (Simon, 1957: 102).

In the Cognitive school early research concentrated on "human organisms". Markus and Zajonc (1985: 141) found that “the idea of the human organism as an information-processor became popular”. The mind came to be viewed by many as a computer-like apparatus that registered incoming information and then subjected it to a variety of transformations before ordering a response”. Recent cognitive theory and research has emphasised individual shortcomings as information processors and decision-makers (Tversky and Kahneman 1974; Nisbett and Ross 1980).

There are differing views of institutional theory from an economic, political and sociological perspective. There are salient differences between institutional theory and

neo-institutional theory from an economic perspective. Similarly, between institutional theory and neo-institutional theory in political science. Likewise, between old institutional theory and neo-institutional theory in sociology. The core ideas of each perspective will be examined in turn.

Institutional economists emphasised the importance of change. Veblen (1898; 1919) embraced an evolutionary perspective and claimed that valid economics could highlight the role of technological change and trace the changing phases of the economy. Commons (1924) stressed the centrality of change, - viewing the economy as “a moving changing process” (p. 376).

Neo-institutional economic theories are concerned with rule and governance systems which develop to regulate or manage economic exchanges. The first theorist to advocate this new approach was Coase<sup>26</sup> (1937). His article “The Nature of the Firm” asks why some economic exchanges are carried out within firms under a governance structure (involving rules and hierarchical enforcement mechanisms), rather than being directly subject to price mechanisms in markets. Coase (1937: 389) concludes the reason must be that “there is a cost of using the price mechanism”, (i.e. the cost of negotiating and concluding a separate contract for each exchange transaction which takes place in a market). It is because of these “transaction costs”<sup>27</sup> that companies emerge.

Jaccoby (1990) argues that the approaches offered by early institutionalists depart from those of their neo-classical colleagues in four important aspects.

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<sup>26</sup> Coase in his article 1937, posed an important question. He asks

“What is a firm and what determines its boundaries”?

The importance of Coase's contribution was the recognition that conventional neo-classical economics cannot explain why firms exist. Coase hypothesised that firms exist because they are able to operate under certain aspects of economic activity more cheaply than the market. This valuable insight has been further developed by economists under the general heading of “transaction costs economics”. Two particularly influential contributions were from Williamson (1975) and Klein et al., (1978). More recently Hart (1995) has introduced “A Property Right Approach” to the theory of the firm (offering a significant extension of the transactions costs approach).

<sup>27</sup> The basis of transaction costs is to explain the existence of different organisational forms as choices from a limited menu of “workable” contracting structures (Walker, 1998).

(a) Indeterminacy versus determinacy: where the orthodox model assumes “perfect competition and unique equilibria, the institutionalists point to pervasive market power and to indeterminacy even under competition” (Jaccoby, 1990: 318).

(b) Endogenous versus exogenous determination of preferences: Neo-classicalists stress the importance of individual wants or preferences, whereas institutionalists argue that such preferences are shaped by social institutions, whose operation should be the actual subject of economic analysis.

(c) Behavioural realism versus simplifying assumptions: Institutional theorists argue that economists should use pragmatic and ‘psychologically-realistic’ models of economic motivation, rather than subscribe to naive utilitarian assumptions.

(d) Diachronic versus synchronic analysis: Rather than accepting the “timeless and placeless” assumptions of neo-classical theorists, institutionalists recommend that economists should ascertain “how the economy acquired its features and conditions and what causes these features to vary over time and place” (Jaccoby, 1990: 320).

Institutional approaches dominate political science in both Europe and America. Eckstein (1963) claims the early institutionalists ushered in the first crude form of positivism in political science. Beginning during the mid-1930s and continuing through the 1960s, the institutionalist perspective was challenged and largely supplanted by the behaviorist approach (not to be confused with “behaviourism” in psychology). This was an attempt to sever the tie to moral philosophy and rebuild political science as a theoretically-guided empirical science (Easton, 1965). The behaviorist persuasion diverts attention away from institutional structure to political behaviour.

Neo-institutionalists within political behaviour have grouped themselves into two camps. Historical theorists and rational choice theorists. Historical institutionalists devote themselves to the detailed analysis of regimes and governance mechanisms (e.g. March and Olsen, 1984; 1989; Hall, 1986; and Skocpol, 1985; 1992). Institutions are viewed as including “both formal structures and informal rules and procedures that structure conduct” (Thelen and Steinmo, 1992: 2). Historical theorists take a social-constructionist position which assumes that “capabilities and preferences (i.e. the vary

nature of the actors) cannot be understood except as part of some larger institutional framework" (Krasner, 1988: 72).

The social-political constitution of accounting practice and regulation has gained increasing attention in research literature (e.g. Hopwood, 1984; Hopper et al., 1987; Miller et al., 1991). Theorists recommend that within the governmental sector, researchers should direct their efforts towards understanding the emergence of political institutions; particularly administrative institutions which have been influential in providing order and change in American politics, (in terms of the regulations they issue) (e.g. March and Olsen, 1989: 17).

Rational choice theorists see institutions as governance or rule systems. This approach represents an extension of neo-institutional work in economics, to the study of political systems. Moe (1984: 750) dissects the major elements making up this paradigm as including: "the contractual nature of organisations, markets vs. hierarchies, transaction costs, the rationality of structure, individualistic explanation, and economic methods of analysis. Standard neo-classical notions, optimisation, marginality, equilibrium are often central to this new tradition".

Thelen and Steinmo (1992: 9) see no conflict between historical institutionalists and rational choice theorists. They examine the historical stance: "Historical institutionalists would not have trouble with the rational choice idea that political actors are acting strategically to achieve their ends. But clearly it is not very useful simply to leave it at that. We need a historically-based analysis to tell us what they are trying to maximise and why they emphasis certain goals over others".

The importance of politics, (specifically in relation to the issue of 'change') is well-documented in management literature (Buchanan and Badham, 1999; Dawson, 1994; 1996; Pettigrew, 1973). This research highlights the key role politics can play in driving and shaping change processes; (though politics is not the only factor). Although it is not intended here to get drawn into a debate of what politics represents, most writers see politics as "attaining interest-based demands" (Pettigrew, 1973) and "getting things done your way" (Buchanan and Badham, 1999). Pfeffer's (1981: 7) definition of politics aptly captures the generally-accepted view amongst most academics that:

"Organisational politics involves those activities taken within organisations to acquire, develop and use power. It uses other resources to obtain one's preferred outcome in a situation in which there is uncertainty or discussion about choice"

Sociologists give more attention to the institution itself than economists and political scientists. Cooley (1956) for example, emphasised the interdependence of individuals and institutions, of self and social structure. Hughes (1936; 1939) shares and elaborates upon this interdependent view. Weber however is caught between the three major debates; between those who view social science as a 'natural' science, and those who argue that it is a cultural science.

Weber argued that the social sciences differ fundamentally from the 'natural' sciences in that in the former both researcher and object of study attach meaning to events. For Weber (1968), action is social, and individuals do not automatically respond to stimuli. Researchers cannot expect to understand social behaviour without taking into account the meanings that mediate social action.

Between the idealist arguments of Durkheim and the materialist emphasis of Marx, Weber employed an interpretative approach to attempt a synthesis between the two. Although the material conditions and interests stressed by Marx constrain choice and action, the idealist interpretations of normative values, motivate and 'activate' action (Alexander, 1983).

Between the institutionalist-historical model of economics and classical interest in developing general theoretical principles, Weber embraced institutionalist arguments. He argued that economics should be historically informed and comparative in its approach. At the same time he agreed with Menger and classicists in supporting the value of theoretical models, (which allow us to derive information from 'historically-embedded' systems in order to formulate and evaluate general arguments. Weber claims by abstracting from the specificity and complexity of concrete events, researchers can create "ideal types" to guide and inform comparative studies<sup>28</sup>.

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<sup>28</sup> Researchers should not insist that individuals under all conditions behave as economists). Such models could then prove useful as guides for analysis, and increase understanding of the real world.

Neo-institutional theory in sociology focuses on legitimisation of organisational forms and processes. Silverman (1971) proposes an 'action' theory of organisations. Silverman attacks prevailing models of organisations (including contingency arguments and Parsons-Selznick's structural-functional view), as being overly concerned with stability, order, and technical efficiency. Silverman proposes a phenomenological view of organisations which focuses attention on meaning systems, (and the ways in which they are constructed and reconstructed in social action).

Meyer and Rowan (1977) embrace the view of institutions as "complexes of cultural rules". These rules are increasingly being rationalised through the actions of academic professions, nation-states, and the mass media. This has therefore engendered the development of more types of organisations. Meyer and Rowan draw attention to the impact of organisational forms of change on the wider institutional environment.

### **2.3 Institutional theory and Accounting**

There is no universal definition of an 'institution'. Scott (1995: 533) defines an institution as consisting of "cognitive, normative, and regulative structures and activities which provide stability and meaning to social behaviour. Institutions are driven by various carriers (cultures, structures, and routines) and they operate at multiple levels jurisdiction. In this conceptualisation, institutions are multifaceted systems incorporating symbolic systems, (cognitive constructions and normative rules) - i.e. the regulative processes carried out which shape social behaviour. As such meaning systems, monitoring processes, and actions are all interwoven".

#### ***Cognitive pillar***

Cognitive elements of institutions are rules that constitute the nature of reality and a frame through which meaning<sup>29</sup> is made. Symbols - words, signs, and gestures - have their effect by shaping the meaning we attribute to objects and activities. Meanings arise in interaction and are employed to make sense of the ongoing stream of events.

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<sup>29</sup> In terms of the organisation's wider institutional context, its members conceptualise and give meanings to terms like "budget", "profit", and "costs" (Preston, 1995). The meanings of such terms are reproduced over time, and become embedded in the rules and routines which define their calculation. As such, accounting practices (e.g., budgeting) and accounting information (e.g., the return on capital employed) represents more than is commonly perceived. They include action and thought, and are more than simple decision-making aids (Swieringa and Weick, 1987). Perceptions and meanings are both cognitively and theoretically bound (Hodgson, 1988). Hence, the term "profit", for example would differ in interpretation for different professions.

Accounting routines facilitate interpretation of the work place, and can help individuals understand how their organisation is performing (March, 1988).

Social scientists have long recognised the importance of symbolic systems and shared meanings. However their early work treats these systems and meanings as internalised and subjective. Beyond the traditional view of institutional theory, formal control systems serve as symbolic displays, leaving actual work activities to be promoted by social means (Meyer and Rowan, 1977). Neo-institutional theory in sociology treats symbolic systems and cultural rules as objective, and external to individual actors. A cognitive perspective directs us to pay attention to the symbolic aspects of social life, however it would be a mistake not to attend to the activities also associated with these belief systems.

Previous research has found accounting to be a symbol of legitimacy (Carpenter and Feroz, 1992; Covalleski and Dirsmith, 1988; DiMaggio and Powell, 1983; Meyer and Rowan, 1977). Meyer and Rowan argue that certain elements of the formal structure in bureaucracies, function as myths. They cite accounting as an example. They argue that "Institutional techniques are not based on efficiency but are used to establish an organisation as appropriate, rational; and modern. The use of these techniques "display responsibility and avoid claims of negligence" (p. 344). They show that bureaucratisation is caused, in part, by the ubiquity of these rationalised myths in society. By designing a formal structure which adheres to the prescription of myths in the institutional environment, an organisation demonstrates that it is acting in a 'proper' and adequate manner.

There are a variety of cognitive elements (D'Andrade, 1984). Of these, 'constitutive rules' are the most important (Searle, 1969). These rules or "processes" involve the creation of categories and the construction of typifications (Berger and Luckmann, 1967: 39). Such processes are variously applied to things, ideas, events, and actors. Constitutive processes offer an explanation for much social behaviour and differ from lay interpretations, and from those found in social science. As Meyer, et al., (1987: 13) argue: "Most social theory takes actors (from individuals to states) and their actions, as real a priori, elements. Conversely we see the "existence" and characteristics of actors as socially constructed and highly problematic. The action is the enactment of broad

institutional scripts rather than a matter of internally-generated and autonomous choice, motivation and purpose".

### *Normative pillar*

The normative pillar focuses on normative rules which introduce a perspective, - an evaluative and obligatory dimension into social life. Normative systems include both values and norms. Values are conceptions of the desirable, (which along with construction of standards, existing structures or behaviour), can be compared and assessed. Norms specify how things should be done. They define legitimate means to pursue valued ends. Normative systems define goals or objectives (e.g. making a profit), but they also designate appropriate ways to pursue them (e.g. conceptions of fair business practices). The normative conception of institutions is embraced by sociologists, because it focuses attention on institutions where common beliefs and values are more likely to exist.

The accounting norm system consists of the institutional environment of the accounting action system<sup>30</sup>. It is characterised by "rules and requirements to which individual organisations must conform if they are to receive legitimacy from the environment" (Scott and Meyer, 1983: 140). The accounting norm system should not however be perceived as a system acting in 'perfect harmony'.

Different interests are represented within the norm system. These often consist of many individuals and organisational actors (Mezias, 1990). The norm system comprises 'the multiple institutional environment' of the accounting action system. The accounting norm system is involved in many activities (most of which can be designated as "talk",- both process and output). The rhetoric of accounting is one of its main activities.

The rhetoric of accounting plays a role in reducing uncertainty in decision-making and accountability (Mellempvik, et al., 1988; Miller and O'Leary, 1990). It is also the basis for most normative and positive accounting theory (American Accounting Association, 1977; Watts and Zimmerman, 1986). Rhetoric is fundamental to accounting as an organisational and societal activity (Birnberg, 1980; Jonsson, 1988).

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<sup>30</sup> The accounting action system comprises instrumental accounting activities. It operates within single organisations and can be divided into separate but interrelated procedures (e.g. the daily registration of transactions and annual reporting, Bergevarn, et al., 1995).

Rhetoric is important to the accounting norm system in the process of regulating norms (Puxty, et al., 1987; Johnson, 1988). It also generates and legitimises norms. Auditing is also involved in the accounting norm system (i.e. the evaluation of accounting procedures in relation to existing norms). From this perspective of the organisation, there are two types of norm systems - external and internal. Whereas an external norm system acts in order to co-ordinate the accounting action of organisations within its domain, an internal norm system acts mainly in order to adapt accounting action to its local context.

In theory, accounting norms should control accounting action. Although a strong link exists between norms and action, the latter may generate more organisational and societal qualities than are included at present in accounting rhetoric (Bergevarn, et al., 1995). This is because an implemented accounting procedure always confronts its context (Birnberg, et al., 1983; Boland and Pondy, 1983; Hopwood, 1983; 1987; Roberts and Scapens, 1985; Swieringa and Wieck, 1987; Nahapiet, 1988). The use of accounting in any environment can only be regulated by norms to a certain extent. The consequences of norms will therefore be different to those from intentions, (even though accounting action may be wholly controlled by norms).

As mentioned, a normative pillar includes values and beliefs. Definitions of value and belief differ in accounting. 'Values' are concerned with the legitimacy of the ends to which accounting is directed, while 'beliefs' are the confidence in the means of pursuing them.

In much of conventional accounting value is attached to capital (the maximising of shareholders wealth). This has a legitimate claim of being a universal value (Stewart III, 1994). Also important are the values of those who propose "social responsibility" or "green accounting" (Jones and Dugdale, 2001). An accountant's overriding duty is to be "a friend of the Earth" (Gray, 1990). Disagreement over the term 'value' can also be detected in management accounting's treatment of costs. Whether labour should be treated as a "variable" or "fixed" cost may be merely a technical issue. Advocates of the latter view suggest there are important humanitarian values at stake (Jones and Dugdale, 1998). These concern whether employees are to be treated as costs (that must be

reduced or eliminated), or whether organisations should (on moral grounds) provide secure employment for their members (Goldratt, 1994).

Disagreement over which path to pursue is accompanied by differing beliefs as to which means should be adopted. The last few decades have seen successive views of "management philosophy" with its familiar acronyms (JIT, TQM). They all propose differing suggestions. Often "new" philosophy runs counter to 'conventional' wisdom (Jones and Dugdale, 2001). To move from one perspective to another requires a fundamental shift in viewpoint. Hence, belief has to be established and should not be taken for granted). Since the 1980s, fundamental changes in views ("paradigm shifts") have been associated with the activities of "management gurus". Observers of this phenomenon have noted that 'beliefs' and 'faith' are important and in this respect not dissimilar to spiritual beliefs (Clark and Salaman, 1995; Wilson, 1996; Oliver, 1997).

Marsh and Olsen (1989: 21) developed a primarily normative conception of institutions: "The proposition that organisations follow rules (where much of the behaviour is specified by standard operating procedures), is a common one in bureaucratic and organisational literature. It can be extended to 'political institutions'. Much of the behaviour we observe in political institutions reflects a routine way in which people do what they are supposed to do".

Very little institutional accounting research examines the internal processes of an organisation. However, Burns and Scapens (1998; 2000) focus on the internal processes of routinisation and institutionalisation. They look at how accounting routines provide the normative basis (i.e. legitimation) for organisational action. Accounting routines have 'productive potential' (i.e. instrumental value). They can also embody norms, values, etc., which favour particular vested interests (ceremonial value).

For cognitive theorists, compliance occurs in many circumstances, because other types of behaviour are inconceivable. Routines are followed because they are taken for granted as "the way to do things". Whereas normative theorists emphasise the power of roles (normative expectation guiding behaviour), the cognitive framework stresses the importance of social identities, (i.e. our conceptions of who we are and what action make sense for us in a given situation).

### ***Regulative pillar***

Regulative processes involve establishing rules. They help in the review of others' conformity and can manipulate sanctions (i.e. rewards or punishments) in an attempt to influence future behaviour. These processes may operate through diffuse, informal mechanisms, involving shaming or shunning activities (Scott, 1995: 35).

Economists view institutions as resting primarily on the regulative pillar. North (1990: 4) argues that "[institutions] are perfectly analogous to the rules of a game in a competitive team sport. That is, they consist of formal written rules as well as unwritten codes of conduct which underlie and complement formal rules. Rules and informal codes are sometimes violated and punishment enacted. Hence, an essential part of institutional functioning is the cost of ascertaining 'violations'. Economists focus their attention on the behaviour of individuals, firms in markets and other competitive situations".

Force, fear and expedience are central ingredients of the regulative pillar. They are tempered by the existence of rules, whether in the guise of informal mores or formal rules and laws. Weber (1968) notes that few (if any) rulers are content to base their regime on force alone. All attempt to cultivate a belief in its legitimacy. Economics emphasises the cost(s) of regulation. Economic historians view this as an important function of the state. North (1990: 64) argues: "Because ultimately a third party must always involve the state (as a source of coercion), a theory of institutions also inevitably involves an analysis of the political structure of a society, (and the degree to which that political structure provides a framework of effective enforcement)".

Some institutional accounting research (e.g., Covalleski et al., 1993; 1996; Mezas, 1990) focuses on the impact of external legitimation in shaping accounting practice. For example, Covalleski, et al., (1993) suggest that pressures exerted by the US Federal Government were crucial in the development of a case-mix accounting system in the health industry. Mezas (1990) describes how various institutional factors (e.g. laws, expectations, professionalism) influenced the formulation of US accounting policies.

Cultures rely primarily on interpretative structures - (codified patterns of meanings and rule systems). The emphasised aspects of culture will vary according to which institutional elements are given prominence. Cognitive theorists stress the importance of categories, distinctions, and typifications. Normative theorists point to shared values and normative expectations; while regulative theorists look to conventions, rules and laws.

Simons (1995) introduces the idea of belief systems (i.e. organisation culture) into his 'levers of control'. He links belief systems to boundary systems, interactive control systems, diagnostic control systems and business strategy. The levers of control can be described as follows:

- (a) Belief systems - to inspire, and direct the search for new opportunities.
- (b) Boundary systems - to set limits on opportunity-seeking behaviour.
- (c) Diagnostic control systems - to motivate, monitor and reward achievement of specified goals.
- (d) Interactive control systems - to stimulate organisational learning and the emergence of new ideas and strategies.

Social structures rely on expectations associated with networks of social positions (role systems). These structures constrain and empower the behaviour of actors, while at the same time they are reproduced and transformed by the same. This aspect of structure, depends on which elements are put into effect. Cognitive theorists stress structural isomorphism. Cognitive typifications are often coded into organisational structures as differentiated departments and roles. Normative and regulative theorists are apt to view structures as governance systems, emphasising either the normative (authority) or the coercive (power) aspects of these structures.

Routines rely on actions which reflect the tacit knowledge of actors - (deeply ingrained habits and procedures based on prior knowledge and beliefs). Early institutionalists viewed habitualised actions, routines, standard operating procedures, and patterned activities as central features of institutions. More recently, evolutionary theorists such as Nelson and Winter (1982), point to the stabilising role played by participants' skills and organisational routines. These are activities involving little or no conscious choice, and

behaviour is governed by tacit knowledge and constrained by rules of which the actor may be unaware.

Nelson and Winter, (1982: 410-411) describe accounting as "a highly structured set of routines". Their work on evolutionary economics is useful in developing an institutional approach to management accounting research. An institutional approach recognises that accounting can both shape and be shaped by institutions which govern organisational activity. Managers now appear to be using their accounting systems and routine financial reports more flexibly, in conjunction with a range of other performance measures, (both financial and non-financial) (Kaplan and Norton, 1992; 1996; Miller and O'Leary, 1993; Ezzamel, et al., 1994; Burns and Scapens, 2000).

During the 1990s, a growing number of scholars characterised their contributions (in the interpretation of accounting systems) as 'organisational routines' (Roperts and Scapens, 1990; Dent, 1991; Scapens, 1994; Burns and Scapens, 2000, Burns 2000). In his institutional perspective on accounting, Burns (2000a) classifies these contributions into three different groupings: Neo institutional economics (or transaction cost economics), Neo institutional sociology and finally Old institutional economics.

There is a two-way relationship in both directions between rules and routines (Burns and Scapens, 1998; 2000). In effect, rules are formalised statements of procedures, whereas routines are the actual procedures used. Rules are normally only modified at intervals, whereas routines are in a cumulative process of change. Rules may be imposed and become implemented through routines, or they can emerge out of established routines.

In the context of management accounting, rules are made up of accounting systems (as set out in procedure manuals), whereas routines are accounting practices in use (Burns and Scapens, 2000). Clearly, there is a relationship between rules and routines, however it is important not to confuse the two. Any given management accounting system in use, may not accurately mirror the procedures set out in the procedure manuals (Robert and Scapens, 1985).

Structuration theory<sup>31</sup> is the relationship between activities of knowledgeable human actors and the structuring of social systems. Giddens distinguishes between systems, (comprising discernibly similar social practices), which are reproduced across time and space through human actions, and structures, which transform those social practices into systems. For Giddens, systems are not structures, but are structures drawn upon in action (Burns and Scapens, 1998; 2000; Jones and Dugdale, 2001).

Giddens set out to develop a theory of the production, transformation, reproduction and dissolution of social institutions by incorporating both structure and agency. These are the structural properties of social institutions (codes, rules and blueprints that influence and are influenced by social actions in day-to-day activities across time and space (Giddens 1984: 17). Agency is strategic actions of knowledgeable, reflexive social actors which illustrate their working lives.

Old institutional economics has defined 'institutions' as "a way of thought or action of some prevalence and permanence, which is embedded in the habits of a group, or the customs of a people" (Hamilton, 1932: 84; Scapens, 1994). This definition embodies both systems (thoughts and actions of prevalence and permanence) and structure (embedded habits and customs). Macintosh and Scapens (1990) argue that management accounting can be understood by drawing upon Giddens' three dimensions of structuration: signification<sup>32</sup>, domination<sup>33</sup> and legitimation<sup>34</sup>.

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<sup>31</sup> Macintosh (1994) summarises: "Structuration theory is the interplay between agent action and social structure, in the production, reproduction, and regulation of social order. Structures existing in virtual time and space, are drawn upon by agents as they act and interact in specific time-space. Agents are setting themselves the outcomes of these actions and interactions" (Macintosh, 1994: 172).

Giddens (1992) does not accord priority to either structure or action. Rather he advocates a study of social practices which both socialises (constitute) individuals as actors, and realise (embody) structures. Thus structure and action are "different ways of looking at the same thing" (Craib, 1992: 34). The production and reproduction of society is seen as a skilled performance for its members who draw upon both practical and discursive consciousness. 'Practical consciousness' is knowledgability about the world, while 'discursive consciousness' is our reflexive monitoring of action (Jones and Dugdale, 2001). The challenge in empirical work (based on structuration theory) is to keep in mind concepts of structure and agency and relate this duality to the inter-relationship of dis-embedded and embedded levels over time and space.

<sup>32</sup> Signification creates meaning in social interaction.

<sup>33</sup> Domination produces power.

<sup>34</sup> Legitimation provides a system's morality.

These three dimensions<sup>35</sup> also appear within institutional literature. Figure 2.1 illustrates the link between them.

**Figure 2.1: Institutional and Giddens' theory**

Institutional theory		Giddens' theory	
Old institutional economics	focus on	Signification	(meaning)
Neo institutional economics	focus on	Domination	(governance structures) reflects a concern for control
Neo institutional sociology	concerned with	Legitimation	of organisational forms and process

Source: Adapted from Scott, W. (1995); and Burns and Scapens (1998)

For institutions, levels may be operationalised as a range of jurisdictions taken from the institutional form. Scott (1995) identifies six categories: (a) levels of world system (b) societal (c) organisational field (d) organisational population (e) organisation and (f) organisational subsystem

This research has focused on the 'organisation level'. This means it focuses on the micro-processes, but does not ignore the broader (macro-institutional) dimension. To understand these micro-processes it is necessary to understand the wider institutional context. This involves both within the organisation (i.e. the organisation's specific milieu of rules, routines and institutions), and outside (i.e. the broader social, economic and political institutions of the organisational field, and the society in which the organisation is situated). Table 2.1 refers to those theorists whose work has pursued on institutional element at each of the specified levels.

<sup>35</sup> Macintosh (1994: 172) argues that the three layers (outlined in the abstract for analytical purposes) are closely entwined in reality. Accounting systems consist of signification codes and the interpretative schemes for applying them. They also include domination codes and resources (rights) used to draw upon them, and also legitimation codes and also norms for using them (Jones and Dugdale, 2001).

**Table 2.1: Institutional Pillars and varying levels: Illustrative theorists**

<b>Levels</b>	<b>Pillars</b>		
	<b>Regulative</b>	<b>Normative</b>	<b>Cognitive</b>
World system	North and Thomas 1973	Krasner 1983	Meyer 1994
Societal	Skocpol 1979	Parsons 1953, 1960a	Dobbin 1994
Organisational field	Campbell and Lindberg 1990, Schmitter 1990, Ezzamel 1993, 1996	Mezias 1990	DiMaggio 1991
Organisational population	Barnett and Carroll 1993a	Singh, Tucker, and House 1986	Carrol and Hannan 1989
Organisation	Williamson 1975, 1985, 1991, Burns 1997, Robert and Westin, 1999	Selznick 1949	Clark 1970, Burns and Scapens 1998, 2000.
Organisational subsystem	Shepsle and Weingast 1987	Roy 1952, Buroway 1979	Zimmerman 1969.

Source: Adapted from Scott, W. (1995)

It is possible to associate various ‘schools’ or ‘types’ of work with different locations in the property space, (created by the cross-classification of emphasis and level, see figure 2.2).

**Figure 2.2: Institutional Pillars and varying levels: Illustrative schools**

Levels	Pillars		
	Regulative.	Normative.	Cognitive.
World-system	Economic history		Neo-institutional sociology
Societal			
Organisational field	Historical institutionalism in political science	Traditional institutional sociology	
Organisational population			Population ecology
Organisation	Neo-institutionalism in economics		Evolutionary theory in economics
Organisational subsystem			Ethno-methodology

Source: Scott, W. (1995)- "Institutions and Organisation", p. 59

Scott (1995) discovered salient differences among schools aligned with neo-institutionalism. Sociologists emphasise a cognitive conception, cultural carriers, and macro level forces. By contrast, neo-institutional economists stress a regulative conception, structural carriers, and a micro focus. Different ideological perspectives share the same view.

Zucker (1977: 728) observed that “institutionalisation is both a process and a property variable”. Mohr (1982) differentiates between variance and process theories. Variance theories (associated with viewing institutions as entities), focus on abstract variables, (both independent and dependent), and attempt to establish their causal relations.

Variance approaches identify the factors causally associated with the phenomena of interest. Variance theories address the question: why did the observed effect happen?

A process approach addresses the question: how did the observed effect happen? This approach assumes that “history matters”. It believes how things occur, influences things that subsequently happen (Scott and Meyer, 1983). Burns and Scapens (2000) have used a process approach to explore the complex and ongoing relationship between actions and institutions. They demonstrate the importance of organisational routines and institutions in shaping the processes of change in management accounting.

This research adopts a process approach. The rationale for choosing this approach is because it allowed the researcher to observe the state of management accounting and control in the Egyptian water industry. Questions to be addressed include: How has the water industry changed? What needs changing? There have long been recommendations for a ‘process’ approach to be adopted in accounting research; - an approach which highlights the characteristics of accounting as a process, rather than as an outcome (Hopwood, 1987; Laughlin, 1991; Coaleski, et al., 1993; Scapens, 1994; Burns, 2000).

Management accounting systems and practices constitute organisational rules and routines. In order to understand the complex processes of the Egyptian Water Industry, it is necessary to examine both the internal and external institutional context of the organisation. An understanding of management accounting as organisational rules and routines, should enable the researcher to focus his energies on developing management accounting concepts, techniques, systems, etc. These are likely to be more useful in practice than the so-called ‘optimal techniques’- designed for abstract rational decision-makers (Burns and Scapens, 2000).

## **2.4 Conclusion**

This chapter has shown the importance of both contingency theory and institutional theory for explaining the design and use of a cost accounting system. The chapter has argued that while technical (or contingent) explanations of cost management were not rejected, they were clearly viewed as incomplete (Scott, 1987). Institutional theory adds the social and political elements, which were typically absent or de-emphasised in the

rational instrumental approach (which guides most of the recent research on cost management).

This chapter works with a definition of 'institutional theory' and its core elements: cognitive, normative and regulative. It states the researcher view of management accounting. This research contends that accounting in organisation is primarily concerned with external or macro institutional effects (social, economic and political) and management accounting as an institution within the organisation.

The chapter looks at previous accounting research and notes that very little institutional accounting research focuses on the internal processes of an organisation. Hitherto, most institutional accounting research has focused on the impact of external legitimisation in shaping accounting practice. This led the researcher to look at the institutional context within the GOGCWS (for example, which models of cost management were followed in the GOGCWS, and what methods of cost accounting were used in the GOGCWS, see sections 8.5, 8.6 and 8.7). It also led the researcher to look at the institutional context outside (i.e. the GOGCWS the legal framework for water industry in Egypt, the external supervision and control body of the GOGCWS and the suggestions by the consultants Black and Veatch International which related to cost management, see sections 8.1, 8.3 and 8.7).

The chapter links the three pillars of institutional theory (cognitive, normative and regulative) with accounting research. It also examines the differences among schools aligned with neo-institutionalism. For example, sociologists emphasise a cognitive conception, cultural carriers, and macro level forces. By contrast neo-institutional economists stress a regulative conception, structural carriers and a micro focus. As mentioned in section 1.4, this research adopts neo-institutional economic theory, this led the researcher to focus on regulative pillar of institutional theory.

The chapter points out the similarity between Giddens' three dimensions (signification, domination and legitimation) - and institutional theory. It focuses on the 'organisational level' of analysis. It gives the chosen approach of analysis, a process approach and offers a rationale for choosing it (see section 2.3). Furthermore, there have long been recommendations for a 'process' approach to be adopted in accounting research. Having

determined the theoretical framework of this research, the next chapter will discuss the role of management accounting from the institutional theory perspective.

## **Chapter 3**

### **Institutional theory and the role of management accounting**

#### **3.0 Introduction**

Management accounting (cost management) research is explained largely by rational economic theory, and neo-classical theory (the normative view). A major criticism of rational economic theory is that it fails to consider the behaviour of the firm. It also neglects the social and political context. Rational economic theory assumes the imperfect market does not exist and therefore neglects the monopoly market, uncertainty, and unpredictability.

In order to address these issues, this chapter examines alternative institutional approaches, - namely old institutional economic theory, neo-institutional economic theory and neo-institutional sociological theory. The chapter begins with a rejection of the core assumptions of neo-classical economics theory. It is argued that institutional theory offers a more useful theoretical framework for understanding management accounting (cost management) practices.

The aim of this chapter is to illustrate the role of management accounting, by examining the theory behind it. For this purpose this chapter is divided into four sections.

The aim of the first section is to illustrate the role accounting has come to serve in both micro-level (organisations) and macro-level (societies). There then follow three sub-sections: the first part explores several views on accounting, explains its role and examines the relationship between the state and accounting. The second sub-section is devoted to the role of accounting in micro-level organisations. It reviews the relationship between accounting and decision-making and its problems as outlined by Thompson and Tuden (1959). The third sub-section looks at the role of accounting in macro-level societies. It focuses on rational decision-making, economic rationality, differences between formal and substantive rationality, while also examining the process of accounting regulation.

The second section reviews the role of management accounting within organisations, from an economic perspective. Problems of management accounting within the organisational setting are discussed.

The third section reviews the different perspective on management accounting. It begins with criticism of management accounting from a neo-classical economic perspective. There then follows a review of management accounting from an institutional perspective, - (incorporating old institutional economic theory, neo-institutional economic theory and neo-institutional sociology theory).

The final section sums up the main conclusions of the chapter.

### **3.1 The role of accounting in organisation**

#### **3.1.1 Different views of accounting and its roles**

Previously accounting has suffered from the misconceptions of being too "narrow" or "technical". Accounting is portrayed as a simple technique, - merely a set of instructions for generating, processing and evaluating information (Carruthers, 1995).

Social science has demonstrated the richness and significance of accounting. Establishing links between accounting research and other paradigms has been an important part of this project. For example, theories of class conflict inform Bougen's (1989) investigation of accounting and industrial relations. Similarly, Miller and O'Leary's (1987) historical analysis of standard costing and budgeting employs Michel Foucault's conception of power. Likewise Baecker's (1992) discussion of accounting draws upon mathematical logic and literary criticism. Such examples serve to reinforce the relevance of accounting for a variety of issues (power, conflict, rationality, governance, and organisational behaviour).

Accounting has functional claims and pretensions<sup>36</sup> at its core. We are led to believe it is essentially concerned with the provision of "relevant information for decision-making". It has a "rational allocation of resources" and maintains institutional "accountability"

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<sup>36</sup> Littleton (1953: 18) in his search for a rationale, argues that: "There must be some basic concept which makes accounting different from all other methods of quantitative analysis. There must be a central idea which expresses better than any other the objectives, effects and results characteristic of accounting. A 'centre of gravity' if you will".

and “stewardship”. Accounting systems are seen as mirrors of both societies and the organisations in which they are utilised. At a societal level, accounting reflects on organisation’s ‘social’ relationships. The organisational level has recently been influenced by the emergence of contingency schools of thought in the study of organisational behaviour (Bruns and Waterhouse, 1975; Hopwood, 1974; Sathe, 1975; Waterhouse and Tiessen, 1978; Watson, 1975).

Accounting systems may be viewed as a product of the complexity, uncertainty of the organisational environment (Galbraith, 1973; Khandwalla, 1972). Accounting may also be seen as ‘technology of the enterprise’ (Daft and MacIntosh, 1978) or a strategy of corporate management (Chandler, 1962). Accounting is a discipline which can encompass a body of ideas, conventions, variable tools/techniques and a variety of actual practices (Boyns and Edwards, 1997). Hoskin and Macve (1992) note that “the power of accounting” is associated with the need to co-ordinate activities of departmentalised large-scale business organisations (Williamson, 1980; Johnson and Kaplan, 1987).

The varied role of accounting can tell us how it influences accounting discourse and the way people have sought to influence accounting. The various roles of accounting have changed its practice. Argyris and Schon (1974) point out a mere theory on paper is very different from theory in practice. The roles of accounting and its actual practice appear to have a rather equivocal relationship.

Functional claims for accounting stem mainly from professional institutes, accounting regulation bodies, state agencies and the academy itself. They very often reflect the pressures on those bodies and a need for a public legitimacy and rationale for action. Formulated in the context of particular institutional needs and actions, functional claims attempt to provide novel interpretations of the accounting mission (Burchell, et al., 1980).

The roles of accounting provide a normative structure for accounting thought. The roles define what accounting is, and ought to be about. These roles therefore facilitate the appraisal of accounting practice. Accounting has changed in terms of the roles it serves. Those who have sought to ‘extend’ accounting promote “corporate accountability” and

further “rational decision making”. Others point to the challenges which social change necessarily creates for accounting practice (Gilling, 1976).

The State exerts influence on accounting in terms of accountability and the furtherance of organisational and societal efficiency (Searle, 1971). Professional institutes and agencies concerned with accounting regulation adopt a similar stance. They emphasise the role accounting could play in improving the flow of information (useful for investment decisions of shareholders). Those practising accounting within organisations, point to its relevance in improving organisational efficiency and the maintenance of organisational control.

Shaoul (1997) claims that since the 1960s, mainstream financial accounting research analyses problems and issues in positivist or technical ways (in which the basic values of the model are not questioned). Issues are therefore conceived as purely technical problems. In financial accounting research, the issue was largely how to make public sector accounting more like that of the private sector. The debate therefore revolved around the value of *accrual* accounting.

Throughout the 1970s, emerging accounting research opposed the technical approach. This research re-examines the theoretical underpinnings of the discipline, - critically analysing the basic concepts of profit, value, efficiency, etc. Other research traces the history of accounting discourses and its pliability according to the social context in question. Other research has looked at accounting’s role as ideological in the distribution conflict over wealth. Some researchers have analysed accounting as rhetoric, examining its epistemological basis.

Critical accounting research has turned away from analysing contemporary events or outcomes of public policy decisions in ways that are useful or helpful to the broader public. This has happened at the very time when the public sector has faced interventions (in which accounting was to play a crucial role). A recent study by Edwards and Shaoul (1996) found that relatively few academic researchers have examined contemporary corporate events. There are also few accounting studies of corporate performance using primary sources (see Adcroft, et al., 1991; Berry, et al., 1985; Cooper and Hopper, 1988). Briloff and Chatov were the foremost accounting

critics of corporate behaviour in the USA. In the UK there was Stamp (see Stamp and Marley, 1970; Stamp, et al., 1980) and more recently, Sikka (see Mitchell, et al., 1992; Mitchell and Sikka, 1993; Russell, 1991).

The different views and roles of accounting are summarised in table 3.1 below:

**Table 3.1: Different views of Accounting and impact on its role**

<b>Views of accounting</b>	<b>Role of accounting</b>
Accounting is seen to have a core of functional claims	Provision of relevant information for decision-making, with the achievement of rational allocation resources.
Accounting is seen as a mirror of society, or a mirror of organisations	Reflects the organisation of social relationships (contingency theory).
Accounting is a discipline which encompasses a body of ideas, a set of variable techniques and a variety of practices.	Changes the practice of accounting.

Source: Adapted from Burchell, et al., (1980)

### **3.1.2 Accounting systems and organisational practice**

The relationship between accounting and organisational decision-making has been an influential basis for the analysis, development and articulation of normative accounting roles and "solutions". Many writers have noted the multiple roles which accounting systems can and do play in providing relevant information for decision-making. They help improve the rationality of the decision-making process and maintain the organisation in 'a state of control'. A problem however is that the relationship between accounting information and decision-making has not been critically examined. Burchell, et al. (1980) refer to the work of Thompson and Tuden (1959). Their study distinguishes between uncertainty over the objectives for organisational action, and uncertainty over the patterns of causation that determine the consequences of action (see figure 3.1).

**Figure 3.1: Decision-making and location of organisational uncertainty.**

		Uncertainty of objectives	
		Low	High
Uncertainty of cause and effect	Low	Decision by computation	Decision by compromise
	High	Decision by judgement	Decision by inspiration

Source: Burchell, et al., (1980)- "The Roles of Accounting in Organisations and Society", p. 13

When objectives are clear and undisputed, the consequences of action are presumed to be known. Thompson and Tuden highlight the potential for decision-making by computation. This situation might represent what Simon (1960) called 'structured decision-making', where the intelligence, design and choice phases are all programmable. Accounting systems serve as "answer machines", providing the simple investment appraisal methods, stock control systems and credit control routines which feature in management accounting texts.

With clear objectives but uncertain causation, the situation becomes more complex and the potential for computation diminishes. Thompson and Tuden see decisions being made in a judgmental manner. Accounting systems might be expected to provide assistance through what Gorry and Scott-Morton (1971) refer to as 'decision support systems' and Churchman (1971) calls 'inquiry systems'.

There are two reasons behind the extending of computational practice into the realms of the judgmental. The first reason stems from the increasing formalisation and objectification of management knowledge. The second from the extent to which accounting practices have become implicated in the development of neo-management and other more complex forms of organisational segmentation and management.

Accounting involves the implementation of changes in management practice. The increasing formalisation of investment appraisals and planning processes has extended the sphere of financial calculation. Developments in accounting practice have enabled 'operationalisation' of organisational efficiency and performance, - allowing objectives for action to be stated in less ambiguous terms.

Given the uncertainty over objectives and relative certainty over causation, values, principles, perspectives and interests will conflict. Standards for appraisal and the criteria for guiding the organisational task are problematic. Here political processes are important in the decision-making process. Modes of accounting can act as "ammunition machines" through which different parties seek to promote their own vested interests. In order to selectively channel distribution of information, certain parties implicated in organised action, can introduce neo-mechanisms for organisational control, and management of information-flow (Pettigew, 1973).

Where objectives are uncertain, accounting systems are often used to promote particular values. Mechanisms for organisational control are now arising out of the political and conflictive nature of organisational life. As Pfeffer (1978) states: "Structure, it would appear, is not just the outcome of a managerial process in which (organisational) designs are selected to ensure higher profit. Structure, rather, is itself the outcome of a process in which conflicting interests are mediated so that decisions emerge as to what criteria the organisation will seek to satisfy. Organisational structures can be viewed as the outcome of contests-for-control and influence occurring within the organisation. Organisational structural arrangements are as likely to be the outcomes of political processes as are organisational resource allocation decisions".

The design of information systems and accounting systems are often implicated in the management of political processes. For organisational actions and their consequences, accounting systems can influence those which become relatively more visible (Becker and Neuheuser, 1975) (particularly to senior management groups). The 'visibility' that is established is very often an asymmetric one. The powerful observe the less powerful, but not vice versa. It is a unique mode of surveillance that is established. The centralised co-ordination of activities may be established. Budgeting, planning and reporting can together provide a framework within which a measured and observed delegation of authority can take place.

With uncertain objectives and causation, Thompson and Tuden point out that decision-making tends to be 'inspirational' in its nature. As such, the accounting system can be created to serve as an organisational "rationalisation machine". The accounting mission focuses exclusively on those accounting roles which precede decision-making.

Accounting systems are often implicated in organisational processes. As Bower (1970) discovered, the widespread use of capital budgeting procedures has resulted in the availability of justification devices for proposals of organisational action. Accounting has gained widespread support, and has a simple provision of information for decision-making (for proposals which remain problematic). Similarly budgets can be built around what is likely to happen. Burchell, et al., (1980: 28) refer to the work of Meyer and Rowan (1978) who claim that: "Much of the irrationality of life in modern organisations arises because the organisation itself must maintain a 'rational corporate persona'. We find planners and economists who will waste their time legitimising plans already made, accounts to justify our prices, and human relations professionals to deflect blame from our conflicts. Life in modern organisations is a constant interplay between the activities that we need to carry on and the organisational accounts we need to give".

Some authors have looked at how accounting is 'implicated' in organisational practices (Burchell, et al., 1980; Hopwood, 1983; Neimark and Tinker, 1986; Hopwood, 1987; Knights and Collinson, 1987; Lehman and Tinker, 1987; Miller and O'Leary, 1987; 1990; Hines, 1988; Loft, 1986; Nahapiet, 1989). This 'constitutive' role of accounting to create particular conceptions of organisational reality, is especially potent in processes of organisational change. The role of accounting in actively constructing organisational purposes and rendering visible the issues, projects, and criteria which accrue significance in the pursuit of those purposes, has been considered by a number of authors (Hines, 1988; Nahapiet, 1989; Loft, 1986; Hopwood, 1983; 1987; Miller and O'Leary, 1987; Neimark and Tinker, 1986; Burchell, et al., 1980).

Accounting researchers agree that accounting techniques are an effective means of facilitating the process of allocating and utilising resources in pursuit of desired objectives. These techniques also produce a variety of other effects within organisations. Covalleski and Dirsmith (1986) suggest that budgetary systems can be used for representing vested interests in political bargaining processes, and in maintaining power-relationships within organisations. Likewise Bariff and Galbraith (1978) concluded that by manipulating the method by which information is processed, control systems can sustain or alter power-relationships within organisations. Nahapiet (1989) found in particular circumstances, accounting can be seen as a set of rules for

negotiating an understanding of organisational reality. This is contrary to being viewed simply as a mechanism for establishing an objective economic reality. Markus and Pfeffer (1983) have illustrated cases of accounting system failures in organisations (following the implementation of modified accounting and control mechanisms to achieve desired ends).

It is increasingly being acknowledged that accounting systems do not simply allow their intended objectives to be realised. The 'effects' of accounting are not necessarily confined to their designated use. As such, "the consequences of accounting do not necessarily have a close and automatic relationship with the aims in the name of which it was introduced" (Hopwood, 1984: 185).

Espeland and Hirsch (1990) in their case study of a conglomerate merger, illustrate the rhetorical power of accounting as a symbolic system for legitimating new corporate forms and practices. Similarly Jones (1992) charted the changing perceptions and use of accounting control systems to improve efficiency following a management buy-out. These studies have been central to the work which has explored the role of accounting in recent public sector organisational reform, (particularly the impact of new forms of financial control), (Broadbent and Guthrie, 1992; Dent, 1991; Humphrey and Scapens, 1990; Humphrey, 1991; Bourn and Ezzamel, 1986). The role of accounting changed from its previous concerns with probity, compliance and control, to one which focused on efficiency, effectiveness and cost saving (Richardson and Cullen, 2000).

Recent studies of organisational change in the private sector have shown pro-active accounting to be an important feature (Espeland and Hirsch, 1990; Jones, 1992) and in the public sector (Bourn and Ezzamel, 1986; Espeland and Bourn, 1990; Broadbent, et al., 1991; Hood, 1991; Broadbent and Guthrie, 1992; Humphrey and Scapens, 1992). It has been especially evident in studies of organisations earmarked for privatisation, (such as the Regional Water Authorities of England and Wales which supply water and sewerage services, Ogden, 1995a).

In the case of water, the constitutive role of accounting (in actively constructing organisational purposes and shaping new images of the organisation and its relationship with its environment), is especially evident. In response to new imperatives to cut costs

and improve financial performance, senior managers sought to re-focus and improve the ways in which the organisation was governed and controlled. As such, more attention was given to economic implications, particularly in term of costs and management decision-making. Subsequently considerable organisational resources have been given over to the development of more elaborate management information systems. These include: (a) developing, planning and control mechanisms (b) Ensuring detailed specification of objectives (c) Generating more accurate assessment and allocation of costs to each unit of operational activity and (d) Introducing performance indicators and output measures (to evaluate and compare achievements). Managers were given new training in management skills and were subject to a much more numerate and performance-based type of reporting and accountability (Ogden, 1995a: 198).

### **3.1.3 Accounting and Social Practice**

Accounting cannot, however, be conceived as purely an organisational phenomenon. Whilst arising out of organisational and institutional pressures, it is also a prevalent feature of the societies in which we live. Certainly the development of accounting itself has paralleled the emergence of numerous other specialised mechanisms for information-processing and social and economic calculation. These include statistics, the compilation of information for social and economic administration, instruments for social and economic categorisation in medicine, psychiatry, education, law and business and economic life (Baritz, 1960; Cullen, 1975; Kamin, 1974; Kendrick, 1970; Sutherland, 1977).

Marx saw accounting as an important tool in decision-making for capitalists. His ideas were taken up by Most (1963) and Bailey (1978). Most (1963) was critical of Marx for not discarding his ideological “baggage”, and rather concentrating wholly on management accounting. However it is important to note that Marx stressed the ‘social rationality’ of accounting. Social rationality encompasses ‘mystification’ of social relationships. Burchell, et. al., (1980: 19) refers to a Marxist text; “The way in which surplus value is transformed into profit by the rate of profit is a further development of the inversion of a subject which takes place in the process of production. In the latter we have seen the subjective productive forces of labour appear as productive forces of capital. The value (or past labour), which dominates living labour, is incarnated in the capitalist. The labourer appears as mere labour-power – (a commodity). Even in the

simple relations of production, this inverted relationship produces correspondingly inverted conceptions..."

Weber (1969: 86) stressed economic rationality: "From a purely technical point of view, money is the most "perfect" means of economic calculation. That is, it is the most rational means of orienting economic activity". Weber saw rationality in terms of the calculative means which might bring it about. He defined the 'formal rationality of economic action' as "the extent of quantitative calculation or accounting, technically possible, which is actually applied" (1969: 85). Weber (1969) distinguished between 'formal rationality' and 'substantive rationality'. He thought formal rationality provided an adequate means to achieve substantive rationality.

Hirst (1976) takes this argument further. He states: "Only formal rationality can adjust a means to an ends in terms of efficiency, (since it provides a quantitative measure of efficiency). A qualitative measure of the efficient use of resources is logically impossible. All economic action therefore requires formal rationality, and indeed, is modelled on formal rationality. Resources cannot be "rationally oriented" to economic ends without quantitative calculation. The definition of 'economic action' is viewed in terms of formal rationality. Formal and substantive rationality are not alternative and equally "rational" calculations. End-rational action (in the economic sphere) requires formal calculation.

Some commentators have stressed the role which accounting plays in allowing the devolution and decentralisation of economic decision-making. Others have pointed to the different internal pressures which should be taken into account when decision-making is centralised, (either in the hands of the monolithic enterprise, Chandler, 1962) or the state (Bettleheim, 1976). Accounting is seen as both reflecting and enabling the construction of society. Institutional forms and modes of social action are intertwined in its emergence and development.

In terms of technical elucidation and standardisation, attention has been given to the institutional and political components of the regulatory endeavour. In the case of inflation-accounting in the United Kingdom, it has been seen that the institutional mechanisms for accounting regulation arose at the interface between a critical media,

concerned agencies of the state and a profession concerned with preserving its powers of self-regulation and control (Zeff, 1972).

The interests of the state are changing. Initially inflation-accounting was concerned with the taxation of corporate income and the formulation of policies for macro-economic management. However other agencies of the state began to devote attention to the role which inflation-accounting might play in the implementation and furtherance of micro-economic policies for industrial recovery and growth. Others have looked at the role accounting plays in coping with both an economic crisis and threat of a changing social power structure.

In a regulatory environment, the conditions for accounting change are complex. Both technical and conceptual developments are required. However to be influential they have to root themselves in a dynamic constellation of issues which constitutes the accounting context. Privatisation led to many changes in different areas. Central to these changes was an all-pervasive managerial concern with introducing and operating more stringent forms of accounting controls over organisational activities. Initiatives in cost-conscious resource management, cost improvement programmes, performance indicators, delegated budgets, cost centres and new management information system have all been variously deployed. Managers have tried to give effect to politically - determined notions of efficiency, cost effectiveness, value for money, and greater financial accountability (Gray and Jenkins, 1986; Fry, 1988; Clarke and Cochrane, 1989; Dent, 1991; Humphrey and Scapens, 1990; Humphrey, 1991; Broadbent, et al., 1991).

Accounting is central to the processes of organisational change. Privatisation has changed accounting information systems and the uses made of accounting information. In the case of the ten Regional Water Authorities of England and Wales, Ogden (1995a) argued that there should be an increased emphasis attached to costs and cost-reduction to meet Government - determined performance aims prior to privatisation. He also stressed the need to enhance their efficiency profiles in the run-up to privatisation. This resulted in a management initiative that not only served to achieve the targeted improvements in organisational efficiency, but also to communicate new organisational

realities and promote cost consciousness as a mobilising rationale for organisational action.

Accounting has come to be seen as a social and institutional practice that acts upon individuals, entities and processes, and transforms them in an attempt to achieve a specific end (Miller, 1994). Accounting is widely seen as a powerful force, influencing both individuals and society (Jones and Dugdale, 2001: 35-36). Miller (1994:1) argues that development of interests in the social and institutional practice of accounting "entailed a move by researchers beyond those organisations at the executive level of research".

Accounting operates more broadly and deeply than appears apparent on the surface of specific practices (Jones and Dugdale, 2001). Accounting is embedded in (and constitutes) social relations, and the strong occupational organisation of accounting (Armstrong, 1987a; Anderson et al., 1997).

Accounting as a process constitutes, and is embedded in social and system relations<sup>37</sup>. The re-embedding of accounting is shaped by social relations of local contexts, (whilst simultaneously shaping those contexts, Jones and Dugdale, 2001). Time is organised around accounting periods - for example, it becomes structured around annual, quarterly, and monthly reporting. Accounting generates chronological cycles of planning and budgeting. Accounting thus regulates relations between individuals, the wider organisation, and parts of the actual organisation.

The claims of accounting to represent corporate activities faithfully, are in part, supported and reinforced by the institutional commitments of regulators, academics and politicians. They are all keen on the idea of "free markets". They characterise markets as "fair" distributive mechanisms. In other words, unimpeded markets (i.e. unregulated), are seen to reward the 'productive' with pecuniary compensation, and punish the "non-productive" with failure. Markets reward productivity and punish non-productivity in an even-handed manner. Hence, intervention into the operation of markets is considered

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<sup>37</sup> '*Social*' integration refers to the ways in which actors relate to each other. '*System*' integration is how institutionalised parts of systems relate to each other (Lockwood, 1964).

inappropriate. A reluctance exists among certain economists, regulators, and politicians to intervene directly into the operation of markets.

Despite the belief in the fairness of markets, there remains a need to monitor market operations at a macro<sup>38</sup> level, (as well as to monitor the success or failure of individual entities as they function in a market economy). Regulators often call upon accounting (with its representational claims) to make the effects of the economic, "visible" and measurable. Accounting is thus seen to act as a scorecard by which we identify productive and non-productive entities. The representational claims of accounting are reinforced when its practices are called upon to provide a window through which to view specific entities operating in the market. This in turn allows us to view operations of the market.

The representational claims of accounting are reinforced by a commitment to the efficiency and effectiveness of markets. They also help maintain a commitment to the non-intervention in the functioning of such markets. As accounting is seen to provide a window into markets, questions about the "fair", "effective" or "efficient" functioning of markets may be re-framed as questions about existing accounting practices.

## **3.2 The role of Management Accounting**

### **3.2.1 Economic perspective**

Ward (1992) discussed the role of management accounting and claimed that in most businesses it is normal to separate the financial function into three main roles. These are:

- (a) Recording the financial transactions of the business and externally reporting to shareholders the historic financial results of these transactions (i.e. financial accounting).
- (b) Raising the funds required by the business in the most appropriate manner (i.e. financial management or corporate finance).
- (c) Supporting the managers of the business in the financial decision-making process (and being part of that management team, i.e. management accounting).

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<sup>38</sup> See the role of OFWAT in the UK water industry (section 7.3.3).

The separation of management accounting from financial accounting is fundamental in highlighting the fact that management accounting does not concentrate wholly on recording past events or on presenting externally published financial statements.

Bromwich and Bhimani (1989) in their study of the development of management accounting in Britain highlighted some key issues. These include: (a) the role of the management accounting system for purposes of strategic decision-making (compared to those of everyday control) (b) The extent to which the system influenced, or was influenced by, organisational structure (c) The extent to which non-routine accounting information was used. Table 3.2 shows the development in management accounting.

**Table 3.2: The historical development of management accounting**

<b>Development</b>	<b>Date</b>
Cost and management control information	1890
Scientific management	1902
Break-even charts	1903
Standard costing and variance analysis	1908
Centralised accounting systems with decentralised functional organisation	1900
Capital and operating budgets	1910
Centralised control and decentralised responsibility	1920
Separation of financial and cost accounting	1923
Residual income method	1940
Simplex method for linear programming	1944
Discounted cash flow	1950
Total quality management	1950s
Cusum charts	1954
Optimum transfer pricing	1957
Computer technology	1960
Opportunity cost budgeting	1966
Zero-base budgeting	1969
Information economics and agency theory	1970s
Just-in-time scheduling	1970s
Activity-based costing	1980s
Target costing	1980s
Value-added management	1980s
Activity-based management	1990s
Benchmarking	1990s
Strategic management accounting	1990s
Supply chain management	1990s

Source: Adapted from Smith, M. (1995)- " New Tools For Management Accounting", pp. 6-8

The investigation into the role of management-accounting information (in complex operations) has focused on the interaction of disciplines in actual practice and the

formalisation and correction of deficiencies. The pioneering work of Robin Cooper, Tom Johnson and Robert Kaplan has been central to such developments since the mid-1980s.

Scapens (1991) found that while there is a large and growing tool-chest of modern management accounting techniques, (including cost-volume-profit analysis, activity-based costing etc.), "little can be said at the theoretical level about the techniques (tools) which should be used in practice" (p. 219). He goes on to argue that before the gap between theory and practice can be closed, "researchers must examine the various roles which management accounting fulfils within the organisation" (p. 221). Scapens (1991: 10) notes that "the terms cost accounting and management accounting are now used synonymously in textbook titles".

Dietrich (2001) outlines different economic perspectives on the firm and examines implications for the role and functioning of management accounting systems. He summarises the different approaches to management accounting in a simple 2 \* 2 matrix set out in figure 3.2

**Figure 3.2: The different roles of Management Accounting**

		<b>Knowledge</b>	
		That	How
<b>Authority</b>	<b>Constraining</b>	(a) Passive optimiser	(d) Active regulator
	<b>Co-ordinating</b>	(b) Passive co-ordinator	(c) Active co-ordinator

Source: Dietrich, M. (2001)- "Accounting for the Economic firm", p. 17

Before the role of management accounting can be discussed, certain terminology needs to be clarified (e.g. 'knowledge that', 'knowledge how', 'authority constraining' and 'authority co-ordination'). Loasby (1998) distinguishes between "knowledge that" and "knowledge how". "Knowing that" is knowledge of facts and relationships and is the result of formal education and the news. According to Loasby, traditional production functions are based on "knowledge that". Dietrich (2001) argues that if the use of institutions is based on "knowledge that", the necessary predictability will be generated by rules that operate as general constraints. This occurs in an optimising world where

rules act as parameters to decisions (i.e. institutions are part of a non-economic background to economic activity).

"Knowing how" is the ability to carry out appropriate actions to achieve desired results. This includes knowledge of a particular skill and of when and where skills should be applied. Dietrich (2001) claims that we can view "knowledge that" and "knowledge how" as respectively 'passive' and 'active', use of information. If institutions are underpinned by "knowledge how", spatial and temporal specific learning is necessary. This learning is a basic requirement for institutions to involve active participation in a social context, (rather than just operate rule-defined behaviour).

Dietrich (2001) argues that different perspectives on the firm, view authority as either being necessary for co-ordination purposes, or see it as a constraint on economic activity. If authority exists for co-ordination purposes, it is viewed as having a positive role in the perspective concerned. For instance, clearly defined authority (and the co-ordination it provides), might be argued to have efficiency advantages. Authority as a constraint, is viewed (in general terms) as influencing relationships to promote the interests of particular economic agents. This constraining effect might involve ex-ante intentions (as with monopoly control over resource allocation).

There are four different roles of management accounting. (a) Management accounting is a passive optimisation tool, where authority is viewed as a constraint, and information-use described in a "knowledge that" manner. This is the world of textbook accounting. Hence the requirement for efficient and effective monitoring fails to recognise the importance of '*bounded rationality*' (Dietrich, 1993). The (implicit) complete contracting is based on a universal "knowledge that" rather than learning-based "knowledge how".

(b) Much of the recent literature in accounting appears to have adopted a transaction-cost logic (neo-institutional economic theory). This is accounting as 'passive co-ordinator'. Accounting systems are viewed here as efficient responses to particular environmental conditions. Authority is one means of co-ordinating resource allocation and is necessary to economise on market-based transaction costs. The "knowledge that" basis of an accounting system is more problematic. We can refer to site and human asset

specificities here (see section 3.3.2.2). Any management accounting system involves set-up costs and 'learning-by-doing', (i.e. the system itself will have firm specific characteristics).

(c) The 'competence' theory of the firm<sup>39</sup> has been shown to involve a more active role in management accounting (but this is still one of co-ordination). This active role involves recognising accounting as informal and routinised, as well as a formal activity. Authority is seen as co-ordinating, and decision-making is based on "knowledge how" rather than "knowledge that". The competence approach emphasises the rationale of the firm, and its long-running competitive advantage. This theory sees institutional characteristics as derived from individual decisions and activities, (i.e. it is based on methodological individualism).

(d) Management accounting prevents what might be called an 'active regulator' (when accountants use constraining authority and "knowledge how" information). "Knowledge how" and learning are linked to co-ordination (described in terms of direction and routines, and hence institutional development). A constraining authority - ("knowledge how") has, what might be called a 'reserve logic'. Institutions are given an existence that logically precedes individual activity, (i.e. it is methodologically holist). Dietrich (2001) argues that the limitations in a constraining authority - ("knowledge how"), should be viewed as leading to more than just exchange-based economy. Dietrich (2001) claims that implications of this general framework affect accounting in two ways: (a) By viewing accounting as a professionalised activity (B) by incorporating a symbolic as well as instrumental significance.

Dietrich and Roberts (1997, 1999) suggest that traditional economic approaches to professionalisation are incomplete as they adopt either efficiency or power. Dietrich (1997), (using institutional analyses of the role of accounting - e.g. Armstrong, 1985; 1987; Fligstein, 1987), shows professional accounting control within an organisational

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<sup>39</sup> The basic difference between the contracting and competence perspective can be understood (in game theoretic terms) as the difference between the prisoner's dilemma and co-ordination problems (Foss, 1993; Longlois and Robertson, 1995). Contracting (prisoner's dilemma) analysis is oriented towards issues of motivation and control, (given the divergent incentives of the factors involved). The emphasis is on issues of organisation and co-ordinating behaviour rather than production. Conversely the competence perspective of the firm sees its basic nature in terms of the co-ordination of divergent capabilities. The way in which this co-ordination problem is solved, influences a firm's productive capabilities.

context, can become "locked-in". As Perkin (1989) found, this organisational dominance of professionals reflects a wider social dominance. It follows that accounting can channel organisational activity partly by formal rule-setting, but also by management of organisational context. This perspective is consistent with that suggested by Roberts and Scapens (1990) in which accounting is viewed as enhancing the position of particular organisational actors relative to others.

The second context is that organisational activity (specifically accounting activity), can be viewed as having a symbolic, as well as instrumental significance. For instance, Carruthers (1995) suggests that management accounting is a legitimisation tool for a firm's 'outside' world. If accounting practices are viewed as having purely instrumental significance, (whether this is contracting or competence-based), such legitimisation is irrelevant. It only becomes significant if institutionalisation processes are based on "participation in a social context".

### **3.2.2 The problem of management accounting in organisation services**

During the 1980s, criticism of management accounting practices began to appear in professional and academic accounting literature. The most prominent critic was Robert Kaplan, who, in a series of articles in the mid-1980s, questioned the relevance of current practices (Johnson and Kaplan, 1987). The principal criticisms of current management accounting practices can be summarised as follows: (a) Conventional management accounting does not meet the needs of today's manufacturing and competitive environment (b) Traditional product costing systems provide misleading information for decision-making purposes (c) Management focuses almost entirely on internal activities and relatively little attention is given to the external environment in which the business operates

Bromwich and Bhimani (1989) identify five persistent weaknesses in management accounting: (1) The subservience of management accounting to external financial accounting requirements (2) The lack of strategic considerations in management accounting and project appraisal (3) The reliance of management accounting on redundant assumptions concerning manufacturing processes (4) The maintenance of traditional assumptions in performance evaluation (5) The continued short-term orientation of performance measurement

Their findings are useful in providing indications of the likely direction of future research. In particular they identify: (a) the need to identify cost drivers which link processes to cost of output (b) the need to measure activity-based costs where these are meaningful and can lead to significant benefits (c) the benefits of non-financial accounting information in different manufacturing environments (d) the opportunity to incorporate both qualitative and non-financial, quantitative information into management accounting information systems (e) the increasing relevance of a strategic approach to management accounting.

Bjornenak and Olson (1999: 237) argue that conventional management accounting has focused primarily on the scope dimension<sup>40</sup> (i.e. what is accounted for, and for what period of time). The scope dimension includes sub-dimensions such as cost items, cost objects and allocation bases. Bjornenak and Olson (1999) argue that the system dimension<sup>41</sup> is almost non-existent in conventional management accounting (p. 328) and that the choice of time perspective plays no important role in management accounting.

Bjornenak and Olson (1999: 333) argue that the conventional view of a management accounting system includes a continuous view of the system itself. This means that the system is assumed to have longevity. This idea of the 'continuous system' was undermined when Madsen (1963) introduced the variability-based accounting system<sup>42</sup>. Bjornenak and Olson (1999) argue that the conventional management view of a management accounting system (one which uses different costs for different purposes), is challenged by the "different system for different purposes perspective". The "different systems perspective" operates at different levels in the organisation. They argue that the conventional wisdom of management accounting shows information symmetry as a way

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<sup>40</sup> The scope system includes three elements: (a) descriptive variability factors or descriptive objects (DO), (its purpose is to describe the variations in costs related to the object) (b) Causal variability factors (CVF) (describes the cause of variation) (c) Time. (The period of time accounted for, p. 328).

<sup>41</sup> The dimension system is the link between the users of the system and how the system is designed. There are two aspects in the system dimension: (a) the lifetime of the system (b) the integration of user aspects in management accounting (Bjornenak and Olson, 1999: 328).

<sup>42</sup> In this system, data collection was considered a continuous task, while reporting was made on both a continuous and ad hoc basis (Bjornenak and Olson, 1999: 333).

of achieving goal congruence through aggregation of cost data. Systems are designed in a top-down fashion because the centre is assumed to know which information has no value.

Management accounting faced a "crisis of confidence" (Dent, 1990) following "an acute failure of managerial expertise, and of calculative expertise in particular" (Miller and O'leary, 1993: 188). Following the "lost relevance" of management accounting (Johnson and Kaplan, 1987) there was development of a new market for new accounting - (e.g. activity-based costing, throughput accounting, target costing, economic value added). Traditional systems were condemned as producing irrelevant (mis)information (Jones and Dugdale, 2001).

Fitzgerald, et al., (1991) have argued that conventional standard costing and variance analysis do not provide useful information for cost control. The majority of costs are fixed with respect to changes in unit production volume, (which is often the case in service industries). Management accountants (Johnson, 1992) and operations managers (Nanni, et al., 1992) both agree that such techniques are irrelevant, untimely and cause manipulation of operations to meet the standard/budget.

Some authors have suggested ways of making management accounting more relevant via either activity-based costing (Cooper and Kaplan, 1988) or throughput costing (Galloway and Waldron, 1988). However, these initiatives would only address part of the problem. Service organisations<sup>43</sup> today compete on a range of dimensions, (not just cost and price), so a good planning and control system cannot focus on the financial dimension alone. Service costing systems must be seen in their wider context, (i.e. as part of management information systems<sup>44</sup> which embrace non-financial information).

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<sup>43</sup> Service organisations have five characteristics (Fitzgerald, et al., 1991). (1) The customer is present during the service delivery process, (which poses threats and offers opportunities to serve managers). (2) Many aspects of services are intangible, making it difficult to know what the customer values. (3) Services are heterogeneous in two ways: (a) The frequently high labour content means that service standards vary from person to person or from day-to-day. (b) Customer expectations may also vary. (4) Production and consumption of most services is simultaneous, so they cannot be counted or tested prior to delivery. Finally, most services cannot be stored because they are perishable.

<sup>44</sup> Management information systems are defined as "a system that enables both internal and external information to be reported at operational, tactical and strategic levels". Management information systems cover such dimensions as quality, flexibility and innovation, as well as finance, within an appropriate control model (Brignal, 1997).

It is commonly agreed that businesses today are competing across a range of variables, (not just cost and price), therefore their management information systems should reflect this (Kaplan, 1983; 1984; Sink, 1985). Fitzgerald et al., (1991) have argued that the measurement of service business performance across six dimensions, is a vital part of feed forward, (feedback control at the strategic business unit level). These six dimensions have been divided into categories. They measure the results of competitive success. "Competitiveness" includes market share, and financial measures include unit cost, profit and value added. The other four dimensions measure aspects of the determinants of that success (quality, flexibility, resource utilisation and innovation). Cost leaders will tend to focus on measures of resource utilisation and cost. Those following some form of "differentiation" strategy will slant the mix and weighting of measures of determinants towards their differentiating aspect, (such as quality). Measures of competitiveness will be necessary under either strategy. There will be interactions and 'trade-offs' made between the six dimensions as priorities change through the life cycle. These trade-offs may be of such importance to competitive success that they must be included in an organisation's reward system.

### **3.3 Theory of management accounting**

The academic production of accounting theory is closely related to economics (Jones and Dugdale, 2001) - (in terms of the theoretical approaches adopted, the disciplinary background of the individuals involved, and the organisational setting of university accounting departments). The issues addressed by those who construct and promote accounting theory may be very different from the concerns of practitioners - (shown by the long-running discussion of "the gap between theory and practice" - Edwards and Emmanuel, 1990). Similarly, Johnson and Kaplan (1987) cite the use of simple (abstracted) economic models by accounting academics in US business schools, as one of the key factors for management accounting losing its relevance for management at local level.

#### **3.3.1 Management Accounting from a neo-classical economic perspective**

The neo-classical theory of the firm seeks to represent the choice behaviour of the firm as a rational solution to the single-person-decision problem (Walker, 1998). Neo-classical theory has been criticised for its inability to address fundamental economic realities. Nelson and Winter (1982: 5) criticised "the inability of the prevailing theory to

come to grips with uncertainty, bounded rationality, the presence of large corporations, institutional complexity, or the dynamics of actual adjustment processes". In recent years various heterodox schools have emerged within economics. These include radical economics, institutional economics, post Keynesian economics, neo-Marxist economics. At the heart of many of these alternative approaches is a concern about the fundamental assumptions of (neo-classical) economic theory (Scapens, 1994). In particular, the assumptions of economic rationality and market equilibrium.

The two core assumptions of the neo-classical economic<sup>45</sup> stance are: (a) the rational maximising economic agent (b) the general equilibrium achieved by market forces (these have been increasingly challenged by institutional and other heterodox economists, Scapens, 1994). Institutional economists argue that these core assumptions are inadequate for such theoretical purposes as understanding economic change and analysing the process of transformation in a modern economy. They see both individual behaviour and the working of the market as influenced by institutions (which are social phenomena in need of theoretical explanation). Machlup (1967) claim that neo-classical theory of the firm was developed for market and industry analyses, not as description of what managers actually do. Scapens and Arnold (1986) argued that neo-classical theory was not intended as an explanation for the behaviour of managers within firms. The neo-classical theory of the firm does not analyse institutional arrangements which govern economic activity within the firm (Scapens, 1994). Walker (1998) argues that the neo-classical model was not designed for understanding the complex issues that arise in choosing an optimal organisational form.

Simon's concept of "bounded rationality" (in relation to Rational maximising economic agents), has had a significant impact on institutional economics (Scapens, 1994). Even the new institutional economists, (e.g. Williamson) claim to be influenced by Simon. They link Simon's concept of bounded rationality with economising on transaction costs. They thereby retain the concept of optimising economic rationality, (although rational choices are bounded by available information and information-processing ability). Simon argues that individuals must "satisfy, because they cannot maximise".

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<sup>45</sup> Scapens (1994) argues that old institutional economic theory has developed in response to neo-classical analysis. Old institutional economic theory makes the "institution" the unit of analysis, rather than the rational maximising behaviour of individual decision-makers. Neo-institutional economic theory has developed as extension to neo-classical analysis.

He links bounded rationality with 'satisfying', rather than optimising behaviour. In line with this view, old institutional economists argue that satisfying can be seen in rule-based behaviour.

Economic-based approaches to theory of organisations assumes self-seeking rational optimisation on behalf of all economic agents. In the specific context of management accounting, there are two potential problems with this approach (Walker, 1998). The first is that by ruling out bounded rationality on the part of decision-makers, one automatically rules out any explanation of a demand for accounting reports (which help decision-makers to understand their decisions). If all individuals are super-rational then they have no need for decision aids of any kind.

The second problem with super-rationality is that it implicitly carries the assumption that all individuals share a common understanding of the world in which they operate. This is an understanding which they all appear to share. The core problem of this approach is that it fails to consider a socially constructed reality. The influence of social and cultural factors on organisational structures cannot be easily captured by models which assume economic agents are adept at calculation.

The economics-based approach sees management accounting as "the provision of information which is designed to enable decision-makers to make optimal decisions" (Scapens and Arnold, 1986). Accounting research which adopts agency theory or transaction cost economics, focuses on equilibrium and optimal solutions. This form of research may introduce new techniques, but it does not assist our understanding of how such techniques become an established part of accounting practice in organisations. For example, it may be possible to demonstrate that the use of activity-based costing (ABC) is more 'rational', than cost allocations based on labour hours. However such 'rational' analysis cannot explain why ABC techniques come to be used in some organisations, but not in others. It also fails to anticipate potential problems or difficulties faced in the implementation process, (Burns and Scapens, 2000).

When viewed from a perspective of management accounting, (neo-classical economic theory can be seen to adopt a conventional wisdom's view of management accounting) for the provision of information in decision-making. This is associated with the design

of optimal organisational structures. Neo-classical theory of the firm provides an inadequate theoretical framework. The standard theory of the firm is based on the assumption of absolute certainty. This assumption is problematic. It cannot explain organisational structures, because there is no rationale for the existence of firms in a world of 'perfect' certainty. In other words, the conventional theory of the firm is inconsistent. Economic uncertainty *must* form an essential part of any attempt to explain why organisational structures are what they are. Conventional wisdom sees accounting as an outcome of "rational" behaviour, - aiming to maximise company profits through the provision of new "optimal" information (Hopwood, 1987; Burns, 2000). This "technical" view is grounded in neo-classical economic theory of the firm (Scapens and Arnold, 1986).

### **3.3.2 Management Accounting from an Institutional perspective**

As mentioned in section 2.1, there are three theories used in accounting literature namely: neo-institutional economics (transaction cost), old institutional economics and neo-institutional sociology.

#### **3.3.2.1 Old institutional economic theory and Management accounting**

Accounting from an Old institutional economic perspective can be understood in terms of the change in accounting routines that may be part of the assumptions and beliefs of an organisation (Scapens, 1994; Burns, 1997; Burns and Scapens, 2000). These assumptions and beliefs, (common to organisational members) are called "institutions".

Old institutional economics was introduced by Veblen (1898; 1919: 239) who defined an institution as the "settled habits of thought common to the generality of man". OIE is undergoing somewhat of a revival in research (Hodgson, 1988; 1993; Tool, 1993). It emerged in opposition to 'static' rational-actor economic theorising, and should not to be confused with neo-institutional economics.

Old institutional economic theory is "a thought or action of some prevalence and permanence, which is embedded in the habits of a group or the customs of people" (Hamilton, 1932: 84). Burns and Scapens (2000) apply old institutional economic theory concepts to show how accounting practices can become routinised. They explain

the nature of organisational rules and routines in the relationship between action and institution, (from old institutional economic theory).

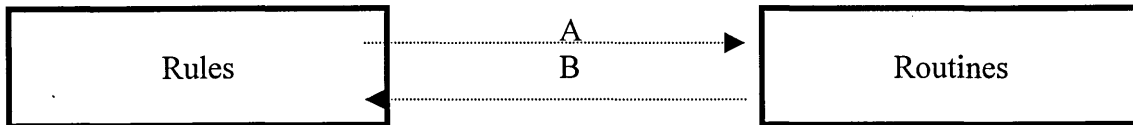
Burns and Scapens (2000) argue that habits are personal. Routines may involve groups rather than individuals. Therefore, routines represent patterns of thought and action which are habitually adopted by groups. Organisational routines play an important role in the relationship between actions and institutions.

Habits and routines are be particularly useful in dealing with the uncertainty and complexity of everyday life. In a complex and uncertain organisational world (i.e. the GOGCWS), it is impossible for an individual to make choices which are 'assumed' in rational economic models (Simon, 1957). Given that routines may involve groups, they become the components of institutions. Institutions may enforce formal and social coherence upon human activity, (partly through continuing production and reproduction of habits of thought and action, Scapens, 1994). Parsons (1940: 190) argued that "institutions are 'normative patterns' which define what it is to be part of a given group or society. Institutions are proper, legitimate, and expected modes of action or social relationship".

Scapens (1994) highlighted the importance of rules when he argued that "rules are necessary to co-ordinate and give coherence to the actions of groups of individuals". He argued that individuals are able to give reasons for following rules, and the rules themselves may be the result of earlier action. In this way, although rules and routines may give structure and coherence to individual action, the rules themselves will have emerged through actions (Scapens, 1994: 309). Institutional economists see the relationship between past actions and current rule-based behaviour, as complex and socially-constructed.

Burns and Scapens (2000) found a two-way relationship between rules and routines as illustrated in figure 3.3.

**Figure 3.3: The relationship between rules and routines**



Source: Adapted from Burns and Scapens (2000), "Conceptualising Management Accounting Change: An Institutional Framework"

Arrow A refers to the first direction between rules<sup>46</sup> and routines. It is here that rules are established (e.g. budgeting procedures), and through their implementation, routine will emerge. Arrow B refers to routines. These routines either deviate from original rules, or were never originally set out in the form of rules. In such cases, it may be decided to formalise established routines in a set of rules. Hence the process moves from routines to rules.

In order to explore the role of rules and routines in the relationship between actions and institutions<sup>47</sup>, it is useful to begin with Giddens theory. Giddens (1984) looked at the relationship between actions of 'knowledgeable' actors and the structuring of social systems. He distinguished between systems (which comprise discernibly similar social practices, - reproduced across time through individual action), and structures which bind those social practices into systems. His theory assumes systems are not structures, but contain structures which are drawn upon in action.

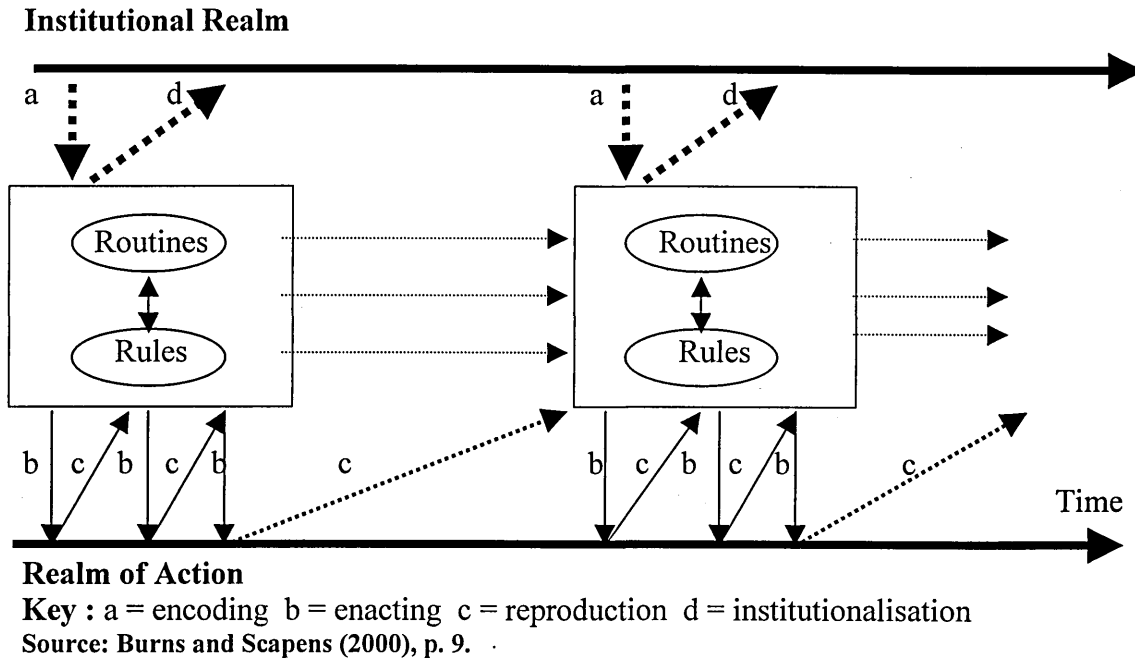
Burns and Scapens (2000) argue that both Old institutional economic theory and Giddens theory contain systems. These are thoughts and actions of some prevalence, permanence and structure, (i.e. embeddedness in habits and customs). According to Old institutional economic theory, it is important to view rules and routines as interacting between the realm of action and realm of the institutional (Burns and Scapens, 2000). Figure 3.4. illustrates this.

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<sup>46</sup> Formulated rules may become modified when a group finds mutually acceptable ways of implementing them (Burns and Scapens, 2000).

<sup>47</sup> Scapens (1994: 309) found there is no simple, one-way direction of causality between institutions and actions. There is a duality in the relationship between them. Institutions which influence actions, are themselves often the outcome of those actions. Hence, institutions do not determine actions, nor do actions create institutions. There is a duality between institutions and actions (Scapens, 1994).

**Figure 3.4: The process of Institutionalisation**



The framework combines both synchronic<sup>48</sup> (arrows a and b) and diachronic (arrows c and d) elements. Burns and Scapens (2000) found that there are four processes.

The first process (arrow a) indicates the encoding of institutional principles into rules and routines. Existing routines will encode prevailing institutional principles, (which in turn will lead to the formulation of routines). This encoding process draws on assumptions which comprise institutional principles and follows the process of change into existing meanings, values and power.

The second process (arrow b) involves actors enacting the routines (and rules) which encode institutional principles. The third process (arrow c) occurs when repeated behaviour leads to a reproduction of routines.

The fourth process (arrow d) is the institutionalisation of rules and routines which have been reproduced through the behaviour of individual actors. This involves a disassociation of patterns of behaviour from particular historical circumstances. Rules and routines therefore take on a normative and factual quality, which obscures their

<sup>48</sup> 'Institutions' constrain and shape action at specific points in time. Actions produce and reproduce institutions diachronically, (i.e. through their cumulative influence over time).

relationship with the interests of different actors. In this way, rules and routines become 'the way things are done'. In this way, routines themselves can be institutionalised. In other words, it becomes an established way of behaving. Routines become an unquestioned way of doing things. The institution assumes that these routines represent appropriate behaviour for a particular social group. The routines themselves are the local environment of the institution. If the institution is accepted in its external environment, the more likely it is to influence action and to resist change.

Management accounting in institutional theory (from an old institutional perspective) provides the basis for decision-making. It also assists in the formation of expectations and beliefs. The extent to which accounting practices give social coherence and meaning to organisational behaviour, and allows individuals, and groups within firms to give meaning to their day-to-day activities.

Burns and Scapens (2000) argue that Old institutional economic theory provides a focus for organisational routines and institutionalisation. In management accounting, OIE focuses on change in organisational routines. Burns and Scapens (2000) see management accounting as a routine, and therefore potentially institutionalised. They believe that management accounting can come to underpin the 'ways of thinking and doing' in organisations (Mouritsen, 1994). This means they view management accounting as an institution within an organisation.

### **3.3.2.2 Neo-institutional economic theory and Management accounting**

Neo-institutional economic theory has been studied by many researchers (e.g. Williamson, 1975; 1985; 1996; and North, 1990). Neo-institutional economic theory has been employed in accounting research (Spicer and Ballew, 1983; Johnson, 1983; Spicer, 1988; Colbert and Spicer, 1995). Scapens (1994) argues that neo-institutional economic theory remains firmly rooted in "static" neo-classical economic theory. On the other hand, Old institutional economic theory attempts to explain phenomena in "processual" terms, (examining why and how things become what they are (or are not), over time.

As Burns (1998) points out, the "markets and hierarchies" theory has probably exerted more influence on management accounting research, than any other branch of new-

institutional economics<sup>49</sup>. The discussion of this sub-section will restrict itself to the link between management accounting and transaction cost theory. The basic components of the transaction analysis framework are illustrated in table 3.3.

**Table 3.3: The Basic Components of the Transaction Analysis Framework**

<b>Transaction</b>	The cost of running the system, and include ex-ante costs (e.g. drafting and negotiating contracts), and ex-post costs (e.g. monitoring and enforcing agreements)
<b>Governance Structures</b>	
Markets versus Hierarchy	<ul style="list-style-type: none"> <li>- Markets - where transactions are conducted between firms, (e.g. manufacturer and wholesaler)</li> <li>- Hierarchies - (where transactions are conducted within a firm, (e.g. vertically-integrated supply chains) are compared for their relative efficiency in sustaining recurrent trading relationships</li> </ul>
<b>Assumptions regarding human nature</b>	
Bounded rationality	Decision-makers intend to be rational, but are constrained by their limited information-processing and communication abilities
Opportunism	Decision-makers may unscrupulously seek to serve their own self-interests, and it is difficult to determine who is trustworthy and who is not
Degree of asset specificity	Problematic, when an inter-firm relationship is supported by specific assets. (Degree of asset specificity, whose values are limited to outside the focal relationship)

Source: Standifird, S. and Marshall, R. (2000)- "The Transaction Cost Advantage of Guanxi-Based Business Practices", p. 17:18

Three factors determine the extent of transaction costs: bounded rationality, opportunism and asset specificity (Dietrich, 2001). In the absence of any of these

<sup>49</sup> The application of neo-institutional theory in accounting is not restricted to perspectives derived from economics. It is also evident that neo-institutional sociology plays an important role, (for example: Covaleski and Dirsmith, 1998; Covaleski et al., 1993).

factors, transaction costs will be zero, and asset specificity is given a pivotal role. Two types of specificity are particularly relevant for the current discussion. "Site" and "human"<sup>50</sup> specificity arise from 'learning by doing'. These asset specificities lead to ex post lock in between contracting partners. Hence, they aggravate bargaining and policing problems if 'arms-length' contracting is adopted. Such problems can be readily managed by using an authority relationship which is accepted by all contracting parties.

An existing management accounting system is consistent with a transaction cost logic. The development and use of accounting systems involve resource expenditures which transactions cost theorists deem as important. Systems provide an important means of codifying rights and responsibilities. Without this codification, the policing and economising of behaviour would be difficult (if not impossible). Changes in accounting system can be explained as response to change in the factors which determine transaction costs (e.g. bounded rationality and asset specificity). The historical development of management accounting has been analysed (Johnson, 1983; Johnson and Kaplan, 1987), likewise the internal organisation (Spicer and Ballew, 1983), transfer pricing (Spicer, 1988; Colbert and Spicer, 1995), and financial control (Ezzamel, 1992).

Zimmerman (1997) approaches management accounting from a neo-institutional economic perspective. He argues that management accounting cannot be properly understood without a theory of the nature of an organisation. Zimmerman's (1997) contribution shows how the transaction costs approach can provide a general framework to which all standard management accounting techniques can be applied. Zimmerman sees management accounting as a general organisational design problem. The design of an organisation involves three key issues: (1) the optimum division of decision rights (2) the establishment of systems for measuring and evaluating the performance of decision centres (3) the choice of system for linking rewards and promotions to measured performance.

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<sup>50</sup> In addition to site and human asset specificity, Williamson (1985) speaks of "physical" and "dedicated" asset specificity. The former involves specialised equipment, the latter, - generalised investments which produce outputs for specific customers. From a transaction cost perspective, human and site specificity lead to vertical integration, (i.e. firm-based organisation), whereas physical and dedicated specificity lead to quasi integration (Dietrich, 1994).

Transaction cost economics has been criticised for failing to recognise the importance of the institutional environment (Robins, 1987). Williamson's (1991) discussion of the hybrid form is a direct response to this criticism. Predictions concerning the hybrid form revolve around the existence of contract law (Williamson, 1991). The hybrid structure is one exception (Granovetter, 1985). Contract law characterises institutional structures. Lack of contract law is assumed to represent a lack of institutional structure (Nee, 1992; Xin and Pearce, 1994).

The main weaknesses of Zimmerman's (1997) theory is that he fails to discuss any alternative approaches, (and their respective strengths and weaknesses). He also chooses to ignore all sociology-based literature on management accounting.

Hopper and Armstong (1991) identify fundamental problems in the theoretical framework of neo-institutional economic theory (transaction costs economics). These are (1) the term "transaction costs" has never been precisely defined (2) There is a failure to consider links between product markets, power and organisational forms (3) There is a failure to take into account the influence of social and political processes on the development of firms (4) A failure to consider the potentially exploitative nature between capitalist firms and their employees. In relation to point one, Walker (1998) argues that 'labour process theory' is also guilty of using terms which are difficult to precisely define, (e.g. "class", "power"). "It is difficult to see why product market conditions should influence organisational form (at least as a first order effect)", (his response to the second point). The problem with considering political and social forces is the implication that one cannot study any economic phenomena in isolation from everything else", (his response to the third criticism).

### **3.3.2.3 Neo-institutional sociology theory and Management accounting**

Scott (1987) distinguishes four sociological research directions and offers a definition of institutional theory which has been utilised in organisational analysis. The first approach sees the structure of the organisation as adaptive, and the result of individual and environmental influences/constraints (Selznick, 1957). 'Institutionalisation' refers to this adaptive process, (Scott, 1987: 493).

The second approach sees institutionalisation as a process of 'creating reality', and is based on the idea of a 'shared reality', (i.e. a construction created in interaction between people), (Berger and Luckman, 1967). 'Institutionalisation' is viewed here as the process whereby actions are repeated over time, and are assigned similar meanings by the subject and by others. In this process, individuals come to accept and share a definition of reality (Scott, 1987: 495).

The third approach has its roots in the work of Berger and Luckman (1967). Institutionalisation is seen not as a process here, but as a set of elements (Scott, 1987: 497). Meyer and Rowan (1977) suggest that organisations adapt to the wider environment in order to gain legitimacy, resources, stability and survival. An organisation can gain legitimacy by turning to experts in a specialist field, (e.g. accounting). The external symbolic, rhetorical or political order is a major influence on the internal structural order. DiMaggio and Powell (1983) propose three ways in which an organisation conforms to symbolic order: (1) coercive (2) mimetic and (3) normative processes.

The fourth approach sees institutions as distinct societal 'spheres'. There are 'symbolic' and 'behavioural' systems, but these differ from institutional 'spheres' (Scott, 1987: 499).

Sociological theory shares a concern with the normative institutionalist approach. Sociology theory looks at the role values play in shaping behaviour within a structure. Selznick (1957) distinguished between organisations as 'structural expressions of rational action' and organisations as 'normative and adaptive'. The latter view is similar to the March and Olsen perspective (1989, 1995).

What appears to differentiate the sociological perspective from the normative institutionalist perspective is the relationship with the environment. This view, is common with one major strand of organisational theory. It looks at organisations as both dependent upon the resources of their environment, in turn, shaped by that environment. March and Olsen (1989, 1995) see institutions as largely autonomous 'actors', (at least after their initial formation). The sociological perspective places an institution on the periphery.

Neo-institutional sociology (DiMaggio and Powell, 1991; Scott, 1995) has previously been employed in accounting research (Covaleski et al., 1993; 1996; Carruthers, 1995). Although there is a significant overlap between Old institutional economic theory and neo-institutional sociology, the former deals directly with the emergence, continuity and change of institutions through time (Scapens, 1994). Neo-institutional sociology focuses more on "macro-institutions"<sup>51</sup> while old institutional economic theory examines micro-institutions within organisations (Scapens, 1994; Burns, 1996; 1997). Neo-institutional sociology research in accounting, focuses predominately on extra-organisational institutions (their social, economic and political effect) (Covaleski et al., 1993; 1996; Carruthers, 1995; Fligstein, 1998).

Miller (1994: 2) argues that "Whilst accounting shares with statistics the ability to translate qualities into quantities, it does so largely by translating these qualitative differences into financial values which need no further referent".

### **3.4 Conclusion**

This chapter has shown that there are different views of accounting. It has highlighted the relationship between accounting and organisational decision-making. This led the researcher to address the question "What role has accounting played in the GOGCWS?" (see chapter 11.2.1). This chapter has stressed the importance of the social aspect of management accounting. It concludes that accounting cannot be conceived as purely an organisational phenomenon. This led the researcher to examine the external environment of the GOGCWS (see chapter 9). It also led him to explore the social aspect of privatisation in the Egyptian water industry (see section 10.1).

The chapter has reviewed different views of management accounting and its different roles (passive optimiser, passive co-ordinator, active regulator and active co-ordinator). It highlights the problem of management accounting generally and in organisation services particularly.

This chapter has argued that the institutional theory approach has the potential to provide a useful theoretical framework for understanding management accounting (cost

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<sup>51</sup> For example a generally-accepted accounting principle at society level (Mezias, 1990).

management) practices. This led the researcher to adopt two propositions from institutional theory in order to explain the findings of this research. These two propositions are: firstly, government policy (coercive isomorphism) shaped the limited use of cost management for efficiency, optimisation and strategy; secondly organisations are the 'theatre' in which institutions are visible.

This chapter has given an overview of management accounting theory. It has criticised and shown the limitations of management accounting from a neo-classical economic stance. The chapter has outlined some alternative approaches to management accounting, (namely neo-institutional economic theory, old institutional economic theory and neo-institutional sociology theory). The next two chapters are going to discuss the elements of cost management (chapter four focuses on the first two elements: efficiency and optimisation and chapter five indicates the third element which is strategy).

## **Chapter 4**

### **Models of cost management**

#### **4.0 Introduction**

The aim of this chapter is to illustrate literature relating to a model of cost management. For this purpose, the chapter is divided into six sections.

The aim of the first section is to examine the concept of efficiency (i.e., Pareto efficiency, technical efficiency, and economic efficiency) and the ways of using cost management to increase efficiency.

The second section illustrates the link between institutional theory, transaction cost and efficiency. It argues that efficiency framework is favoured by transaction cost theories.

The third section reviews literature relating to activity based cost (ABC), emerging ideas and its core idea, the difference between ABC and traditional accounting systems, the adoption of ABC and its criticisms, the limitations of ABC and alternative approaches. It also highlights the relation between ABC and institutional theory.

The fourth section discusses activity-based management (ABM) as ABC cannot totally eliminate arbitrary allocation of overheads. The key extension of ABC is into ABM. This section discusses emerging literature on ABM and the similarity and differences between AMB and ABC, the difference between the views of traditional cost and ABM, and its cost and importance.

The final (fifth) section outlines the main conclusion of this chapter.

#### 4.1 Efficiency

The aim of this section is to review literature relating to the struggle for efficiency.

Control has two problems:

- (a) The regulation of the processes of the formulation of purpose
- (b) The regulation of the processes of purpose achievement

Thompson (1967) suggested these problems could be further understood through three major themes; firstly, the establishment of purpose; secondly, the pursuit of effectiveness; and finally, the struggle for efficiency.

The control of efficiency via the loop of the budgeting and reporting process, in connection with standard costing as a part of design and planning process, leads to the emphasis given to calculation and analysis of variances. For example Ezzamel, et al., (1994) stated that companies are focusing on improving the technical capabilities of their management accounting system in order to improve their costing calculations and therefore enhance their efficiency. But control of efficiency and standard costing might have become obscured by the attention paid to the observation and analysis of variances.

Pareto improvements<sup>52</sup> have come to be labelled improvements in efficiency, and, Pareto optimal situations have come to be labelled efficient situations, and in the process the special assumptions that “lie behind this persuasive shorthand have tended to become obscured” (Williams and Giardina, 1993: 66). It is quite difficult to resist a proposal which has apparently been demonstrated to improve efficiency, yet there may be very good reasons for doing so in certain circumstances.

Efficiency is the relative amount of inputs used to achieve a given level of output (Horngren, et al., 1999: 539). Efficiency is the relationship of outputs to given sets of inputs (Berry, et al., 1995). This relationship can be expressed in many ways. Accountants find themselves relating the value of outputs in the market-place to the value of inputs in the factor market place: raw material and supply, labour, management, capital and financing, and technology, concluding that efficiency gains

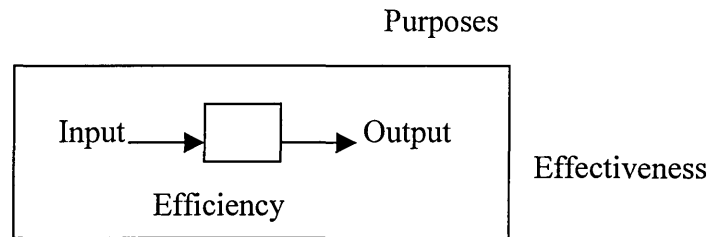
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<sup>52</sup> The general rule is that, if such a change means at least one person is better off, and leaves nobody worse off, that change is “Pareto improvement”, and if the system reaches a situation in which it is impossible to make someone else worse off, that situation is “Pareto optimal” (Williams and Giardina, 1993: 66).

might occur if either the value of the outputs rises per unit of input, or the cost of inputs fall per unit of output. It is helpful to notice that even technical efficiency gains measured in this way might be confusing in relative price changes and gains in technical efficiency during the transformation process.

Thompson (1967) argued that technical efficiency can only be discussed in a bounded system where the boundaries are closed for analysis, and that effectiveness can only be discussed in an equally, but different, bounded system. Purpose will tend to be unbounded and to be the product of social interaction.

**Figure 4.1: Bounding domains for purpose, effectiveness and efficiency**



Source: Berry, et al., (1995)- "Management control", p. 6.

Does efficiency variance occur in fixed manufacturing overheads? Horngren, et al., (1999) argue that the efficiency variance<sup>53</sup> pertains only to variable manufacturing overhead. There can be no notion of efficiency for fixed manufacturing overhead because this does not alter with changes in output level. With fixed capital equipment, the most important issue is not "what you have but how you use it". Against this, management accounting texts assume that capacity and efficiency are fixed at the level set by "currently variable standards based on efficient operating conditions" (Ricketts and Grays, 1988).

Miller (1989) argues that the vocabulary of cost provides the basis for an economic language of organisational motive, which subsequently informs the construction of new operational concepts of accountability and performance measurement. Priority objectives were seen in terms of "reviews of operating costs", "cost saving investment programmes" and "close examination of the potential for further cost saving". Better

<sup>53</sup> Efficiency variance: the difference between the actual quantity of input used and the budgeted quantity of input that should have been used multiplied by the budgeted price. Also called input efficiency variance or usage variance (Horngren, et al., 1999: 523).

management information systems, new performance measures, cost base reviews, new methods of budgeting, more rigorous business planning, the introduction of new technology and reductions in manpower were all extolled as a means of securing reductions in costs. Achievements and measures of performance were reported in terms of "cost saving".

Al-Hazami (1995) in his literature review on management accounting and the accounting and control paradigm concludes that three ways of using cost management to increase efficiency are discussed: throughput costing (Waldron and Galloway, 1988; 1989a, b; Darlington, et al., 1992; Dugdale and Jones, 1994; Tayles and Walley, 1994), benchmarking and target costing<sup>54</sup> (Monden and Hamada, 1991; Tani, et al., 1994), and cost leadership<sup>55</sup> (Porter, 1985; Simons, 1990). These ideas on cost management are driven by the economics of internal organisation and transaction cost analysis (Coase, 1937; Alchian and Demsetz, 1972; Williamson, 1975; Jensen and Meckling, 1976). A brief discussion on each of them - three ways of using cost management to increase efficiency - is given below:

The first method of using cost management to increase efficiency is throughput accounting (TA). Galloway and Waldron, published a series of articles in Management Accounting in late 1988 and early 1989 explaining the ideas of throughput accounting. They identify three concepts which should be taken into consideration:

(1) Manufacturing units are an integrated whole whose operating costs in the short term are largely predetermined. It is more useful and infinitely simpler to consider the entire cost, excluding material, as fixed and to call the cost the "Total Factor Cost" (TFC). Dugdale, et al., (1996) illustrate the core idea of this concept and say Galloway and Waldron point out that any approach to allocation of overhead, particularly depreciation, is likely to generate misleading information (for example, cost per hour rate) and so lead to poor decisions.

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<sup>54</sup> For target costing (see section 5.5).

<sup>55</sup> See section 5.2.2.

(2) For all business, profit is a function of the time taken for manufacturing to respond to the needs of the market. This in turn means that profitability is inversely proportional to the level of inventory in the system, since the response time is itself a function of all inventory.

(3) It is the rate at which a product contributes money that determines relative product profitability. And it is the rate at which a product contributes money compared to the rate at which the factory spends it that determines absolute contribution as sales revenue less material costs. If the total of this contribution from all products per unit time exceeds total expenditure per unit time then an overall profit will be generated (Dugdale, et al., 1996).

Galloway and Waldron's first concept indicates that throughput accounting presumes that all factory costs (except materials) are fixed in the short/medium term - the opposite of activity based costing, which presumes all costs to be variable! Throughput accounting is therefore closely allied with traditional contribution analysis which emphasises the importance of maximising contribution in order to maximise short-term profits.

The second concept is rather contentious. It is hardly self-evident that profitability is inversely related to manufacturing response time and Galloway and Waldron's corollary, in order to maximise, is hardly easier to accept.

The third concept is very similar to the traditional idea of "contribution per unit of limiting factor". Galloway and Waldron argue that profitability will be maximised by maximising the rate at which cash is generated (cash being the difference between selling price and material cost for each product), and they propose that products be ranked according to the throughput accounting (TA) ratio which is defined as:

$$TA = \frac{\text{Return per factory hour}}{\text{Cost per factory hour}}$$

Where: -

$$\text{Return per factory hour} = \frac{\text{Sales price} - \text{Material cost}}{\text{Time on key resources}}$$

$$\text{Cost per factory hour} = \frac{\text{Total factory cost}}{\text{Total time available on key resource}}$$

Dugdale, et al., (1996) argue that aspects of throughput accounting can be integrated into conventional theory. The particular usefulness of the TA ratio appears to be that it indicates whether, if one product only were manufactured, the result would be a profit or a loss (a TA ratio of more than 1.0 indicates profit, less than 1.0 indicates a loss).

In conclusion, cost derived by activity costing and by throughput accounting serve very different purposes. Activity costing aims to identify all overhead costs with a product as accurately as possible. A medium to long term time-scale is envisaged so that product strategy decisions can be reflected in changed levels of overhead costs. Throughput accounting costs focus on short term with overhead attributed to product accounting and usage of existing manufacturing bottlenecks. In short, the view of Dugdale, et al., (1996) is that the idea of building up product cost on a "throughput accounting" principle is probably impracticable.

The second way for using cost management to increase efficiency is benchmarking and target costing. The following section will discuss benchmarking and the fifth chapter will discuss target costing.

American Productivity and Quality Centre defines benchmarking as "a systematic and continuous measurement process, a process of continuously measuring and comparing an organisation's business processes against business process leaders anywhere in the world to gain information which helps the organisation to improve its performance" (Beretta, et al., 1998: 11).

Benchmarking was seen as a management technique to be used only by specialists and to be applied only when large breakthrough improvements were needed, often in a crisis situation. Benchmarking has since become an important tool in the management

process. It represents ongoing, structured comparisons with the goal of promoting continuous improvement from organisational solutions adopted by each company in managing its business processes. Clarke and Marton (1997) argue that benchmarking is a tool for change management.

There is no doubt that organisational aspects of the benchmarking process are crucial to the success of the project. Benchmarking attempts to help companies by providing reliable answers to two basic questions: how much can the performance of process be improved and which practices lead to best performance. Beretta, et al., (1998) argue that there are at least four methodological issues that are extremely critical to the success of benchmarking projects. These four methodological issues are: (a) how to define the performance measures (b) how to achieve comparability of performances (c) how to identify best practices (d) how to evaluate the transferability of best practices. The core idea of each element is discussed in turn

The first methodological issue is how to define performance measurement. Benchmarking is aimed at answering two basic questions connected to breakthrough performance improvement: (1) how much can a company improve its performance? (2) how to dramatically improve performance? Connecting performance measurement of accounting activities to value generation implies two logical shifts in performance measurement methodology: (1) changing the point of view: from organisational units (the accounting department) to organisational processes (the accounting processes). (2) expanding the traditional cost based perspective: from a uni-dimensional perspective (typically cost-based), to a multi-dimensional perspective (considering the process cycle, time and quality of services as well as cost).

The problem in defining performance measures is how to compose a well-balanced multi-dimensional vector (integrating cost, time and quality) for target setting and evaluation of an accounting process. The performance should include three performance measures: cost minimisation, cycle time minimisation and improvement of quality.

The second issue is to achieve comparability of performance. This issue relates to comparing company performances for benchmarking purposes. The boundaries or parameters of the process context need to be established for comparability of

performance targets derived from external benchmarks. The performance of an accounting process is dependent on the way resources (mainly human resources) are organised, the way technology (mainly information technology) is applied to the process, and the peculiarities of the process environment (or context).

In short, comparability of performance data has to be assured through the identification of the structural performance drivers that mostly influence the context in which the process is managed. For accounting processes, structural performance drivers are process specific more than industry specific.

The third methodological issue is to identify best practice. Benchmarking should not be limited to gap measurement. It should help management identify the drivers or practices underlying the best performance (Beretta et al., 1998). The starting point is the task of defining what is best practice. Although the idea of best practice implies universality, universality has two invincible enemies in benchmarking. The first is the fact that there is no practical possibility to include in a benchmarking study all the best practitioners. So, best practices are those that, having applied certain criteria of performance evaluation, have proved to work better than others among all that we benchmarked. The second enemy is the fact that in operations it is very difficult to prove that there is one best way of doing something.

In summary, for identifying best practices in accounting processes, an effective benchmarking methodology should clearly show the different ways accounting activities can be carried out and how they are connected with each other (practices). Also, it should highlight the functionality induced on accounting processes by non-accounting processes and practices (enablers).

The final issue is how to evaluate the transferability of best practice. Benchmarking is a methodology intended to facilitate learning from outside. However, sound practices developed by one company often cannot simply be adopted by another company. Identification of best practices should be followed by the test of transferability in different contexts. What is needed is a methodology for the specific to a well defined context.

## 4.2 Institutional theory and efficiency

Granovetter (1985) claims that transaction cost theory provides an under-socialised account whereas institutional theory offers an over-socialised perspective. More specifically, "economic approaches to the study of organisation, transaction cost analysis included, generally focus on efficiency" (Williamson, 1981a: 549). Whereas "institutional theorists place particular emphasis on legitimisation processes and the tendency for institutionalised organisational structures and procedures to be taken for granted" (Oliver, 1992: 563), regardless of their efficiency.

Peter and Royston (1997) argue that transaction cost and institutional perspectives are not necessarily in conflict, but are complementary elements of a constrained-efficiency framework. The constrained-efficiency framework illuminates the adoption of organisational designs by viewing organisations as efficiency seeking (Nelson and Winter, 1982) under cognitive and institutional constraints, as opposed to efficiency optimising.

Transaction cost theory has evolved from the initial question, why do organisations exist?, to address questions of more immediate concern to organisation theory. In particular, what designs will organisations adopt under various circumstances (Williamson, 1992)? Thus, Williamson (1981a: 568) suggested that the reason "there are so many kinds of organisation [is] because transactions differ so greatly and efficiency is realised only if governance structures are tailored to the specific needs of each type of transaction". Transaction cost explanations have been employed to examine hierarchies, franchises, multidivisional, conglomerates, holding companies (Williamson, 1975), clans (Ouchi, 1980), networks (Jarillo, 1988), and market-hierarchy hybrids (Williamson, 1991b). In each of these explanations, the rationale for existence of any given organisational design is its efficiency compared to the set of available alternatives, including markets (Winter, 1991). In this sense, the transaction cost explanation rests on a comparative-efficiency account of design selection (Klein and Shelanski, 1994).

Peter and Royston (1997) argue that the conceptual foundation for the constrained-efficiency framework is cognitive<sup>56</sup> constraints, competitive<sup>57</sup> pressures and institutional influences. For the purpose of this research the concentration will be on institutional pressures. Williamson (1992: 41) is explicit about the role of institutional environment suggesting that "the institutions of governance (firms, markets, hybrids, bureaus) are embedded in the institutional environment". However, the institutional environment envisioned by transaction cost economists consists only of the "set of fundamental political, social and legal ground rules that establishes the basis for production, exchange and distribution" (Williamson, 1993: 111). The institutional environment envisioned by institutional theorists includes its more cognitive and sociological elements, such as patterns of social relations (Burns and Wholey, 1993) and embeddedness interpretations (Meyer and Rowan, 1977).

Scott (1987: 493) pointed out, "the beginning of wisdom in approaching institutional theory is to recognise at the outset that there is not one but several variants". The critical consideration is the contrast between transaction cost theory, which addresses an organisation's concerns with efficiency, and institutional theory, which "demonstrates how non-choice behaviours can occur through the exercise of habit, convenience, or social obligation" (Oliver, 1991: 151). In its strongest form, the institutional approach rejects the premise that organisational phenomena are the products of rational choice based on technical considerations (Westney, 1993). Rather, emphasis is placed either on the decisions made, or on the pressures to secure legitimacy that operate on organisations, or both.

In general, institutional theorists have been more interested in explaining uniformity than diversity (DiMaggio and Powell, 1983). Isomorphism, a central concept within institutional theory (Westney, 1993), captures the extent to which the organisational designs adopted within organisational fields tend toward increasing homogeneity over

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<sup>56</sup> March and Simon (1958) recognised that decision-makers operate under cognitive constraints that make strict optimising theories untenable. In their framework, and that of Cyert and March (1963), decision-makers tend to conduct more-or-less limited searches among available alternatives to obtain satisfying, rather than optimising solutions.

<sup>57</sup> Although individuals are cognitively constrained in their pursuit of efficient organisation designs, one might still argue that efficiency-based competitive pressures should ensure that observed designs will be those in which organisational efficiency is optimised. However, Robins (1987) stressed that in the absence of perfect competition, optimal exchange efficiency need not always result.

time. This emphasis on uniformity naturally leads institutional theorists to focus on the organisational field, or even society at large, as the primary unit of analysis (DiMaggio and Powell, 1991).

Echoing Granovetter's (1985) concerns about over-socialised theory, Powell (1991: 194) suggested that "much of the imagery of institutional theory portrays organisations too passively and depicts environments as overly constraining." Finally, DiMaggio and Powell (1983) and Tolbert and Zucker (1984) recognised that institutional forces are not always primary, noting the tendency for early adoption to be driven by technical, as opposed to legitimacy considerations. These shortcomings are addressed by integrating elements of institutional theory into the comparative-efficiency approach offered by transaction cost theorists. The various institutionalisms (Scott, 1987, 1995) may be grouped into two broad categories of institutional effects: pre-conscious and post-conscious.

According to preconscious institutionalisation, organisations operate and make choices in environments where much is taken for granted. These elements, which are either infused with excess value (Selznick, 1957) or constructed in the process of social interaction (Berger and Luckmann, 1966), serve as powerful 'frames', shaping the decision-making process by influencing what is or is not perceived by decision-makers. Preconscious institutionalisation, in other words, corresponds to DiMaggio's (1988: 4-5) factors "that make actors unlikely to recognise or act on their interests". According to post-conscious institutionalisation, tangible forces in an organisation's environment directly or indirectly divert design adoption away from the proposed dynamic in transaction cost economics (i.e., comparative efficiency) and toward the dynamic of legitimacy.

Although the terminology may be new, these two constructs find support elsewhere within the institutional theory literature. Jepperson (1991: 147), for example, stresses that "one may take for granted some pattern because one does not perceive it, or think about it [preconscious]; alternatively, one may subject the pattern to substantial scrutiny, but still take it for granted . . . as an external objective constraint [post-conscious]".

Pre-conscious and post-conscious institutionalisation may be discussed in relation to Scott's (1995) normative and cognitive pillars of institutional theory. According to Scott (1995: 38-39), the normative pillar refers to sets of expectations within particular organisational contexts of what constitutes appropriate, and thus legitimate behaviour. Rational action is always grounded in social context that specifies appropriate means to particular ends; action acquires its very reasonableness in terms of these social rules and guidelines for behaviour. Here, choices are structured by socially mediated values and normative frameworks.

In other words, Scott's (1995) normative pillar is grounded in the "logic of appropriateness" (March, 1981); that is, what is expected of organisations. Scott's (1995) normative pillar may be viewed as either pre- or post-conscious institutionalism. Much of the writing on normative constraints emphasises how the normative expectations assume a taken-for-granted form; the ways of organising become unquestioned, and alternatives become unthinkable (Zucker, 1983). In this sense, normative expectations correspond to the current use of the term preconscious; organisational actors may simply be unaware of possible alternatives. However, as soon as actors deliberately consider alternatives, the normative expectation is no longer preconscious. Post-conscious institutionalism is evident when organisational actors are aware of the need to change, but actively consider only a limited range of alternatives, each of which is acceptable within the prevailing institutional context.

Scott's (1995) cognitive pillar of institutional theory was focused on the frameworks of meaning by which actors interpret and make sense of their world. Unlike bounded rationality within transaction cost theory, the cognitive influences emphasised by institutional theorists (e.g., Fligstein, 1991: 315; Greenwood and Hinings, 1996) relate to "the internalised symbolic representations of the world" (Scott, 1995: 40). The role of these symbolic representations has been examined through various terms (see Walsh, 1995) and there have been calls for a more careful synthesis of the cognitive and normative perspectives (see Scott, 1994). It is important to note that the cognitive pillar (as with the normative pillar) may be unwitting and therefore preconscious or it may be post-conscious.

### 4.3 Activity Based Costing (ABC)

This section aims to review literature relating to the cost of product generally and activity-based cost especially.

Cost accounting research has been concentrated on two broad areas (Vollmers, 1994):

- (1) The study of modern cost methods and techniques<sup>58</sup>, (e.g.; ABC<sup>59</sup>)
- (2) The study of the origin and development of cost accounting (Johnson and Kaplan, 1987; Ahmed, 1992), for example how budgeting and standard costing resulted in increased control over labour.

Horngren (1995) says in the U.S. during the past 30 years there were three noteworthy developments in management accounting:

- (a) In the early 1960s, emphasis on variable costing and contribution reporting; these ideas influenced designing and changing of the basic management accounting system
- (b) In the late 1970s, emphasis on Zero-based budgeting (ZBB), these ideas gave welcome attention to how to improve the budgeting process; but ZBB has practically vanished from actual practice<sup>60</sup>
- (c) In the late 1980s, activity based costing (ABC) dominated U.S. literature on management accounting. Furthermore, Johnson (1990) describes ABC, variance analysis, and return on investment as three of the most important management accounting theories in the twentieth century.

Activity-based costing (ABC) has been established for the best part of thirty years (e.g. Staubus, 1971) and its current popularity and form can be traced to the development and implementation in the U.S. (Cooper and Kaplan, 1988; Cooper, 1988). Use of ABC has spread quickly; to varying degrees, in the US, Canada, and the UK. One might expect the use of ABC to spread to other countries, particularly countries that share a common language and have similar capitalistic business cultures.

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<sup>58</sup> This involves theoretical development, e.g.; new cost drivers, or implementation of these techniques, e.g.; implementation of ABC.

<sup>59</sup> Johnson, 1988; Cooper and Kaplan, 1988; Jeans and Morrow, 1989; Noreen, 1990; Johnson, 1990; Innes and Mitchell, 1990; Bjornenak and Mitchell, 2000; Daniels, 1999; Malmi, 1999; Innes, et al., 2000

<sup>60</sup> ZBB has vanished because it has no history.

Some factors have contributed to the dissatisfaction with conventional costing systems.

The problem was caused by three compounding factors (Innes and Mitchell, 1995):

- (a) The structure of product cost<sup>61</sup> in many contemporary businesses had changed substantially, with production and non-production overhead costs growing in relative size and importance while direct labour had shrunk dramatically.
- (b) Direct labour and machine hours have persisted as major bases of production overhead absorption products. Both of these bases relate fairly closely to production volume and their use therefore rests on the assumption that overhead incurrence is output driven.
- (c) There is a shift in emphasis from production overhead costs driven mainly by output to production overhead costs driven by the diversity and complexity of production. Production overheads of this type have been concisely summarised by Miller and Volluman (1985) as falling within four transaction type categories: (a) Logistical transactions (b) Balancing transactions (c) Quality transactions (d) Change transactions.

Kaplan, (1994) argues that traditional cost allocation systems allocated overhead costs on simplistic measures such as direct labour, or sales dollars or direct costing systems that ignored overhead costs entirely for calculating the costs of products. Johnson and Kaplan (1987); Cooper and Kaplan (1988); Miller and Volluman (1985); all suggested Activity based costing – a two stage cost allocation model - to trace overhead costs to specific activities (cost pools) and then from these activities to individual products or groups of products using cost drivers. If we assume the previous argument regarding the traditional cost is right, it is less clear what new approaches could overcome these limitations.

ABC goes for greater complexity by expanding the notion of cost variability implicit in the second half of the procedure. ABC uses multiple "cost drivers" linked to functional activities in all parts of the organisation's value chain, assuming that only activities cause costs. These factors, together with the lagged relationship between resource consumption and cash spending, mean that ABC is not a perfect cost control or prediction model (Piper and Walley, 1990).

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<sup>61</sup> Product cost: The cost of a finished product built up from its cost element (CIMA, 2000).

ABC tries to solve the "allocation problem" identified by Thomas (1974), but Brignall (1997) argues that it is focusing on the wrong area: accurate product cost rather than cost engineering to gain a target market share at a predetermined price with acceptable profit, with planned cost reductions through the life cycle as in target costing (Hiromoto, 1988; Kato, 1993).

ABC may have some merits as a product costing system for those mass services (for example, Water services) which compete via a "cost leadership" strategy. As they have significant amounts of short-term fixed, indirect costs, it appears to be a cumbersome and ineffective method of cost management.

ABC systems could be valuable not only for analysing manufacturing overhead costs and influencing product design decisions, but also for assigning marketing, selling and distribution costs to customers, business segments and distribution channels. The costing field shifted from arguments on how to allocate costs (the traditional domain of cost accounting) to identifying the cost flows from organisational spending to supply resources that create the capability to perform organisational activities.

ABC systems came from two theoretical developments (Kaplan, 1994) that elevated the approach from deductive assertions to scientifically testable hypotheses:

- (1) Discovery of the cost hierarchy of indirect and support expenses
- (2) The distinction between costs of resources supplied and the costs of resources used i.e. the role for unused capacity costs.

In comparison with the conventional costing model, (full absorption costing 'FAC'), two major points are made by Kaplan and his colleagues:

- (1) They move away from the notions of short-term fixed and variable costs which are an important feature of management accounting's conventional wisdom, and focus on the variability of cost in the longer term
- (2) They propose a hierarchical resource consumption costing model which assumes that the costs which are shared at one level will be variable at a higher level (Scapens, 1991; Brignall, et. al., 1991).

ABC will generate product (or service) line costing which will differ from those produced by a traditional system primarily in respect of their indirect cost content. This is because costs will be attached to products in a way which reflects how these products have created a demand for, and effected the consumption of, the resources which comprise the organisation's overheads. Where this element of cost is material and where traditional methods of overhead costing (e.g. labour hour/cost rates) do not adequately capture resource consumption, then the use of ABC will improve the product cost information which is produced (Innes and Mitchell, 1995).

Turney, 1991a; Kaplan, 1995; and Cooper, et al., 1992 argue that ABC is important because it allows management accountants to become part of the organisation's value-added team by working in conjunction with other organisational and administrative functions. The Accounting function in firms which choose to adopt ABC moves from a narrow recording role to a broader management decision-support role. For example, it is argued that ABC provides more precise costing which leads to more informed pricing and more informal cost control. Furthermore, the information provided by an ABC system can also lead to changes in the operational design of the firm. Firms which choose not to consider ABC may risk having cost systems that possess computational accuracy but lack conceptual integrity (Emore and Ness, 1991)<sup>62</sup>. This is because the traditional accounting system merely collects and aggregates data but does not reflect or encourage the changes necessary in today's manufacturing climate (e.g. computer-aided-manufacturing, just-in-time production processes, or inventory management techniques such as material requirement planning). In addition, decision-makers tend to exclude accountants from the management team when they could benefit from their insight and expertise.

Bjornenak and Olson (1999: 326) argue that most studies examining the new models (techniques or ideas) focus on a limited set of characteristics, for example the cost function assumptions in the ABC model (Noreen, 1991; Christensen and Demski,

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<sup>62</sup> This does not suggest that ABC is appropriate for all firms. Contingency theory research in accounting argues that factors such as the environment, technology, and organisational size and structure influence the choice of accounting and information systems (Hayes, 1977; Bruns and Waterhouse, 1975; Waterhouse and Tiessen, 1978; Otley, 1980) and therefore, there is no "universally appropriate accounting system which applies equally to all organisations in all circumstances". In practice, Cobb, et al., (1993) also note that implementation issues (particularly lack of resources) continue to hinder the use of ABC in UK firms.

1995). Furthermore, they argue that the ABC literature identifies the need for different objects<sup>63</sup>.

Activity-based costing can be considered an administrative innovation. Evan (1996) distinguishes between technical and administrative innovations. For example, technical innovations include new products or processes while administrative innovations include such changes as new organisational structures and internal reporting systems. Hopwood (1974) and Merchant (1981) classify accounting systems as administrative innovation.

Damanpour and Evan (1984) suggest that administrative innovations more often lead technical innovations than the reverse. This implies that firms with innovative accounting (administrative) systems will be more likely to adopt technical innovations. Further, Dunk (1989) suggests that non-innovative accounting control systems can act as barriers to technical innovation.

Dunk (1989) also discusses the difference between technical and administrative innovations and focuses on the lag between administrative (accounting) innovations and technical innovations. Dunk suggests that one reason that organisations are loath to adopt accounting innovations (e.g. ABC) is because the perceived economic benefits of a change in accounting system are difficult to quantify. Kaplan (1984) and Johnson and Kaplan (1987) also contend that the cost of management accounting systems (which do not support financial reporting requirements) are difficult to justify economically.

Several surveys have examined the adoption of ABC in companies in the US and report a range of results. For example, Green and Amenkhienan (1992) state that 45% of responding manufacturing firms using advanced technologies have implemented ABC to some degree in their firms. Shim and Sudit (1995) state that 27% of the manufacturing firms surveyed had fully or partially implemented ABC. A 1993 study conducted by the Cost Management Group of the Institute of Management Accountants (1993) found that 36% of responding US firms had implemented ABC and a 1995

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<sup>63</sup> Bjornenak and Olson (1999: 330) identify three major developments regarding descriptive objects in the new techniques: (a) the traditional focus of responsibility centres and products extended to a larger number of factors (b) financial data is combined with non-financial data to extend the description of variability (c) external descriptive objects (e.g. competitors) and external descriptions of variability (e.g. customer satisfaction) are introduced in the techniques

survey by the same group (Cost Management Group of the Institute of Management Accountants, 1996) showed that the percentage of ABC adopters had increased to 41%.

In the UK, Innes and Mitchell's (1991) research on the implementation and use of ABC systems reveals that only 6% of surveyed U.K. firms had begun to implement ABC by 1990. Drury and Tayles (1994, 2000) who report that 13% of UK manufacturing firms had adopted ABC by 1991 found somewhat higher rates of adoption. Recent research indicates that the upward trend in adoption of ABC continues as Innes and Mitchell (1995) report that 20% of the top 1,000 firms in the UK have adopted ABC. Innes, et. al., (2000) review the changes that have occurred in the ABC adoption status of companies over a recent 5-year period and their result reveals that the use and interest in ABC has not increased in this time.

Although the result of Innes, et al., (2000) highlighted that the use of ABC has not increased over the past 5 years. Some changes have been observed in the purposes<sup>64</sup> of ABC. For example, there is an increase in the use of ABC for cost reduction, product/service pricing, cost modelling, customer profitability analysis, output decisions, new product/service design and decreased use of ABC for performance measurement/improvement, budgeting and stock valuation. Comparatively less research on adoption of ABC in Canada exists. However, a survey sponsored by the Society of Management Accountants of Canada found that 23% of responding manufacturing firms have adopted ABC (Armitage and Nicholson, 1993).

Shields and Young (1989) developed a theoretical model about the implementation of cost management systems (CMS) that is applicable to ABC. They identified seven behavioural and organisational factors as being critical to the implementation of CMS:

- (a) Top management support
- (b) Linkage of CMS to competitive strategies
- (c) Linkage to performance and evaluation systems
- (d) Adequate internal resources
- (e) Training
- (f) Non accounting ownership

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<sup>64</sup> The researcher acquired this knowledge from the comparison between the survey in 1994 and 1999 which was highlighted by Innes, et al., (2000).

This approach is in line with the tool approach where researchers survey managers to determine factors that appear to be important, and correlate these factors with success and failure (Shields, 1995; Gosselin, 1997). The table 4.1 summarises prior studies relating to ABC implementation.

**Table 4.1: Prior studies to ABC implementation**

<b>Study</b>	<b>Method</b>	<b>Implementation Model</b>
Cooper et al. (1990)	Field study of eight companies	Analysis and action
Anderson (1995)	Field study of one company	Initiation, Adoption, Adaptation, and Acceptance
Coderre (1995)	Theoretical model	No stages
Anderson and Young (1997)	Surveys and multiple case studies of 21 ABC projects	No stages
Mackley and Thomas (1993)	Field study of one company	Goal attainment, Adaptation, Integration and Long term development
Norkiewicz (1994)	Field study of one company	No stages
Shields (1995)	Survey of 143 firms that had implementation of ABC	No stages
McGowan and Klammer (1997)	Survey of 53 employees from 4 target sites	No stages
Gosselin (1997)	Mail survey of 161 Canadian manufacturing SBUs	Adoption and Implementation.

Lemond (1992) predicted that ABC would become a major force in Australia. Yet, Joye and Blaney, 1990; Dean, et al., 1991, Corrigan, 1996 and Booth and Giacobbe (1995) report little use of ABC in Australia. In fact Dean, et al., (1991) reported that only 8% of Australian firms had adopted ABC by 1990 and Booth and Giacobbe found a similarly low adoption rate of 12% in 1995.

Surveys of ABC systems in non-English speaking countries, for example, Sweden (Ask and Ax, 1992), Finland (Lukka and Granlund, 1994). France (Bescos and Mendoza, 1995), Spain (Sales, et al., 1995) and Denmark (Sorensen and Israelsen, 1996) suggested adoption rates below those recently found in the Anglo-American countries. Malmi (1997) reported low but increasing emphasis on ABC in Finland.

Kaplan, 1988; and Hartnett, et al., 1994 argue that firms are less likely to change management practices (e.g. ABC) when costs, especially those relating to inventory valuation, may have to be restated under financial accounting reporting requirements. In addition, successful adoption of management accounting practices will not occur without support from top level management (Shields, 1995).

In theory, it is possible to trace all overheads, but, in practice, it is quite difficult to trace some overhead costs such as head office administrative costs or joint cost to individual products, and hence there is still some room for arbitrary cost allocation. For example, Scapens (1991) described an allocation problem where there might be a temptation to terminate production of individual products when their joint production is still worthwhile. In addition, the ABC model has been criticised for being based on the simple economic analysis which underlies management accounting's conventional wisdom, and on the assumption that there is a sense of harmony and co-operation among operating units, and between operating units and service functions; it does not acknowledge the possibility of conflict over the allocation process (Ahmed and Scapens, 1991; Gietzmann, 1991; Bhimani and Pigott, 1992).

Most of the few studies which have addressed ABC success and/or failure have been the so-called factors studies<sup>65</sup> (Cobb, et al., 1992; Shields, 1995; Anderson, 1995). The focus has been on identifying factors which ABC success or failure. Shields (1995), for example, found top management support, linkage to competitive strategies, linkage to performance evaluation and compensation, training in implementing ABC, non-accounting ownership and adequate resources all positively correlated with ABC

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<sup>65</sup> The term "factors study" is borrowed from information technology (IT) implementation literature (Kwon and Zmud, 1987; Lucas, 1990; Cooper and Zmud, 1990), where it refers to studies which "try to identify those "factors" most related to IS implementation success and failure (Kwon and Zumd, 1987: 228). Most of these studies are typically cross-sectional seeking statistical correlation between factors hypothesised to influence implementation outcome and some measure of that outcome.

success. Cobb, et al., (1992), in turn, suggested that the major problems experienced with ABC related to the lack of adequate internal resources, particularly staff time and computer resources. Anderson (1995) identified 21 factors, related to the individuals involved, the organisation structure, the task, the technology employed and the external environment, which influenced ABC implementation at General Motors. One problem with the factor approach is that there is hardly any limit to the number of possible factors affecting the relative implementation outcome.

Argyris and Kaplan (1994) seek an alternative way of explaining ABC failure by presenting a behaviour model of why and how employees resist ABC. They build on Argyris (1985, 1990: 38), noting that "...barriers to change arise from the defensive routines that participants trigger to protect themselves from experiencing embarrassment and threat from the new idea' (see also Cooper, et al., 1992). Apart from the ABC context Markus (1983) argued that resistance to new information systems can be understood in terms of organisational power and politics. In a similar vein, Scapens and Roberts (1993) illustrated how division's attempts to increase unit accountability led unit management to resist a new accounting system. Malmi (1997) proposed that claims on ABC failure result, in part, from assessing the use and value of ABC's from the decision-making perspective.

Innes and Mitchell (1995) said ABC will not solve all of the complexities of product costing. Some arbitrariness will certainly remain. For example, some overheads are incurred at a level divorced from that of any individual product. Cost drivers may suffer from the problem of "jointness". If the number of orders is being used as a driver for procurement overhead and the direct material for a number of products is made on each individual order then the association of the cost driver with the individual products becomes problematic. Indeed the identification of sets of cost drivers, which explain 100 percent of the relationship between products and activity costs, is unlikely. ABC product costing has some technical difficulties.

Horngren (1995) said the ABC movement, in the late 1980s has been stimulating and beneficial. Nevertheless, the following aspects are troublesome:

- (1) Excessive of the past developments and excessive claims regarding what is new

- (2) The lack of respect for history. For example, although ABC had another name, its basic ideas were expounded in Longman and Schiff (1955: 70) as practical distribution cost analysis. Many scholars and consultants have neither time nor the inclination to explore the history of thought
- (3) Outrageous claims. These exaggerations included such statements as all costs are variable or all costs are fixed
- (4) Proneness toward regarding product costs as the major influence on decisions regarding pricing, product mix, and make or buy decisions
- (5) The proclivity to not practice what is preached
- (6) The lack of ABC in Japan. American literature abounds with descriptions of changes in management theory and practice inspired by developments in Japan
- (7) The frequent failure of ABC systems to distinguish between resources provided and resources consumed

ABC has maintained a high profile status as an important management accounting innovation for well over a decade (Bjornenak and Mitchell, 1999). However, despite a strong and durable advocacy (Cooper, 1988; Cooper and Kaplan, 1991; 1992; 1998; Kaplan, 1992), several reservations have been expressed concerning

- (a) The substance of its practical attraction (Bjornenak, 1997; Gosselin, 1997; Malmi, 1999), i.e. that it may be a fad or fashion, engendering a bandwagon effect rather than a genuine and useful technical enhancement
- (b) Its decision-making relevance (Noreen, 1991; Bromwich and Hong, 1999), i.e. that several restrictive (and practically unlikely) conditions must apply before the ABC information can legitimately be used to generate relevant costs for decisions
- (c) The problematic and costly design, implementation and operation of the systems required for ABC in an organisation context (Cobb, et al., 1992; Malmi, 1997).

Hornigren, 1995; and Innes and Mitchell, 1995 summarised the advantages from ABC as follows: ABC has generated enormous enthusiasm about its basic ideas. It links causes (cost drivers) with effects (changes in costs). ABC entreats us to choose cost allocation bases with great care. In particular, we should be aware of the fact that costs are driven by many factors other than the volume of units produced or sold. ABC has correctly advocated the use of multiple cost allocation bases that are appropriate cost drivers. It criticised the overuse of direct labour as a cost allocation base, particularly when it is

used as the lone base for applying indirect costs to products. ABC has stressed that executives manage costs by overseeing activities instead of products. The accounting for costs by activities highlights the interdependencies among activities in many departments or functional areas. ABC has emphasised that product costs are affected by all functions in the value-chain, not just by manufacturing alone. It has alerted managers to the existence of cross-subsidisation among the product cost where there is a wide range of operating and a wide range of products.

ABC advocates have started to admit that the complexities of a detailed ABC system may inhibit its use as an ongoing cost accounting system. ABC information may give a good indication of how a product has consumed resources in the recent past; this may bear little relationship to future incremental cost (from expansion) or future avoidable cost (from dropping the product). The use of ABC will generate information of relevance to cost control. Overheads are made more visible through pooling by activity and their underlying cause, to the extent it is reflected in their cost driver, is also indicated. ABC has given a greater understanding of cost behaviour, improved communication of cost information due to the logic of ABC. It is also directly related to how costs are incurred, particularly indirect labour costs, and the gathering of information to run the system can be a matter of some sensitivity. ABC will result in a new set of information, which can be used to measure aspects of operational performance within the organisation, i.e. cost drivers and cost driver rates. These may provide useful and quick regular feedback to line management and may help to foster cost consciousness and efficiency (Johnson, 1988).

ABC possesses several compelling positive attributes. It has the potential to contribute to strategic decision-making, cost control and management and performance measurement. But both system designers and users, in order to realise the benefits of ABC and minimise the costs, must exercise some care. Implementation success will depend particularly on attention being given to the following three factors:

- (a) A recognition of the nature and variation in ABC
- (b) A recognition that ABC is not a complete general purpose system which will meet all cost information needs

(c) A recognition that any ABC system will have some limitations and if not carefully designed and monitored will have the potential for dysfunctional consequences for the adopting organisations

Activity based costing has been seen to offer important advantages over traditional costing techniques including: enhanced product cost accuracy (Brimson 1991; Cooper and Kaplan, 1987; Roth and Borthick, 1989), more comprehensive cost data for performance evaluation (Berliner and Brimson, 1988), more relevant information for managerial decision making (Cooper and Kaplan, 1988), greater potential for sensitivity analysis (Shank and Govindaragin, 1989), and generally, in providing a novel outlook on value-adding organisational transactions and activities (Johnson, 1988).

Bhimani and Pigott (1992) argue that although research concerns over such consequences in relation to organisations implementing ABC have remained largely un-addressed. It has been acknowledged that behavioural, organisational and social factors are likely to be implicated in replacing conventional costing systems with more complex and innovative accounting techniques (Bromwich and Bhimani, 1989).

ABC is the basis of the cost assignment view in which resources are assigned to activities and then to cost objects (products). While this process can provide more accurate costing of products or services, it does not in itself manage costs (Rouse and Putterill, 2000: 368).

Regarding to the relationship between ABC and institutional theory, Soin et al., (2002) used old institutional economic theory to interpret the role of management accounting in organisational change. They present an interpretative study of the introduction and implementation of an Activity Based Costing (ABC) system in the clearing department of a UK-based multinational bank. Soin et al., (2002) was concerned with the interplay between management accounting and other agents of organisational change that drew on rationalities and legitimating for spheres such as scientific management and human resource management. Their paper drew on institutional theory in order to understand the extent of change, as a way of evaluating the relative roles of other institutionalised practices apart from management accounting and to assess the relative impact of the new management systems.

Although it is easy to find technical justifications for ABC in literature, sociological institutional theory does not automatically assume that particular techniques are chosen purely for their instrumental efficiency (Sion, et al., 2002). Actors often have a hazy view on the nature of the problem and have a socially constructed view of reality (Berger and Luckmann, 1966).

#### **4.4 Activity Based Management**

This section reviews literature relating to the cost of product in general and activity based management in particular.

Williams and Ashford (1994) highlighted four of the changes in control systems and product costing systems that may be necessitated by new manufacturing technologies:

- (1) Competitive pressures necessitating shorter product life cycles and faster introduction of new products and services. Management Accounting Control System (MACS) must respond with flexible management structures, project teams and new performance measures (NFIS)
- (2) Emphasis on activity analysis and the supply chain. MACS must respond with much closer attention to long-term supplier alliances and investigate activity-based management systems (ABM) and customers' profitability analysis
- (3) Adoption of Total Quality Management (TQM). MACS must respond with an increased emphasis on NFIS, to observe internal and external failure costs, to monitor prevention costs and to measure the costs of quality
- (4) Adoption of Just in Time management (JIT). MACS must respond by making wholesale modifications to traditional systems based on labour productivity machine efficiencies, rejection and wastage rates, and inventory holdings. These will no longer be appropriate and new NFIs must place the emphasis on service to customers and speed of delivery

The evidence suggests that it will be impossible to eliminate arbitrary allocations of overheads totally, even under an ABC system, so we must look beyond product costing to a more appropriate emphasis on process management. ABC may be a useful starting point.

The key to the extension of ABC into Activity Based Management (ABM) is a wider appreciation of the concept of “drivers”. We can no longer focus on cost drivers alone but must investigate the manner in which resources are consumed in non-dollar areas (Smith, 1997). Customers have perceived need in at least four areas, all of which require simultaneous satisfaction: lower costs, higher quality, faster response times, and greater innovation.

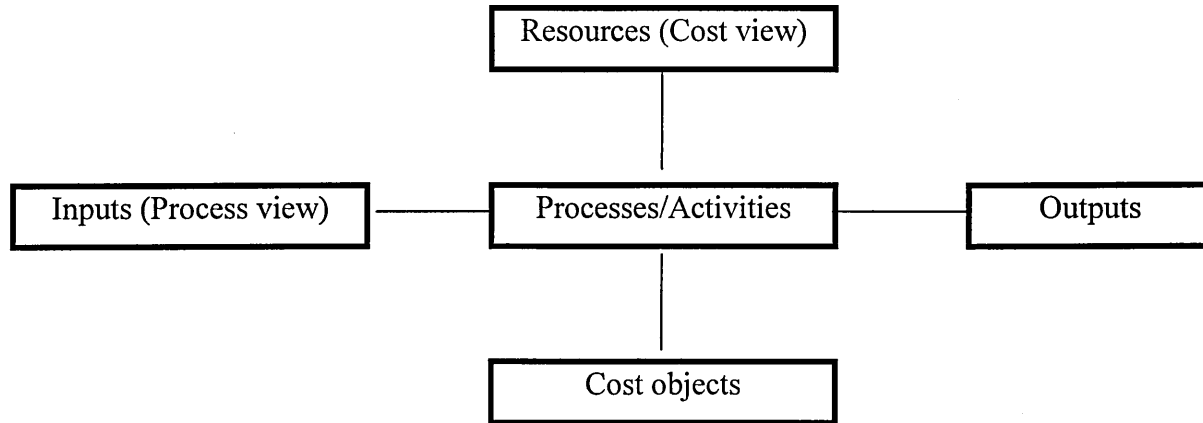
Activity Based Management (ABM) reshapes how companies manage costs. By understanding its activities, a company can expose opportunities for performance improvement that conventional cost accounting systems seldom detect. Cost management is improved by identifying what the organisation does and providing a benchmark to judge how much better a company’s performance might be (Brimson, 1996). Activity based management is a system of management which uses activity-based cost information for a variety of purposes including cost reduction, cost modelling and customer profitability analysis (CIMA, 2000). Activity-based management (ABM) is a system that incorporates many of the concepts of strategic management re-engineering and applies them to cost management (Trussel and Bitner, 1998). Activity based management is a modern cost accounting and management model that is consistent with the concepts of strategic management and re-engineering. ABM is both an accurate cost accounting system and a performance improvement tool (Turney, 1991b).

Business process re-engineering (BPR) is a management tool for redesigning business processes in order to obtain dramatic improvements in performance measures, such as cost and quality. The idea behind BPR is to fundamentally revise all aspects of performing activities, from a revision of strategic goals and operating objectives to an alternation of work methods. Under BPR, work should be focused on processes and not functional tasks (Harmmer and Champy, 1993). Activity-based management (ABM) is similar in nature to BPR but adds the analysis of the cost management.

ABM consists of two viewpoints: a cost view and a process view. Under the cost view, ABM is a cost accounting system (called activity-based costing). The value of the cost view is to determine the cost of a product in service. Under the process view, ABM is used to develop financial and non-financial performance indicators for the output of

each activity centre. The goal of the process is to measure performance (Trussel and Binter, 1998). The two viewpoints of ABM are summarised in figure 4.2.

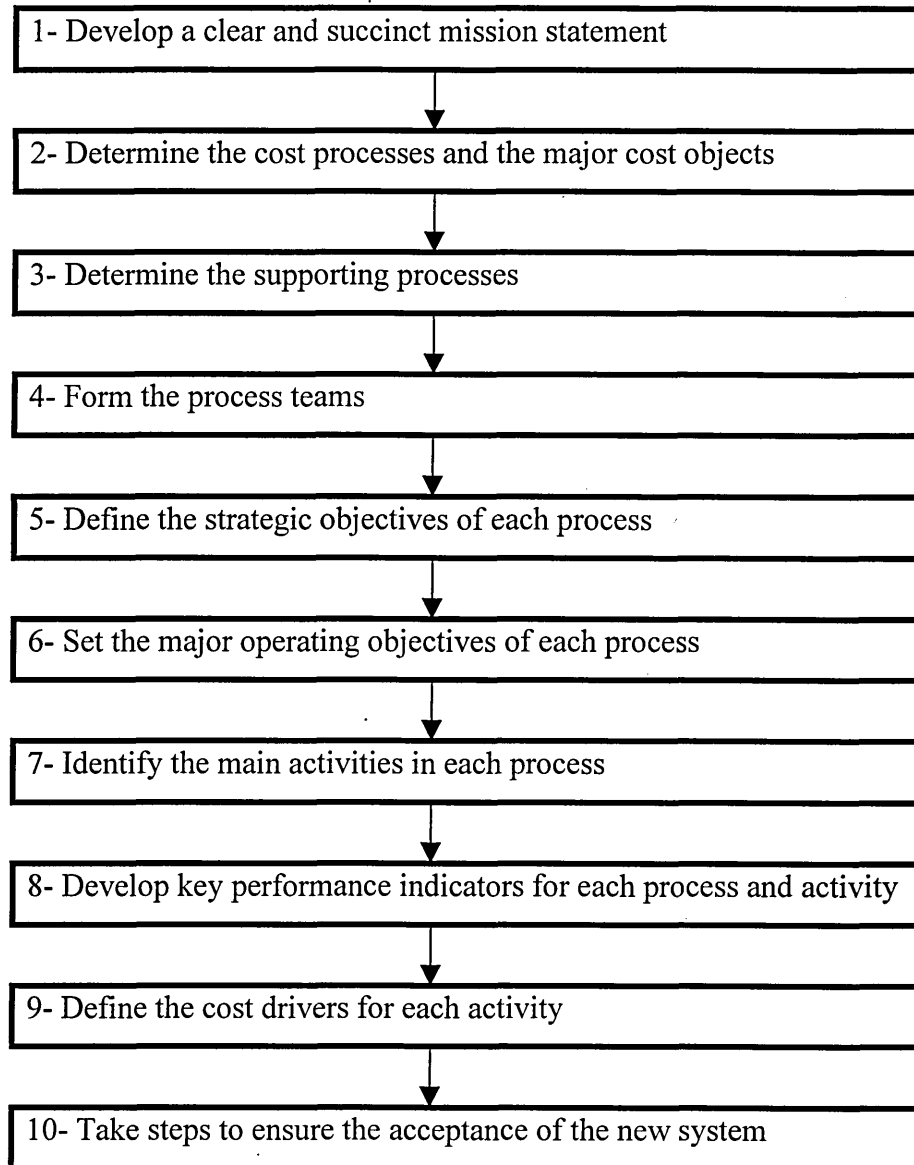
**Figure 4.2: Activity-Based Management**



Source: Trussel and Bitner, (1998)- "Strategic Cost Management: An ABM approach", p. 442

Rouse and Putterill (2000: 368) argue that cost management is pursued via ABM, which is portrayed in a process revealing the causes (cost drivers) of work or activities, and focusing attention through performance measurement on how activities are conducted. The process by which activities are triggered by cost drivers is shown separately to recognise that the mere occurrence of a cost driver may not in itself initiate an activity and that management authorisation may be required. Trussel and Binter (1998) determined ten steps for designing and implementing the process view of activity-based management. The steps are based upon procedures espoused by Hammer and Champy, 1993 and Cooper, et al., 1992. The steps of ABM are summarised in figure 4.3.

**Figure 4.3: Implementation steps of the process view of AMB**



Source: Adapted from Hammmer and Champy, 1993; Copper, et al., 1992; and Trussel and Bitner, 1998.

Cooper, et al., (1992) discuss the implementation strategies of ABM systems for eight companies: five manufacturing entities, one distribution company, one financial services provider, and one energy company. Anotos (1992) discusses ABM for a not-for-profit organisation. Hammmer and Champy (1993) discuss the implementation of business process re-engineering for several companies.

The steps necessary for designing and implementing the cost view of ABM follow (Cooper et al., 1992) the cost view of ABM called activity-based costing (ABC):

(a) Determine the activity centre

- (b) Assign costs to the activity centres
- (c) Define the cost objects
- (d) Link activity costs to the cost objects

The traditional view is that costs are best controlled by department managers who are responsible for minimising the variance between budgeted and actual costs by cost element. The emphasis is on efficient use of resources. The ABM view is that costs are best controlled by managing the workload, eliminating non-value added activities, managing the factors that drive costs, continuously improving value added activities, and streamlining management. The emphasis is on effective use of resources. (Brimson, 1996). In addition to that the initial literature on ABC essentially viewed it as a product costing system (Cooper and Kaplan, 1988). Whereas ABM was viewed as a broader management system incorporating activity-analysis, analysis of business processes and analysis of value and non-value activities.

The output from the ABM system can be utilised for many purposes. The costs of all activities and all programs are more accurately determined. The information from ABM enables better decisions to be made relating to resource allocation, programme retention, marketing strategies, programme returns and like (Trussel and Binter, 1998). Activity information allows managers to identify and eliminate waste. It also confirms progress in removing waste from operating activities (Brimson, 1996).

Managers need activity information to help them achieve enterprise excellence. Activity accounting identifies what the organisation does. In order to improve profitability and performance, it is critical to understand where the enterprise's precious time goes and, in detail, what the enterprise does and how it does it. Activity-based management is a powerful tool for managing the complex operations of a business through a detailed assessment of its activities. Activity accounting attributes cost and performance data to activities. Activity cost and performance data provide management with information needed to determine an accurate product cost, improve the business process, eliminate waste (non-value added activities) identify cost drivers, plan operations, and set business strategies. Activity-based management generates cost and production information in a manner that drives continuous improvement and total quality. Continuous improvement and total quality control are facilitated by treating each

activity as a process and identifying the source of cost rather than focusing on the symptoms. In focusing attention on the source of problems, management must assign responsibility to those departmental activities that drive costs and monitor their execution to see if the planned results are achieved.

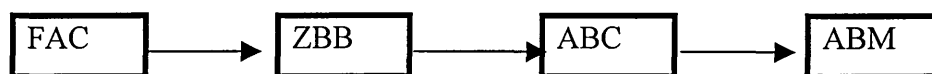
### 4.3 Conclusion

This chapter has highlighted the concept of efficiency<sup>66</sup> and the way<sup>67</sup> of using cost management to increase this. It has been argued that some techniques/tools of cost management relate to traditional management accounting such as throughput accounting and others relate to contemporary management accounting (i.e. ABC). The chapter has argued that institutional theory (sociology institutional theory) does not automatically assume that particular techniques of cost management are chosen purely for their instrumental efficiency.

The chapter has highlighted the focus of transaction cost theory (under-socialised) and institutional theory (over-socialised). It has been argued that transaction costs and institutional perspectives are not necessarily in conflict. It shows the transaction cost explanations rests on a comparative-efficiency account. The chapter has also highlighted the importance of institutional environment and shown that isomorphism is a central concept within institutional theory (DiMaggio and Powell, 1983). Scott (1987; 1995) grouped institutional effects into two board categories: pre-conscious and post-conscious.

Figure 4.4 will help to demonstrate that some of the new tools of cost management - ABC/ ABM - contain aspects of the same idea used in past tools of cost management.

**Figure 4.4: Models (tools) of cost management**



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<sup>66</sup> Efficiency is the relationship of outputs to given sets of inputs. It can only be discussed in a bounded system where the boundaries are closed for analysis.

<sup>67</sup> There are three ways of using cost management to increase efficiency; throughput costing, benchmark and target costing, and cost leadership.

Berry, et al., (1995: 55) say that Johnson and Kaplan (1987), in their critique of management accounting and control, argued that the systematic structures of cost accounting did not make much of a connection with the systematic problems of managing an enterprise. To recapitulate a little, the structures of traditional cost accounting, especially methods such as full absorption costing, fit beautifully with the notion of functional bureaucracy, in that they are a classic case of decomposition and disaggregation of hierarchic elements to lower-order activities.

Managers need an analysis to enable them to see the relationship between the way in which they were using resources and the way in which they were allocating costs. Even if we accept the economic managerial resource vs. managerial cost analysis, it should be noted that the use of full absorption costing to reflect opportunity cost was unhelpful and inadequate. What Kaplan argued was that it was important to break this systematic notion of full absorption costing, and to actually create the idea of activity pools to which overheads could be allocated. Then these activity pools would be rigorously criticised (in other words, there would be the emergence of the ideas of Zero-based budgeting, i.e. a new form) to decide upon appropriate cost structures, then the costs in the activity pools would be allocated to products on some reasoned basis.

In the late 1980s and early 1990s ABC has become widespread. It is claimed that ABC can be used as part of the strategic management process through understanding cost behaviour and analysing the profitability of customers and the newly created products (Brignall, 1997). In ABC and the traditional literature, cost causality is related to internal factors like number of set-ups, number of machine hours or number of products (Bjornenak and Olson, 1999: 331). The ABM literature expands the view on cost causality in activities by identifying a set of different drivers, e.g. initial drivers, resources drivers and cost drivers (AX and Ask, 1995).

In conclusion, it was observed that most models of cost management previously mentioned such as; FAC, ZBB, ABC, and ABM focus on internal factors and neglects the external factors. This leads to choose institutional theory as the framework because it helps to recognise the institutional context, both inside and outside of the organisation. Furthermore, this leads the researcher to look for another model of cost

management that considers internal and external environment (see strategic management accounting).

## **Chapter 5**

### **Strategic management accounting and cost management**

#### **5.0 Introduction**

The aim of this chapter is to focus on cost accounting in service organisations and illustrate strategic management accounting as one of the models of cost management which considers the internal and external environment. Furthermore, it focuses on how cost accounting can support corporate strategy. For these purposes, this chapter is divided into four sections.

The first section illustrates the gap between changes in cost accounting practices and changes in textbooks and it links the idea of cost accounting in the past and the present. It also highlights the cost accounting in a service organisation.

The second section examines strategic management accounting (SMA) from four viewpoints (Lord, 1996). The first viewpoint emphasises the extension of traditional management accounting's internal focus to include external information about competitors. The second viewpoint has been developed in business strategy literature and has examined the relationship between the strategic position chosen by a firm and the expected emphasis on management accounting. The third viewpoint advocates the analysis of ways to decrease costs and/or enhance differentiation of a firm's products through exploiting linkages in the value chain and optimising cost drivers. The fourth viewpoint challenges the basis of the other viewpoints. It points out that they assume that managers are able to deliberately plan what strategy the firm will follow.

The third section aims to explain how costing techniques can support strategy. It gives a brief discussion on six cost management techniques that support strategy and illustrates how these six models can help to manage the cost of existing products and future products.

The final (fourth) section outlines the main conclusion of this chapter.

## **5.1 Cost accounting**

### **5.1.1 Changes in cost accounting practices textbook**

There is a gap between the content in changes costing in textbooks and the methods used (Scapens, 1991). The conventional wisdom of management accounting textbooks suggests that in many situations absorption costing cannot provide relevant costs. In practice, however, absorption costing seems to be the dominating technique in most Western countries (e.g. U.S.: Howell, et al., 1987; U.K.: Drury and Tayles, 1994; 2000; Sweden: Ask and Ax, 1992).

The gap between costing practice and textbooks and the current criticisms of both costing practices and conventional wisdom (e.g. Johnson and Kaplan, 1987) are based on a limited number of studies of costing practices. Scapens (1994) argues that more attention should be given to management accounting practices, and less to the comparisons of management accounting practices against theoretical "ideas". There is little<sup>68</sup> evidence of how different costing methods are being used. There is less research on why one method is being used, and even less research on why one method is preferred to another, and on how accounting practices have developed over time or on the sources (institutions) that have influenced the development.

This research does not aim to highlight the gap but rather the clear link between changes in practices and textbooks. Table 5.1 shows this link.

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<sup>68</sup> With the exception of few studies (e.g. Ask and Ax, 1992; Drury and Tayles, 1994; 2000; Innes and Mitchell, 1995).

**Table 5.1: Major characteristics in three phases**

	<b>Source of inspiration</b>	<b>Textbooks major (new) topics</b>	<b>Costing practice major characteristics</b>
1936-55	German tradition	Advanced allocation How to implement Absorption costing	Advanced allocation absorption costing
1955-70	U.S./ Danish inspiration	Contribution margin Standard costing Variability accounting	Contribution costing
1970-95	U.S. inspiration	Decision orientation Optimal production Inventory valuation	Different methods for different situations

Source: Bjornenak, T. (1997)-" Conventional Wisdom and Costing Practice", p. 378.

The link between changes in costing practices and changes in textbooks seems to continue. The major new topic today is Activity Based Costing. Most textbooks adopted the conceptual framework related to ABC around 1990. A gap between costing practices and conventional wisdom in textbooks is found in all periods.

Bjornenak (1997) concluded that no one can assume that textbooks have a major influence on costing practices. More likely, both costing practices and textbooks are the results of the same institutional influences, for example academic institutions or consultants introducing the contribution margin approach in the 1960s or ABC in more recent years.

### **5.1.2 Cost accounting in the past and now**

Clark (1923) coined the phrase "different costs for different purposes: stock valuation, planning control and decision-making (Johnson and Kaplan, 1987; Drury and Dugdale, 1992). Chandler (1977: 109) argued that the key to subsequent developments is found in change. "Did cost accounting become a basic tool of railroad managers" (Chandler, 1977: 116).

Cost accounting is not embedded in accounting theory. German literature has emphasised that accounting systems transform cash flow into flows of periodic surplus. German literature identifies four basic systems for measuring monetary flows and hence income, namely:

- (1) Net cash flows, which are defined as changes in liquid funds. They are used as the underlying income concept to perform capital budgeting
- (2) Changes in the sum of liquid funds plus accounts receivable minus liabilities. Kloock and Schiller (1997) define flows as being the basis to Riebel's "costing" system (Riebel, 1974)
- (3) Earning, defined as revenues minus expenses
- (4) Operating revenues<sup>69</sup> minus costs<sup>70</sup>

In Anglo-American literature the term "cost" does not often seem to be well defined and is frequently confused with other concepts of surplus determination. Costs always include a quantity components (consumption of input factors) and a value component. The associated value component can be measured in two ways. The first involves only the assignment of payments in the form of actual, past or future market prices to the consumed input factors. This is the concept of "pagatory" costs<sup>71</sup>. The second approach adds opportunity costs to pagatory costs, and from optimisation theory, opportunity costs can only be computed after optimal decisions have determined (Hax, 1965: 145). Nevertheless, the system of marginal costing allows for the inclusion of opportunity costs. Lucker's Theorem is important for costing purposes. It demonstrates how to compute the capital given the decision-maker has decided to measure income by (revenues - costs). Lucker's Theorem bridges the gap between long-term and short-term decision-making.

Cost accounting has not been central to WCM ideas, though activity-based costing (ABC) is sometimes incorporated within it. However, WCM with its emphasis on non-financial measures, continuous improvement, computerised information systems, and

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<sup>69</sup> Operating revenues are defined as the periodic creation of goods (or services) in the pursuit of the substantive goal of the corporation.

<sup>70</sup> Costs are defined as the value of the periodic consumption of goods (or services) in pursuing the substantive goal of the corporation.

<sup>71</sup> This expression is German which means "consisting of (cash) payments".

changed management structures and roles is likely to impact upon the role of management accounting.

In the pre-WCM era it was thought that production could be managed "by numbers". The numbers would show what to make, what to buy, who to blame. If, for example, the latest cost report shows a negative cost variance in welding, the onus is on the welding supervisor to cut costs. But how? There is no data on the causes of the cost average - WCM mandates simplification and direct action: Do it, measure it, diagnose it, fix it, manage it on the factory floor. Don't wait to find out about it by reading a report later (Schonberger, 1986).

Schonberger's position is not dissimilar to Johnson's thesis in *Relevance Regained* (1992). Johnson argues that accounting relevance was not lost but rather it was never relevant to the efficient running of businesses: "Certainly I do not believe the answer is to reform how we do management accounting. In that regard I refute the advice. You hear from people who advocate activity based costing, or ABC, as the panacea to what ails American business... Improving how companies trace overhead costs may be important for some things, but in the guise of cost drivers, ABC does not necessarily stimulate continuous improvement nor does it mark a pathway to competitive excellence" (Johnson, 1992: 8).

Schonberger (1991) passed similar comments indicating that whilst ABC may be relevant to product line decisions it was unsuitable for performance assessment, adding that the cost reporting role would diminish as managers spend more time on physical customer-centred measures of continuous improvement. Clark is often given the credit for introducing the concept of "different costs for different purposes" (Frank, 1990). Schmalenbach introduced the importance of dividing fixed and variable costs for decision purposes as early as 1899 (Solomons, 1952).

Coward (1944: 287) argues that "the costing schemes should be designed in a way that enables one to separate direct costs, variable overhead and fixed overhead". Shark (1943) and Coward (1944) presented alternative classifications of cost pools, called "kostnadssted". The normal choice of "kostnadssted" would be department, but Coward argued for other alternatives: "if a manufacturing company follows the conversion of

materials in different steps through the factory, then it is natural to divide the production process into sub-processes" (Coward, 1944: 49). The meaning of the concept "sub-process" is the same as what we today might call an activity. Whether using activities, functions or departments, the importance of using many cost pools is pointed out, and little attention is given to the use of only one plant wide overhead cost pool.

Henzel (1931) argued that the overhead costs should be allocated on a casual basis. Coward (1944) discussed how to allocate under-absorbed cost due to sub-normal activity. Coward calls these costs "cost of unused capacity" and discusses eight different approaches to this problem. The same concept is used in the contemporary debate about spending versus consumption (Cooper and Kaplan, 1991; 1992).

### **5.1.3 Cost accounting in service organisations**

Silversto, et al., (1992)<sup>72</sup> identified three different service delivery process types, professional, shop and mass, whose costing systems also varied systematically (Fitzgerald, et al., 1991). Brignall, et al., (1991) discovered that cost traceability varied systematically, being greatest in professional services and least in mass services. Mass services (for example Water services) use a complicated mix of equipment, facilities and mainly back-office staff at each strategic business unit to deliver a standardised service. Professional services are labour intensive, with their cost structure dominated by front-office staff delivering a customised service.

Traditional full product costing systems trace input costs into the conversion process, separating them between those which can then be traced directly to outputs (products) and those which cannot (indirect costs): these indirect costs are then allocated to products through a two-stage procedure. The indirect costs are first collected into cost pools within the conversion process, and then attached to products by some method based on unit volume of production such as direct labour hours.

Johnson and Kaplan (1987) argue that this second step may cause product costs to fail to reflect the resources they consume. ABC<sup>73</sup> and Throughput Accounting<sup>74</sup> aim to improve product costing system by attacking different parts of the two stage allocation.

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<sup>72</sup> From a study of operations management literature and their research in 11 service organisations.

<sup>73</sup> See section 4.3.

The life cycle model (Koutsoyiannis, 1982) argued that a business unit's/product's life has four basic stages (launch, growth, maturity, decline) with attendant changes to various contingent variables such as its external environment, mission and chosen generic strategy (Porter, 1980). Business risk is high in the first phase (where the future is uncertain and the mission is to build) and low in the final phase, but financial risk is low in the first phase yet high by the final one. As businesses in the launch phase are cash-negative, and businesses in the mature phase cash positive, appropriate capital structure moves from equity (perhaps venture capital) at the start to a mix of debt and equity by maturity and debt in the final phase (Ward, 1993). Cost structure and cost behaviour will therefore vary systematically across the business life cycle. Cost traceability may also vary if fixed, indirect costs are kept to a minimum unit at the mature stage.

In consequence, management information systems (and the costing and performance management systems within them) may also need to change through time so as to maintain the visibility of the changing factors critical to competitive success at each stage of the life cycle. Ideas drawn from Target costing and life cycle management may be more helpful for cost management here than conventional ABC or Throughput Accounting. For example, "Target costing is not actually a form of costing. Target costing is an activity which is aimed at reducing the life-cycle costs of new products, while ensuring quality, reliability and other consumer requirements, by examining all possible ideas for cost reduction at the product planning, research and development, and the prototyping phases of production. But it is not just a cost reduction technique, it is part of a comprehensive strategic profit management system" (Kato, 1993: 36).

Some authors (Govindarajan and Shank, 1992; Adamany and Gonsalves, 1994) argue that the type of cost and other performance management information to be monitored should vary at different organisational levels and stages of the business/product life cycle.

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<sup>74</sup> Throughput Accounting attacks the first half of the two-stage costing model by eliminating the distinction between direct and indirect, treating all costs as facility factory costs (Goldratt and Fox, 1989). Throughput Accounting is similar to the contribution per unit of scarce resource approach and assumes that all non-material costs are fixed in the short-run (for Throughput Accounting, see section 4.1).

## **5.2 Strategic Management Accounting (SMA)**

The aim of this section is to review literature relating to strategy and management accounting. Strategy is hotly debated and elusive (Dent, 1990). The term is employed in literature of many disciplines. Penning (1985) notes that economists, social psychologists, anthropologists, sociologists and political scientists use it, and in addition, literature abounds with definitions ranging from the general to the specific (Dent, 1990). The term “strategy” has been borrowed from the military. It is defined as the “art of so moving or disposing troops or ship or aircraft as to impose upon the enemy the place and time and conditions for fighting preferred by oneself” (The Concise Oxford Dictionary, 1983).

The theorists have attempted to provide taxonomies of “generic strategy” that are generalisable across firms and industries. There was considerable agreement in the literature that the scope of strategic choice includes: (1) Corporate strategy that deals with the allocation of resources among various business or division of an enterprise (2) Business strategy that concerns primarily the question of the competitive position of a particular business or division of an enterprise (3) functional (operational) strategy that is limited to specific functional areas (e.g., marketing and distribution) within particular businesses. Each of these strategies is concerned with specific sets of strategic characteristics and choices, which are related to different levels of an enterprise (Dent, 1990; Johnson and Scholes, 1993).

Literature on strategic management accounting has several views. These views could be divided into four viewpoints (Lord, 1996). The first viewpoint emphasises the extension of traditional management accounting’s internal focus to include external information about competitors. The second viewpoint has been developed in the business strategy literature, identifying the relationship between the strategic position chosen by a firm and the expected emphasis on management accounting. The third viewpoint advocates analysis of ways to decrease costs and/or enhance differentiation of firm products, through exploiting linkages in the value chain and optimising cost drivers. The fourth viewpoint challenges the basis of the other viewpoints. It points out that they assume managers are able to deliberately plan what strategy the firm will follow.

### 5.2.1 The first viewpoint of SMA.

Johnson and Kaplan (1987: 33-34) wrote that, “Carnegie relied on financial information which concerned his competitors’ direct production costs. Carnegie’s operating strategy [of pushing] his own direct costs below his competitors’... promoted him to require frequent information showing his direct costs in relation to those of his competitors”.

Simmonds’ (1981; 1982) definition and description of strategic management accounting focused on comparison of the firm with its competitors. The contribution of Simmonds (1981; 1982; 1985; 1986) was most significant from the viewpoint of showing how strategic management accounting might be undertaken (Wilson 1991: 100-104). He suggested adding more relevant market data to management records and a regular reporting system. Simmonds advised accountants to collect market share details, costs, sales and volume data against those of competitors (market leader, close competitors and laggards). He emphasised in particular the need for the relative competitive data on levels and trends of prices, costs, profit and volume changes for the firm and its competitors. For example, Simmonds (1981) pointed out that management can gain strategic advantage via its pricing policy and low cost strategy (e.g. the market leader can control the competitive situation with the highest volume and profits, plus the lowest unit cost and price).

In addition Simmonds drew some attention to time and long run strategic reconfiguration in relation to cost structure “profit is stemming from the pattern of competition over time in the competition configuration 'rather than from' internal efficiency. For example, increased profit can be reflection of decay in competitive position as a result of higher prices, decreased quality, reduction in advertising or any other reduction in spending that reduces market share” (Simmonds, 1981: 26).

Bromwich (1988: 26) intends that the focus of the firm should be on external matters, as “it is in the firm’s markets that profits are made and where competitors challenge the enterprise”. He said that it is necessary to go even further than Simmonds’ suggestions, not only comparing the firm with its competitors, but also evaluating “the benefits of the enterprise’s products both from the customer’s point of view and the firm’s perspective” (p. 27).

Allen (1985) stated that information for strategic decision-making must be forward looking not based on past costs and the concept of capital maintenance, but being concerned with values, investments and cash flows over the long-term continuum. Taylor and Graham (1992) promoted the inclusion of non-financial information crucial to strategic planning and control.

### **5.2.2 The second viewpoint of SMA**

Before the relationship between strategic management and management accounting is examined, one question should be addressed: Why do we need to be concerned with the relationship between strategic management and management accounting at all?

One reason is that it seems as if every organisation is supposed to have both a goal and an idea of how to reach this goal. In addition, it must be efficient in its actions towards achieving the goal before we will consider calling it an organisation. A more practical reason for looking at the relationship between the two kinds of management is the fact that many organisations over the years use a considerable amount of resources, measured in employees' time and company money, on making budgets, accounts and strategies. Furthermore, when both managers and researchers are asked what the difference is between strategic management and management accounting, they cannot give a clear answer, although none of them would reduce one discipline or practice at the expense of the other.

The relationship between strategic management and management accounting has been described from several perspectives such as a hierarchical, contingency theory, Miles and Snow (1978) or new economic view. The relationship between strategic management and management accounting has been described as a hierarchical relation within much of the literature that takes a rational and objectivistic perspective on organisations and their environment.

Ansoff (1965) and Anthony (1965)<sup>75</sup> saw Strategic Management as a holistic interdisciplinary device that was engaged in determining the relationship between the organisation and its environment. In comparison, Management Accounting was seen as an instrument for calculation, implementation, and control that belonged to the tactical and administrative level as only one out of several functional disciplines within the organisation. Strategic Management is supposed to deal with the future of the whole organisation in a creative and innovative form, whereas Management Accounting is expected to handle the history of the company and all its every day details and routines.

Andrew (1971) took this view even further in a formal planning perspective. He saw strategic management as the first part of the rational decision-making process concerned with goal setting and development of strategic alternatives. Management accounting, on the contrary, was concerned with evaluating alternative strategies and translating these into operational and measurable budgets for securing and controlling the implementation of the strategy.

During the 1980s and 1990s, the planning and control tradition extended the use of financial measures to include non-financial representations as strategic indicators, organised in strategic control concepts like Critical Success Factors (Bruno and Leidecker 1984), Benchmarking (Spendolini 1992) and the Balanced Scorecard (Kaplan and Norton 1992; 1996).

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<sup>75</sup> Anthony (1965) prescribed three normative and universalistic control activities to be the core functions of managing: strategic planning, management control and operation (task) control. Strategic planning was viewed as being concerned with setting and changing of overall corporate strategies and objectives and the establishment of policies to govern the acquisitions and uses of resources. Management control is involved with the manner in which managers monitor activities and take action to ensure that resources are being achieved as stipulated in strategic planning. Task control (physical production) was concerned with the monitoring of specific day-to-day activities that call for little judgmental activity (due to differences in tasks and the nature of the activity itself, Anthony, et al., 1989).

Anthony had no doubts, "structure is given- systems are therefore designed to meet the needs of a given structure" (Anthony, 1965). The strategies were taken as given and control systems were used to implement these strategies two levels: management level and task level. It should be noted that Anthony's model assumed a hierarchical relationship (institutional hierarchy) between three separated layers of management in a formal stable world: strategic planning, management control and operational control. This categorisation explicitly avoided addressing the issues of organisational goals and objectives formulating process (Berry, 1983; Berry, et al., 1991; Otley and Berry, 1980) and adoption to environmental contingencies (Otley, 1980). However, this perspective of strategy and control procedures of cost practices may have been suited to organisations that have a wide geographical dispersion of sub-units where reliance on control procedures as designed is greater (Emmanuel, et al., 1992).

What are the problems with applying this hierarchical perspective on the relationship between strategic management and management accounting?

First of all, when we take a rationalistic view, it is not clear whether strategy or economics are the goal or the means of the organisation. This depends on the situation and the actors speaking about strategy and economics. Secondly, these perspectives look at the organisation from an objectivistic and rationalistic point of view, which presumes that a manager's task is limited to increase efficiency in the organisation and to secure optimisation and control. In real life, top managers often need to take care of many other tasks besides efficiency, such as securing the legitimisation of the organisation (Meyer and Rowan, 1991), reinforcing the order within and around organisations (Mintzberg, 1983) and participating in many symbolic activities as well as non-formal actions (Mintzberg, 1973). Third, the efficiency perspective on planning and control is not adequate to explain the processes that take place in organisations between strategic planning, budgeting and the follow-up on budgets by utilisation of accounting and strategic control devices.

Goold and Quinn (1990) point to four problems of strategic control, namely: to overcome uncertainty and flexibility at the same time, to motivate rather than control managers, to assist rather than replace management judgement and to secure rather than destroy mutual confidence between management levels. From a management accounting view, Dent (1990) suggested that we should at least look at the relationship between strategic management and management accounting from three different perspectives, namely, as already suggested above, from a control system perspective, from a decision-making perspective and from a perspective legitimising strategic change. By looking at the role of accounting in decision-making and how accounting provides a language for justification of strategic changes, Dent argued that it was possible to get much closer to what is going on in organisations' everyday life. Finally, it can be argued that leaders do not only conceive and justify their visions of the future organisation by creating images of the development of the surrounding environments, they also mobilise the past as an argument for present and future actions. Therefore, leaders also need to look at the capabilities of management accounting to legitimise the present and future by reconstructing the past.

Based on the above arguments, it seems as if the relationship between strategic management and management accounting is much more complex than just a typical hierarchical relationship. It appears that the concepts of both strategy and accounting play many roles within organisational life other than generating efficiency and profit.

The contingency approach is based on the premise that there is no universally acceptable model of organisation that explains the diversity of organisational design. It simply states that the most efficient form of organisation is contingency theory and the type of conditions relevant to the situation. In particular, under contingency theory, the type of management accounting system (MAS) varies according to specific circumstances or the situation in which the organisation operates. Hence, the choice of MAS design is constrained by these conditions and depends on the ability of management to find the best solution.

Within the contingency perspective, strategic management is more comprehensive than management accounting. Both Govindarajan and Gupta (1985) and Simons (1987) suggested how control systems could be best suited to a strategic business that follows a specific strategy. The major focus of Simons was on the link between business strategy and management control systems. He explicitly used the contingency framework as a dominant logic for research on control systems design (Simons, 1987: 358). His first attempt (1987) was to extend Miles and Snow's (1978) analysis to the financial control attributes system. It was based on the premise that control systems should be modified in accordance with the business strategy of a firm. However, his result was inconsistent with Miles and Snow's (and also Ouchi 1979; Hirst, 1983; Govindarajan, 1984) evidence that defenders tend to use more detailed cost analysis techniques and cost control oriented towards efficiency in task performance (Dent 1990). Simons (1987) found that prospectors tend to use their financial control system more intensively than defender with tighter budget goals and more frequent reporting on forecast and outputs than cost control.

Porter (1980; 1985) detailed two specific ways in which managers can position their firms so they have a strategic advantage over their competitors: firms need to either differentiate their product(s) or achieve a position of cost leadership. To differentiate its product, competitive advantage is attained by being able to charge high prices, by being able to sell

more at the given price, or by achieving increased customer loyalty. For cost leaders, having lower costs than all competitors attains competitive advantage.

Shank (1989) and Shank and Govindarajan (1989) analysed the relative importance of several management accounting methods depending on whether the firm was pursuing cost leadership or differentiation. They suggested that companies choosing cost leadership would put the most emphasis on traditional cost accounting applications. They would use standard costs to assess performance, product costs as an input to pricing decisions, and flexible budgeting for manufacturing cost control. They would perceive meeting budgets and analysis of competitors' costs to be of great importance. On the other hand, companies differentiating their products as a way of achieving competitive advantage would consider marketing cost analysis to be critical to their success. They would consider flexible budgeting and meeting budgets to be of only moderate importance, and rank standard costing for performance assessment, product costing for pricing decisions and competitor cost analysis of little importance.

Shank (1989), Shank and Goverdarajan (1989) focused on the question of how cost information could be used to assist managers in formulating and implementing strategy. They developed a conceptual framework based on a four stage process of the strategic management cycle; formulation, communication, implementation and action. They defined strategic cost management (SCM) as "the managerial use of accounting information explicitly directed at one of the four stages of the strategic management cycle" (Shank, 1989: 50). The proposed framework of SCM simply was strategic control model concerned with the financial analysis of the value chain and cost driver in different strategic positions (Porter, 1985; Shank, 1989). To some extent, they addressed the literature debate on how the use of cost information is based on different costing models. For example, full absorption costing, activity based costing and contribution costing led to different scenarios on comparisons of competitors' cost structure and how competitors could attack firms who use each of these models. Their suggested solution to the problem of variance analysis was that companies should develop a strategic management accounting system rooted in Simmonds' approach.

Bromwich (1990) used two economic theories in an effort to provide theoretical support for strategic management accounting, linking the theories with Porter's taxonomy. Their

theory attributed analysis supports accountants “costing attributes and monitoring the performance of these attributes over time” (p. 28), which in turn contributes to Porter’s differentiation strategy. The theory of contestable markets “requires that the accountant extends cost analysis beyond the firm and reports on the cost structure of rival enterprises” (p. 29), which contributes to Porter’s cost leadership strategy.

Bromwich (1990) extended this perspective to include the differentiation strategies on management accounting reports. He tried to differentiate between two types of cost information in relation to strategic position. The first was related to differentiation strategy and was concerned with “costing the characteristics provided by goods and in monitoring and reporting on these costs regularly” (Bromwich, 1990: 44). The second was related to low cost strategy and was concerned with the analysis of “competitors” costs and cost structures and the monitoring of the enterprise’s strategy and those of its competitors in these markets over a number of periods” (Bromwich, 1990: 28).

Bromwich’s work was based on economic theory on the value of product attributes in differentiation (Lancaster, 1966; 1979) and more recent work on the theory of contestable market (Baumol, 1982; Baumol, et al., 1988). He drew on these two economic theories to provide a theoretical basis for the involvement of accountants in strategic cost management. Bromwich used these two theories to establish the need for accountants to compare the cost structures of their own firms with those of actual and potential competitors in relation to demand factors. In particular, Bromwich drew attention to both (1) the role of sunk cost as an important feature of cost structures in creating barriers to entry and then to determining the sustainability of enterprise strategies (2) The cost of joint products to be of critical nature when compared to the cost of producing these products individually (economic of scope).

Govindarajan and Shank (1992) added dimension to the expected management accounting emphasis, by linking the firm’s “mission” (i.e. build, hold or harvest) to its strategic position. They concluded that accounting implications for strategic planning, budgeting and incentive compensation would be similar under both 'harvest' mission and cost leadership strategic position. Similarly, the accounting emphasis suggested for the differentiation strategy would also fit a 'build' mission.

Simons (1990: 141) added the suggestion that defenders “need only focus on strategic uncertainties often related to product or technological changes that could undermine current low cost positions”. Simons focused on the management process as it related to management control and strategy. Basically he considered the management control system as tools used for both strategy implementation and strategy formulation. He provided a “dynamic process model of strategy and control in which top management regulates strategic (environmental) uncertainties through its choice of strategy and the institutionalisation of management control system” (Gray, 1990: 145).

Simons (1990) provided empirical evidence of the way in which management control systems were not only important for strategy implementation, but also for strategic formulation. His research was based on a two-year field study and it provided an illustration of how top managers used formal systems to guide the emergence of new strategies and ensure competitive advantage.

Simons introduced the idea of interactive management control as opposed to programmed control: "Management controls become interactive when business managers use planning and control procedures to actively monitor and intervene in on-going decision activities of subordinates. Since this intervention provides an opportunity for top management to debate and challenge underlying data, assumptions and action plans, interactive management controls demand regular attention from operating subordinates at all levels of the company. Programmed controls, by contrast, rely heavily on staff specialists in preparing and interpreting information. Data is transmitted through formal reporting procedures and operating managers are involved infrequently and on an exception basis" (Simons, 1990: 136).

The focus of attention in Simon's work was business strategy and the way in which top managers use interactive control systems to monitor the progress of the business unit towards its business goals. He argued that the top managers make selected control systems interactive in order to monitor the strategic uncertainties that they believe are critical to achieving the organisational goals. It is also suggested that these control systems can be linked to the use of subjective reward systems which are not formula based. Company B, for instance, in Simons (1990) had a reward system based on effort. As a result of debate

and dialogue that surrounds the interactive management control process, new strategic and tactics emerge over time.

Although the view of management control presented in his paper (1990) differed from the traditional approach (management control is an important tool for strategy implementation). His methodological approach was linear, based upon a functionalist approach “the control system refers to formalised producers and systems that use information to maintain or alter patterns in organisational activity” (Simons, 1990: 623). His model essentially was normative and was based on the premise that top managers are always able to alleviate the effects of environmental uncertainties by designing an appropriate control system (contingency view). Simons (1991) gave some attention to the complex nature of strategy formulation and implementation. Presumably, Simons viewed strategies as organisational learning and as an emergent process (Hartman, 1993).

The analysis thus far has been based on contingency theory approach, which has been criticised on the grounds that it suffers from two fundamental problems related to conceptual deficiencies and methodological assumptions. Firstly, the contingency approach is epistemologically rooted in functionalism (Otley, 1980; Berry, 1983). These critics argue that contingency theory is based on linear deductive model of causality and relationship, and assumes a highly technical view of organisational choice. Hence, studies based on this theory tend to ignore the wider context of organisation as well as the critical and dynamic issues such as organisational goals and effectiveness (Otley, 1980; Otley and Berry, 1980; Lowe and Puxty, 1989) and authority and accountability (Berry, et al., 1985). Secondly, the conceptualisation, definition and measurement of key variables within a contingency theory have not been adequately elucidated which has led to an emphasis on statistical analysis at the expense of theoretical and empirical attention (Otley, 1989; Dunk, 1989). Despite the difficulty in employing a contingency theory, it was commonly agreed that this approach provided useful insight for understanding how environmental factors were related to management accounting systems (Berry et al, 1991; Hoque, 1993).

Miles and Snow (1978: 29) classified organisations by their way of responding to the environment, and according to their “particular configuration of technology structure, and process”. Miles and Snow’s typology (1978) attempted to study strategy at business level in four industries. They identified four major viable strategies: Defenders, Prospectors,

Analysers and Reactors. The dimension underlying the typology is the rate at which an organisation changes its products or markets. Defenders are organisations (strategic business unit, SBU) that engage in little or no new product development or new market development. Often they control relatively secure niches within their industries, competing primarily by price, quality, delivery or service. Prospectors attempt to pioneer in product/market development. They tend to offer a frequently changing product line and compete primarily by stimulating and meeting new market opportunities. Analysers are an intermediate type. They make fewer and slower product/market changes than prospectors, and are less committed to stability and efficiency than defenders. Reactors behave with a passive strategic adaptation.

Miles and Snow's view formed the basis for a range of research concerning the best fit of strategy and MAS design (e.g. Simons, 1987; 1990). This body of research emphasised the relationship between the firm and changing market and focuses on how an optimal accounting system can be designed in accordance with a specific strategy the firm had decided to follow.

Within the "new economic view" (Hartmann, 1999) we found, among other perspectives, transaction cost theory, evolution theory and resource based perspective. The transaction cost perspective explained the existence of market and companies, vertical integration, product diversification, and divisionalisation of companies, etc. by referring to the cost of co-ordination in each transaction. The evolutionary theory explained the company as a transmission and variation mechanism, whereas the market function was called a selecting mechanism selecting, choosing the most economic efficient companies. The resource-based perspective saw the company as a bundle of resources and competencies that competitors could not easily imitate due to the complexity of the competencies, their historical nature, and because the competencies sometimes existed as tacit knowledge. Even though these perspectives differed extensively in their perception of rationality and in their explanation of the firm and competition, they used economic efficiency as an explanatory factor, thus reproducing a hierarchical view of management.

### 5.2.3 The third viewpoint of SMA

Cost can be reduced by reducing activities that incur costs without increasing value. They can also be reduced by exploiting linkages in the value chain. The value chain is “the linked set of value-creating activities all the way from basic raw material sources... through to the ultimate end-use product” (Shank, 1989: 50).

Porter's model (1985) provided a potential alternative to ABC. He proposed a value-chain (VC) model which breaks down the firm's activities into nine strategic units of interrelated activities and collects cost information about a set of value-creating activities all the way from basic raw material suppliers to the ultimate end-users (see Wilson, 1991 for summary). Porter (1985) listed twelve factors, including learning, economies of scale, interrelationships with suppliers, and discretionary policies, that should be examined with a view to reducing costs. He identified three strategic postures to manage pricing in relationship to the VC cost<sup>76</sup>. So while some companies tended to construct efficient scale facilities and reduce cost through accumulated experience, others gained strategic advantage via the cost of differentiation (e.g.; services and image) in the market place (Brignall, et al., 1991). Porter's value-chain approach becomes difficult to use in practice (Hargert and Morris, 1989; Hartman, 1993), because firms define their business activities around responsibility centres rather than strategic business units and value chain activities as defined by Porter.

Porter (1985) presented value chain analysis to gaining competitive advantage. The aim of value chain analysis is to find linkages between value creating activities, which result in lower costs and/or enhanced differentiation. This linkage may be within the firm or between the firm and its suppliers, channels and customers.

Shank and Govindarajan, (1988; 1992a; b; c) have promoted accounting inputs to chain analysis under the name “strategic cost management”. They gave several examples of how value chain analysis using accounting figures would result in different decisions than using traditional management techniques.

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<sup>76</sup> These strategic postures are: (1) cost leadership (competition on price) (2) product/service differentiation (3) focus strategy (a closely defined target segment of the market [niches])

Hargert and Morris (1989) asserted that much accounting is not in a suitable form to be used in analysing the value chain. They pointed out that a traditional management accounting system does not adequately quantify the costs and benefits of joint optimisation and co-ordination between parts of the firm, and between the firm and suppliers and buyers. Hargert and Morris, (1989) considered that the process itself provided a useful insight, even if it was impossible to estimate precise numerical output. “One of the strengths of value chain analysis is that it forces managers to think about which activities created profits, to choose a generic strategy for each product and to ask of each item of expenditure “how does this add value to buyers”? (p.187).

Shank and Govindarajan (1992b) recognised that there were problems involved in calculating the value chain, but reiterated that “Even the process of performing the value chain analysis, can be quite instructive” (p. 184).

Shank (1989) grouped cost drivers into two types: structural and executional. Structural cost drivers are scale, scope, experience, technology and complexity. Increasing these structural drivers does not necessarily decrease costs. Executional drivers include work force involvement, total quality management, capacity utilisation, plant layout efficiency, product configuration effectiveness and exploitation of linkages. Shank (1989) pointed out that the cost drivers analysis suggested by Porter (1985) was a much broader concept than “activity based costing”, which focuses primarily on complexity.

Nanni, et al., (1992) recognised the need for performance measurement both as a guide to putting strategy into action and evaluation of actions taken. However, they suggested that both financial and non-financial measures be used.

As mentioned in the introduction, this viewpoint advocates analysis of ways to decrease cost and/or enhance differentiation of firm products, through exploiting linkages in the value chain and optimising cost drivers. This view leads to the issue of supply chain management. According to Harland (1996), the term “Supply Chain Management” (SCM) seems to have originated in the early 1980s in discussion on the integration of the internal business functions of purchasing, manufacturing, sales and distribution. Slack, et al., (1998) defined SCM as a holistic approach to managing across company boundaries.

Ellram (1991) saw SCM as a competitive tool that share similar advantages and disadvantages with vertical integration<sup>77</sup> and obligation contracting<sup>78</sup> form of governance. The advantages of vertical integration as opposed to obligation contracting were that integration increased control, reduced the probability of opportunism, improved communication and avoided the replication of activities. The disadvantages of integration included problems in achieving economies of scale, problems of span control, the loss of high powered market incentives and the possible perpetuation of obsolete processes (Williamson, 1985).

The DTI (Department of Trade and Industry) (1997) argued that supply chain management is "the strategic management process, unifying the systematic planning and control of all technologies, materials and services, from identification of need by the ultimate customer. It encompasses planning, designing, purchasing, production, inventory control, storage handling, distribution, logistics and quality. The objectives are to optimise performance in meeting agreed customer service requirements, minimising cost, whilst optimising the use of all resources throughout the entire supply chain".

Berry, et al., (1997) argue that the above definition outlines four main uses of the term "supply chain management". The internal supply chain which integrates business functions had new materials and derived information in a "inbound" "outbound" way. Secondly, the management of dyadic or two party relationships with immediate suppliers. Thirdly, the management of a chain of businesses including a supplier, a supplier's suppliers, a customer and a customer's customer. Fourthly, the management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers.

Berry, et al., (1997) argue that total cost control is the idea of open book costing. Open book costing means the supplier opens his books to the customer and this supports the idea of active collaboration and partnership. Lamming (1993) talked about cost

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<sup>77</sup> Vertical integration internalises the whole activity (Williamson, 1985).

<sup>78</sup> Obligation contracting whereby firms recognise their interdependence and ongoing nature of relationships (Williamson, 1985).

transparency and the sharing of cost information between customer and supplier in a way which allowed customer and supplier to work together to reduce costs. This was analysed into constituent parts and could support an exercise based on target costing or continuous improvement (Kaizen costing).

Seal, et al., (1999) argue that open book accounting could enable both greater trust as well as self-enforcing agreements. From an economics perspective, the relation between information and trust ran in two (opposite) directions. First, trust between partners could reduce costs of negotiating and monitoring agreements by avoiding the need for complex contingency agreements. Second, if the costs and rewards of agreements could be verified at low cost, then the need for trust was reduced.

Seal, et al., (1999) argue that there were a number of areas where accounting and, in particular, management accounting was involved in supply chain management. These areas included the make-or-buy decision leading to the choice of the partnership mode, the role of accounting in managing a partnership and the accountability of the partners to their internal constituencies. The researcher's view was that the supply chain had four important dimensions (reliability, availability, efficiency/effectiveness, and flexibility) and it has three major criteria. These were as follows:

- (a) Cost
- (b) Response of the market
- (c) Strategic management of the competition

The researcher saw cost as the main element and the core idea of supply chain management was to eliminate non-value activity (cost effectiveness). For the purpose of this research it would be useful to focus on cost related supply chain management.

Slack, et al., (1998) demonstrated the gearing effect on profits of reducing material costs. Seal, et al., (1999) argue that traditional manufacturing was characterised by poor quality cost accounting information which could not identify drivers in the assemblers' own operations. The prescribed roles of management accounting emphasised reporting and controlling functions within a bureaucratic hierarchy. Management accounting might also be used in simple "make-or-buy" decisions with the danger here (as in other areas of decision-making) being that cost data from the reporting function may influence costs for decision-making (Johnson and Kaplan, 1987).

Lere and Saraph, (1995) highlighted the problem of supply chain management caused by cost and suggested a solution for it. They argued that most suppliers would tend only to provide information based on traditional costing. Lere and Saraph, (1995) suggested that one way round this problem was to deduce a supplier's cost by asking for a process flow chart that may indicate any wasteful, non-value adding activities and a breakdown of overheads to indicate activities that were performed specifically on his or her product.

Rajagopal and Bernard, (1993) emphasised the importance of focusing on "all-in-cost"<sup>79</sup> rather than purchase price. They argued that cost management drew on a number of functions but focused on total quality management, negotiating, and supplier alliances.

Seal, et al., (1999) argue that cost information not only played a role in the strategic sourcing decision but would also influence the ongoing management of partnerships. In a strategic approach, the ongoing management of a strategic partnership should be on a cost rather than a price basis.

#### **5.2.4 The fourth viewpoint of SMA**

The concept of strategic planning and positioning only covers part of business strategy. Strategies emerge from interaction between management, employees and the environment.

Mintzberg (1978) was one of the first to point out that strategic planning literature ignored other types of strategy formation. He made a distinction between strategy formulation and formation. He defined strategy formulation as long-range planning by leaders of organisations. Strategy formation, on the other hand, he defined as the result of interplay between the environment, the organisational operating system and the organisation's leadership. Mintzberg (1978: 935) defined the strategies that formed, "the realised strategies", as "a pattern in a stream of decisions". He considered a strategy to have formed "when a sequence of decisions in some area exhibits a consistency over time.

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<sup>79</sup> The term of "all-in-cost" refers to the sum of the purchase price plus all in-house costs involved in receiving and converting the purchased materials into finished products.

Strategy is not formulated and implemented solely by top management. There are likely to be several interest groups within an organisation; each having “its own set of stakeholders with whom it knowledge’s relationships and whose exceptions it considers” (Dermer and Lucas, 1986: 473).

Simons (1992: 44) raised the question, “what role can accounting ... play in... stimulating emergent strategies?” He suggested that accounting plays a role in interactive control systems. In a more recent piece of work, Simons (1995) talked about levers of control. In his 1995 work, Simons referred to interactive control systems and diagnostic control systems. Diagnostic control systems are in fact just another name for programmed control systems. What was interesting about Simons (1995) was the way in which he introduced the idea of belief systems (organisation culture) into his levers of control<sup>80</sup> and linked belief systems to boundary systems, interactive control systems, diagnostic control systems and business strategy.

Simons (1995) suggested that these four levers of control work in opposite ways to ensure effective strategy implementation and development. Two of the control levers (belief systems and interactive control systems) created positive and inspirational forces. The two other levers (boundary systems and diagnostic control systems) created constraints and ensured compliance with orders. Simons suggested that effective top managers used the levers of control to inspire commitment to the organisation; to stake out the territory for experimentation and competition; to co-ordinate and monitor the execution of today's strategies; and to stimulate and guide the search for strategies of the future.

Dermer (1990: 74) proposed that accounting has three roles in shaping strategy: it may be used as “a language of discourse”, as an authority establishing and maintaining credibility, and as a provider of an historical context for strategy. Dermer also argued

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<sup>80</sup> The levers of control can be described as follows:

- \* Belief systems - used to inspire and direct the search for new opportunities.
- \* Boundary systems - used to set limits on opportunity seeking behaviour.
- \* Diagnostic control systems - used to motivate, monitor and reward achievement of specified goals.
- \* Interactive control systems - used to stimulate organisational learning and the emergence of new ideas and strategies.

that research on the relationship between accounting and strategy has been biased towards attempting to make accounting more useful to managers. He pointed out that stakeholders will access and use “the strengths and weakness of conventional accounting ... in ways not anticipated by accountants” (p. 75).

### **5.3 Cost accounting and corporate strategy**

The main aim of this section is to explain how costing techniques can support corporate strategy. In order to explain this, the section will firstly highlight how companies have to compete and what elements are successful. Secondly, it will give a brief discussion of six cost management techniques and how they support strategy. Finally, this section will explain how firms manage costs.

Sustainable competitive advantages play a critical role in determining the way firms compete. They do so by enabling firms to avoid competition by adopting the generic strategies of either cost leadership or differentiation (Porter, 1990). When firms cannot create sustainable competitive advantages, they are forced to compete by repeatedly creating temporary ones.

Three elements<sup>81</sup> play a critical role in determining the success of firms. These three elements comprise the product price, quality<sup>82</sup>, and functionality<sup>83</sup>. Competition is based upon firms performing better than rivals in one or more characteristics. In markets with perfect information and only strictly economic rational customers, the specific customer trade-offs between price, quality and functionality would be clearly visible. Therefore, well specified functional relationships between values for the three elements could be set down as the basis for determining a starting point.

When firms adopt a confrontation strategy, a highly effective cost management programme is a necessity not a luxury. Cooper (1996) argued that these programmes consisted of six products and production process related techniques. Three of them were

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<sup>81</sup> These three elements - price, quality, and functionality - are called survival triplet by Cooper, in (1995).

<sup>82</sup> Quality is defined as conformance with product specification.

<sup>83</sup> Functionality refers to the degree of success in designing the product to meet specifications that customer require.

forward oriented and designed to help manage the costs of future products. These techniques were:

- (a) Target costing
- (b) Value engineering
- (c) Inter-organisational cost management systems

The other three techniques were feedback oriented and designed to help manage the cost of existing products. These techniques were:

- (a) Product costing<sup>84</sup>
- (b) Operational control
- (c) Kaizen costing

The core idea of each technique will be explained in turn.

#### *Target costing.*

Kato (1993: 33) defined target costing as "an activity which is aimed at reducing the life cycle costs of new products, while ensuring quality, reliability, and other consumer requirements, by examining all possible ideas for cost reduction at the product planning, research and development, and the prototyping phases of production. Kato emphasised that it was not just a cost reduction technique, rather it was part of a comprehensive strategic profit management system. Target costing was the discipline which ensured that new products were profitable when they were launched. There were two major steps in target costing. The first was to determine a product's target price and target margin so that its target cost could be determined. The second was to break down that target cost down to the component and raw material level so that the purchase prices of those items could be determined. A product's target cost was determined by subtracting its target profit margin from its target selling price. That is:

$$\text{Target cost} = \text{Target price} - \text{Target margin}$$

The target price of a new product is determined primarily from market analysis. The target margin is set based upon corporate profit expectations, historical results, competitive analysis, and sometimes, computer simulations. The new product's target

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<sup>84</sup> See full absorption costing, activity based costing.

price can be used as the basis for determining the purchase price of components, and raw materials acquired externally (Cooper, 1996: 237).

The critical factor that identifies target costing (as opposed to other approaches to managing the costs of new products) is the intensity with which the rule, "The target cost can never be exceeded" is applied. Without the application of such a rule, target costing systems typically lose their effectiveness. Target cost challenges the calendar-time perspective of costs (Monden and Hamada, 1991). Bjornenak and Olson, (1999) argued that target costing took a normative perspective. It said something about how it should be, and not how it has been.

#### *Value engineering.*

Value engineering (VE) is a systematic inter-disciplinary examination of factors affecting the cost of a product in order to devise means of achieving the specified purpose at the required standard of quality and reliability at the target cost. VE, like target costing, is applied during the design phase of product development. VE is a multi-disciplinary team based approach. Teams are typically drawn from multiple function areas, including design engineering, applications engineering, manufacturing, purchasing, and, sometimes, even the firm's suppliers and subcontractors. VE plays a critical role in the management of product costs by helping the firm manage the trade-off between functionality and cost.

VE requires that each product's basic and secondary functions be identified and their values analysed. A basic function is the principle reason for the existence of the product. The secondary functions are outcomes of the way the designers chose to achieve the basic functions.

#### *Inter-organisational cost management systems.*

For many firms, the pressure to become more efficient has caused them to try to increase the efficiency of the firms that supply them with raw materials and components by developing inter-organisational cost management systems. For this it is necessary to be part of the most efficient supply chain<sup>85</sup>. There are many ways to achieve this

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<sup>85</sup> Seal, et al., (1999a) argue that inter-firm supply chains were embedded in institutional environments offering resources that may be drawn on by firms that face difficulties in regulation cost and quality issues.

objective such as: the company can opt to blur their organisational boundaries in numerous ways (organisational blurring typically occurs when information that is critical to one firm is possessed by another firm either further up or down the supplier chain); create relationships that share organisational resources, including information that helps improve efficiency of the inter-firm<sup>86</sup> activities.

### *Operational control.*

Operational control requires holding individuals responsible for the costs they control and for determining how well they control them. The two primary techniques of operational control are the establishment of responsibility centres and variance analysis.

As regards to responsibility centres, for an individual to be held responsible for a cost, that cost must be assigned directly to the centre over which the individual has control. If indirect cost assignments are used, then it is impossible to hold the individual responsible for any apparent changes in the level of resource consumption. They cannot be held responsible because there is no way of knowing if apparent changes in resource consumption are due to distortions in the indirect assignment process or to an actual change in the level of consumption. In other words, the first technique aims to change the nature of cost management to focus on different objects and process objects.

As regards variance analysis, the traditional use of variance analysis is to monitor how well the responsible individual is keeping control over costs. The aim is to ensure that the budget is achieved.

### *Kaizen costing.*

Kaizen stands for continuous improvement. Kaizen costing is the application of kaizen techniques to reduce the costs of components and products by a pre-specified amount. Kaizen, unlike Kaizen costing, typically does not focus on individual products, instead it focuses on making the production processes themselves more efficient. As a kaizen programme achieves its objectives, the overall cost of production and hence reported

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<sup>86</sup> Inter-firm relations were partly the outcome of technology, transaction characteristics and industry structure (Ellram, 1991; Slack, et al., 1998). Seal, et al., (1999a) added to that, inter-firm relations were also influenced by interaction between the firms' strategies and institutional environment of the industry.

product cost falls. Kaizen does not concern itself with product design, which is considered as given.

The difference between target and kaizen costing focuses on the point in the life cycle when the techniques are applied, (and what their cost reduction objective is). Target costing is applied during the design stage of the product life cycle. It achieves its cost reduction objective primarily through improvements in product design. In contrast, kaizen costing is applied during the manufacturing stage of the product life cycle. It achieves its cost reduction objectives primarily through increased efficiency of the production process.

Firms can manage costs in three ways. Firstly, they determine the mix (both present and future) of products that the firm sells. Secondly, they manage the costs of future products, and thirdly, they manage the costs of existing products.

The effectiveness of the various techniques for a given firm appears to be dependent upon several factors including the competitive environment, the maturity of the technologies used in the products, and the length of the product life cycle. The role of these three factors in determining the effectiveness of the six cost management techniques is primarily shaped by how the firm is competing using the following three elements: price, quality, and functionality. Under confrontation, firms compete on all three dimensions, but one of the three characteristics typically dominates the way the firm competes. The feed-forward techniques are particularly effective when firms are competing on functionality. The feedback techniques are particularly effective when firms are competing on price.

## **5.4 Conclusion**

This chapter has focused on cost accounting in service organisations. It has identified three different service delivery types, professional, shop and mass and related water industry as a mass service. The study sees strategic management accounting as the sole model of cost management which considers both the internal and external environment. Furthermore, it has centred attention on how cost accounting - six models - can support corporate strategy.

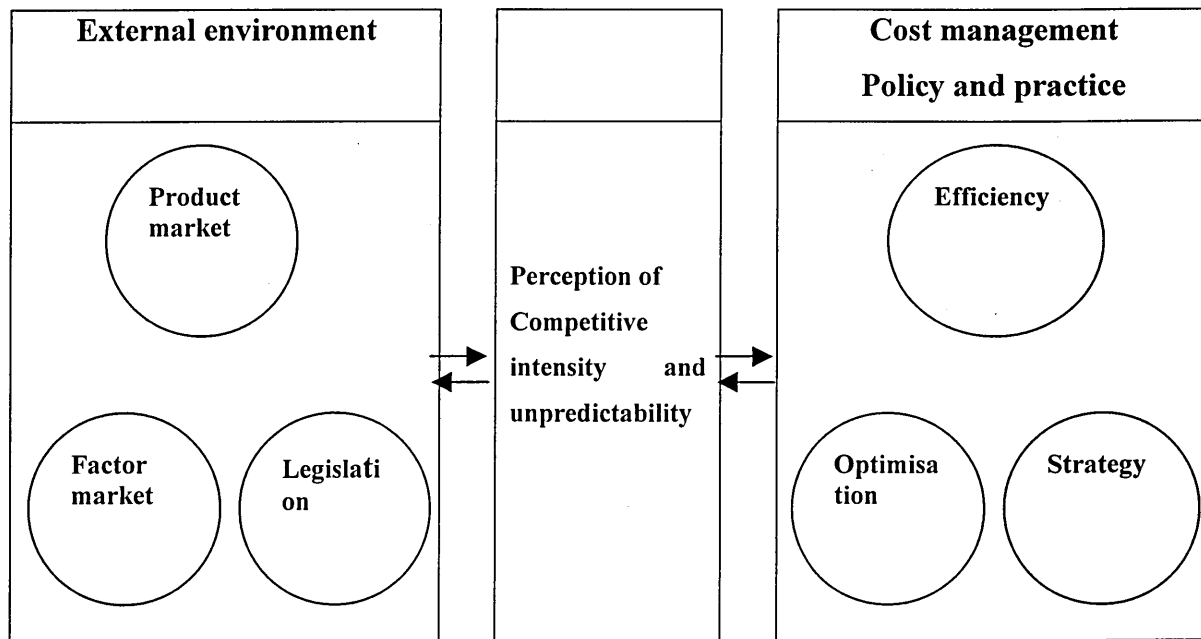
In ABC and traditional literature, cost causality is related to internal factors like number of set-ups, number of machine hours or number of products (Bjornenak and Olson, 1999: 331). ABM literature expands the view on cost causality in activities by identifying a set of different drivers, e.g. initial drivers, resources drivers and cost drivers (AX and Ask, 1995). In SMA literature the cost variability factor is inspired by the broader set of causal variability factors inspired by strategy literature (Bjornenak and Olson, 1999: 331). Porter (1985) included external factors (institutional factors) in his set of structural cost drivers. Thus, the cost driver concept in SMA is much broader than in ABC, which primarily focuses on complexity (Shank, 1989).

Chapters 2, 3, 4 and 5 have helped to build the framework for this research. Chapter two has shown the importance of both contingency and institutional theories for explaining the design and use of a cost accounting system. The chapter has argued that while technical (or contingent) explanations of cost management were not rejected, they were viewed as incomplete (Scott, 1987). This led the researcher to look at the institutional context within (e.g. which models of cost management were followed in the GOGCWS, and what methods of cost accounting were used in the GOGCWS, see sections 8.5, 8.6 and 8.7) and outside (i.e. the legal framework for water industry in Egypt, the external supervision and control body of the GOGCWS and the suggestions by the consultants Black and Veatch International which related to cost management, see sections 8.1, 8.3 and 8.7) the GOGCWS. The discussion of both the external and internal environments of the GOGCWS will be discuss according to neo-institutional economic theory in chapters ten and eleven (see figure 5.1).

Chapter three highlighted the different roles which accounting can play in organisational practice and social practice. It also illustrated that three institutional theories have been used in the accounting literature: old institutional economic theory which focus on micro-institutions within organisations; neo-institutional sociology which focuses predominately on extra-organisational institutions and neo-institutional economic theory which focuses on both micro and macro institutional contexts. As mentioned in section 1.4, this research adopts neo-institutional economic theory, this led the researcher to look at different kinds of environment in the water industry such as: (privatised water services in the UK, hybrid water services in France and hierarchical water services in Egypt, see section 7.2).

Chapters four and five focus on the model of cost management which this research has adopted. This research is based on a model of cost management which has three elements: efficiency, optimisation and strategy (see figure 5.1). Chapter four focuses on the first two elements of cost management: efficiency and optimisation. It identifies some models of cost management which indicate how to increase efficiency (i.e. throughput accounting, benchmarking, target costing and ABC) and others to increase optimisation (such as, ABM)<sup>87</sup>. The chapter identifies links between institutional theory, transaction cost and efficiency. It examines how the efficiency framework is favoured by transaction cost theories. Chapter five identifies strategic management accounting as one of the models of cost management which considers both the internal and external environment (the third element of cost management). This led the researcher to explore the question "is there any relationship between cost management (efficiency, optimisation and strategy) and the perception of competitive intensity and the perception of unpredictability related to three areas of the external environment (product market, factor market and legislation)? See figure 5.1 and chapter 9.

**Figure 5.1: The relationship between cost management and the external environment**



<sup>87</sup> For the discussion of these models within the GOGCWS see section 8.7.

In order to understand and explain the dynamic relationship between cost management and external environment, a case study method has been adopted (see chapter 6). The data is collected from multiple sources (triangulation) including company documents and questionnaires as a basis of the semi-structured interviews.

## **Chapter 6**

### **Methodology and method**

#### **6.0 Introduction**

The aim of this chapter is to outline the research design and methodology, and methods of data collection. For this purpose, this chapter is divided into three main sections, - each further divided into three sub-sections.

Section one outlines the methodology that the research intends to utilise and the rationale for choosing it. Section two clarifies the method followed in this research and the rationale for using it. Section two is divided into three sub-sections. The first explains case study research, case study theory, case study (qualitative). It gives the rationale for using case studies in management accounting research and examines some accounting case studies. Sub-section two looks at the strengths, weaknesses, and problems of the case study method. It suggests ways to understand case study research (in the preparation, collection and assessment of evidence, the analysis of data, theory development, and report writing).

Sub-section three opens the debate between qualitative and quantitative research, and examines three methods of qualitative data collection. It explains why the researcher combined qualitative research interviews and questionnaires. It discusses the different types of research interview and the strengths and limitations of each. It then explores the advantages and disadvantages of qualitative research interviews. Next it explains the different forms of company documentation, its advantages, and why it is not commonly used organisational research. Finally it describes the method which will be used in the analysis of organisational documents (the hermeneutic method) and the rationale for choosing this method.

The final section outlines the main conclusions of the previous sections (and sub-sections) of this chapter.

## 6.1 Research design and methodology

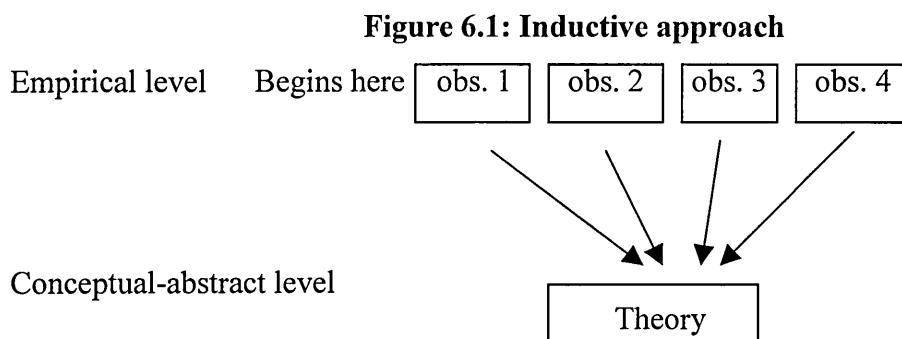
Methodology refers to the methods and ways used to conduct research. A methodological position consists of three elements (epistemology, ontology and human nature, Burrell and Morgan, 1979: 1).

### 6.1.1 Epistemology

Epistemology is the nature and forms of knowledge. It defines what 'knowledge' is, and the relationship between our ideas about what is going on in the world and the nature of the world itself. Epistemology explains the assumptions about knowledge – (i.e. about how we might begin to understand the world and communicate this knowledge) (Burrell and Morgan, 1979). It is the study of criteria, by which we determine what constitutes 'valid' knowledge.

Epistemological debates are concerned with the appropriateness of procedures and methods in the process of knowledge acquisition. A central debate focuses on induction and deduction. The inductive/deductive debate arises from whether knowledge is acquired by observation, or through theory.

The inductive approach<sup>88</sup> assumes that true knowledge begins with observations, from which theory can then be inferred. It is a process which begins with a set of observations (i.e. descriptions), and moves on to develop theories of these observations (see figure 6.1).



Source: DeVaus, D. (1996) - "Survey in Social Research", p. 12.

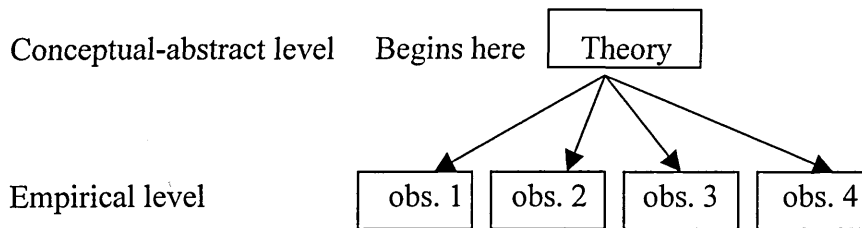
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<sup>88</sup> Theory construction / Grounded theory / Post Factum Theory / Ex post facto theory.

The deductive approach (theory testing), begins by formulating tentative theories (hypothesis), and goes on to develop procedures in order to test these theories. The deductive approach is sometimes referred to as ‘hypothetico- deductive’ or the ‘falsificationist’ approach, or “the method of conjecture and refutation” (Blaikie, 1995: 143-144). The deductive approach begins with a question or a problem that needs to be understood or explained<sup>89</sup>. The first stage involves producing a possible answer to a question, or an explanation of the problem itself. The deductive approach begins with a theory. This theory then allows us to predict how things will be in the “real” world (see figure 6.2).

The literature review gave the researcher certain expectations, as to how institutional pressures work to influence the role of cost management in the Egyptian Water industry.

**Figure 6.2: Deductive approach**



Source: DeVaus, D. (1996)- "Survey in Social Research", p. 12.

This study adopts a hybrid approach (focusing on the inductive method). The rationale for choosing a hybrid approach is because objectives of this research are to describe what is going on (i.e. what is the current cost structure for the provision of water in the Egyptian water industry), and to understand and explain why it is going on (i.e. what is the rationale of the water companies for their cost structure?). This therefore involves induction and deduction. DeVaus (1996: 11) argues that inductive and deductive approaches are not alternative ways of arriving at theories, rather they represent two stages with different starting points.

<sup>89</sup> The main objectives of this research are to understand, describe and explain the role of cost management in the Egyptian Water Industry.

### 6.1.2 Ontology

Ontology is the nature of reality and “being”. Ontology refers to the claims or assumptions which social enquiry makes about the nature of social reality. This involves claims about what exists, what it looks like, what units make it up, and how these units interact with each other (Blaikie, 1995). Ontological assumptions are at the core of the phenomena (cost management) (Burrell and Morgan, 1979: 1).

The core debates in ontology relate to “nominalism” and “realism”. Nominalism refers to assumptions that the social world (external to individual cognition) is made up of names, concepts and labels which are used to structure reality. The nominalist does not admit to there being any “real” structure to the world (Burrell and Morgan, 1979: 4). Nominalism assumes that situations and objects are not independent of prior knowledge and the perceiving mind. Researchers’ from different ideological backgrounds can arrive at *different* conclusions about the same thing.

Realism<sup>90</sup> claims that the social world, (external to individual cognition) is a ‘real’ world made up of hard, tangible and relatively immutable structures. Whether or not we label and perceive these structures. They still exist as empirical entities (Burrell and Morgan, 1979: 4). Realism assumes that situations and objects exist in their own right, (external and independent of the observer's mind). It assumes that the researcher's view of the world is unaffected by his/her beliefs and prior knowledge. Researchers therefore arrive at the *same* conclusions about a given problem in a similar situation.

This research has adopted a nominalist view. The rationale for choosing a nominal approach was largely due to the debate between Macintosh and Scapens<sup>91</sup> (1990) and Boland<sup>92</sup> (1993). Boland (1993: 126) claims that Macintosh and Scapens exaggerate the operation of management accounting systems when they describe it “as a monolithic set

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<sup>90</sup> Realism encompasses “metaphysical realism” and “epistemological realism”. “Metaphysical realism” perceives reality existing independently of the cognitive structure of observers. Epistemological realism perceives reality as cognitively accessible to the observer. Much of realism encompasses both views, although some realists would claim that while reality does exist independently of our efforts to understand it, it is not cognitively accessible (Gill and Johnson, 1991: 166).

<sup>91</sup> Macintosh and Scapens (1990) employ structuration theory to frame their analysis of the budget at the University of Wisconsin (as reported by Covaleski and Dirsmith, 1988).

<sup>92</sup> Boland (1993) draws upon existing empirical work. He re-interprets Milne's (1980) study of MBA students, through the use of accounting reports and utilising structure theory.

of structuring priorities". Boland stress "the actor's creative open possibilities for making meaning (p. 140). Macintosh and Scapens discovered that the 'power of accounting' "signifies, dominates and legitimises action". While Boland, however, stresses the 'power' of the actor in interpreting accounting as an open text.

Jones and Dugdale (2001) claim that these differences in opinion relate to methodological differences<sup>93</sup>. Boland (1993) characterises Macintosh and Scapens's approach as "a view from a distance", in contrast to his own which is, "up close". Scapens and Macintosh (1996: 681) define their own approach as "institutional analysis", and Boland's as "analysis of strategic conduct". This study has adopted institutional analysis. Scapens and Macintosh (1996: 683) argue that "in institutional analysis, the knowledge, skill and awareness of actors are kept in suspension, while institutions are treated as chronologically reproduced rules and resources. In the analysis of strategic conduct, the institutional properties of interaction are assumed to be given methodologically. Attention is focused on the processes through which social activities are produced and reproduced.

### **6.1.3 Human nature**

Human nature concerns assumptions about the relationship between human beings and their environment, (i.e., human life as the subject enquiry, Burrell and Morgan, 1979: 2). The issue of human nature is that of what model of man is reflected in any given social-scientific theory (Burrell and Morgan, 1979: 6). In other words, they select a position which sees human beings as either 'deterministic' or 'voluntaristic', when they act.

The deterministic view regards human beings and their activities as being "completely determined by the "environment" in which they are situated" (Burrell and Morgan, 1979: 6). The deterministic position assumes that human action can be understood as a direct response to external stimuli. It seeks to establish a "cause and effect" relationship between stimulus and action. The voluntaristic view assumes that human beings are free-willed, they act independently of external stimuli, and exercise choice (Burrell and Morgan, 1979: 6).

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<sup>93</sup> Researchers with different viewpoints and differing ideological backgrounds can come to different conclusions about the same subject.

Although accounting offers rules and guidelines which companies should follow, (especially public sector companies or public utilities which have specific laws – e.g. the GOGCWS, deterministic view). This study adopted a voluntaristic view.

Jones and Dugdale (2001) stress the importance of the empirical content of a study by comparing Macintosh and Scapens' (1990) study with that of Boland (1993). Macintosh and Scapens (1990) studied the University Wisconsin's relationship with the state of Wisconsin. Boland (1993) studied managers in organisations confronting a fictional case study. (Where no indication was given of organisational value, or meaning systems that might be the basis for sharing). Jones and Dugdale (2001) argue that if we are concerned with shared values and meanings constructed at the concrete, embedded level of the organisation, then it is studies such as that by Macintosh and Scapens that might reveal them. Conversely, if we are concerned with values and meanings constructed at the abstract dis-embedded level, we might then expect them to be discovered in studies such as that by Boland.

This study focused on shared values and meanings constructed at the concrete embedded level of the GOGCWS. Therefore, this study adopts a more 'voluntaristic' view of human behaviour than that which guides contingency<sup>94</sup> and neo-institutional<sup>95</sup> research. This approach can be compared with more recent advances in institutional theory, which calls for more in-depth, interpretative analyses of dialectic between stability and change (Czarniawska and Sevon, 1996).

## **6.2 Research method**

### **6.2.1 Case study**

#### **6.2.1.1 Case study and the rationale for using it**

The argument about methods depends on two factors. (1) The relationship between theory and method (2) how the researcher attends to the potential weaknesses of the method (Hartley, 1995).

The first of these factors (the relationship between theory and method) is discussed initially. In the 1990s there was significant interest in both the practice and theory of

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<sup>94</sup> See Child, 1972; Schreyogg, 1980.

<sup>95</sup> See DiMaggio, 1988; Oliver, 1991.

cost management and management accounting. Many researchers were interested in studying practice to document and understand the many roles (economic, political and social) that management accounting systems can play in the functioning of organisations (Lowe and Machin, 1983; Berry et al., 1985; Chua et al., 1988). A major objective of these studies was to examine organisational practice for the development of a sociology of accounting practice (Scapens, 1988). Many of these case studies (of activity-based accounting systems) explored the issue of how systems could be used to assist managers in formulating and implementing strategy (Spicer, 1992).

One reason for studying accounting practice (the case study approach) is to develop a better understanding of the role a company's management accounting, control system and cost management can play in the formulation and implementation of strategy. Several factors distinguish case study research from other empirical research methods. These are:

- (a) A case study is one of a number of different research methods that can be applied to cost management and management accounting research
- (b) Case studies involve an empirical inquiry where multiple sources of evidence may be used (e.g. questionnaires, interviews, document analysis and observation)
- (c) Case study research design can focus on a single organisation, (i.e. the GOGCWS, Yin, 1989)
- (d) Case study research is likely to be valuable where existing theories are inadequate or incomplete

Case studies can give an analysis of the context and processes, of the phenomena under study - (usually involving inductive analysis, data collected over a period of time, and of one or more organisations or groups (Hartley, 1995). Case study is a research design which focuses on understanding the dynamic relationships present within a single setting (Eisenhardt, 1989). Case studies must be constructed to be sensitive to the context in which management behaviour takes place. A case study approach is not a method, but rather a research strategy. As Yin (1981) notes, "because the context is deliberately part of the design, there will always be many 'variables' for observation made". A case study (defined in terms of its theoretical orientation) gives an understanding of processes alongside their contexts (Hartley, 1995).

Scapens, 1990 and Ryan, et. al., 1992 note that the term "fieldwork" and "case study" have been used to refer to studies of accounting in its actual setting. Fieldwork means studies of social practice in the 'field of activity' in which they take place. This can be a study of a single company, or a number of companies. A case study implies a single unit of analysis. This might be a company or a more aggregated unit of analysis.

Case studies need to develop theoretical frameworks in order to inform the data, provide a sense of general relevance and interest, and offer wider meaning than mere description. Case studies have been widely used to study culture and change in organisations. Case studies are distinguished by their approach to theory-building, which is usually (but not exclusively) inductive. The opportunity to explore issues in depth, (and in their actual context), means that theory development can occur through the systematic piecing together of detailed evidence to generate (or replicate) theories of general interest. Yin (1981) suggests that the case study researcher is someone akin to that of a detective who must sift evidence in order to "build a picture of motive, opportunity and method". In case study research, this 'detective' work is undertaken, not only to understand the unique features of the case, but also to draw out an analysis which is widely applicable.

Within a broader strategy, several methods may be used. These may be either quantitative, qualitative or both. The emphasis is generally more on qualitative methods, (because of the kinds of questions which are best addressed through the case study method). Participant observation is an alternative research method (Burawoy, 1979). Interviews are another research technique. These may range from semi-structured to unstructured (King, 1995). A case study may involve the use of questionnaires (with members of management or the workforce), in addition to observations and interviews.

The distinction between interviews (carried out as part of a case study) and interviews (carried out as part of a survey), is a matter of degree. As part of a case study, interviews are used to explore and probe in-depth, the particular circumstances of the organisation. They can also examine the relation between organisational behaviour and its specific context. In surveys, the emphasis is likely to be on comparisons of the organisation.

#### 6.2.1.2 Case study and accounting

Case studies have become increasingly popular in management accounting research. Little has been written on the methods of case study research in accounting, (although there is a growing literature on case study methods in other areas of social sciences).

What constitutes case study research? How do we evaluate a management accounting case study? When are case study methods more appropriate than other research methods? Otley and Berry, (1994; 1998) argue that one reason for adopting a case-based approach (in the study of accounting control), is because the accounting role and other controls cannot be fully understood in isolation. A more contextual approach is required. Case studies can be used in a variety of ways in accounting research (Scapens, 1990; Ryan, et. al., 1992; and Otley and Berry, 1994; 1998) as follows:

*(a) Descriptive case studies.* These are case studies which describe accounting systems techniques and procedures currently used in practice. The research objective is to describe methods of accounting practice. Descriptive case studies may be useful in determining the extent of the 'gap' between accounting theory and practice (i.e. what constitutes 'best' practice and "successful" companies)?

*(b) Illustrative case studies.* These are case studies which utilise the innovative practices developed by different companies and organisations (Ryan et al., 1992). Kaplan (1984) claims that accounting researchers have much to learn from studying innovative companies. These case studies are an illustration of what has been achieved in practice. Illustrative case study research begins with a clear theoretical standpoint. It then takes a 'real-world' situation and interprets it (in light of the theoretical standpoint adopted). Theories are used to explain observations (Otley and Berry, 1994).

*(c) Experimental case studies.* These are case studies, which examine the difficulties involved in implementing new proposals. Accounting researchers have developed new accounting procedures and techniques, - which intended to be helpful to accounting practitioners. These procedures and techniques have developed from existing theoretical perspectives.

(d) *Exploratory case studies*. These are case studies which explore the reasons for certain accounting practices. They enable the researcher to generate hypotheses about the reasons for particular practices (Ryan, et al., 1992). The research objective is to produce generalisations about accounting practices (Scapens, 1990). An exploratory case goes beyond mere description<sup>96</sup> towards 'explanation'. Research is a process between theory (explanation) and data (description) (Otley and Berry, 1994; 1998).

(e) *Explanatory case studies*. These are case studies which explain the reasons for observed accounting practices. The focus of the research is on a specific case. Theory is used in order to understand and explain specifics, rather than offer generalisations. The research objective is to generate theories which offer valid explanations.

(f) *Critical case*. A critical case can be used to disprove a theory by generating a set of phenomena which is inconsistent with established theories.

(g) *Accidental case*. An accidental case arises by accident, because "access" to the company is not pre-planned. It also restricts a number of aspects of organisational life.

Scapens (1990) and Ryan, et. al., (1992) found that these case studies have many areas of overlap. For example, the distinction between exploration and explanation, is rather ambiguous. An exploratory study can generate initial ideas, which will then form the basis of a theory of accounting practice. The use of case study research methods will depend on the nature of the research and the methodology of the researcher.

The researcher pursued three objectives in carrying out this case study research (descriptive, illustrative and explanatory). The rationale for choosing three objectives was to assist the researcher in his attempt to answer the research questions include:

- What is the current cost structure for the provision of Egyptian water services?
- What methods of cost accounting were and are used in the Egyptian water industry? (descriptive and illustrative)
- What is company rationale for choice of cost structure? (explanatory)
- What is the role and function of accounting in controlling the water industry? (descriptive and explanatory).

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<sup>96</sup> It is difficult to distinguish 'descriptive' case studies from 'exploratory' case studies.

It was Spicer (1992) who classified case studies into (a) Descriptive/explanatory and (b) Informing/explanatory. Group (a) descriptive and/or explanatory, case studies seek to describe/explore reasons for particular accounting practice(s). Group (b) informing and/or explanatory are case studies used indirectly to help inform non-case empirical research, or used directly to explain observed practice.

The primary objective of this research was to "understand, describe and explain the role of cost management in the Egyptian water industry". A group (a) case study was therefore considered most useful for this research. Scapens (1990) argues that the distinction between exploration and explanation is ambiguous. The rationale for choosing a descriptive/explanatory (exploratory) case study was because knowledge of cost management is insufficient to allow the development of good theoretical statements. In other words, the aim of this research was to develop theories for practice, which may then assist managers with the design of cost management systems in future.

Several authors have discussed the criteria with which to judge case-study, (e.g. Yin<sup>97</sup>, 1981; 1989; Kazdin, 1982; Bruns and Kaplan<sup>98</sup>, 1987; Eisbenhardt, 1989; Young and Selto, 1990; Atkinson, 1990; Scapens, 1990; Spicer, 1992). Perhaps the most significant contribution was that made by Scapens (1990). The case methods, (when used for explanatory purposes), relied on *analytical* not *statistical* generalisations. Therefore this research does not draw on a larger population (based on sample evidence), but rather generalises back to theory.

Case study research which describes, explains and explores cost management, can be grouped into three categories, according to the objectives of cost management (efficiency, optimisation and strategy<sup>99</sup>):

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<sup>97</sup> Yin explored case studies general.

<sup>98</sup> Bruns and Kaplan examined case studies in accounting.

<sup>99</sup> The three objectives of cost management (efficiency, optimisation and strategy) was adopted from Al-Hazami (1995). The models of cost management relating to each objective, generates originally from this thesis.

- (1) Research which studies throughput costing, benchmarking, target costing, cost leadership, full absorption cost and activity based costing, all aim to achieve efficiency
- (2) Research which studies activity-based management, re-engineering and economic costs focus on optimisation
- (3) Related research which studies Strategic management accounting, focuses on strategy. This research study incorporated all three objectives of cost management.

#### **6.2.1.3 Understanding case study research**

Researchers have identified the strengths and weaknesses of the case study method (see Miles, 1979). Since the 1970s, an increasingly sizeable literature has emerged on how to conduct case-study research and analyse its data (Campbell, 1975; Eisenhardt, 1989; Gummesson, 1991; McClintock, et al., 1979; Rose, 1991; Yin, 1981; 1989; Scapens, 1990).

A strength of the case study method lies in its capacity to explore social processes as they unfold in organisations. By using multiple (often qualitative methods, e.g. observation), a researcher can learn much more about processes than is possible with other techniques (e.g. surveys). Social studies are also useful in understanding social processes in their organisational and environmental context. Behaviour is only understandable in the context of wider forces operating within the organisation, (whether these are contemporary or historical, Hartley, 1995).

Case studies have an important function in generating hypotheses and theory-building. They can generate new theory and the emergent theory can be tested with constructs that can be measured, and hypotheses that can be disproved (Eisenhardt, 1989). Case study research provides a 'vehicle' by which theories can be modified from newly generated. Case study research is valuable when existing theories are inadequate or incomplete. Case studies can explain a sub-set of the topic under investigation. Case studies provide a more holistic approach.

Case studies can be useful in 'capturing' the intrinsic properties of organisational life. A case study is a useful technique where an insight into organisational life is required (especially if this is informal, unusual or even clandestine). In detailed case studies,

what is required is an understanding of what certain (organisational) concepts and behaviours mean.

It is useful at this point to give an overview of the problems of the case study approach. Several researchers have highlighted problems with the case study approach, and what future researchers should do to avoid potential problems (Goode and Hatt, 1952; Yin 1989; Scapens, 1990; Ryan et al., 1992; and Otley and Berry, 1994). These problems are summarised into five areas:

**(a) Wholeness.** Ryan et al. (1992) argue there is a difficulty of drawing boundaries around the subject matter (the role of cost management in the water industry) of the case. Case-study researchers must place certain limits on the on the area of study, (and make those limits quite explicit). Another possibility is to try to study every thing in 'superficial' way. Goode and Hatt (1952) posed the question "how can the wholeness of cases be preserved?" They identify four points: (a) the breadth of data<sup>100</sup> (b) levels of data<sup>101</sup> (c) formation of indexes and types<sup>102</sup> and (d) interaction in a time dimension<sup>103</sup>

**(b) 'Certainty of the researcher' and the failure to test reliability.** A weakness in the case study method is the *response of the researcher*<sup>104</sup>. The researcher may feel a false sense of certainty about his/her conclusions.

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<sup>100</sup> The collection of a large amount of data allows a unit to be studied as a 'totality'.

<sup>101</sup> The case-study method is distinguished by its use of data from abstract levels (other than purely sociological). Sociologists incorporate economic, political and psychodynamic data into their analyses, yet social research has (in the main), been moving towards a clearer definition of 'the sociological', It advocates better researchers techniques in order to abstract it from the complexity of other relationships.

<sup>102</sup> An important technique in preserving the 'wholeness' of the unit is the development of typologies and indexes. This technique is not confined to the case-study method and is used in other qualitative analysis.

<sup>103</sup> The case-study method also relies heavily on process and time.

<sup>104</sup> The 'problem' is created by the observer himself. Consequences of 'this feeling of certainty' are many, but most of them can be grouped under the heading 'a temptation to ignore basic principles of research design'. The researcher feels confident in his own specialist subject area and therefore feels no need to check the overall design of proof. The researcher has a strong conviction that his selection is "representative". He did not follow an established mode of sampling and therefore is certain there was no bias present in the study. Researchers are not categorised into different "types". An investigator who absorbs facts from a large number of cases will believe he has a statistical 'factory' sample, (no matter how knowledgeable he is about sampling design).

When an investigator feels "at home" with a given case, s/he may be tempted to "feel" the right explanation even though other researchers may arrive at an entirely different conclusion. This is what is known as *ad hoc* theorising. 'The feeling of certainty' a researcher has, might lead him/her to fail to test reliability of the data, the classifications used, or the analysis of the data.

**(c) Costs (time and money).** It is clear that the case-study approach is a costly one in terms of both time and money. Goode and Hatt (1952) argue that each case becomes a research project in itself. Therefore, even several adequately-documented cases may easily consume two years of a researcher's time. Therefore, for certain types of analysis, the use of case study research, can prove fruitful. Other types of analysis may involve a simple polling study, or mailed questionnaires. However, the analysis of detailed processes of social interaction requires some preliminary resource to case study (even where there is not complete reliance upon the case-study method).

A case-study investigator may inadvertently allow evidence or biased views to influence the direction of his findings and conclusions. As a result, each case-study investigator must work hard to avoid such a situation. Yin (1989) supports this view and claims that researcher-bias may influence the findings (Rosenthal, 1966). This problem may also emerge with other research strategies, (such as designing questionnaires for surveys, Sudman and Bradburn, 1982), or conducting historical research (Gottschalk, 1968). Yin (1989) claims that case studies are too lengthy and result in overly-complex documents. This is a valid criticism but a well-planned case study need not prove problematic.

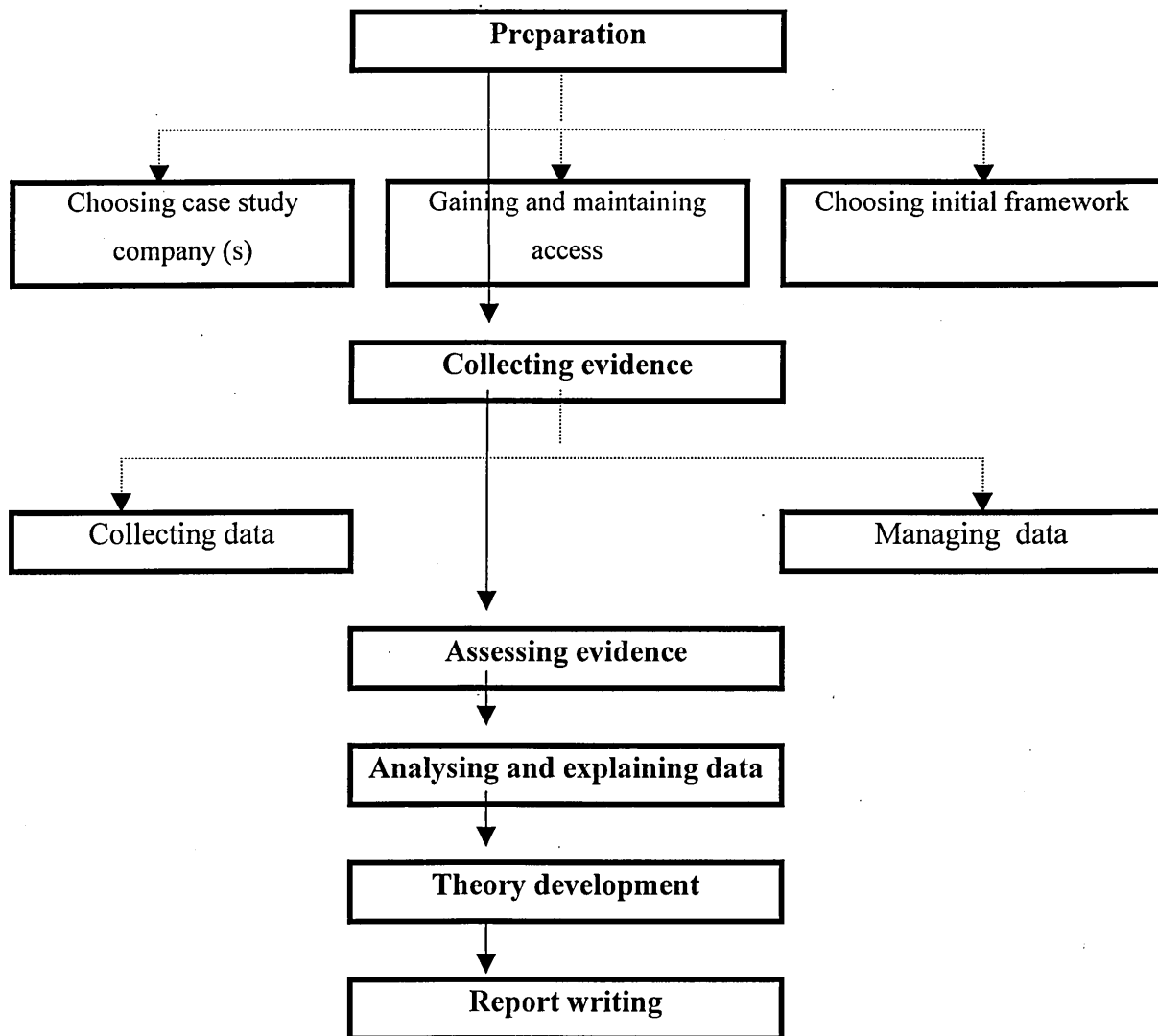
**(d) Generalisation.** Case studies provide very little basis for scientific generalisations. A frequently-heard question is "How can you generalise from a single case"? Yin (1989) claims that theoretical generalisations are possible from case studies but cannot be applied to wider populations.

**(e) Skills involved in effective case study research.** These skills have not yet been defined. Case studies are difficult to carry out effectively. We have little in the way of screening or testing for an investigator's ability to carry out effective case study research. Rules for carrying out effective case studies have not been established. As a result, "most people feel they can carry out case-study research, and nearly all of us

believe we can understand them. Neither view is well-founded, and the case studies generally receive a great deal of credit they do not necessarily deserve" (Hoaglin et al., 1982: 134). Otley and Berry (1994) argue that case studies (in the accounting and control tradition), have been "varied" in their focus. Otley and Berry (1994) claim there is currently not much theory-building or cumulation of knowledge. A major criticism of accounting and control research case studies is that researchers adopt invariably one epistemological stance, and ignore the nostrums of another.

There are certain steps a researcher should follow in order to understand case study research. These were suggested by Scapens, 1990; Ryan , et al., 1992 and Hartley, 1995. (For an explanation of these steps, see figure 6.3).

**Figure 6.3: Understanding case study research**



Source: adapted from Hartley (1995); Scapens (1990); and Ryan. et. al. (1992).

## Preparation

At the preparation stage, a researcher should review a number of available theories. This will determine the way in which the researcher examines a case. Preparation can involve new theories. It is useful to divide the preparation stage into three sub-stages as follows:

*Choosing a case study company (s).* Single case studies can yield valuable information about the topic under investigation. A research study may become more valid by company two or more cases, or indeed even carrying out a comparative study within the case organisation itself (e.g. perceptions of employees in different departments).

This research was based on one case study on the General Organisation for Greater Cairo Water Supply (the GOGCWS). Reasons for choosing this company were several: (1) It was the first company established in the Egyptian water industry. It could therefore help the researcher achieve his aim of describing and explaining the role of cost management in the Egyptian Water industry. The GOGCWS represents "the total experience of Egyptian Water"

(2) The GOGCWS provides water for 25% of the population in Egypt. It has a unique<sup>105</sup> laboratory - ideal for analysing water in the Middle East (The cost of this laboratory was 25 million Egyptian pounds<sup>106</sup>)

(3) There are discrepancies between the expenses of the GOGCWS and its income. The cost per  $m^3 = 0.46$  pence (wages 8.03 + Power and electricity 6.99 + raw materials 4.47 + other current expenses 7.00 + interest "local and international" 11.29 + Depreciation 8.19)<sup>107</sup>. By contrast, average income was per  $m^3 = 0.16$  pence, so this price does not encourage efficiency

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<sup>105</sup> The GOGCWS, (no date source given, c) - "Greater Cairo Water", The Administration of Public Relations.

<sup>106</sup> N.B: English pound £ = 6.00 Egyptian pounds.  
American Dollar \$ = 5.00 Egyptian pounds.

<sup>107</sup> The GOGCWS (no date source given, c) - "Greater Cairo Water", The Administration of Public Relations.

(4) It is estimated that the General Organisation for the Greater Cairo Water Supply loses 40% of water through leakages each year. This results in an estimated wasteful expenditure of 250 million Egyptian pounds every year. Efficiency in the company is therefore low

*Gaining and maintaining access.* Gaining access to an organisation is complex. Maintaining this access requires continual attention. Access is affected by changes in personnel or the fortunes of the company. It is also influenced by how much organisational time the researcher is taking and the perceived contribution of the research. "Reporting back" discussions with the principal sponsor in the organisation can be useful (Buchanan, et al., 1988).

This research aimed to explain the role of cost management in the Egyptian Water Industry. The General Organisation for the Greater Cairo Water Supply (GOGCWS) was chosen as a case study. Egypt has a bureaucratic state. Government bureaucrats often create unnecessary red-tape. As Cook (1998) found his research in Egypt, some topics have 'universal' sensitivity in developing countries. These include military matters, political power structures, government decision-making processes and religious and social problems which reflect the national image. The water industry is a good example of the latter. In March 2000 the researcher prepared his preliminary research for access into the GOGCWS and in June 2000 was granted access into the company. The Fieldwork place as outlined below:

On 13 March 2000, my research supervisor wrote to the Chairman of the Educational and Cultural Bureau of Egypt (my sponsor) to ask his assistance in gaining access to the GOGCWS (for no later than May 2000, see section A1.1). On 20 April 2000, my supervisor sent my fieldwork plan to the Chairman of the Educational and Cultural Bureau of Egypt (see section A1.1). The Chairman granted permission for my fieldwork. On 9 June 2000, I arrived in Cairo and the following day I made my way to the central government building in downtown Cairo the "Mugamma". I was advised there to go to the Central Institution for General Statistical (the CIGS). On 12 June, I went to the CIGS and filled in a form requesting permission to carry out interviews and questionnaires. They asked me to return in seven days. The following week, I returned to the CIGS, only to be told to return a week later. I made it clear then that I only had a

short time in Egypt and asked them to make sure my papers were ready the following week. The next week I return to the CIGS. They informed that a decision had been made and would be sent to the Mission department in Mugamma. I requested permission to take the documents myself to the Mission department.

On 21 June 2000, I took the decision papers and a covering letter and the following day I took these documents (see section A1.1) to the Mission department. They asked me to return in 48 hours. On 24 June I received a letter from the Mission department addressed to the Chairman of the General Organisation for the Greater Cairo Water Supply (the GOGCWS). On the same day I went to see the Chairman of the GOGCWS who asked me to return the next day. On 25 June, I returned to the GOGCWS who passed the letter to the Vice Chairman of Technical Affairs, who in turn transferred it to the Vice Chairman of Financial and Administrative Affairs. From that day I had access to the GOGCWS.

*Choosing initial framework.* Literature is used to focus the study to avoid producing a narrative, rather than theory-based study. In order to avoid being overwhelmed by data, theory is used to examine, support or contest.

### **Collecting evidence**

The researcher should allow issues and theories to emerge out of the case, rather than imposing their own view(s) on it. Typical sources of evidence include interviews, documentation, direct observation and participant observation. In most cases it is important to use multiple sources of evidence. This might include two elements: collecting data and managing data.

*Collecting data.* The data should give the researcher an overview of structure and the functioning of the organisation. It should give information as to which people to talk to, what to observe, research methods, and systematic questioning (not ad hoc data collection). The GOGCWS research utilised company documents, questionnaires and interviews. The questionnaire<sup>108</sup> was used as the basis for interviews<sup>109</sup>. The researcher

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<sup>108</sup> For employee position (name and job of people who filled in the questionnaire, see table A2.1).

<sup>109</sup> The people who were interviewed were the same people who filled in the questionnaire (see table A2.1) except Nos. 20, 38, 39, 41- 46, 48-50.

spent time with each respondent, clarifying the questionnaire in order to make it easier and understandable. If a respondent became tired, they were asked to complete it another time. Most questionnaires were completed by the third interview. The interviews were semi-structured because I was 'open' to any new issues (such as privatisation in the Egyptian water industry). In addition, if any new issues were raised, I would ask all respondents about it.

*Managing data.* The researcher should observe and record data about the organisation and its people. Glaser and Strauss (1967) make a distinction between observation notes, method notes and theoretical notes.

### **Assessing evidence**

The validity of each piece of evidence should be assessed by comparing it with other evidence on the same issue (triangulation). In assessing evidence there are two crucial issues for the case researcher to resolve: (1) The "rules of evidence" which should be applied to the case concerned and (2) The "standard of proof" which is sought at each stage of the analysis. In order to assess validity, this research used questionnaires, interviews and documentation analysis. The questionnaire had different types of questions to measure a single idea. These questions checked the validity and reliability of respondents. The researcher compared the information obtained from questionnaires, with the information from interviews and documentation.

### **Analysing data**

Data collection and analysis is an iterative process which allows theory to develop, grounded in empirical evidence. Yin, (1989) argued that to avoid the danger of 'premature closure' - what is required is careful description of data and the development of categories (i.e. key themes, topics and questions). It is sometimes helpful to prepare models (diagrams, flow charts, etc.) which attempt to link the various themes and issues. In the light of these suggestions, the researcher began his own analysis of data by devoting a chapter to the current accounting system of the GOGCWS. The subsequent chapters dealt with the analysis of data.

## Theory development

The researcher should compare existing literature with expert opinion. The researcher should ascertain that the case is an accurate rendition of facts, producing plausible explanations and conclusions based on best explanation.

## Report writing

The report should draw out theoretical implications, which will carry over other case studies. Many researchers experience a common problem. How should a researcher select a suitable case study for his/her research? Ryan, et al., (1992) illustrate five different uses of case study research, namely experiment case<sup>110</sup>, critical case<sup>111</sup>, extreme case<sup>112</sup>, exploratory case<sup>113</sup>, and multiple cases<sup>114</sup>. There are no universal rules for selecting a suitable case study but the selection depends on the research question (s). How does the case study help the researcher answer his/her research question (s)?

### 6.2.2 Qualitative approach

#### 6.2.2.1 The Debate between qualitative and quantitative research

Bryman (1988) draws out some differences between quantitative and qualitative research. These differences can be summarised as follows:

##### *(a) The role of qualitative research*

Quantitative researchers rarely deny the usefulness of qualitative research, but have tended to view it as an essentially exploratory way of conducting social investigations. Consequently, they have typically seen it as useful at the preparatory stage of a research

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<sup>110</sup> The 'experiment case' relies on theoretical generalisations. Hence, the issues involved in selecting cases, should be similar to those considered in selecting topics for experiment, (rather than those used for selecting a statistical sample).

<sup>111</sup> A 'Critical case' is used where there is a well formulated theory and the major research issues are clearly defined. The objective of such a study would be to determine that the theory provides good explanations, otherwise alternative theories need to be developed.

<sup>112</sup> An 'Extreme case' is used where the researcher wants to extend a theory to cover a wide(r) range of circumstances.

<sup>113</sup> An 'Exploratory case' could be used to begin the process of theory development. The selection of a particular case for study, is relatively unimportant. What is needed is a case within the relevant area, which will then enable the researcher to begin the process of theory development.

<sup>114</sup> 'Multiple cases' can be used for two purposes. The objective of multiple cases is to develop a rich theoretical framework, capable of explaining a wide range of circumstances.

project. Qualitative research is often depicted as useful as a means of hunches and hypotheses which can be tested more rigorously by quantitative research (Bryman, 1988). This research study has combined<sup>115</sup> methods of quantitative research (questionnaires), and qualitative research (interviews).

*(b) Relationship between researcher and subject*

In quantitative research, the researcher's contact with the people under study is fairly fleeting, or even non-existent. This was not the case with the GOGCWS research study because an example amount of time was spent with each respondent who completed the questionnaire. By contrast, qualitative research requires much more sustained contact, especially when participant observation is the central method.

*(c) The researcher's stance in relation to the subject*

Quantitative researchers adopt the role of an outsider looking in on the social world. He/she applies a pre-ordinate framework on the subjects being investigated and are involved as little as possible in that world. This was not the case with the GOGCWS research study. Among qualitative researchers there is strong urge to "get close" to the subject being investigated. For qualitative researchers, it is only by getting close to their subjects and becoming an "insider", that they can view the world as a participant in that setting. Adler (1985: 11) in his research, found that "the only way I could get close enough to [upper-level drug dealers and smugglers] to discover what they were doing and understand the world from their perspectives was to take a membership role in the setting".

*(d) Relationship between theory/concepts and research*

The model of quantitative research, is that theories and concepts are the starting point for investigations carried out within its framework. However the extent to which quantitative research is explicitly guided by theory has been questioned by many commentators. Some argue that theoretical reasoning often occurs towards the *end* of the research process (Cicourel, 1982). Qualitative researchers often reject the idea of using theory as a pre-cursor to investigation (except perhaps as a means of providing an initial orientation to the situation as in "ground theory"), since it may not reflect subjects' views about what is going on and what is important. Consequently, as one

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<sup>115</sup> Questionnaires are used as a basis for interviews.

advocate of qualitative research has put it: "It is marked by a concern with the discovery of theory rather than the verification of theory" (Filstead, 1979, p. 38). The GOGCWS research had an uncompleted theoretical framework before the fieldwork began. The framework was completed after the fieldwork. Hence, the researcher deemed a combination of quantitative and qualitative research as most appropriate.

*(e) Research strategy.*

Quantitative research tends to adopt a structured approach to the study of society. To a large extent, this tendency is a product of the methods with which it is associated-both surveys and experiments. By contrast, qualitative research tends to be more open. Many ethnographers advocate the delineation of a research focus be deferred as long as possible (Cohen, 1978). Consequently, many qualitative researchers feel overwhelmed during their early days in the field, since everything they observe is potentially "data". Whyte (1984) for example, sees ethnographic research as deriving much of its strength from its flexibility, which allows new leads to be followed up or additional data to be gathered in response to changes in ideas. But he also notes a limitation of such flexibility since "you may find so many interesting things to study that you are at a loss to delimit the scope of your project and focus on specific problems" (p. 225). For the purpose of the research and the method used in this study (a combination between quantitative and qualitative), the questionnaire had several open-ended questions and was used as a basis for the semi-structured interviews.

*(f) Scope of findings.*

It is common to conceive of the quantitative/qualitative dichotomy in terms of respective commitments to nomothetic and ideographic modes of reasoning (Halfpenny, 1979). This distinction effectively refers to the scope of the findings, which derive from a piece of research. A nomothetic approach seeks to establish general law-like findings, which are deemed to hold irrespective of time and place. An ideographic approach locates its findings in specific time-periods and locations. The findings of this research were done in a specific time-period, and in one location (the GOGCWS) because the researcher focused on only one case study of an Egyptian water company. This means the research followed mainly a nomothetic view. However, the findings can

generalise<sup>116</sup> across the Egyptian water industry, because there is only one law and one accounting system applied in all water companies in Egypt.

Quantitative research exhibits a nomothetic approach because of the investigator's ability to extrapolate findings to larger populations. By contrast, the qualitative researcher frequently conducts research in a specific milieu (a case study), whose representatives are unknown, so the potential for generalisation is also unknown.

*(g) Image of social reality.*

Quantitative research conveys a view of social reality which is static, (in that it does not consider the impact and role of change in social life). Qualitative research examines connections between variables. The proponents of qualitative research argue that quantitative research rarely examines the processes which link to qualitative research (Blumer, 1956; 1969). They also claim that the independent and dependent variables fail to take into account the flow of events in which these variables are located. The qualitative researcher is in a better position to view the connections between events and activities, and to explore people's interpretations of the factors which produce such connections. This stance affords qualitative researchers a much greater opportunity to study processes in social life.

*(h) Nature of data.*

The data arising from quantitative studies is often depicted as hard, rigorous, and reliable. This suggests that such data exhibits considerable precision, is collected systematically and may be checked by another investigator. These factors mean that quantitative data is more persuasive, and hence more likely to gain the support of policy makers.

Qualitative researchers routinely describe the data derived from ethnographic work as "rich" and "deep", thereby drawing a contrast with quantitative data (which tends to be depicted as superficial). The adjective "rich" suggests an attention to (intricate) detail which many qualitative researchers often provide. For many qualitative researchers, quantitative research produces superficial data. For example, qualitative researchers see

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<sup>116</sup> The objective of the study is not to provide generalisations or explanations at abstract levels. Rather it is to provide theoretical explanations of observations in a particular rather than a general setting.

survey research as merely a source of 'surface' information, which relates to abstract categories. By contrast, the quantitative researcher may consider a limited ample research studied in one location as somewhat lacking (Liebow, 1967). The data collected may be heavily influenced by the particular emphases and predisposition of the researcher.

For a summary of the above arguments see table 6.1

**Table 6.1: Differences between quantitative and qualitative research**

	<b>Quantitative.</b>	<b>Qualitative.</b>
1- Role of qualitative research	Preparatory	Means to exploration of actors' interpretation
2- Relationship between researcher and subject	Distant	Close
3- Researcher's stance in relation to subject	Outsider	Insider
4- Relationship between theory/concepts and research	Confirmation	Emergent
5- Research strategy	Structured.	Unstructured
6- Scope of findings	Nomothetic	Ideographic
7- Image of social reality	Static and external to actor	Processual and socially constructed by actor
8- Nature of data	Hard, reliable	Rich, deep

Source: Bryman, (1988)- "Quantity and Quality in Social Research", p. 94.

Both qualitative and quantitative research involves the development of methodological skills, e.g. (gaining access, conducting different types of interview, different approaches to participant observation, work histories, case studies, and ethnographic research). However qualitative research is more than a series of methodological skills. It involves reflection on such skills, understanding different approaches to analysis, dealing with issues of generalisation and specificity, and an engagement with theory and method.

Confusion only arises with qualitative research over the way such data must be handled, and the use to which such data can be put. This confusion is caused by a failure to differentiate between several orientations in qualitative data. The difficulty of

qualitative research methods is how to treat the data in an appropriate way, and how to choose methodological issues.

Within the positivistic paradigm, qualitative researchers tend to look for cause and effect on the assumption there is a 'real' world which has determinate characteristics. These theories will show how certain variables interrelate - especially how they relate to each other in a cause and effect fashion. Some writers disagree with this view of positivism. The idea is that of an underlying unequivocal reality, consisting of a web of relationships between specifiable variables, and scientific theories are testable models of that reality. It is true that positivism favours quantitative methods, but it is incorrectly thought that qualitative research data cannot fall within a positivist philosophy of science. Ashworth (1997) considers "the ground theory" of Glaser Strauss and colleagues (Strauss and Corbin 1990), as having many of the hallmarks of positivism, despite the fact that qualitative techniques are seen as appropriate to the whole research process, not merely to the early "discovery" phase.

It is clear from the above argument that although qualitative research has several advantages, it also has disadvantages. In order to limit the effect of these disadvantages, the researcher combined both qualitative research (interviews) and quantitative research (questionnaire).

#### **6.2.2.2 Qualitative research interview**

The most widely used qualitative method in organisational research is the interview method. It is easy to see why. It is a highly flexible method, it can be used almost anywhere and is capable of producing data of great depth (King, 1995). Above all, it is a method with which most research participants feel comfortable. When a researcher tells interviewees "I would like to interview you about..." most people have a reasonable idea of what to expect. This is not necessarily the case with other qualitative methods, such as participant observation or the Twenty Statement test.

King (1995) argues that qualitative research interviews have "depth", are "exploratory", semi-structured, or unstructured. Kvale (1983: 174) defines the qualitative research interview as "an interview, whose purpose is to gather descriptions of the meaning of the described phenomena". The goal of any qualitative research interview is therefore to

see the research topic from the perspective of the interviewee, and to understand how and why he or she comes to have this particular perspective. Hence, what is required for any interview is a low degree of structure imposed by the interviewer; open questions, and a focus on "specific situations and action sequences in the world of the interviewee", rather than abstractions and general opinions (Kvale, 1983: 1976).

There are three kinds of interview: qualitative research interview, quantitative research interview<sup>117</sup>, and structured open-response interviews<sup>118</sup> (King, 1995).

Qualitative research interviews vary in their focus - focusing on an individual's whole life-world. Fetterman (1989) looks at particular topics and how they are perceived and understood by interviewees. Though never highly structured, qualitative research interviews also vary in the degree of structured imposed.

The research used semi-structured interviews (structured open-response interviews). The rationale for choosing this type of interview is that it lies somewhere between the qualitative research interview and the structured interview, (in terms of its degree of imposed structure and the balance of open and closed questions). King (1995) refers to them as "structured open-response interviews". They tend to focus on factual information and general evaluative comments, without exploring deeper layers of meaning. King (1995) argues that the structured open-response interview is most

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<sup>117</sup> The antithesis to the qualitative research interview is the structured interview. In this, the interviewer uses detailed a schedule with questions asked in specific order. Questions are mostly closed, and will use numerical rating scales, and/or tick- boxes. A small number of open-ended questions may be used to allow the interviewee to expand upon particular points or make general comments about the research topic. The interview will not normally taped; instead the interviewer will record responses by hand. The qualitative research interview is most appropriate when: (a) a study focuses on the meaning of a particular phenomena to participants (b) to study individual perceptions of processes (within a social unit are to be studied prospectively, using a series of interviews) (c) where individual historical accounts are required of how a particular phenomena developed - (for instance, a new shift system) (d) where exploratory work is required before a quantitative study can be carried out (e) where a quantitative study has been carried out and qualitative data is required to validate particular measures or to clarify and illustrate the meaning of the findings.

<sup>118</sup> This type of research interview lies somewhere between the qualitative research interview and the structured interview in terms of its degree of imposed structure and balance of open and closed questions. King (1995) refers to them as "structured open-response interviews". They tend to focus on factual information, and general evaluative comments without exploring deeper layers of meaning. The structured open-response interview is most appropriate: (a) where a quick, descriptive account of a topic is required, without formal hypothesis-testing (b) where factual information is to be collected, but there is uncertainty about what, and how much information participants will be able to provide (c) where the nature and range of participants' likely opinions about the research topic are not well known in advance, and cannot easily be quantified.

appropriate (a) where a quick, descriptive account of a topic is required, without formal hypothesis- testing (b) where factual information is to be collected, but there is uncertainty about what and how much information participants will be able to provide (c) where the nature and range of participant opinion about the research topic is not well known in advance and cannot easily be quantified

Qualitative research interviews have many advantages. For example, different type of qualitative research interview can be used to tackle different types of research questions in organisations, making them one of the most flexible methods available. They can address quite focused questions about aspects of organisational life, (for instance, specific decision processes such as selection decisions, or decisions about innovation adoption). Similarly, they can focus on experiences of a particular training or development programme, perhaps as part of a wider assessment process. At the other end of the scale, qualitative research interviews can be used to examine much broader issues, in such areas as gender, organisational culture and the effects of unemployment.

The key feature between the quantitative and qualitative research interview is the nature of the relationship between interviewer and interviewee. In a quantitative study using structured interviews, the interviewee is seen as a research “subject”, in much the same way as he or she would if completing a questionnaire or taking part in an experiment. The researcher’s concern is to obtain accurate information from the interviewee, untainted by relationship factors. The interviewer therefore tries to minimise the impact of interpersonal processes on the course of the interview. By contrast, qualitative researchers believe there can be no such thing as a “relationship-free” interview. Indeed, the relationship is *part* of the research process, not external to it. The interviewee is seen as a “participant” in the research, actively shaping the course of the interview rather than passively responding to the interviewer’s pre-set questions.

The qualitative research interview is ideally suited to examining topics in which different levels of meaning need to be explored. This is something that is very difficult to do with quantitative methods, and problematic for many other qualitative techniques. Finally, the qualitative research interview is a method which most research participants accept readily. Some researchers have suggested that people like talking about their

work, whether to share enthusiasm or to air complaints, but rarely have the opportunity to do so with interested outsiders (King, 1995).

Without doubt, there is no one-research method which has advantages without having its disadvantages. Qualitative research interviews have several disadvantages. The process is very time consuming, (in developing an interview guide, carrying out interviews, and analysing transcripts). It is essential that the researcher does not attempt to take on more interviews than he or she has time for in a study. Qualitative research interviews are also demanding to conduct, as they involve considerable concentration from the interviewer. Interviews are also time-consuming for interviewees, and this may cause problems in recruiting participants in some organisations and occupations. The best recruitment strategy is probably to send a letter with basic details of the study's aims and what will be required of the interviewee, with a follow-up phone call in which the researcher can explain his or her aims in more depth and answer any queries.

Occasionally, the researcher will experience "difficult" interviewees, defensive, hostile or unable/unwilling to focus on the research topic(s). To be told directly "that was a ridiculous question!" or 'I can't see why you are asking me these things' is much more uncomfortable than receiving a questionnaire back from a survey participant with "stupid question!" scrawled across it. The researcher may be able to use interpersonal skills (above all, patience) to defuse awkward situations, and must ensure that his or her research questions are likely to be relevant to the people being interviewed.

A difficulty faced by many researchers using qualitative research interviews is the feeling of data overload as a result of the huge volume of rich data produced by even a moderate-sized study. It is easy for the researcher, particularly if inexperienced in the method, to feel that he or she is lost and sinking in a quagmire. This is most likely to happen when the researcher is utilising solely qualitative methods in an institution dominated by traditional quantitative techniques. In these circumstances, King (1995) suggests three directions where the researcher can turn for a 'rope' to pull him or herself out of the swamp. First, there are the original aims of the study. If beginning to feel lost in a particular line of exploration, the researcher should ask: 'Is this adding to my understanding of the topic(s) I set out to study? If not, is it raising new and related topics which are of interest?' If the answer to both questions is "no", then the researcher

should change the direction of the analysis. Second, the inexperienced researcher can turn to literature describing other studies using qualitative research interviews, to provide examples of how problems in data analysis were tackled, including material outside his or her own area. Third, personal networking is of great importance. If there is no one even sympathetic to qualitative methods in the researcher's own department, he can try other departments.

#### **6.2.2.3 Company documents**

Organisational documentation comes in many forms: company annual reports; public relations material and press releases; accounts statements; corporate mission statements; policies on marketing strategy; formal charters and legal documents; policies on rules and procedures; human resources management strategies; policies directive on training, career management; job mobility and relocation management; formal memos between different groups and departments; and informal and private correspondence between staff and correspondence between respondent and researchers (Forster,1995).

There are many advantages to using organisational documents such as:

*(a) Organisational documentation and the history of the company.* Documentary records data is often more comprehensive than the kind of material which the researcher who is new to an organisation could obtain from either interviews or questionnaires. They are often contemporary records of events in organisations. This can help the researcher to look more closely at historical processes and developments in organisations, and can help in interpreting informants' "rewriting" of history. Most of it is within company boundaries and even those documents which are explicitly public relations in tone, can tell the researcher a great deal about the kind of "image" and the culture of a company.

*(b) Organisational documentation and understanding.* Company documents are (con)-textual paradigms which are an integral part of other systems and structures in organisations. They can highlight different understandings and interpretations of life amongst different groups within companies.

(c) *Organisational documentation and time and validity*. Company documents save time in research. They enable the researcher to access detailed information on, for example, organisational structure, succession planning systems, career development policies, and so forth. Organisational documentation provides another means of triangulating data.

If company documents have all these advantages why are they not used more in organisational research? Forster (1995) argues that company documentation may not be an accurate record of actual events and processes. So they should never be taken at "face-value". Company documents need to be carefully checked, interpreted and triangulated with other data sources. There is no universal method of analysis of organisational documents. This research will use the hermeneutic method to analyse company documents. The hermeneutic method is concerned with the study of historical texts, with understanding rather than hypothesis-testing, and analysing the meaning of individual texts. The rationale for choosing the hermeneutic approach is that it describes the process of developing an inductive understanding of clusters of company documents, through to a deductive understanding of the whole.

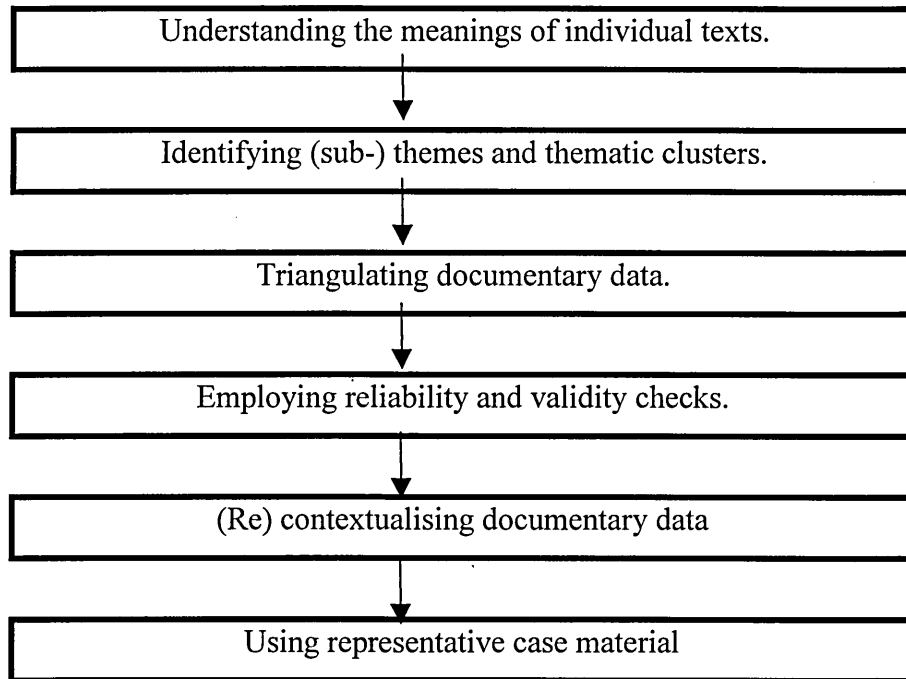
Forster (1995) identifies seven stages in the hermeneutic process and the researcher has broken them down into six stages<sup>119</sup> (see figure 6.4).

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<sup>119</sup> The researcher sees the third stage of Forster's 'seven stages' as identifying thematic clusters, which developed from the second stage which identified (sub-) themes. The researcher combined the two stages in the GOGCWS.

**Figure 6.4: The hermeneutic process**

**Research design.**



Source: Forster, N. (1995)- " The analysis of company documentation", p. 151

*Understanding the meanings of individual texts.* This stage involves a continuous back and forth process between the parts and the whole. The initial task of the researcher is to search for themes within each document and then within clusters of the documents. At this stage the focus of attention is on meaning rather than on analysis. From this, "ground knowledge", themes and sub-themes will emerge, and the researcher can then determine what is important to extend our understanding of textual themes and sub-themes.

*Identifying (sub-) themes and thematic clusters.* At this stage the researcher tries to understand contradictory sub-themes, so it then becomes possible to cluster documents.

*Triangulating documentary data.* At this stage, the analysis of company documents is critical. A serious problem arises here, because whilst a segment of text may be analysed in the researcher's own right, the true meaning of these can only be evaluated with reference to other texts and other forms of data. There are two solutions for these problems. The first solution is to recognise that it impossible to do full justice to the range and quantity of documents in any organisation. The best that we can hope to

achieve is to provide slices of organisational life in academic journals. The second solution is to check reliability and validity. The GOGCWS research study opted for the second solution (see section 9.3).

*Employing reliability and validity checks.* The aim of this stage is to enable the researcher to verify the findings.

*(Re)contextualising documentary data.* Company documents can only be fully understood within broader organisational contexts and processes, and with reference to other forms of data. The GOGCWS research study used company documents, questionnaires and interviews.

*Using representative case material.* At this stage, a researcher selects which documents are to be sampled and used as the case materials in company reports, conference presentations and research publications.

### **6.3 Conclusion**

This chapter has focused on the methodology and method used in the GOGCWS research. The research combined inductive and deductive approaches, focusing more on the inductive strand. It adopts both nominal and voluntraistic views. This research is characterised as "institutional analysis", similar to that of Scapens and Macintosh (1996). Theory is used in order to understand and explain the role of cost management in the Egyptian water industry. The research objective is to generate theories which provide good explanations (explanatory case study, Scapens, 1990).

The case study method was adopted in this research. The argument about methods depends on two factors; firstly, the relationship between theory and method, and secondly, how the researcher attends to the potential weaknesses of the methods (see sections 6.2.1.1 and 6.2.1.3).

This research is based on one case study - The General Organisation for the Greater Cairo Water Supply (GOGCWS) (the rationale for choice of company, can be found in section 6.2.1.3). The case study method was used for analysis of processes of cost management at the GOGCWS (inductive approach). The case study focused on

understanding the dynamic relationship between cost management and the external environment (see chapters 9 and 10).

This chapter has illustrated different types of accounting case studies (descriptive, illustrative, explanatory, exploratory, etc). It also explained how a case study is conducted, - beginning with its preparation and ending with report writing. The case study in this research had a descriptive and explanatory purpose.

The research combined quantitative research (i.e. questionnaires) and qualitative research (interview methods). The questionnaire was used as a basis for the semi-structured interviews. The data was collected from multiple sources (triangulation), including company documents and questionnaires.

## Chapter 7

### The Water industry, Cost management and Institutional theory

#### 7.0 Introduction

The aim of this chapter is to illustrate the importance of water, to explore the phenomenon of privatisation in the water industry and the effect it has on the role of accounting, considering cost management in particular. The chapter will also consider the pros and cons of public versus private-owned water systems. Finally the issue of costs in the water industry will be explored (i.e. how do people pay for their water requirements, how to calculate the cost of water, and is this system fair or is a new system required).

The research focuses on England, France and Egypt. The rationale for choosing these three countries is England has experience of privatisation and problems in the water industry. Before privatisation, England experienced similar problems to those currently experienced in Egypt. France was selected because in the researcher's view, it has one of the 'best'<sup>120</sup> water industries in the world (in terms of the management of water). The French system is a state-regulated system. Egypt is currently experiencing many problems with its public utilities (especially the water industry).

This chapter is divided into four sections. Section one offers a definition of a public utility and indicates that the water industry is one of these. The chapter also highlights the importance of water, the responsibility of government (in relation to) water, and how to meet the growing demand for water.

Section two examines the aim of privatisation and why the UK government chose to change from a regulated water industry to a privatised one. It also examines the effect of privatisation on the customer, on efficiency, on costs, on competition, and on

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<sup>120</sup> The researcher has built his view from many examples such as; in the global water industry, the two largest companies are both French; Suez Lyonnaise des Eaux and Vivendi. These two giants dwarf the UK water companies- Suez Lyonnaise has a market capitalisation of £15.6 billion and Vivendi £22.9 billion. Their mission is also clear. When the chairman of Suez Lyonnaise was asked about this strategy, he replied: "In water and waste water services, we want to be world leaders". These companies are competing aggressively in the global market and are respectively four and six times larger than the largest UK water company, Thames Water, which has a market capitalisation of £3.9 billion.

performance. Finally, a brief assessment of the system of water in France and Egypt is conducted from an institutional perspective.

The third section illustrates cost systems and problems in the water industry; i.e. how people pay for their water requirements, how the cost of water is calculated and whether this system is fair or a new system is needed.

The final (fourth) section outlines the main conclusion of this chapter.

## **7.1 Public utility**

### **7.1.1 Characteristics**

No single characteristic distinguishes a public utility from other firms. However, several conditions that follow Howe and Rasmussen (1986) when considered in combination do serve to identify a company.

- (1) A public utility frequently has natural monopolies, in a similar way to electric, gas, water and telephone companies
- (2) The prices these industries charge for services are determined by government regulation
- (3) The utility must supply all who require the service, when they want it and at the regulated price. The utility cannot turn away customers who are willing to pay the prescribed price
- (4) Utilities are given franchises as exclusive suppliers within the franchise area
- (5) The utility is subject to additional regulations not required of other firms, including regulation of accounting practices, procedures of security issuance, plus extensive reporting of business activities
- (6) A utility must provide a service that is essential in some sense to modern living but this condition is difficult to define in practice

### **7.1.2 Types of services**

Another way of identifying a public utility is by specifying the services it provides. As the well-known public utility economist (Bonbright, 1961) put it, there are basically two categories of public utilities:

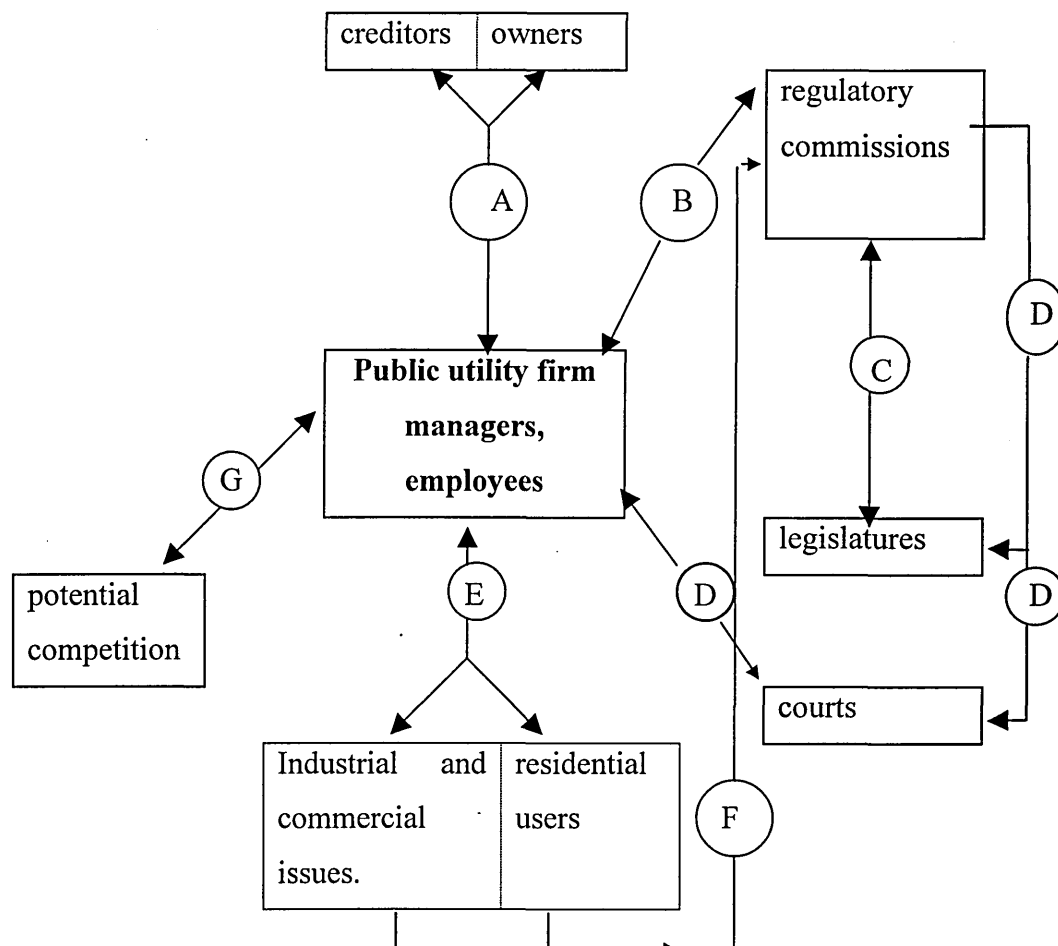
- (a) Those enterprises which supply, directly, continuous or repeated services through more or less permanent physical connection between the plant of the suppliers and the premises of the consumer
- (b) The public transportation industries. Important among this first group are utilities supplying electricity, gas, telephone, telegraph and water. The second group includes airlines, motor freight carriers, railway, water carriers, petroleum pipelines, and local transit systems.

An interesting alternative viewpoint is expressed by the economist Primeaux, (1979) who argues that the electric utility currently does not possess the prerequisite conditions for a natural monopoly and therefore its monopoly status, as a public utility, ought to be re-examined.

### 7.1.3 A schematic Diagram of the public utilities

The political and economic institutions that are important in public utility economics are shown in figure 7.1.

**Figure 7.1: The public utility and its related constituencies**



Source: Howe and Rasmussen, (1986)- "Public Utility Economics and Finance", p. 9

A brief explanation of the relationships among the various participants is given as follows:

A- Creditors and owners provide capital to finance the rate of base-working capital, land, and plant and equipment; and in turn, receive interest payments and dividends.

B- Regulatory commissions regulate and control; they set rates so as to provide a reasonable return to the capital suppliers of the utility and ensure adequate service. Public utility managers provide information and request permission for changes in service, corporate policy, and rates.

C- Legislatures give the mandate to monitor and set the general provisions of the regulation.

D- The acts of state and federal legislatures and administration are subject to review by the court.

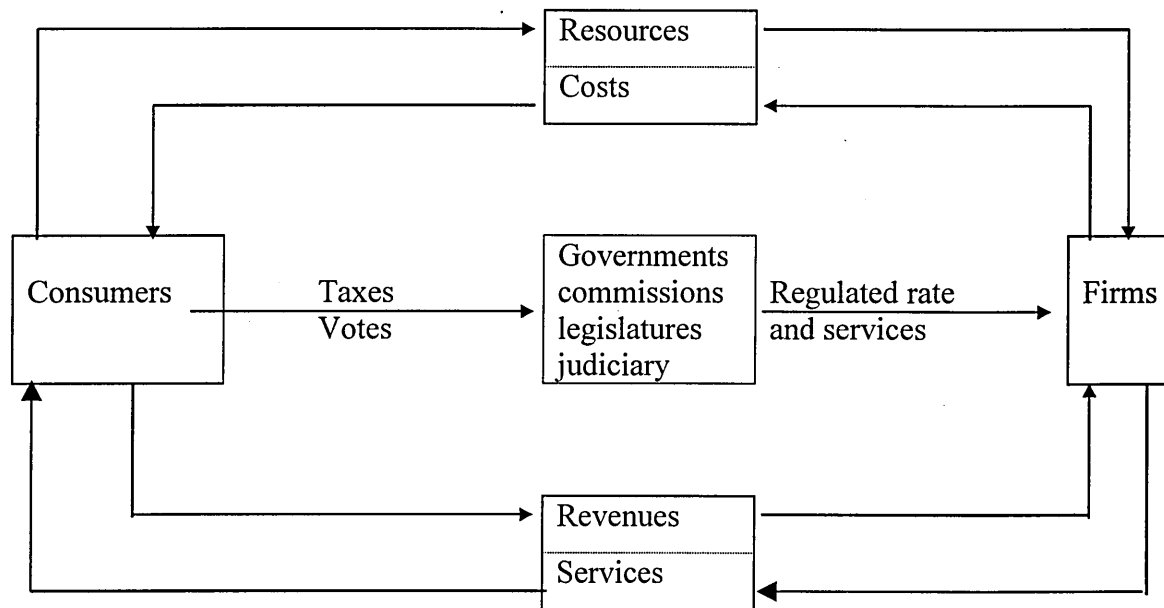
E- Public utility firms provide a service to various classes of customers and receive payment.

F- Industrial and commercial consumers and residential users render service complaints and suggestions for rate level and structure change.

G- Potential competition is largely limited, although specific types of competition are allowed in some areas by the regulators.

These institutional relationships may be compared and contrasted with the economic circular flow diagram presented in figure 7.2.

**Figure 7.2: Economic Circular Flow**



Source: Howe and Rasmussen, (1986)- "Public Utility Economics and Finance", p. 10

As with economic circular flow, firms provide services in exchange for revenues and incur costs by purchasing resources, thereby providing income to resource suppliers. Since competition does not work well in many utility markets, the balance between revenues, costs, utility services and resources is distorted.

The public therefore regulates the rates and services of public utilities and attempts to restore the imbalance by eliminating monopoly profits and the underproduction of services. (Tax revenues, raised from general revenues or from excise taxes on utility services finance regulatory commissions and other governmental bodies). The administration of the regulatory commission will also affect each regulatory jurisdiction via public employment and governmental budget policies.

Public utilities are ultimately public only by law. For example, oil refineries, though in many ways a public utility, cannot said to be so without legislation establishing regulation. Fundamentally, a public utility is a creature of law, a creation of property rights more limited than those permitted by businesses and consumers in general.

To summarise, the water system is increasingly being distanced from other utilities. The boundary between the competitive market and regulated activities has been drawn in the

water industry so, that competition is almost excluded. With the implication that the industry as a whole is a natural monopoly, their activities will be subject indefinitely to prospective regulation.

#### **7.1.4 Importance, demand for water and the responsibility of government**

Byatt - The Director of Office of Water Services in England - (1997) set some objectives which he wanted to achieve generally in public utilities but especially in the water industry. These aims are as follows:

- (a) Price review<sup>121</sup>
- (b) Customer service standards<sup>122</sup>
- (c) Competition<sup>123</sup>
- (d) Charging policy<sup>124</sup>
- (e) Open and transparent regulatory regime<sup>125</sup>

Water is the most important natural resource in the world, as without it life cannot exist and most industries could not operate. Although human life can exist for many days without food, the absence of water for only a few days has fatal consequences. The presence of a safe and reliable source of water is thus an essential prerequisite for the establishment of a stable community.

In the absence of such a source, a nomadic life-style becomes necessary and communities must move from one area to another as demands for water exceed its

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<sup>121</sup> A price review aims to reset water and sewerage price limits and to reduce prices in real terms for customers through significant reductions in bills. It also aims to maintain incentives for companies to increase their efficiency and reduce costs, while also ensuring an adequate level on investment in capital assets in order to arrive at the price limits via an open, transparent, fair and responsible process. This includes a high level of consultation with the industry and its customers.

<sup>122</sup> Customer service standards protect the interests of customers by ensuring a good quality service. The comparative competition between water companies to increase standards and reduce costs, protects the interests of customers by maintaining and improving the efficiency and effectiveness of the system of customer representation.

<sup>123</sup> Competition develops an effective policy to maintain the role of comparative competition as this is important where direct competition is not possible.

<sup>124</sup> A charging policy is necessary to secure a cost reflective tariff structure that encourages efficient use of water and takes into account the needs of customers.

<sup>125</sup> An open and transparent regulatory regime provides information about the industry and its regulation.

availability. Therefore it is not surprising that sources of water are often jealously guarded and over the centuries many skirmishes have taken place over water rights.

History shows many occasions where agricultural development has been hindered by interference with water supplies as part of the conflict between landowners and settlers. This has occurred in numerous parts of the world. Other conflicts in relation to water supplies can arise because of the effects which human and industrial waste can have on the environment. This means that the importance of water as a natural resource, which requires careful management and conservation, must be universally recognised. Although nature often has great ability to recover from environmental damage, the growing demands on water resources necessitate the professional application of fundamental knowledge about the water cycle to ensure the maintenance of quality and quantity.

Demand for water is growing into the 21st century, particularly demand for public water supplies. The most important factor affecting the demand of water is the rise in population, for example; Egypt's population increased from 55 million in 1994 to 63 million by the year 2000 and is expected to increase to 86 million by 2025. The demand for water is also expected to increase.

There are some approaches to meet the growing demand for water such as

- (1) Raising awareness of the importance of water through public education campaigns
- (2) Encouraging people/ business/ industry not to waste water
- (3) Installing water meters on all domestic properties, which could reduce demand by about 10% (as water becomes scarce should we pay more for it?)<sup>126</sup>
- (4) Increasing the price of water on a graded scale of charges
- (5) Restricting water use during periods of drought
- (6) Managing water pressure to reduce leaks (the General Organisation for Greater Cairo Water supply, which provides water to 25% of population's Egypt, loses 40% of water through leakage each year)<sup>127</sup>

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<sup>126</sup> Information source: <http://www.Oxfordshire.gov.uk>- "Water- where are we going? Agenda 21".

<sup>127</sup> The GOGCWS, (no date source given, c)- "Greater Cairo Water", The Administration of Public Relations.

Recent approaches to meet the growing demand for water have focused on voluntary mechanisms to conserve water and reallocate it among competing users rather than on developing new supply resources. At the same time, governments are seeking alternative ways to finance the operation and management of existing infrastructure and the construction of new infrastructure. These alternative approaches may be divided into three categories (Thobani, 1997):

- (a) Pricing policies
- (b) Informal water market
- (c) Formal water market

In many developing countries, governments consider water to be too precious a resource or too difficult a commodity to be left to the market. Decisions about who gets water, at what price and for what use have thus been entrusted to public officials. Although the state retains ownership of this asset, it typically endows private and public entities, such as farmers, industrial users, and power and water companies with the right to use surface water or groundwater for a particular purpose.

The allocation of water rights is typically the responsibility of the government, as is the construction, ownership and operation of the infrastructure such as dams, reservoirs, and canals. In some countries the government even installs and operates wells. Recently many countries have transferred operations and management responsibility to user association; enforcement is the responsibility of public authorities or water user associations, or both (Thobani, 1997).

User associations are typically informal entities that play a role in distributing the water from a canal or river. In some countries, however, such as Chile, Mexico, and Peru, user associations are legally recognised bodies which set and collect fees and who operate and maintain the hydraulic infrastructure. Publicly administered systems of water rights have all too often resulted in inefficient use and supply of water.

Government control has not been effective at ensuring that the poor have access to water. In many cities in developing countries, the poorest are not served by piped municipal water and must resort to buying water from private vendors at prices that are several times higher of those paid by more wealthy residents. Also, farmers who are

politically influential manage to get easier access to water rights, which are obtained without charge and for whose use farmers typically pay only a nominal fee.

## **7.2 Privatisation**

### **7.2.1 The aim of privatisation in UK**

In 1967, a White Paper (Cmnd 3437, 1967) introduced more formal criteria for pricing and investment decisions, and public sector industries in the United Kingdom had been “steadily pushed towards behaving according to commercial rather than social criteria” (Whitehead, 1988: 6).

In the early 1980s, the Conservative Government sought radical changes in the management of public enterprises, inspired by its belief in the innate inefficiency of traditional public sector provision of goods and services. Alarmed at increasing demands on the Exchequer to make good operation losses and finance capital programmes, the government determined to remedy the lack of any efficiency checks on industries’ performance.

More generally, difficulties in measuring efficiency and productivity and the problematic nature of making comparisons between public and private sector enterprises, have led to debate about the government’s claim that private sector provision of goods and services is necessarily better (Kay, et al., 1986; Utton, 1986; Vickers and Wright, 1989). Some academic commentators have been especially critical over the limited extent to which privatisation has actually promoted more competition (Heald and Steel, 1986; Bishop and Kay, 1988; Kay and Thompson, 1988; Vickers and Yarrow, 1988). Opportunities to break up the old public sector monopolies and create greater competition have been largely ignored, not least because of the influence of the treasury and senior management within the industries concerned. The treasury has been primarily concerned with raising revenue from the sales of public assets and was very aware that “monopolies are worth more than competitive industry” (Kay and Thompson, 1986). Senior management had also opposed any re-structuring of their industries. In the early phases of privatisation policy, some chairmen of nationalised industries were openly critical of the government’s policy (Thomas, 1986), they were generally more supportive of the policy, however, when concessions from government

were forthcoming in terms of competition, debt write-off, and regulation (Hills, 1986; Utton, 1986; Heald, 1989; Vickers and Wright, 1989; Mitchell, 1990).

Ogden and Anderson (1999) say the aim of a move from public sector to private sector for a public service is to achieve “profit and creating shareholder value”. Ogden (1995) says the main public justification for pursuing privatisation had been the government’s claim that it would bring greater efficiency and improvements in the production of goods and services through more competition and easier access to capital markets. This basis for policy has been informed by the government’s belief that private sector provision of goods and services is intrinsically more efficient than public sector provision. Management in the public sector, with little market incentive to improve performance, is viewed as “operating bureaucracies and not businesses” which leads to rigidity and inefficiency, and an inability to respond effectively to technological change or changes in consumer demand (Moore, 1985). For example, the white paper on Water privatisation (Cmnd 9734, 1986) argued that removal of government intervention and political interference in the day-to-day management of enterprises would improve management performance and access to private capital markets would make it easier for enterprises. It concluded:

"Freeing the authorities from the constraints imposed by state ownership will help them to carry out their tasks with vigour and imagination"(para. 38). The Government’s claim as for example, argued in the 1986 White Paper on water privatisation (HMSO, 1986), that private sector provision of goods and services, subject to the disciplines of market forces, is more efficient than public sector provision.

The aim of Privatisation (Ogden and Anderson, 1999: 96) is that “private enterprise is both more flexible and readier to pursue energetic and innovative approaches than the public sector. The demands of the market will give management and staff the impetus they need to secure greater efficiency”. This aim can be achieved if the privatised enterprise is more competitive. In the case of privatised public utilities, this has not happened, attracting critical attention (Heald and Steel, 1986; Kay and Thomposon, 1986; Bishop and Kay, 1988; Vickers and Yarrow, 1988). Consequently the monopoly character of the industry has remained unchanged with privatisation.

Moore (1985) says that privatisation can achieve great efficiency and many of benefits. The privatisation of the utilities has resulted in generous dividends to the shareholders and remuneration to top management, an unsuccessful spending spree in search of future earning growth, and a 25 percent fall in employment for the workforce (Froud, et al., 1996). In the UK, Water Authorities were privatised in 1989 and other major state industries which have been sold off include British Telecom in 1984, British Gas in 1986, and Electricity distribution and generation in 1990 and 1991.

In 1989, the ten Regional Water Authorities of England and Wales were privatised. The Regional Water Authorities were a product of a major re-organisation of the Water industry in 1973. Ten Regional water authorities consists of nine in England (Anglia, Northumbria, NorthWest, Severn Trent, Southern, South West, Thames, Wessex and Yorkshire) and one in Wales (Welsh Water). They vary in size from Thames, the largest with a turnover in 2000 of £1,367,8 million and workforce of 9,9995 to SouthWest, the smallest with a turnover in 2000 of £467 million and a workforce of 3,500 (Annual and Summery Reports, 2000).

From an institutional perspective, the researcher can argue that the policy of the UK's water industry has been informed by the government's belief that one external-factor is expected to motivate government managers to acquire and use cost accounting systems if the presence of competition and funding is uncertain (Scott, 1987). Government reform literature argues that agencies that are required to be self-supporting and compete for funds face many of the same competitive pressures encountered in the private sector, and are similar to private sector firms with zero profit targets (Brown and Sproghe, 1987; Osborne and Gaebler, 1992).

As a result, reform advocates claim that agencies faced with market pressures and requirements to recover all expenditures with revenues will become more businesslike and cost conscious, and will make greater use of cost accounting data in order to control costs and prevent funding shortfalls and associated sanctions (Osborne and Gaebler, 1992; Gore, 1993).

### **7.2.2 The effect of privatisation**

The aim of any market, private or public, is to satisfy the customer. The customer is satisfied if he/she receives a good product, properly delivered, at a fair price. These elements lead us to look at efficiency, competition, and performance.

#### **7.2.2.1 The effect of privatisation on efficiency**

Efficiency is the main aim of privatisation through competition. In other words, competition is seen as the tool to achieve efficiency. Why do we need efficiency in the water industry? The Confederation of British Industry (1991) answers this question and sets some comments for this point such as; "the cost of water depends not just on the unit price but also on the volumes used and wasted". Minimising water wastage on site can mean reduced capital input and operating costs for on site water treatment and help to reduce the pressures and demands on the service network. Efficient water use can mean energy savings and improved water management can increase operational efficiency. The financial advantages of water saving and reduced wastewater discharge can offset the cost of re-circulating, recycling and re-using water. This is due to water being the main constituent of many effluents. Through the minimisation of water use and the reduction of losses, the effluent volume may be reduced and on-going effluent treatment costs cut, thereby reducing the demand on water supply and helping to safeguard supplies for the future.

The main issues of how to procure investment and how to drive efficiency improvement exist under both public and private regimes. The problem economists have called it "principal/agent<sup>128</sup>", refer to differences in information and incentives between players. Companies know best about their own business but do not have the same motivation as

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<sup>128</sup> The basic insight of principal-agent theory (PA) is, well known. One party (the principle, P) hires another (the agent, A) to undertake a particular task, but the former party suffers from an information asymmetry that introduces a problem in terms of motivating the agent.

In both economics literature (Arrow, 1985; Rees, 1985; Laffont, 1989; and essays in Diamond and Rothschild, 1985) and the accounting extensions (Jensen and Meckling, 1976; Watts and Zimmerman, 1986) the solution to a PA problem involves the development of an optimal incentive package that furthers the objectives of the principal and constrains the actions of agents. To investigate the difficulties we can identify two types of information asymmetry: hidden information (or adverse selection) and hidden action (or moral hazard). The former asymmetry exists ex ante but the information becomes available after completing the transaction. Hidden action asymmetries exist ex post in that an agent's actions can affect the outcomes that occur but these are not observed by the principal.

politicians. Therefore regulators are needed to protect consumers from excessive prices and to ensure quality standards, investment and efficiency.

Does the efficiency saving benefit customers? (OFWAT, 1996). If yes, how? The role of Office of Water Services (OFWAT) in England is to ensure that the prices paid by customers are fair and justified. The regime must also ensure that companies are efficient. A price control system ensures that the benefits of efficiency improvements are shared between customers and shareholders. The best way for the companies to do this is to reduce or defer the take up of their price limits. If profits are to be directly controlled, the regulator must stipulate the maximum acceptable return on assets that can be made in any period. This “rate of return” regulation can involve the regulator adjusting prices every year on the basis of the profit made by the company. The excess return could be clawed back by the regulator which could lead to companies boosting their asset base and providing “gold plated” solutions.

The Director of Office of Water Services must encourage companies to operate efficiently. He monitors standards, comparing performance between companies, against each company’s targets and with other sectors. The Director must give companies incentives to reduce operating costs and the cost of sustaining their assets, raise money cheaply and complete environmental projects at low cost.

The regulator in the U.K. is forced to employ very unsatisfactory methods, such as ‘comparative’ (yardstick) competition which has come to occupy a central place in efficiency comparisons in the water industry. Comparing different companies and trying to bring the less efficient up to the level of the more efficient might appear to be a superficial way of simulating real competition. But, in practice, this does not happen.

Bryan, (1998) identifies three issues related to competition in water. Firstly, there is a big difference in principle between dynamic competition in a real market and static comparisons between companies in a non-competitive market. Where there is no competition, the incentive for improvement which exists in competitive markets is absent. In tightly regulated markets, companies are not so much trying to better their rivals by innovating and reducing costs, they are just trying to impress their regulator. Secondly, making meaningful comparisons in a comparative competition regime is

extremely difficult. In principle, the problem is that there are many variables which affect the costs of any given company. Some means of standardisation for these has to be found if useful efficiency comparisons are to be made. Thirdly, concentration on comparative competition distracts attention from introducing the real thing. It has also produced side effects in water which verge on the ridiculous. There is much concern to avoid "losing" comparators.

Privatisation is best regarded as part of a continuing process of change that has affected the industry over the decade of the 1980s, rather than a singular event. In the early 1980s the water authorities were subject to increasing pressure from new government financial controls and performance aims to become "more efficient". Once the Government publicly announced its interest in privatising them in 1985, and published its intention to do so in its White Paper in 1986, these pressures intensified. Like other privatised enterprises, the water authorities were strongly encouraged to improve their profitability and efficiency profiles to make their successful flotation more viable (Aylen, 1988; Chambers, 1988; Rickard, 1988). They had an extended opportunity to do so, as they experienced an untypical prolonged period of run-up to privatisation, owing to a number of technical and political difficulties the Government encountered with its privatisation proposal (Ogden, 1991).

The water authorities had to transform themselves from public sector bodies concerned with containing costs to private sector PLCS pursuing profitability. The vocabulary of profit replaced the previous one of costs as senior managers deployed a new economic language for describing organisational motives. Managers in the new water PLCS have had to respond to new expectations and assessments of corporate performance that will be measured by shareholders, investors and financial analysts in term of profitability. Although many have been persuaded, by the government's rationale for privatisation by 1989, there remained some managers and employees who retained doubts about the legitimacy of profit as the primary objective for the new Water PLCS. Southern Water's group finance director said in a speech to the Institution of Water Officers in 1992, found that it was still necessary, three years after privatisation, to argue that: "We have to make everybody think profit. Profit is not inconsistent with this industry. It's not a dirty word" (Water Bulletin, 1992).

#### 7.2.2.2 The effect of privatisation on competition

This section considers competition in the UK water industry in a global context. The importance of competition is examined and its implications for efficiency are investigated.

A competitive force in the utilities generally has brought benefits to customers by reducing costs and improving the quality of the service. In the water industry, the chances of market competition were extremely limited, a view shared unequivocally both within and outside the industry (Littlechild, 1986; Harper, 1988). Nevertheless, although it did not entail any significant developments in competitive market forces, privatisation has brought into operation a new economic regulatory framework for the provision of water services which provides considerable stimulus to achieve better performance through the operation of a pricing formulae and “yardstick” competition.

During the 1980s the water authorities were subjected by the Government to increased scrutiny and rigorous demands in order to improve their financial performance, improve their efficiency and profitability in preparation for successful flotation as privatised Water PLCs and to submit themselves to yardstick competition and comparative judgements by the financial markets. The ways in which the water authorities adopted new strategic postures as they responded to these successive changes, provided a fertile research site for exploring the roles accounting may play in processes of organisational change.

The international market for water and waste water services is estimated to grow to between \$370 billion and \$380 billion per annum by 2010 (West, 1999). Clearly, this represents a substantial opportunity for UK water companies. Indeed, UK companies are already establishing a presence on the global water stage. Thames Water, the UK's largest water company, has responsibility for supplying water of the city of Izmir in Turkey. Anglia Water has recently won a contract to supply one and a half million people in Valparaiso in Chile. Yorkshire Water has announced its intention to buy Aquarion, a US water company. The UK, the US and France currently have water companies of sufficient experience and critical mass to take advantage of this opportunity.

In France, there are two large companies: Suez Lyonnaise des Eaux and Vivendi. Suez Lyonnaise has a market capitalisation of £15.6 billion and Vivendi has a market capitalisation of £22.9 billion. Their mission is clear. When the Chairman of Suez Lyonnaise was asked about his strategy, he replied: "In water and waste services, we want to be world leaders" (Rider, 1999).

Competition in the water sector is very valuable; the UK water regulator (OFWAT's) prospects for price reductions between (10% to 20%) could extract in excess of £2 billion out of the industry over the five-year period of the review<sup>129</sup>. This will be a blow to the water companies and leave them with fewer funds for international expansion. Even with substantial investment to date, it is estimated that meeting the quality of standards will still cost in excess of £8 billion.

The Department of the Environment produced a consultation paper considering ways of extending opportunities for competition in the water industry which was published on 1 April 1996, with a consultation period open until 1 July 1996. The consultation paper proposed seeking legislative changes for inset appointments, cross-boundary supplies, common carriage and liberalising connections between companies. The Director of Water Services has been involved in the preparation of this paper and supports these proposals.

Summerton (1999) says no degree of regulation can match genuine competition and in the next few years we should expect to see far greater effort and imagination going into how to introduce real competition in certain aspects of the water industry.

Before we leave the subject of competition in the water industry we should look at the view of the UK water regulator on mergers (who has prevented mergers between UK water companies). Byatt (1997) has argued that mergers, which reduce the number of comparators, are against the public interest and should only be allowed to proceed if they result in the emergence of a new better comparator who is able to deliver a better service at a lower price to customers. The regulator believes that consolidation would

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<sup>129</sup> The estimated £2 bn revenue shortfall is derived from the estimated Po and K factor projection for the Water Services Companies delivered in the prospects for prices consultation paper (October 1998).

reduce the number of companies and therefore it will be harder to compare their performance to determine which companies are efficient (and should be rewarded) and which are inefficient (and need to improve).

Indeed, the regulatory regime in water seems inconsistent with the present U.K government's commitment to protect consumers via competitive markets wherever possible (Robinson, 2000). A price review is even more important to the companies concerned than elsewhere in the utility sector because the scope of regulation is so wide. On the other hand utility companies are becoming more entrepreneurial and more occupied with ways to match and, where possible, beat the actions of their competitors. In water, there is a preoccupation with comparative competition. Real competition is marginal: regulation, both "economic" and "social", is the big issue because it bears such weight.

Another symptom of the absence of competition in the water industry is the tendency for government intervention in the industry to continue. Politicians evidently feel the need to prompt the regulator into setting targets (e.g. for leakage) rather than using market incentives (The Financial Times, 1997).

Consolidation could provide significant opportunities for price reduction for the consumer. There are two reasons: firstly, the most efficient companies will prosper and less efficient companies will be taken over and have standards raised. Secondly, companies will share significant overheads (such as call centres and billing systems) and this will reduce the unit cost of serving individual customers. Consolidation will create companies of a size which can compete on a level playing field with the small number of international giants. For example, the combination of Thames Water (£3.9 billion) and Severn Trent (£3.4 billion) would create a £7.3 billion company which could begin to take on the major US and French players on their own terms (Rider, 1999).

#### **7.2.2.3 The effect of privatisation on company performance**

Prior to privatisation, the Water Authorities were already subject to Government imposed financial targets and performance aims on operating costs since 1981; they

were strongly encouraged to improve their profitability and efficiency profiles to make their shares more attractive to buyers when flotation occurred (Ogden 1995).

After privatisation, The Director General of the Office of Water Service (OFWAT) had responsibility for ensuring that

- (1) The water PLCS are able to finance the proper responsibilities of their functions
- (2) Charges are regulated through a pricing formula based on the retail price index  $PRI+K$ ; the K factor is assessed separately for each water company. The pricing formula is expected to promote efficiency and reduce costs as a means of enhancing profitability
- (3) Developing competition through a review in “K” factor in the pricing formula. In the interim, OFWAT has published annually comparable information on issues such as comparisons of unit costs on water delivered and sewerage collected (OFWAT, 1993b), capital investment (OFWAT, 1992a) and levels of service (OFWAT, 1992b). The latter have been developed to assess company performance to customers and are measured by seven levels of service indicators: (DG1 and DG4); adequacy of Water Distribution System (DG2 and DG3); adequacy of the sewerage (DG5); and response to customers (DG6 and DG7).

In conclusion, the Director General is not the only person interested in efficiency. In their assessment of the water PLCS current and future profitability, the financial markets and city investment analysts are equally keen to scrutinise management performance in achieving cost savings and making other improvements in efficiency. While financial indicators of corporate performance are clearly the key indicator for city analysts, they also take careful account of management performance on levels of service to customers (Ogden, 1994).

To summarise, the UK water industry moved from the public to the private sector because the government believes that private sector provision of services is more efficient than public sector provision. This move affected the role of accounting<sup>130</sup> and this is the case of the water environment that transferred from the public to the private

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<sup>130</sup> For example, prior to privatisation, the water authorities were concerned with containing costs, but after privatisation, in pursuing profitability. In other words, vocabulary of profit replaced the previous vocabulary of costs.

sector. The researcher's view is that it is of more value to look at other water environments before we look at the main case study of the thesis, the public water environment in Egypt. E.g. France, whose water industry has been mixed between public and private sector (see section 7.2.3).

#### **7.2.2.4 Institutional Change and Privatisation**

In numerous text and articles researches identify differences between public and private sectors in terms of their environments, resourcing and management practices (Alford, 1993; Harrow and Willcocks, 1990; Ring and Perry, 1985). Gerry, (2000) argues that privatisation can be seen as coercive institutional change. Furthermore, he argues that during the transitional process of privatisation, two institutional templates coexist and compete for legitimacy<sup>131</sup>. The public sector template may be deeply embedded, taken for granted and largely mindlessly enacted. However, as privatisation proceeds, the private sector institutional template and its implications are mindfully anticipated.

Institutional theory can, however, help us to understand processes of privatisation. Its proponents point to the importance of realising that privatisation constitutes institutional change and suggest mechanisms by which resulting archetypes of organisations will emerge, not only through coercive mechanisms but through normative and mimetic processes (DiMaggio and Powell, 1983). There is also a growing body of literature on deinstitutionalisation and change from an institutional point of view, the conclusions of which can be extended to the context of privatisation.

Fligstein (1991) underscores the need of shocks to the organisational field while acknowledging the role of organisational elites. Oliver (1991) uses institutional and resources dependency theories to explain strategic responses to institutional processes in the context of differing institutional factors. Greenwood and Hinings (1996) argue that radical change is more likely if there is loose coupling within institutions and less well-defined means for preserving dominant templates. Kondra and Hinings (1998) also predict that change is more likely to occur in institutional environments where there is more, rather than less, diversity or higher influence from other organisational fields.

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<sup>131</sup> In the actors' eyes.

As mentioned in section 2.3, this research adopted a process approach and focused on the micro level. The discussion of this section aims to provide a better understanding of the role of actors in institutional change. Institutions are defined by their rules, this is so both in terms of what is meant by institutionalisation and in terms of how individuals identify with those institutions by "learning to act in a particular way" (March, 1994: 42). Changes in institutional templates, as in privatisation, involve a period of flux (Greenwood and Hinings, 1993). In such circumstances, both from an institutional and individual point of view there is a search for identity (Dutton and Dukerich, 1991), which may be strongest when external cohesion or constraints weaken (March, 1994), as in the context of privatisation.

In the context of institutional change in privatisation, actors are moving from a well-established, familiar institutionalised context to a less familiar and, therefore, uncertain private sector context. Thus, we would expect increased conscious information processing because some tasks will be familiar and some unfamiliar and inconsistent with prior experience (Lord and Smith, 1983). Gerry (2000) argues that processes of privatisation may be different in terms of sequencing and procedures, for example there could be a direct sale to a single private sector company, a break up and sale to a number of companies, or management buyout. This shift from public to private sector could be at a particular point in time, or there may be a period of transition.

Processes of privatisation also may affect the extent to which actors have opportunities to reflect on such experiences and are again important in promoting conscious processing (Lord and Smith, 1983). Furthermore, the involvement of actors in changing processes increases not only the likelihood of their acceptance but also their commitment to change (Coch and French, 1948; Nutt, 1998; Watson, 1976). Gerry (2000) argues that the greater the extent of actors' personal involvement in privatisation processes, the greater their direct experience of the private sector. The more actors identify personally with the outcome of privatisation, the more conscious their information processing.

Institutionalists have long understood the significance of organisational structures and systems (Meyer and Rowan, 1977), not only as functional entities but also as symbols "invested with socially shared meaning" (Tolbert and Zucker, 1986: 117). Gioia et al.,

(1994: 365) show more broadly how "symbolic action is central to the institutional legitimacy" of change. In the context of privatisation, such symbolic reinforcement might include a structural form but also actors' experience and involvement regarding organisational rites (Trice and Beyer, 1984) and narratives (Barry and Elmes, 1997). The extent to which actors relate to such symbols as signifying public or private sector templates will be a likely influence on their preference with one or the other.

This section has argued that privatisation can be seen as a process of de-institutionalising public sector templates and institutionalising private sector templates. Viewing privatisation through an institutional lens highlights the inherent changing institutional templates. This section has conceptualised privatisation as institutional change.

### **7.2.3 The system of water in France**

The aim of this section is to illustrate the management of water in France because in the researcher's view it has one of the 'best' water industries in the world in terms of management. It begins with a brief overview of who is responsible for water and expose two options for water management.

Water has become a major political point for local communities since the management of water resources has a direct effect on fundamental issues such as public health and economic development (Anonymous, 1994). Water supply and sanitation drainage is also receiving increased attention as a result, due to heightened concern for the environment. Water authorities are all too aware that the cost of improved water quality and uninterrupted service must remain affordable to the user. Full costs are almost always borne by consumers on the basis of their actual consumption.

In France, the national government is responsible for creating basic rules and specifying essential sanitary control measures. Local authorities are responsible for water services (i.e. drinking water supply, wastewater and rainwater drainage). For a total of 36,763 communes (local authorities), there are 15,244 separate supply systems and 11,992 drainage systems. Regional government authorities only step in on matters concerning investment scheduling and funding. France is divided into six-water catchment areas. Each catchment area has its own water authority, which receives taxes on all water

drawn and discharged in the catchment area in question. These taxes are re-distributed to regional authorities in the form of subsidies for investments aimed at bringing improvements in drinking water quality, supply lines, and wastewater treatment.

Local authorities have no actual legal obligations governing the supply of drinking water supply, but all of them do in practice. The main regulations governing the supply of drinking water are contained in the Public Health Regulations and the Water Act of 1992. Local authority obligations also cover wastewater treatment, removal of residual sludge and supervision of non-collective treatment systems. The local water authorities are required to take responsibility for organising their own water services. French law on decentralisation also sets up an independent organisation to govern financial and budgetary aspects of local authority spending.

Local authorities can choose either to run their water services directly or to commission this task from a private sector. If the direct management option is chosen, the local authority takes on full responsibility for the water services. Staff working for the municipal water services will have public sector employment contracts with local authority status. About 40% of French communes choose the direct management option for drinking water supply systems. This option allows the local authority to develop in-house technical competence, which is useful when developing partnerships with private operators. Furthermore, direct management is also cheaper for the consumer, though this is gained only the expense of flexibility, especially with regard to staffing.

If the direct management option is chosen to commission all or some part of the tasks involved from a private operator, this sort of management is covered by long term contracts that also specify the cost of water supply and permissible range of variation. This system has been practised in France since the 20th. The system works in one of two ways: leasing and concession.

With a leasing arrangement, the local authority bears the initial investment costs and commissions management tasks from a private operator over a period of 5-20 years. The operator is paid for water supplied but must also pay the local authority rental on the plant it uses. The local authority uses this rental revenue to repay the technical and financial costs on the initial investment.

With a concession arrangement, the private operator builds and runs the plant itself. Concession contracts are between 25-50 years and when the concession terminates, the plant becomes the property of the local authority. In France in 1994, concession arrangements represent 75% in water supply and 35% in wastewater treatment. To finance long term investments for concession contracts, private operators often sign “BOT” (build, operate, transfer) partnership agreements with local authorities. This enables private and public operators to share financial risks and mobilise substantial bank loans.

#### **7.2.4 The water system in Egypt**

The aim of this section is to expose the current situation in Egypt, to explain who is responsible for the management of water and to explain the history of water planning and to highlight some characteristics of water resource planning in Egypt.

Dr. Abu-Zeid, chairman of Egypt’s Water Research Centre points out that “satisfying future demands in Egypt depends on better utilisation and efficient use of present water resources. Optimal water management is an essential prerequisite for sustainable development of Egypt”.

The future looks bleak if Egypt does not succeed in formulating and implementing a water policy, which can match the limited fresh supply with the increasing demand. Per capita water resources are expected to drop from a current value of about  $922\text{ m}^3$  per year (1990) to about  $337\text{ m}^3$  per year in 2025. If the present management practice and cropping patterns prevail, this could mean that up to 60 % of agricultural land will not be irrigated.

The system of irrigation in Egypt is tremendous in its size and complexity. It consists of the Aswan High Dam, eight main barrages, approximately 30,000 KM. of public canals, 17,000 KM. of public drains, 80000 KM. of private canals (mesqas) and farm drains, 450,000 private water-lifting devices (sakias or pumps), 22,000 public water-control structures, and 670 large public pumping stations for irrigation. Throughout this system, approximately 59 billion  $\text{m}^3$  of water is distributed annually, not only for cultivated

land, but also for municipal and industrial use, for generation of hydro-electricity and for the navigation of freighters and tourist boats on the Nile (Hvidt, 1998).

The Ministry of Irrigation, formerly called the Ministry of Public Works and Water Resources (MPWWR), is responsible for national water resources and is the only body to authorise use of water from the Nile, canals, drains, and groundwater resources. The ministry also has control over works built to discharge water into canals, drain, and the Nile. MPWWR is authorised to impose penalties if its orders are not obeyed. A number of other ministries are involved in water management and use, including agriculture and land reclamation, health, tourism, power, transportation, industry, housing and reconstruction.

The Ministry of Agriculture and Land Reclamation has special responsibilities because agriculture consumes around 85% of water produced. Prior to 1992, when cropping patterns were liberalised, the Ministry of Agriculture and Land Reclamation decided, in consultation with the Ministry of Industry, which crops were to be grown in which localities. Such planning was undertaken a year in advance. From this exercise, the Ministry requested specific volumes of water to deliver to each canal and each branch canal. Following the liberalisation of the cropping pattern, however, it is not known precisely how the water allocation takes place. The Ministry of Health, which also holds special responsibilities, is authorised to close portable water supply works if the water produced does not meet the required standards. The Ministry of Health is further responsible for drafting quality standards for various water uses and for discharges of waste water.

Three committees have been formed to ensure co-ordination among agencies involved in water resources. Two of them, the Supreme Committee of the Nile, headed by the minister of the MPWWR, and the Co-ordinating Committee for Land Reclamation meet monthly to direct and review different developments plans, as well as to resolve conflicts between ministries. The third committee is called the Inter-Ministerial Committee on Water Planning (ICWP) and was established in 1977 as a part of the Master Water Plan project. ICWP is, as the name indicates, a cross-ministerial committee with a strict focus on planning. It has been given the responsibility to set planning assumptions and review development plans.

In Egypt, water planning is said to have started in 1933 when a policy was formulated to use the additional storage capacity made available by the second heightening of the old Aswan High Dam (AHD) and the Gabal El-Awlia Dam in Sudan. This plan introduced programmes for land-reclamation, conversion of some basin irrigation to perennial irrigation and increases in the areas under rice cultivation. This policy was first revised in 1974 and again in 1975 when a new plan was drafted to accommodate the extra volumes of water resulting from the erection of the Aswan High Dam (AHD).

In 1981, the first attempt was made to create a master plan for all water use in Egypt. It was carried out in the early 1980s under the auspices of UNDP and the International Bank for Reconstruction and Development (IBRD). The Minister of Irrigation at the time pointed out the objective to be achieved by this effort: "Because of this increasing competition for water and limited availability, it was imperative to introduce new scientific techniques, and to use mathematical models to design future plans for water development, and to ensure efficient use of this resource." The resulting plan, the "Arab Republic of Egypt Master Plan for Water Resources Development and Use" is, however, not the plan as such, but a first step in a process which is intended to lead to improved planning capabilities within the sector. The main objective of the plan is to implement planning tools (i.e., to establish data bases and build flow models) which will make it possible to plan the development and use of water resources with greater precision in the future and, thus, to guide investment decisions.

The aims of this planning effort were: establishment of a data base; the setting-up of specific planning tools including six models which were built and implemented; establishment of three planning scenarios for new land development and determination of an economic rate of return and returns to water for ranking land-development projects. Hvidt (1998) points out that the results obtained from these planning tools are to be seen more as trials than final results since, due to a lack of data, the assumptions built into the models need to be replaced with real values when they are determined. The plan established three scenarios for future water demand and supply. Three main variables were analysed in detail: the supply, through implementation of water conservation projects, i.e., the Jonglei I and II project in Sudan, the demand for all user-groups; and the resulting potential expansion of agriculture on new land. The plan also

established priorities for the satisfaction of water needs. Firstly, the plan stated that water demand for municipal, industrial, navigation and spills should be satisfied and secondly water use on the old agricultural land should be satisfied, and thirdly the remaining volumes of water could be used to satisfy water demand for land reclamation.

The latest update of Egyptian water policy dates from June 1990. It is a ten-year plan covering the period 1990 to 2000. This plan was made in response to several events which, in the late 1980s; altered previous assumptions and had a direct impact on water planning in Egypt. The main events are as follows:

- (1) The 1979-88 drought period during which the Nile flows yielded 99 billion  $m^3$  less water than expected into Lake Nasser and reduced the reservoir to a critical minimum of 6.8 billion  $m^3$  by July 1988
- (2) Cessation in 1983 of construction works on the Jonglei Canal because of the civil war in southern Sudan, a project which would have provided Egypt with extra 2 billion  $m^3$  per year
- (3) Revitalisation of the land-reclamation programme planned to reclaim 60700 hectares annually, requiring one million  $m^3$  of additional water each year. In other words, less water than anticipated would been available to satisfy needs.

The very critical water situation in 1988 opened the eyes of Egypt's water planners. Despite the AHD, Egypt was still vulnerable to the Nile flows and thus the "need for rationalisation and reductions in water use emerged as common agreed possibilities to face the coming unknown" (Hvidt, 1998: 3).

Hvidt, (1998) in his research illustrates eight characteristics from his analysis of water resource planning in Egypt as follows:

- (a) Shift from water abundance to water deficit
- (b) Importance of international co-operation
- (c) Supply bias
- (d) Environmental concern
- (e) Lack of data
- (f) Established priority to non-agriculture uses of water
- (g) Delayed implementation
- (h) An uncertain administrative framework for water resource planning

The general problems of the water industry in Egypt and the GOGCWS<sup>132</sup> can be divided into three kinds: (a) compliance and management of demand for water, (b) the management and (c) the finance and financial resources<sup>133</sup>. The problem of compliance and management of demand for water arose from different reasons such as:

- (a) The population: the number of residents in Cairo is 13 million, and in addition, there will be three million visitors per day (16 million) by 2005. The following example should be enough to imagine the huge increase in demand for water. In 1968 the population in Giza was 610,000 and today it is one of the 50 biggest in the world, bigger than Paris and Berlin (the GOGCWS, no date source given, a: 17). The population in Shoubra El-Khama city was 185,000 in 1968, in 1986 was 700,000 and today it is the fourth biggest city in Egypt (Egyptian Geographic Association, no date source given: 2).
- (b) This will potentially change the focus from cost management of supply to cost management of demand
- (b) Reinvestment for renewal and replacement of the old dragnets (which will eliminate of water losses valued at 250 million E. P., Ministry of Planning: 10) should be equivalent with establishing new stations
- (c) Problems with water meters i.e. there are not meters enough due to breakdowns (The GOGCWS, no date source given, a: 42)

With regard to the problem of management, in 1968, 85% of the population (i.e. customers) were centralised alongside the east of the River Nile. Between 1976-1996 the density of the population decreased in the centre of Cairo by 8%. In 1996 the customer percentage in the centre of Cairo decreased to 67%. This means the population who will be provided with water are a great distance from the River Nile. In the past, the GOGCWS faced technical problems relating to the connection of the services, however today the GOGCWS faces the planning of capital problems, finance problems and customer services. The question raised here is how can opportunity cost play a role in the water industry? (see section 10.1.2).

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<sup>132</sup> The case study of this research.

<sup>133</sup> For the problem of finance and financial resources (see section 8.6.4).

### 7.2.5 Water industry and institutional perspective

According to old institutional economic theory, there are three different types of change processes (Burns and Scapens, 2000) as follows:

- (a) Formal versus informal change
- (b) Revolutionary versus evolutionary change
- (c) Regressive versus progressive change

(a) Formal change occurs by conscious design, usually through the introduction of new rules and/or through the actions of a powerful individual or group (Rutherford, 1994) as in the case of the UK water industry. In 1989, the ten Regional Water Authorities of England and Wales were privatised. The Regional Water Authorities were a product of a major re-organisation of the water industry in 1973.

Informal change occurs at a more tacit level; for example, as new routines adapt over time to changing operating conditions. Also, informal change has occurred in the UK water industry (Yorkshire Water Company). In 2000, after 11 years of privatisation in the UK water industry, the Finance and Commercial Manager of The Water Business Unit of the Yorkshire Water company stated that " we follow full absorption costing - we are not using activity based costing but we consider some ABC principles".

It would probably be reasonable to expect that formal cost management change (e.g. the implementation of new techniques such as ABC, ABM, etc) will be more straight forward than attempting to change the ways of thinking which are embedded in existing cost management routines. This expectation was confirmed when the Chief of Commitment (Engagement) Department (Balance Sheet) of the GOGCWS in Egypt stated that " There have been no significant changes in the cost method and if there were any small changes, these changes were built on the comments from The Accounting Central Institution. I think if there are any plans for change, it is necessary to get support for this plan from the state".

At a practical level, it seems reasonable to expect that hierarchical (i.e. imposed) cost management change will have its initial and most direct impact on the formal rules (i.e. the technical aspects) on cost management systems, but only an indirect impact on the informal processes which underpin cost management routines (for example, the

changing of the of the economic forms and legal structure of the GOGCWS during their life, see section 8.2.1). Whereas, bottom-up change (initiated by organisational members who use cost management from one day to the next) is more likely to have an impact at a tacit level and to shape informal as well as formal cost management processes.

(b) Revolutionary change involves a fundamental disruption to existing routines and institutions (for example, the privatisation of the water industry in UK, - see sections 7.2.1 and 7.2.2). Evolutionary change is incremental with only minor disruption to existing routines and institutions (for example the GOGCWS in Egypt). It was clear from section 7.2.1, a brief history of the GOGCWS, that the economic forms and legal structure of the company were changed during their life starting as a "foreign company", changing to a general institution and then transferring to a stock company and finally an economic general organisation. The GOGCWS was an economic organisation but it aimed to achieve balance between expenditures and revenues and not to make capital profit like the private sector.

(c) Regressive and progressive. Tool (1993) distinguished between what he called "Ceremonial" behaviour and "instrumental" behaviour. Ceremonial behaviour emerges from a values system which discriminates between human beings and preserves an existing power structure; whereas instrumental behaviour emerges from a values system which applies the best available knowledge and technology to problems and seeks to enhance relationships.

Institutional change in the wider economy, especially deregulation and increased competition in the UK water industry set a series of changes in organisation and cost management practices that are still being used by worker. Privatisation of the UK water industry in 1989 and increased competition in the 1990s had forced UK water companies to become more explicitly profitable and cost conscious (Ogden, 1995).

The literature advocates that government agencies faced with market pressures and requirements to recover all expenditures with revenues will become more business like and cost conscious, and will make greater use of cost accounting data in order to control

costs and prevent funding shortfalls and associated sanctions (Osborne and Gaebler, 1992; Gore, 1993).

The contingency literature provides considerable theoretical and empirical support for this claim. Zimmerman (1976), for example, develops an analytical model which suggests that non-profit organisations facing funding uncertainty will place greater emphasis on budgets and costs to avoid the sanctions associated with deficit spending. Cooper's (1995) theory of cost system choice argues that intensified competition increases the benefits from more complex cost accounting systems since competitors will be more likely to take advantage of poor decisions arising from inadequate cost information. Similarly, the contingency framework developed by Gordon and Miller (1976) maintains that organisations facing greater environmental uncertainty, due to factors such as competition, require more extensive, frequent and detailed financial and non-financial information and relatively sophisticated cost accounting and control systems.

Empirical studies provide support for the institutional theory and empirical theory. Khandwalla (1972), for example, found that the level of competition was positively associated with the use of more sophisticated cost accounting practices such as standard costing, incremental costing and flexible budgeting, while Gordon and Narayanan (1984) and others supported the hypothesis that greater environmental uncertainty increased the demand for decision-making information.

With an institutional realm<sup>134</sup>, it seems that a highly regulated set of institutions outside the water industry in Egypt were mirrored by institutions and routines within the industry that made these organisations bywords for stability and conservatism.

According to neo-institutional economic theory (transaction cost)<sup>135</sup>, there are three models of governance: (1) markets (2) hybrids and (3) hierarchies or internalisation

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<sup>134</sup> The Burns and Scapens (2000) model invites its users to identify three elements: (a) organisational routines and habits (b) an institutional realm and (c) a realm of action

<sup>135</sup> The central aim of the studies of transaction costs is to explain why some transactions are more likely to be executed within one form of organisation, whereas other transactions tend to be associated with different organisational models. The main thrust of transaction cost is that a specific institutional arrangement is chosen to govern a specific transaction because that arrangements offer some distinctive set of control devices to the control needs of that transaction (Spekle, 2001).

(Williamson, 1975; 1979; 1985; 1996). These alternative governance structures differ in the control mechanisms they employ to safeguard contract execution and to achieve successful adaptation. Hierarchical governance attains control primarily by means of authority, internal incentive structures and monitoring, for example, the management of the water industry in Egypt (see section 7.2.4). Market governance derives control from free competition, for example the management of the water industry in the UK (see sections 7.2.1 and 7.2.2). The hybrid form of governance is typically based on explicit, long-term contracts in conjunction with additional safeguards to assure compliance, for example, the management of the water industry in France (see section 7.2.3).

In conclusion, the researcher can see that there are differences between Egypt, the U.K. and France - from a neo-institutional economic theory (transaction cost) perspective - as shown in table 7.1.

**Table 7.1: Key differences between Egypt , U.K and France**

<b>The key differences</b>	<b>Egypt</b>	<b>England (U.K.)</b>	<b>France</b>
Privatisation or regulation	is still public	transferred from public to private <sup>136</sup>	a mix of privatisation and regulation
From institutional theory perspective	Egypt water is hierarchical	UK water is provided by highly regulated market	French water is hybrid

Furthermore, in institutional theory literature, in terms identified by DiMaggio and Powell (1983), the researcher can relate Egypt to institutional isomorphism and the UK to competitive isomorphism. Isomorphism is a process that causes one unit in a population to resemble other units in the population which face the same set of environmental conditions. Because of isomorphic pressures, organisations will become increasingly homogeneous within given domains and conform to expectations of the wider institutional environment (Carpenter and Feroz, 2001).

DiMaggio and Powell (1983) identify two types of isomorphism: competitive and institutional. Competitive isomorphism is not of interest for this study because it relates primarily to free and open market competition scenarios, and therefore, is not applicable

<sup>136</sup> In the researcher's view, the UK water industry is mixed between privatisation and regulation in real terms. The researcher based this view on the role of the OFWAT (see the role of OFWAT in 7.2.2.3).

to the analysis of public utility (sector) organisations. In this study, the focus on the concept of institutional isomorphism which relates to organisational competition for political power, social fitness, and institutional legitimacy. DiMaggio and Powell (1983: 150) state that the concept of institutional isomorphism is a useful tool for understanding the politics and ceremony that pervade modern organisations and contain a number of exogenous pressures that influence their structure and practices (this is the case of the GOGCWS in Egypt, see section 8.6).

Moreover, in terms identified by Brunsson (1994), the researcher observed that the water industry in Egypt relates to "political-ization" (see section 11.2.4) and the water industry in the UK to "company-ization". Company-ization means that an organisation which originally possessed a strong political element, assumes certain features deriving from the company's institution. For example, a state or local government authority begins to regard the people in its environment as customers, or these people begin to consider themselves as such (Brunsson, 1994).

### **7.3 Issues of costs in water industry**

The aim of this section is to illustrate cost systems and some problems in water industry, e.g. how people pay for their water requirements, how the cost of water is calculated and whether this system is fair or a new system needed.

#### **7.3.1 Cost system in water industry and some issues**

In the U.K., the development of effective cost systems have been handicapped by the absence of suitable output measures for most of the industry's activities. Very detailed analysis of expenditure is provided but comparison is normally with the expenditure budget rather than on a unit cost basis.

The industry has put a great deal of effort into attempting to overcome this problem and internally a number of comparisons are made between broadly similar areas of activities on the basis of the most suitable output measure available. Collectively, regional water authorities have commissioned a comparison of revenue collection costs, using for the most part the number of consumers as the "output measure". Similar studies in other areas are under way.

An alternative approach is to direct greater attention to budget preparation. The objectives of each area of activity are defined, the procedures determined and necessary resources identified on a "Zero based" approach. This type of exercise also provides a basis for determining priorities between different areas of activity.

It is likely that regional water authorities will continue to invest substantial resources in the improvement of this system. Apart from the obvious need to use resources as effectively as possible, regional water authorities are under pressure to open up more of their activities to competition, as local authorities have been required to do for their direct labour organisation. There is, therefore, a need to make proper comparison between external and internal provision.

In the U. K., in 1974, regional water authorities faced the problem of changing from the local government type of accounting operated by their predecessors to a more commercial style. The main changes (Meredith, 1985) were:

- (a) Accrual of both capital and revenue expenditure in annual accounts
- (b) The use of a single pool of finance in place of separate capital and revenue finance
- (c) The use of straight-line depreciation in place of loan redemption provisions

It was necessary to construct the accounting system in such a way as to enable appropriate charges to be levied to cover the costs incurred on each service, avoiding cross-subsidisation between services.

In 1974 costs of fixed assets were usually available only to the extent that loan debt was transferred and there was no complete information regarding assets financed from revenue or where loans had been fully repaid. This was not a problem of major significance - while depreciation was calculated on historical costs only, some approximation to the normal straight-line depreciation charge could be calculated. With the introduction of current cost accounting in 1981, the matter became of far greater significance. Inventories of above ground assets could be prepared but the majority of water authorities' expenditure is on below ground assets (water mains and sewers) and the best estimates of these had to be prepared according to whatever information was available. Valuations were generally on the basis of nationally agreed formulae. Work will be necessary for some years in order to improve the accuracy of fixed asset valuations.

Regional water authority internal accounts, therefore, are mainly designed to measure performance against an annual expenditure budget. The budget is prepared on a basis of cost centres, each representing an area of activity for which an identifiable person is responsible, and will be broken down into accounting periods against which actual expenditure can be compared. The original budget is prepared on the basis of price rulings at a given date, and a separate estimate is made for price changes. There are also procedures for amending budgets during the year where necessary.

Authorities also carry out a substantial “contracting” business usually described as “rechargeable work”. Charges for regular work, for instance providing connections to new properties, are usually charged according to fixed price schedules, based on distance and other factors affecting costs, but other work is charged at actual cost. The accounting system must therefore include provision for “job costing” of these activities.

There are lots of issues in cost systems in the water industry such as, cost allocation. Cost allocation is used for many purposes, e.g. requirements in manufacturing for external reporting. Why? Because the allocation of depreciation cost is of major importance, cost allocation acts as a guide to decision taking within the firm, for example pricing decisions. Cost allocation is demanded

- (a) To categorise the firm’s overall production control problems into more manageable chunks
- (b) To sustain a system of incentives to encourage efficient production
- (c) To co-ordinate the activities of separate units
- (d) To provide information relevant to pricing

The cost allocation problem would be trivial in a world with the following properties:

- (a) no joint or common cost
  - (b) marginal and average cost equal
  - (c) instantaneous adjustment of all inputs
  - (d) complete information.
- In practice, however, none of these conditions applies. Most utilities are based upon substantial joint and common costs.

A firm freed from competitive pressure may be able or be required to choose other objectives than simple profit maximisation. These may include the setting of “fair” prices and attainment of aims such as universal service. Fairness can be defined in

various ways, several of which may involve the sharing of some particular cost or benefit among competing products according to particular rules. Universal service will typically involve elements of cross-subsidy and an averaging of charges across consumers with different costs.

The questions which costing procedures are intended to answer include:

How should prices be related to costs, in order to attain aims not related to efficiency while achieving a target level of overall revenue or profitability?

What degree of cross-subsidy is present in the existing set of prices? But this assumes that the need for regulation is clearly established. For the regulator, the decision typically comes in two stages: (a) whether competition should be permitted (b) what price controls need to be imposed to ensure that it is conducted fairly. This situation raises a new set of issues;

Do the cost characteristics of particular products or subsets of products make them natural monopolies?

Will competition jeopardise universal services through “cream skimming”? If competition is fostered and emerges in markets for some products but not in others

How can the incidence of cross-subsidisation of products be identified and prevented, in cases where a firm produces both types of outputs? (Cave and Mills, 1992).

In the context of cost allocation used for regulation, one of the main dimensions of competitive rivalry is the degree of joint supply, or bundling of services, which often occurs. There are many cost allocation procedures one of which is fully distributed costs<sup>137</sup>. Beyond this simple approach the four main candidates for establishing the cost share are in accordance with

(a) Relative output

(b) Gross revenue

(c) Net revenue

(d) Attributed costs

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<sup>137</sup> To determine fully the cost of each service. Each service takes attributes cost, which is assigned to it, and a share of the common costs. The fully distributed cost of service I (FDCi) can be written as:  
Fully distributed cost service of I = Attribute cost of I + Share of common cost of service of I.

Unfortunately, the various fully distributed cost methods give different results, so the economist's criticisms of fully distributed cost have been strong; Kahn and Shew (1987: 207) forcefully attack the use of conventional rather than a causal basis for cost allocation: "The only costs that have objective reality are ones that describe a causal relationship between the act of purchase and their incurrence. Cost allocations that are not grounded in causality have no basis in objective reality - they have no independent meaning to the prices they are suppose to justify, except in some ritualistic, incantation sense".

There is no attempt to incorporate marginal cost or promote economic efficiency. As Baumol writes: "There is obviously not the slightest reason to expect that the prices emerging from a full-costing process will bear the slightest resemblance to those known to be necessary for efficiency in resource utilisation" (Baumol 1983: 181).

One of the regulatory purposes of cost allocation is to establish a fair set of charges which can be imposed upon customers in a way which is consistent with satisfactory incentives for the water industry.

The Director General of the UK's water service stated in a discussion paper entitled "Paying for water" (OFWAT, 1990) "If charges are to be broadly related to costs, in order to avoid under discrimination and provide proper incentives, the basis for the allocation of costs needs to be determined. In setting in their tariffs, companies will need to decide how to allocate cost between services and customers, and the proportion of costs should be recovered by means of capital contributions standing charges, where charges are related directly to use".

In the same paper, the Director General talked about problems facing the water industry in England and Wales. The water industry has faced major difficulties because most domestic customers pay for their water on a tariff which is related to rateable value of their dwellings while the majority of business customers are metered. Cairo (the capital of Egypt) has a similar problem.

OFWAT's view on the accounting cost should be matched as far as possible to economic costs (for example, via current cost accounting), and suggests that the following structure might provide an appropriate balance (see table 7.2).

**Table 7.2: Accounting and economic costs in the water industry**

Capital cost of connection to system and enhancement of local network	Capital contributions connection plus charges plus requisitions
Average capital cost of enhancement of general infrastructure	Use- related charge
Capital cost of enhancement of general infrastructure is above average	Capital contributions (infrastructure charges)
Operating costs related to number of consumers (billing, meter reading)	Standing charge
Other operating costs of water supply and fuel drainage	Use- related charge
Other operating costs of surface drainage	Use- Related charge or (banded) standing charge

(OFWAT, 1990, Annexe 4, page 8).

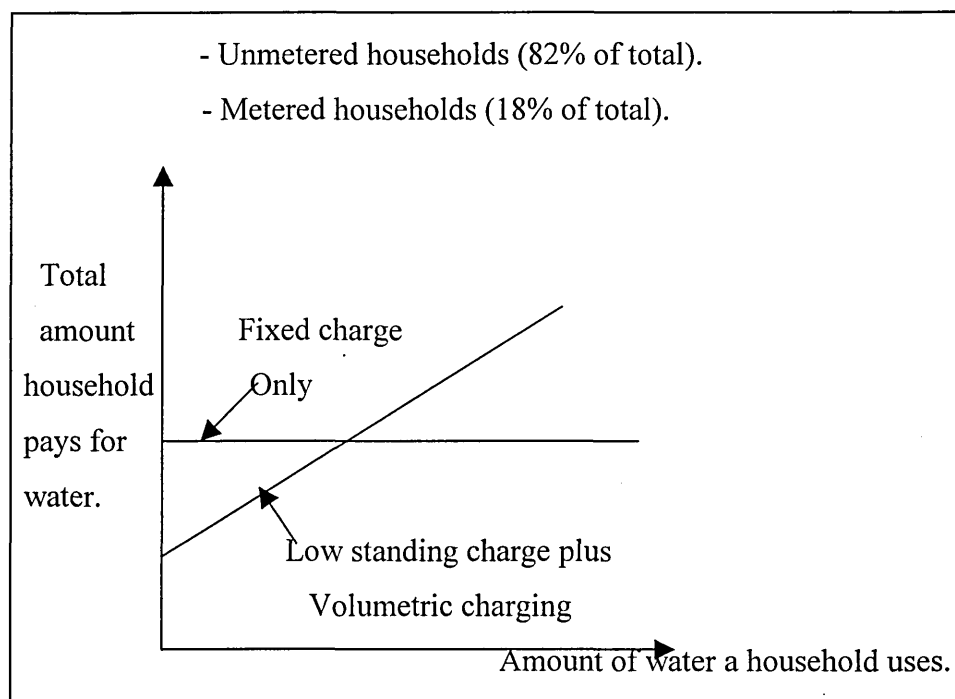
In the case of water tariffs for metered domestic customers, OFWAT argued that the correct principle was to distinguish between costs which related to the number of customers connected, and those which related to the volume of water supplied. Costs such as billing and meter reading should be recovered through a service charge, while capital-related and operating costs of reservoirs, etc, which are generally related to the amount of water used, should be recovered through the volumetric charge.

### **7.3.2 How do the people pay for the water?**

The basis on which water bills are estimated in England and Wales is "rateable value". The growing minority who have had water meters installed pay on a very different

basis. Their bills have two elements: a small and uniform fixed charge, plus a variable amount proportional to their water usage (the “volumetric” charge). Water metering can be justified on both economic and environmental grounds, as it introduces financial incentives for efficiency among customers and companies. This is illustrated in Figure 7.3.

**Figure 7.3: Current Payment Method**



Source: Kenway, (1999)- “New Stateman Privatised Water: Who paying the price?, p. vii

Objections of the currently favoured system of water charges based on rateable value (Kenway, 1999) include;

- (a) Rateable values were last set in 1973, so are more than a quarter of a century out of date. As they are no longer used for local taxation, it would be prohibitively expensive to carry out a new valuation for water alone.
- (b) A charging system that is completely independent of the amount of water used makes it impossible to encourage efficiency or economy via financial incentives;
- (c) Bills based on rateable values are at odds with the way the water industry regulator has chosen to interpret “fairness” in water charging. The view of regulator is that

fairness means “charges should broadly reflect the cost of providing water and sewerage services to different classes of customers”. From this point of view, two households using the same amount of water should pay the same for it. Under rateable value, the two households pay different amounts if they live in different-sized houses.

Cost reflectiveness has much to be said for it. It is the basis on which almost all prices are set, regardless of whether a customer is rich or poor. Yet it is not the basis on which we pay for our public services via taxation, and an attempt to introduce such a principle into local government ten years ago was decisively defeated. Most of us still automatically think of water as the public service it was until privatisation.

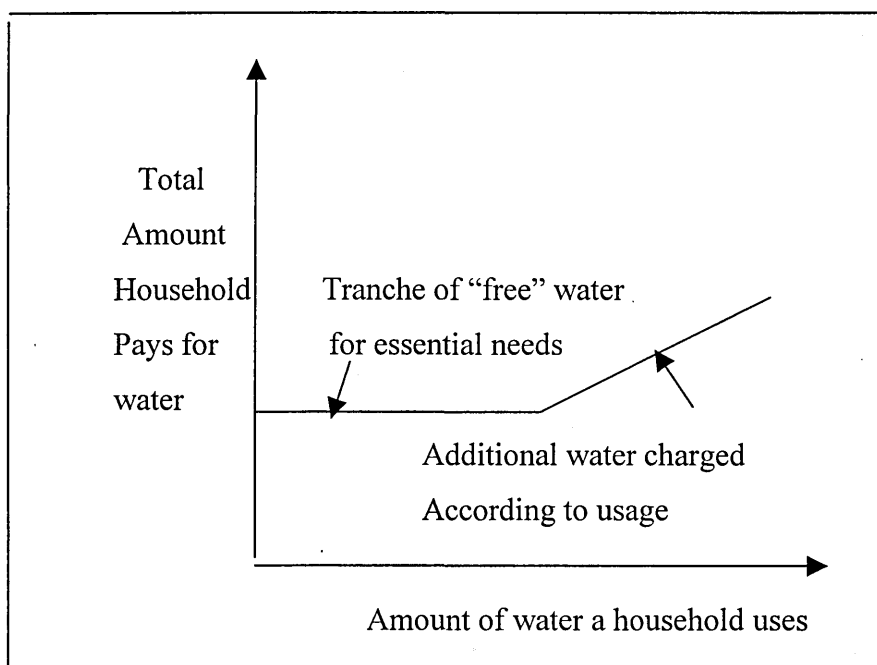
How much should be paid for each extra unit? The economist’s answer would be the “forward-looking long-run marginal cost” of providing that extra unit. Short-run marginal costs would be the cost of providing the extra unit on the assumption that the necessary physical infrastructure (reservoirs, pumping stations, the network of distribution pipes and so on) is already in place. Long-run marginal costs do not take this infrastructure as given but include an amount that reflects the cost of providing it. Forward-looking long-run marginal costs assume that providing additional water may be more costly than providing the current supply if, for example, new reservoirs have to be built in less advantageous locations. Long-run marginal cost is a financial incentive for the customer and the company. The customer, in deciding whether to consume more water, pays a price that reflects the additional costs of supplying it. The company, benefiting from the extra revenue generated by higher water usage, will make the right investment decisions.

It is not as easy to get agreement on what the numerical value should be. But while there is genuine room for disagreement, there is one reason why we should err on the side of caution when setting the unit price of water: if the price is too high, the water companies will make undue profits from each extra unit sold. It would no longer be in their interests to encourage the rest of us to be economical with water (for example, via promotions of new more water-efficient appliances such as washing machines), since this would cause their profits to fall. But such a switch would be politically difficult, chiefly because it would create many losers at all income levels, whose opposition might be weightier politically than the support of many winners.

Hitherto the debate about how to price water intended to polarise the question of water metering, with the strongest opposition coming from those predominantly concerned about social welfare and justice. Their concerns are compelling: for reasons both of public health and private well-being people should not face financial incentives to economise on water for essential needs such as drinking, preparing and cooking foods, washing and bathing, and flushing the toilet.

Kenway (1999) suggests new system for charging for water. This new system focuses on metering, in the sense of measuring how much each household uses. But what really matters is the tariff, which is then built around the information that metering yields, to determine how much each household has to pay. The heart of objection to metering is that it creates a financial distinctive for people to use any amount of water, including the water they ought to be using for health and hygiene. Figure 7.4 shows the new proposed system.

**Figure 7.4: A fairer alternative**



Source: Kenway, (1999)- "New Stateman Privatised Water: Who is paying the price?, p. vii

Here, the amount a household pays rises above the fixed charge once consumption exceeds a predetermined level (often, though inaccurately, called the "tranche of free water"). Only then would any financial disincentive to use water kick in. The volume of

water covered by a fixed charge could vary between households, so those with more people would have a proportionally larger tranche of free water. And the amount payable in fixed charge could vary between households according to their liability for council tax, thereby preserving an important element of payment according to means. This certainly is a more complicated system, but it satisfies economic, social justice and environmental objectives.

### **7.3.3 How to calculate the cost of water?**

In England, between 1990 and 1995 average prices rose in real terms by 5.5% a year and by 1.5% a year between 1995 and 2000. The main drivers were the need to improve drinking water quality and environmental protection in response to European legislation, and the need to eliminate capital maintenance backlogs that had built up before 1989.

The regulator fixes a price-increase cap (known as the K factor) separately for each of the 18 water companies and the ten combined water and sewerage companies 'RPI + K'<sup>138</sup> (Summerton, 1999; OFWAT, 1991). Initial K values were set for 10 years by the secretaries of State for the Environment and for Wales in 1989. The Licence requires Ks to be completely reset after 10 years at a "periodic review". A review may also take place after only five years if either company or the Director feels it is necessary. The Director took the earliest opportunity available to him to reset K values in July 1994. The new price limits take effect for 10 years from 1 April 1995.

The question arising here is, does K cover all company charges? No. K is the price limit for a "basket of charges" (OFWAT, 1991). These are; charges for unmeasured water supply, charges for measured water supply, charges for unmeasured sewerage services, charges for measured sewerage services, charges for reception, the treatment and disposal of trade effluent. Charges for any of these particular items may be more or less than RPI + K. However, several charges are not covered by the K formula, for example

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<sup>138</sup> PRI "The Retail Price": to be used in the formula is the PRI in the November prior to the start of the April 1 charging year.

K is a charging limit. It represents the amount by which average charges can rise in any one year. It is set individually for each company year. It reflects the provision services to customers, including financing its capital expenditure programme.

Example: if K is 1 and the RPI increase in the 12 months to previous November is 1.5% then the average charges increase can be no more than 2.5%

infrastructure charges. Limits on other charges, e.g. connection charges, are not laid down, but OFWAT would expect these charges to be reasonably related to costs.

The K factor indicates the percentage figures by which the water companies may raise their prices in each of the five years. For the customer, the K factor is modified by two other factors (Summerton, 1999): Firstly, inflation or deflation: for any given year the change in the retail price index is added. Secondly, there may be changes resulting from the rebalancing of charges between different types of customer.

OFWAT is responsible for ensuring that each company's K continues to reflect the assumptions made when Ks were first set. Under certain limited circumstances the Director can adjust K without reference to the Secretary of State. Condition B of the Licence allows the Director to make, in any year, adjustments to a K factor for certain "relevant changes of circumstance" where they exceed, in total, 10% of turnover. For example: changes in the obligations placed on the companies; failure to achieve a legal obligation or a service standard; non-receipt of sale of surplus land assumed at the periodic review (OFWAT, 1991). Any interim reference notice must be issued by 1 October and a determination made by OFWAT within three months. If a company is not happy with the outcome it can appeal to the Monopolies and Mergers Commission.

Individual K factors are related to what the Director considers companies would need to spend to fulfil their statutory obligation. They are ceilings on what companies can charge, and are based on the assumption that companies can achieve substantial increases in efficiency (OFWAT, 1992). There are some factors, which have a crucial effect on the K factor (Summerton, 1999):

- (a) The cost of capital: the water regulator has become increasingly tough about the rate of return he will assume in making his decision, given the low-risk nature of the water business
- (b) Efficiency: the water regulator believes improvements of 3 to 4 % a year are feasible between 2000 and 2005, with all the benefit enjoyed in the form of lower prices
- (c) Maintenance and replacement of networks and equipment: the water regulator believes existing levels of expenditure are sufficient to preserve the status quo. Some companies' assessments indicate that higher rates of capital maintenance and

infrastructure renewals are needed to prevent a return to the deterioration of the 1970s and 1980s

(d) Comparative quality of service: the regulator proposes to reward the most effective companies by giving them more scope to increase their prices and, conversely, to penalise the least effective with less scope. The principle is to try to ape a competitive market in which profit gravitates to the companies that customers perceive to be offering the best value for money. The “least effective” companies argue that the regulator’s ways of measuring quality of service are too blunt for the job

(e) Efforts to establish customers’ views and to consult interest groups have been much more extensive. But there is a question of whether the regulator prefers the views of the OFWAT Customer Service Committees (which he appoints) to market-research evidence that customers would be content with a smaller price cut or more stable prices, as long as the extra income is spent on service and environmental improvements

(f) There is the interaction between metering and company income. The UK's government has decided to make water meters voluntary and prohibit disconnection as the ultimate deterrent against “won’t pays”

OFWAT ensures customers get a fair deal via the companies which have limited scope for increasing their dividends, unless they are able to increase their efficiency above what is allowed for in price limits (OFWAT, 1992). OFWAT (1994) divides the role of The Director of Water Services into two categories, primary duties and secondary duties as follows:

(a) The Director’s primary duties: He is required to act in a way he considers is best calculated to ensure that: the financial of a water and sewerage company, as specified in the Act, are properly carried out. Companies are able to finance their functions, in particular by securing a reasonable rate of return on their capital.

(b) The Director’s Secondary duties:

(i) Protecting customers: “customer’s bills should, in general terms, reflect the costs which the customer imposes on water and sewerage systems for a supply of clean water, disposal of dirty water and draining of surface water. Other aspects of customer’s interests are protected, including quality of service and benefits from the sale of land transferred to the companies at privatisation, or acquired since then”

(ii) Promoting economy and efficiency: “the Director must encourage companies to operate efficiently. He monitors standards, compares performance between companies, against each company’s targets and with other sectors. The Director must give companies incentives to reduce operating costs and the cost of sustaining their assets, raise money cheaply, and complete environmental projects at low cost”

(iii) Competition: “the Director has a duty to facilitate competition between suppliers and potential suppliers, ensuring that a framework exists in which competitions can develop. He encouraged the Government to change the law, widening the scope for competition”

(iv) General Environmental duty: “the Director is required to exercise his power subject to achieve (among other things) “the future of conservation, enhancement of flora, fauna and geological or physiographical (landscape) features of special interest”

(v) Limiting charges: “the Director sets price caps, which allow the companies to finance their functions. This gives companies the incentive for greater efficiency. The Director does not control profits or dividends. The Director limits the annual price increase, or “K” factor, for each company to reflect what it needs to charge to finance the provision of services to customers”

## **7.4 Conclusion**

This chapter highlights the importance of water as one of the most important public utilities. Furthermore, it ensures that the water industry is an extreme monopoly even if it is privatised. It raises the argument of privatisation or regulation in the water industry and it agrees that no one can give a clear answer on privatisation or regulation being the right decision for the water industry by looking to three countries having three different systems (England is a private "market", Egypt is a public "hierarchy" and France a mixture of privatisation and regulation "hybrids").

This chapter has given attention to the new tool of cost management in an indirect way, which is that of privatisation<sup>139</sup>. This is clear when the vocabulary of profit replaced the previous vocabulary of cost in the UK Water industry<sup>140</sup>. Furthermore, it has been stressed that management of water is a major political point. In addition, this chapter

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<sup>139</sup> See section 7.2.

<sup>140</sup> When UK Water Authorities had to transform themselves from public sector to private sector.

has raised the issue of centralisation vs. decentralisation and this become clear by comparison between the management of water in France<sup>141</sup> and Egypt<sup>142</sup>.

This chapter raises some essential points about deficiencies in water utilities such as paying for water on a rateable value for domestic use and on metered value in the majority of business use in Egypt and England. The independence between price and cost prevents efficiency, in other words, there is a gap between accounting and economic theory and this leads the researcher to ask what is the role of accounting and why would accounting be useful in this situation? Furthermore, it highlights the dimension of social elements in the water industry, when explaining the objection to the new system which depends on meters. It exposes the dry future in Egypt and gives a brief history of water planning in Egypt (the case study of this research) which will be discussed in the next chapter.

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<sup>141</sup> In France, local authorities can choose either to run their water services directly or to commission this task from a private sector.

<sup>142</sup> In Egypt, The Ministry of Public Works and Water Resources is responsible for national water resources.

## Chapter 8

### Cost management in the GOGCWS

#### 8.0 Introduction

As mentioned in sections 5.4 and 2.1, while technical (or contingent) explanations of cost management were not rejected, they were viewed as incomplete (Scott, 1987). This led the researcher to look at the institutional context within and outside the GOGCWS (see figure 5.1). The aim of this chapter is to describe the accounting system used in the "General Organisation for Greater Cairo Water Supply" (GOGCWS), and its supervision and control body. It explores the question "which model of cost management was followed in the GOGCWS" and " what methods of cost accounting were used in the Egyptian water industry". The chapter examines the perceptions of the GOGCWS's managers of the organisation structure, cost accounting and cost management in the GOGCWS. The rationale for investigating the perceptions of the GOGCWS's managers is largely due to the argument in section 6.2.1.3. This argument is based on the premises that a single case study (such as the study of the GOGCWS) can yield valuable information about the topic under investigation by carrying out comparative study within the case organisation itself (e.g. the perceptions of employees in different departments). The chapter also explores the question "is there any difference or similarity between the rules and routines<sup>143</sup> related to the cost accounting system that is followed by the GOGCWS".

For this purpose, this chapter is divided into eight sections. The first section gives a brief discussion of the legal framework for public utilities in Egypt generally, with emphasis on the water industry. The second section describes the General Organisation for Greater Cairo Water Supply. It is opened by a brief history of the GOGCWS to highlight the change in the economic forms and the legal structure of the organisation. It also looks at the roles and the structure of the GOGCWS.

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<sup>143</sup> The term rules and routines used in the context as Burns and Scapens (2000) identified rules comprise the accounting systems as set out in the procedure manuals, whereas routines are the accounting practices in use.

The third section examines the organisational structure of the GOGCWS in reality and identifies it with institutional theory. The fourth section gives a brief discussion of the supervision and control body of the "General Organisation for Greater Cairo Water Supply" whether internal (Department of the inspection, financial and managerial control, etc), external (the Cairo region and the Accounting Central Institution, etc), and financial or technical control.

The fifth section discusses the accounting system in the GOGCWS. It highlights the objectives, the notions and the contents of The Unified Accounting System<sup>144</sup>. It studies the general standard followed in preparing the Unified Accounting System and its accounting transactions. This section outlines the role of the cost accounting system in the GOGCWS.

The sixth section aims to explain the methods of cost accounting used in the Egyptian water industry. In other words, this section gives a brief summary of the cost accounting system's background in the GOGCWS; its description, cost recognition and measurement and reporting procedures. Furthermore, this section has looked at whether there are any differences or similarities between the rules (documentations) and routines (practices) in this cost accounting system.

The seventh section aims to explore the question "which model of cost management was followed by the GOGCWS". In other words, this section looks at "whether there was any use or potential use of throughput accounting, benchmarking, programme planning and budgetary systems, activity based costing, activity based management, strategic management accounting, etc in the GOGCWS. The section also discusses alternatives to cost management as suggested by consultants Black and Veatch International. It also discusses perceptions of the GOGCWS managers' towards the issue of cost management.

The final section (eight) highlights the conclusion of this chapter.

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<sup>144</sup> The accounting system which is followed in GOGCWS.

## 8.1 The Legal framework for public utilities in Egypt

The water public utility in Egypt was centrally controlled<sup>145</sup>, but varies widely in institutional organisations. The largest city, Cairo, was designated through presidential decree as “General Organisation” with a corporate structure and regional responsibility. It was, however, subject to the control of both the governor and the Ministry of Housing and Public Utilities (MHPU). Most local utility organisations were administered through regions.

While public utilities in Egypt were managed, staffed and operated on a local or regional level, there was an excessive amount of central control (see section 8.4: the supervision and control body on the GOGCWS), lack of qualified technical support and inadequate budgeting by the GOE (Government of Egypt) ministries. Local utility organisations lack sufficient powers to make management, financial and personnel decisions (Cooper, 1992). Local authority and popular councils frequently complain about poor communication and poor service from the GOGCWS organisation and therefore often object to proposals for tariff increases or payment for central agency services (Cooper, 1992).

The water sector in Egypt was a nationalised programme. All policy making, planning, budgeting and administration for utilities in the country was carried out under the Ministry of Housing and Public Utilities. Each utility was required to use a centrally-mandated cost accounting method (see section 8.6) which was manual rather than computerised. The Ministry of Finance also seconded accountants to GOGCWS to ensure compliance with the government requirements.

Civil service rules prevented managers from discharging employees except for criminal acts. Wage and salary levels were too low<sup>146</sup> to attract and keep good operators. No career development programmes had been developed. There was little incentive for operators to be productive or to work efficiently.

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<sup>145</sup> See section 8.4.

<sup>146</sup> Comparing with the private sector.

Public utilities in Egypt were generally established as public authorities. The President of the Republic issued the decisions necessary for creating, empowering and organising public utilities and public departments (Act 146 of the Constitution). Under Law 43 (the law of Local Government System) units of local administration establish and manage all utilities under their jurisdiction with the exception of national public utilities or those of a special nature as designated by the President. Executive regulations of the Ministry of Local Administration defined local utilities which Governors might establish and operate. Governors had authority over all public utilities within their region. A Governor had the authority of a Minister regarding review and approval of all actions by a local utility and its board of directors. This was also a provision of article 1 of law 43/1979 regarding juristic powers of local government.

A public utility, by definition, was an enterprise created by a government agency, for the implementation of a common interest/purpose such as satisfaction of the needs of the people in compliance with the principle of equality of users (Cooper Report, 1992)<sup>147</sup>.

Public authorities were established by Presidential decree under law No. 61/1963. The General Authority had the right to contract, undertake execution of work, and act in order to achieve the goals for which it was established. The authority was represented by the Chairman of its Board of Directors in all relationships with other entities and in court. A General Authority could be merged with other authorities or be cancelled by Presidential decree only.

A General Authority was usually established to manage a public utility. All their assets, monies and properties were considered to be public. All laws and regulations (see section A1.2.1) concerning public domain applied to them, unless stated otherwise in the enabling decree. A General Authority was permitted its own budget, based on any conditions in the Presidential decree. The budget was prepared by the Chairman and

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<sup>147</sup> The researcher does not have this resource but found two pages inside the GOGCWS discussing the organisations legal background and used information from the end of these two pages (source: Cooper Report- 15 October 1992).

approved by the Board of Directors. The central agency for accounting supervised<sup>148</sup> all budget and accounting activities.

An authority could establish its own internal regulations without having to abide by government regulations, and could write regulations concerning the hiring of its staff, its workers, their promotion, dismissal, salaries, benefits and pensions. If delegation of these matters was not included in the presidential decree, the authority must abide by government regulations concerning employment. It should be noted that ministerial review and supervision was limited to general and decision-making affairs, and not to the daily workings of a General Authority.

The water utility in Cairo was created as a public authority under law No. 61/1963. It operated directly under the local authority and had autonomy to operate independently, except that tariffs were approved by the ministries. Annual funding was through the State budget and personnel policies were strictly regulated by the region (local authority).

## **8.2 The description of the GOGCWS**

### **8.2.1 A brief history of the GOGCWS**

- On 17 May 1865, the joint-stock company<sup>149</sup> of Cairo Water was given a mandate for providing water to Cairo City for 99 years.
- On the first of July 1957 a law was introduced (No. 145/ 1957) to nationalise the joint-stock company of Cairo Water and establish Cairo Water Service which answered to the municipal council of Cairo City.
- In January 1958, Gizera water and Helwan joined the Cairo Water Service.
- In January 1964, Amada water was brought under the management of the Cairo Water Service.
- On 28/11/1965 the president of Egypt issued the order (No. 4417/ 1965) which transferred the management of the Cairo Water Service to an Egyptian stock company called "Greater Cairo Water" which answered to The General Egyptian Institution for Services Work.

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<sup>148</sup> The Accounting Central Institution was responsible for controlling and auditing the revenues and expenses (see section 8.4.2.6).

<sup>149</sup> This company was managed by England (foreign company).

- On 30/11/1968, the decision of the Egyptian president was issued (No. 1683) to establish " General Organisation for Greater Cairo Water Supply" which answered to the Ministry of Housing.
- On 17/10/1971 the president of Egypt issued order (No. 2420) which declared that the General Organisation for Greater Cairo Water Supply had to answer to the city's region.
- On 31/10/1991, the Prime Minister of Egypt issued an order (1655/ 1991) to include Maser Elgededa water in the General Organisation for Greater Cairo Water Supply.

From the previous brief history, it was clear that the economic forms and legal structure of the GOGCWS were changed during their life starting as a foreign company, becoming a general institution, being transferred to a stock company and becoming finally an economic general organisation according to the order of the Prime Minister (No. 1039/ 1979). The GOGCWS was an economic organisation but it aimed to achieve a balance between expenditures and revenues, and not to make capital profit like the private sector.

### **8.2.2 The role (activities) of the GOGCWS**

The General Organisation for Greater Cairo Water Supply was responsible for managing water utilities in the cities of Cairo, Kalubia and Giza and its related organisations (and was also responsible for operation, and maintenance for utilities which were answerable to the organisation). The Presidential Decree No. 1938 of 1968; concerning establishing the General Organisation for Greater Cairo Water Supply, stated that the organisation was responsible to establish, operate, and manage the water station in order to achieve its aims. Furthermore, the GOGCWS produced the following types of water:

(a) Fresh water<sup>150</sup> (see section A1.2.2)

(b) Industrial water<sup>151</sup>

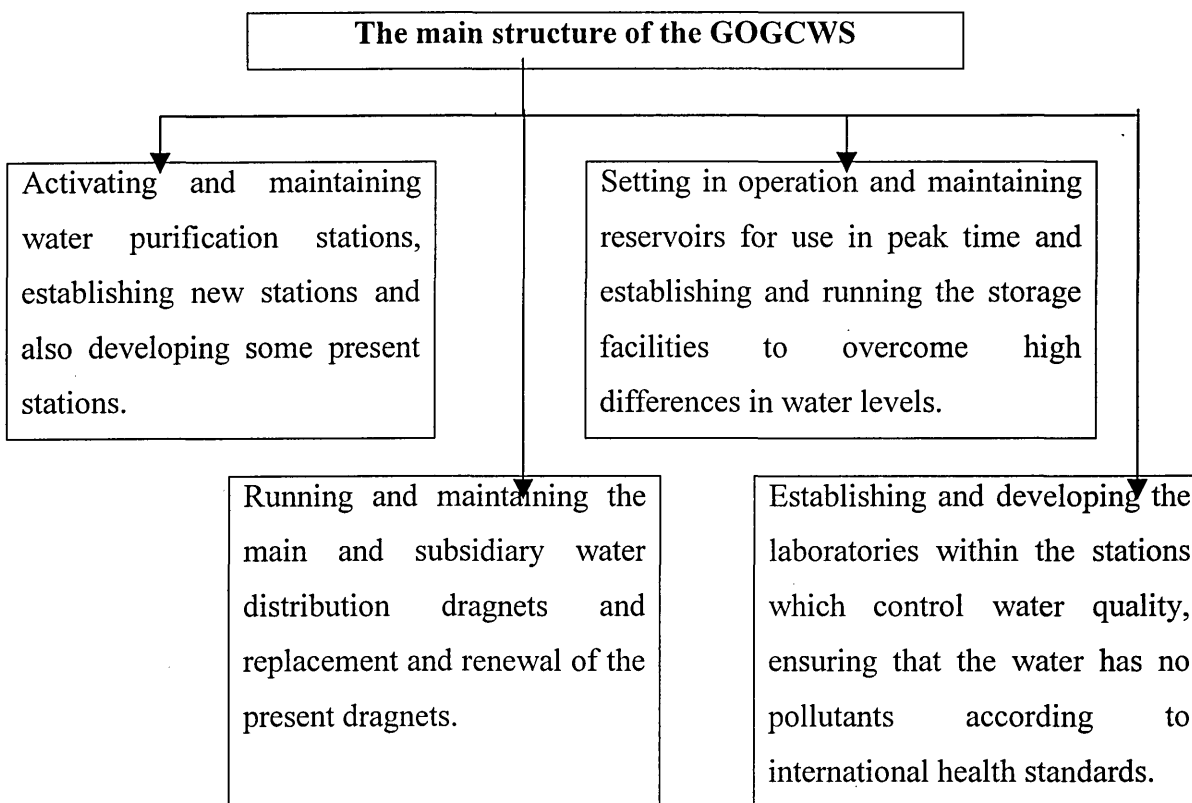
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<sup>150</sup> The GOGCWS established water stations which were necessary to provide fresh water for Greater Cairo (around 25% of the population in Egypt) and any new areas in the scope of Greater Cairo whether for domestic use or service use. These included worship centres, charitable associations, bakeries, popularity squares, young peoples care centres, embassies, sports, clubs, unions and party centres. In addition it provided water to the governmental sector, public business sector, companies, commercial shops and different institutions and organisations.

<sup>151</sup> The GOGCWS produced water which was not suitable for drinking and used it in industry. This water was less clean than fresh water and the production of it depended on the clarification method. There were several kinds of industrial water, which depended on the amount of chlorinate added.

The main structure of the GOGCWS could be summarised in figure 8.1.

**Figure 8.1: The Structure of the GOGCWS**



Source: Based on the GOGCWS (no date source given, c), p. 7

### 8.3 The organisation structure of the GOGCWS

The organisation structure consisted of a Chairman and two Vice Chairmen. Each of these were answerable to their central and general administrations - and a group of department were answerable directly to the chairman (see the organisation structure of the GOGCWS<sup>153</sup> in section A1.2.3).

The organisation had a hierarchical structure. The base of the organisation consisted of departments, then administrations, general administrations, central administrations (for the function of the board of directors and central administration of the GOGCWS, see section A1.2.3), etc.

<sup>152</sup> The least clarified water was used in garden irrigation.

<sup>153</sup> The organisation structure was taken from the administration of the organisation and management at the GOGCWS.

The investigation of this research has focused on the perceptions of the GOGCWS managers<sup>154</sup>. The sample study included all managerial levels (high or senior managerial level "H", medium or middle managerial level "M" and low or junior managerial level "L"). The basis for this classification is the job of the respondents<sup>155</sup>. The Chairman, the two Vice Chairmen and each chief of administration are classified as high level managers. This represents 20% of the sample (10 respondents). Each chief of a department and member of staff working in administration are classified as middle level managers. This represents 26% of the sample (13 respondents). The staff who work at the operating levels are classified as low level managers. This represents 54% of the sample (27 respondents)

For an illustration of *how the GOGCWS is organised*: see table 8.1

**Table 8.1: Perceived organisation of the GOGCWS (N =50)**

Organisation of the GOGCWS	Managerial level			Total
	High	Medium	Low	
According to the nature of the production process	10%	12%	16%	<b>38%</b>
According to the nature of geographic areas	---	2%	14%	<b>16%</b>
According to the nature of the market served	---	2%	---	<b>2%</b>
Others	10%	10%	24%	<b>44%</b>
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

The researcher saw these different answers were due to the complexity of the water environment (see the GOGCWS's law and decrease in section A1.2.1.1 and figure A1.6), which created different perceptions between different managerial levels of the GOGCWS. For example, staff who work in the calculations of revenues and costs for each region of Cairo tended to choose "the nature of geographic areas" as the basis of the existing organisation structure of the GOGCWS. However, there is even a different perception among the same managerial level of the GOGCWS. For example, half of the high managerial level chose "according to the production process" and the other half chose "others" which is a combination of production process and geographic areas.

<sup>154</sup> For the rationale for investigating the managers perceptions of the GOGCWS, see sections 6.2.13 and 8.0.

<sup>155</sup> For employee position (name and job of people who filled in the questionnaire) see table A2.1.

Similarly, differences exist among the medium managerial level, 12% chose "nature of production process", while 10% chose "other" with 2% choosing "nature of geographic areas" and "nature of market served" respectively.

For a description of the control structure at the GOGCWS *how do you describe the control structure at your company/division?* see table 8.2

**Table 8.2: Perceived control structure of the GOGCWS (N =50)**

Control structure	Managerial level			Total
	High	Medium	Low	
Investment centre	---	4%	---	4%
Profit centre	---	---	10%	10%
Contribution centre	---	2%	---	2%
Cost centre	16%	8%	30%	54%
Others	4%	12%	14%	30%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

This was not unexpected result - just over half of the respondents (54%) saw the control structure as the cost centre - because the Unified Accounting System divided the production into Production Centre, Productive Services Centres, Marketing Services Centres, and Administrative and Financial Services Centres. So this caused the control structure to be focused on cost. There were two kinds of control structure at the GOGCWS; external control (95% of respondents mentioned this control - observation from the interviews) and internal control<sup>156</sup> (only 73% of respondents mentioned it - observation from the interviews). This came from high pressure for the GOGCWS to satisfy legislative requirements and led to the question "is the accounting system designed to achieve efficiency and optimisation for the company primarily or to satisfy legislative requirements primarily"? (see chapter 9). Furthermore, the researcher did not observe economic efficiency or 'pareto optimal' but there were efficiency controls or effective controls and pareto improvements in the organisation<sup>157</sup>.

<sup>156</sup> The role of internal control is too limited, it is checked only on signature, but this research would like the internal control to be able to discover the mistakes which the external control did not discover (Accountant in Central Accounts Department).

<sup>157</sup> Accountant in Participating Accounts Administration said there was a procedure of control and no practice control at the same time.

Regarding the question *how does the control structure fit within the organisation structure?* see table 8.3

**Table 8.3: Perception of how control structure fits within the organisation structure (N =50)**

How Control structure fits within the Organisation structure	Managerial level			Total
	High	Medium	Low	
A good fit	2%	4%	14%	20%
Reasonable fit	10%	12%	30%	52%
Problematic fit	8%	10%	10%	28%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

It can be observed from table 8.3 above, that 72% of respondents indicated that there was a "reasonable or good" fit between the control structure and organisation structure. However, just over half of the respondent's - observation from the interview - said it was not reasonable. This findings<sup>158</sup> led the researcher to ask the interviewees why the control structure did not fit with the organisation structure of the GOGCWS. The interviewees stated that there were several explanations for the unsuitability of the control structure, such as; "the structure is built on favouritism"<sup>159</sup>, "is unchangeable"<sup>160</sup>, "executive command is bad"<sup>161</sup>, "the structure is bureaucratic"<sup>162</sup>, "is centralised"<sup>163</sup> and "like a pyramid"<sup>164</sup>, "the problem is abuse of power"<sup>165</sup>.

Regarding "change in the organisation structure", the majority of respondents (90%) - observation from the interviews - stated there had been no substantial changes in the

<sup>158</sup> The answer from the interviewees.

<sup>159</sup> Accountant in participating Accountants Administration.

<sup>160</sup> Accountant (Central Accounts Department).

<sup>161</sup> Chief of Bills Auditing and Stamp Department.

<sup>162</sup> Accountant in Cost Department.

<sup>163</sup> Accountant (Documentary Credit Department)

<sup>164</sup> Chief of Documentary Credit Department.

<sup>165</sup> Auditing (Maturities Department).

organisation structure but there had been developments in the technical and legal aspect, although no developments regarding the financial and administration aspect except for very small changes such as; establishing new administrations and raising new managers.

There was a plan to change the organisation structure in the GOGCWS but nothing materialised<sup>166</sup>. The GOGCWS suggested a new organisation structure<sup>167</sup> and sent it to the Accounting Central Institution but the Accounting Central Institution did not acknowledge it<sup>168</sup>. One accountant in the Central Department stated "if we want to change we should change the people not the structure". The researcher saw this answer as meaning it was extremely important to change the belief (attitude) of the worker as well as the structure. Furthermore, this raised the issue that organisation structural arrangements were as likely to be the outcomes of political processes as were organisational resource allocation decisions" (Pfeffer, 1978).

## **8.4 The supervision and control body on the GOGCWS**

The General Organisation for Greater Cairo Water Supply followed several control procedures. These procedures could be internal or external and also within these either technical or financial.

### **8.4.1 The internal control**

#### **8.4.1.1 The technical control (examination of production quality)**

The general administration for laboratories and research of GOGCWS supervised the technical aspect of all the organisation and its workers. Each laboratory in the stations supervised and controlled the water at all stages of water purification; the subsidiary stations and also each laboratory controlled the dragnets, which were provided by the station.

On that basis, the laboratory's station was responsible for controlling water treatment operations to ensure that the water produced was suitable for drinking, and following it to dragnets until reached the customer, according to health standards.

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<sup>166</sup> Accountant (participating accounts Administration).

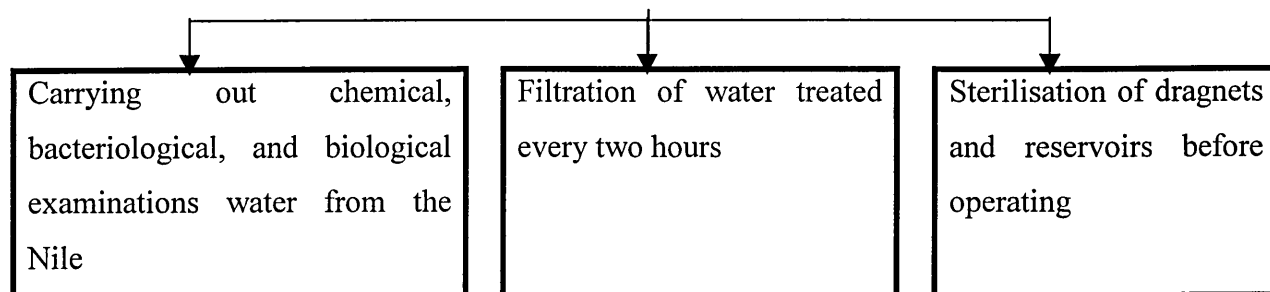
<sup>167</sup> See the new organisation structure of the GOGCWS in figure A1.5.2.

<sup>168</sup> Chief of Final Statement of Accounts and Follow-up.

The control water treatment operations included chemical and biological examination of raw, filtered and treated water (every two hours). In addition, several searches and studies, which had no fixed system or programme, were carried out according to the circumstances of the work.

Regarding water quality control, each of the GOGCWS's stations had a laboratory which carried out examinations of water treatment. These examinations are represented in figure 8.2

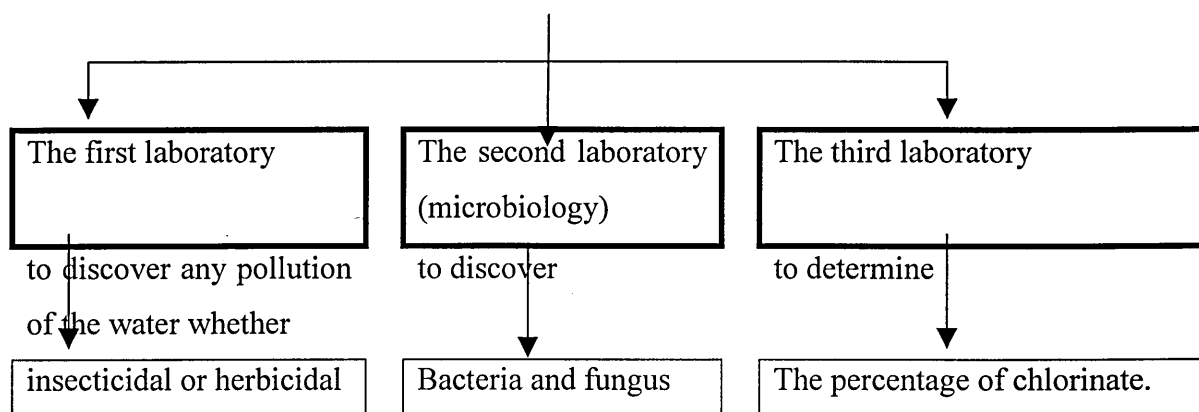
**Figure 8.2: Water Quality Control**



Source: Based on the GOGCWS, (no date source given, c), p. 12

In addition, the GOGCWS had the biggest central laboratory in the Middle East - the capital cost of which was 250 million Egyptian pounds. The laboratory consisted of three sub-laboratories to measure all kinds of pollution and to provide immediate treatment.

**Figure 8.3: Water quality control**



Source: Based on the GOGCWS, (no date source given, c), p. 12

#### 8.4.1.2 The financial control

The inspection of the financial and managerial administration was considered the main system for internal control of the GOGCWS. It gave direction and reduced the

variances<sup>169</sup>. Its work included all the GOGCWS's activities (technical, financial and managerial). In general the functions of the inspection of financial and managerial administration were as follows (Accounting Central Institution, no date source given):

- Setting internal audit rules for financial and administrative research and follow up procedures to ensure the efficiency of workers' performance in production and services, follow up of achievements, discovery of mistakes and the difficulties which face the GOGCWS. Setting internal audit rules show incapacibilities in carrying out the legal regulations, suggest solutions and show the different variance to reduce these immediately.
- Making random periodical inspections of activities and works' administrations of the GOGCWS and preparing the necessary reports (which include the results of research) to send to the chiefs of these administrations. After approval of these reports from the chief of the committee, the recommendations and suggestions in the reports will be carried out.

#### **8.4.1.2.1 The performance of the inspection of financial and managerial administration's functions**

Although the Department of the Inspection of Financial and Managerial Control was considered the fundamental control system inside the GOGCWS, and was responsible for ad-hoc inspection in all areas and administration of the GOGCWS, it had not received due recognition from the GOGCWS' administration (Accounting Central Institution, 1994: p. 61). This led to a lack of factors could have helped the administration to achieve its aims. In addition, there were some obstructions and difficulties which faced the inspection of financial and managerial administration to achieve effective internal control. These difficulties could be summarised as follows (Accounting Central Institution, 1994: 62):

- The lack of technical human ability in administrative areas (the inspection of financial and managerial administration).
- The absence of due care by the GOGCWS's administration.
- The lack of suitable means of transportation for administration workers.

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<sup>169</sup> In term of activity not the variance occurred from procedures.

- The absence of collaboration between the GOGCWS administrations.

#### **8.4.2 The external control**

The GOGCWS followed technical supervision and control from the general administration for central laboratories within the Health Ministry, and it also followed financial control from several institutions. The style of external control may be illustrated as follows:

##### **8.4.2.1 The technical control (examination of quality production)**

The external control on water production in the GOGCWS was through the central administration within the Health Ministry which did chemical analysis and bacteriological analysis. The health supervisors took and analysed samples of treated water.

##### **8.4.2.2 The financial control**

There were several institutions which were responsible for financial control on the General Organisation for Greater Cairo Water Supply namely:

- The Cairo region.
- Finance Ministry (treasury department).
- Ministry of planning.
- The Accounting Central Institution.

Every institution had its role and worked separately from the others. The role of each can be summarised as follows (Accounting Central Institution, no date source given):

###### **8.4.2.2.1 The Cairo region**

The General Organisation for Greater Cairo Water Supply was one of many organisations which had to answer to the Cairo region in the administrative affairs and workers affairs of the organisation. In addition, the Governor of Cairo City determined the price<sup>170</sup> of water sold by the GOGCWS.

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<sup>170</sup> The researcher made great effort to get an appointment with the Governor of Cairo City in order to obtain information of how the price of water was set. However, he was unable to gain access which limited the research.

#### **8.4.2.2.2 The Finance Ministry (before buying)**

A Finance Ministry delegate<sup>171</sup> was responsible for controlling purchasing before buying (allowing or not allowing to spend), control and supervision of the budget of GOGCWS, controlling all the accounting and calculation procedures and ensuring that it was identical to the laws, rules and procedures of the GOGCWS. The GOGCWS gave accounts to the Finance Ministry - within a time period determined by the Treasury Ministry, which was monthly, quarterly, and annually according to the rules, leaflets, and periodic publications which were issued by the Finance Ministry.

#### **8.4.2.2.3 Ministry of Planning**

The Ministry of Planning confirmed the medium term (five years) plan and the annual plan for the GOGCWS. In addition, it gave approval to the annual assignment of funds which the GOGCWS asked for in relation to all items in the budget.

#### **8.4.2.2.4 The Accounting Central Institution**

The Accounting Central Institution was responsible for controlling purchasing after buying supplies for the GOGCWS. It was responsible for controlling and auditing the revenues and expenses. The most important elements that were audited are as follows:

- The control of salaries, bonus and wages<sup>172</sup>.
- The control of general expenditures<sup>173</sup>.
- The control of investment expenses<sup>174</sup>.

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<sup>171</sup> This person works for the GOGCWS but reports to the Finance Ministry.

<sup>172</sup> The control of salaries, bonus and wages were controlled through seeing the balance sheet of the GOGCWS and also identifying the number and level of seniority by personnel records kept and compared between expenditure documents - salaries, bonus and wages - with personnel and salary records. Auditing of the internal control for wages and salaries was carried out. Employees files were checked and decisions made relating to appointment, bonus, leave without salaries and suggestions for avoiding mistakes in the future.

<sup>173</sup> By seeing the projected budget and its distribution to the branches, different administrations examined the system used to distribute these funds. The internal system and rules which determined the expenditure were checked to ensure that all expenditure was according to the rules. Ensured that all expenditure documents relating to rents, travelling, petty expenses were correct.

<sup>174</sup> Ensuring that the procedures relating to expenditures were correct and documentation relating to these was available by looking at the plan. Ensuring that expenditures were made according to the GOGCWS's plan and furthermore that expenditures were limited to the approved expenditure and not exceeded. Finding out why the limit was exceeded if this did happen.

- The control of the organisation's revenues<sup>175</sup>.
- The control of financial statements<sup>176</sup>.

## 8.5 The Accounting system in the GOGCWS

The main development of accounting in Egypt can be divided into two stages: bookkeeping and accounting stages. In the bookkeeping stage, the double entry notion was followed in records, which were represented in an original "journal" connection with the subsidiary journal. Different kinds of business were recorded and carried over to the ledgers general and subsidiary which included classification for these entries to personal and named accounts. Thompson (1994: 51) argues that towards the end of the 15th century, double-entry book-keeping was part of a "larger project to re-emphasise a belief in order sanctified by god". Then financial statements and the balance sheet was derived from the personal and named accounts.

The Unified Accounting System - the system which was followed in the GOGCWS - was established at this stage. In the accounting stage, the accounting information - which the economic organisation<sup>177</sup> used to meet their aims - was connected with the requirements of external institutions.

### 8.5.1 Objectives, notion and contents of the Unified Accounting System

In spite of the Unified Accounting System meeting certain purposes within the organisation, it was not conceivable<sup>178</sup> that it could meet all the requirements of

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<sup>175</sup> Examining the internal auditing system, studying laws, ministerial decisions, rules relating to the revenues of the GOGCWS. Examining the collection system, evaluating it and suggesting any modifications. Comparing the actual collected revenues with the revenues which should be collected and studying the reasons for failure and suggesting solutions for that.

<sup>176</sup> Ensuring that financial statements and balance sheets were prepared according to the rules issued by the Finance Ministry.

<sup>177</sup> The Unified Accounting System was applied on

(1) The economic organisation within the public sector (with exception, by law, of banks, credit companies and insurance companies). The definition of the economic organisation, which had to apply the Unified Accounting System, was that "the unity which is practising industrial activity, business activity, agriculture activity, landed activity or any activity had economic characteristics"

(2) The general organisation or institution which had to, by law, prepare the balance sheet as a business balance sheet even if it did not have any economic activity

The economic organisation in the public sector took different kinds of forms such as (a) general institution or organisation (b) public sector company (c) co-operative society or (d) subsidiary company

<sup>178</sup> See section 8.6.

planning and following up the execution of financial, economic and technical control (The GOGCWS, no date source given, b: 4). The objectives of the Unified Accounting System could be summarised as follows: (a) Providing the essential information and analytic tools which were a requirement for planning, execution, and controlling at different levels<sup>179</sup> (b) It provided the link between the accounts of the economic organisation and the national accounts. The Unified Accounting System combined the terminology and concepts between the accountant of the economic organisation and the national accountant (c) It simplified the collection of accounting information and its classification and therefore recording it was easier.

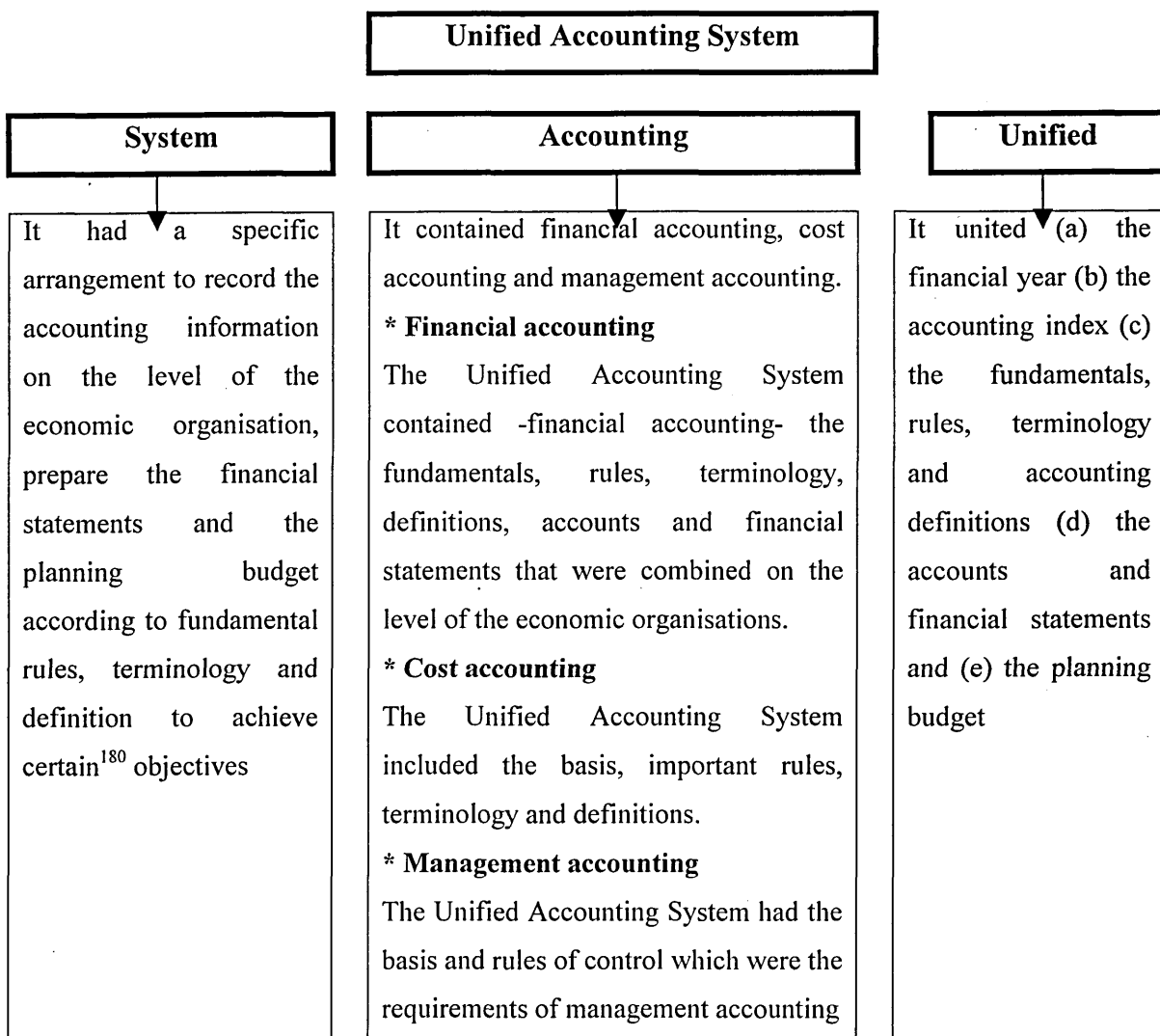
The notion and contents of the Unified Accounting System are illustrated in figure 8.4.

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<sup>179</sup> **The level of organisation:** The Unified Accounting System provided information, which helped in control, supervision and direction. In addition it participated in planning.

**The level of external institution:** The Unified Accounting System helped the Ministry of planning to achieve integration between the budget in kind (the budget in kind contained the goods requirements, the service requirements and workers. It was called the budget in kind because it expressed by quantities before translating it to cash values), the financial budget, and the cash budget with the period horizons (short, medium, and long term) which were consistent with national plans.

Figure 8.4: Contents of the Unified Accounting System



Source: Based on the GOGCWS, (no date source given, c), p. 10

The Unified Accounting System was built on general standards. These were:

- (a) The simplicity<sup>181</sup>, clarity<sup>182</sup> and flexibility<sup>183</sup> standards
- (b) Honouring of the accounting rules and principles standards<sup>184</sup> (see section A1.2.4.1)

<sup>180</sup> See section 8.6

<sup>181</sup> Simplicity. It concentrated on financial accounting.

<sup>182</sup> Clarity. It gave a detailed explanation of the Accounting index (see section A1.2.4.2) which was considered as the main resource information.

<sup>183</sup> Flexibility. It used special records to record any details which were work requirements.

<sup>184</sup> These were considered the basis of records in the assets evaluation and goods inventory (the cost of fixed assets were represented by all the capital expenditures for purchasing and preparing the fixed asset to work. There was a difference between the new fixed assets purchased and the old fixed assets purchased) and depreciation (the depreciation was calculated annually whether the result of the activity was loss or profit. The straight-line method was used in the cost accounting system in the GOGCWS with the exception that the usage related method was used for stationary, etc. in the end of each financial year). These principles and rules were approved by the convention. So, the preparation of the Unified Accounting System was built on existing rules and fundamentals.

(c) The verified standards of implementation<sup>185</sup>

(d) Satisfied all the requirements which were created from inside or outside of the economic organisation.

The Unified Accounting System also gave freedom of choice regarding the manner in which documents were circulated within the organisation. It depended on several conditions such as the nature of activity, the size of the organisation and the kind of information required. In addition, the Unified Accounting System gave some examples of records or guidance which were not obligatory.

## 8.6 Cost accounting System

The aims of cost accounting in the GOGCWS could be summarised from the documentation of the organisation as follows (the GOGCWS, no date source given, c):

- (1) Perfect control of production costs and the uses of production factors
- (2) Providing the right basis to evaluate the finished production, uncompleted production and the work under implementation at the end of financial period
- (3) Providing accounting information according to the planning budget (responsibility centres and cost centres)
- (4) Helping to set policy and decision-making procedures at all levels (from the economic organisation to the national level)
- (5) The cost accounting system recorded the actual cost<sup>186</sup> relating to production and costs according to the centres and stages.

The aims of cost accounting in the GOGCWS were compared with the aims of cost accounting which were mentioned in section 5.1.2. It was observed that the aims of cost accounting (from a theoretical viewpoint) could be summarised in three ways: (a) stock valuation (b) planning control and (c) decision-making (Clark, 1923; Drury and

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<sup>185</sup> It gave a chance for the economic organisation to study the system project before it was issued. All economic organisations were obliged to apply the Unified Accounting System from the beginning of year 67/68 with the possibility of a one year delay for any economic organisation that requested it, but on condition it had the permission of The Accounting Central Institution.

<sup>186</sup> Actual cost means in this context historical cost. The calculation of the cost of water per cubic meter was as follows: costs were calculated for each centres separately - The Unified Accounting System in the GOGCWS divided the production into: (a) Production Centres (b) Productive Services Centres (c) Marketing Services Centres (d) Administrative and Financial Services Centres - which depended on the actual (historical) cost. The cost of each centre was added together in order to get the total cost and finally the total cost on the water production was divided in order to obtain the cost per cubic meter.

Dugdale, 1992; Coward, 1944; Frank, 1990; Cooper and Kaplan 1991; 1992). These were similar to the aims of cost accounting in the GOGCWS. For example, the heart of the first, third and fifth aims of cost accounting in the GOGCWS were planning and control. The focal point of the second and fifth aims were stock valuation and the core idea of the fourth aim was decision-making. On the other hand, it was observed there was a limitation in the aims of cost accounting in the GOGCWS because it depended on historical costs relating to traditional management accounting (for further explanation of this point, see section 9.2.1.1). Furthermore, this suggested that cost information had no role or a very limited role in shaping the strategy of the GOGCWS (see section 9.2.1.3).

Although the records of cost accounting systems in the GOGCWS depended on historical costs, which were useful for knowing the direct and indirect actual costs for the production unit and controlling and monitoring of performance. Furthermore, the record of GOGCWS was divided into four main groups as follows: (1) Records for financial accounts (2) Records data for financial accounts (3) Records value group relating to inventory control (4) Records related to costs. This research concentrated on the records related to cost (a brief summary of its contents as given in section A1.2.4.3). This section is divided into seven sub-sections as follows:

### 8.6.1 Cost accounting development and the needs

For an illustration of the development of cost accounting - *how was the cost accounting system developed?* - see table 8.4

**Table 8.4: Development methods of the cost accounting system (N =50)**

Development of cost accounting system	Managerial level			Total
	High	Medium	Low	
In-house	14%	22%	22%	58%
Contractor	6%	2%	26%	34%
Software package	---	---	---	---
Customer prepared	---	---	---	---
Borrowed from another agency	---	---	---	---
Others	---	2%	6%	8%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

From table 8.4 above, it could be observed that 58% of the respondents chose "in-house" as a method of development of the cost accounting system. This result is consistent with the analysis of the documentation of the GOGCWS. The UAS (which includes the cost accounting system, see figure 8.4) was imposed on the GOGCWS by government regulation (see section 8.5).

On the topic of *what standards are used for your cost accounting activity?*, see table 8.5

**Table 8.5: Standards used for cost accounting system (N =50)**

Standards of cost accounting	Managerial level			Total
	High	Medium	Low	
Agency standards	2%	2%	8%	12%
Government cost accounting standards	12%	8%	26%	46%
Generally accepted accounting principles	---	---	---	---
Others	6%	16%	20%	42%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

These answers highlighted the effect of legislation on cost practice (see section 9.2.2.3). They also raised the question of why the respondents answered differently. In order to explore this question, the percentage (42%)<sup>187</sup> of others was analysed, due to it being the second highest percentage, following the 46% which stated government cost accounting standards.

The question *is this cost system adequate for your needs?* is illustrated in table 8.6

<sup>187</sup>

**Effect of legislation on cost practice in the GOGCWS (N =21)**

Average of previous years.	Technical Committees within GOGCWS.	There is no standard	I do not know
26%	8%	4%	4%

Source: Analysis of questionnaire.

These answers - (26%) stated that the standards used for the GOGCWS were the average of previous years - and did not conflict with the answers of - 46%, which stated government cost accounting standards. It could have been that the standards used for cost accounting in the GOGCWS related to government cost accounting standards based on the average for the previous year.

**Table 8.6: Adequacy of the cost accounting system (N =50)**

Adequacy of the cost accounting system	Managerial level			Total
	High	Medium	Low	
No needs	---	---	4%	4%
Few needs	12%	4%	14%	30%
Most needs	8%	18%	22%	48%
All needs	---	4%	12%	16%
I do not know	---	---	2%	2%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

The analysis of adequacy of the cost accounting system above shows that the majority of respondents (48%) viewed the cost accounting system within the GOGCWS as adequate for most of their needs. It was noted that at senior managerial level 60% (12% / 20%) perceive the cost accounting system as adequate only for few needs. The senior managerial levels have more an overview of the GOGCWS and this could account for this result.

### 8.6.2 Changes in cost management

On the topic of the cost method being revised in the GOGCWS "*Has there been a major revision to the method used in the GOGCWS for estimating and measuring product cost?*", see table 8.7

**Table 8.7: Any revision of methods used for estimating and measuring product cost (N =50)**

Yes	10%
No	86%
I do not know	4%

Source: Analysis of questionnaire.

This result was confirmed by the analysis of the documentation of the GOGCWS which showed that although the economic forms and legal structure organisation changed during the organisation's life (see section 8.2.1), there was no change in the cost

method<sup>188</sup>. This respondent's answer raised the question "*why was there no change?*" (For more detail, see section 11.2.4). Unintentional changes to cost management in the GOGCWS "may occur in the absence of systems to monitor the execution of the routines where the rules and routines are not sufficiently understood or accepted by the actors" (Burns and Scapens, 2000: 10).

Regarding the question whether changes should be made in the cost department - observation from the interviews, 45% of interviewees could not comment or give any suggestions or advise about the cost department. Of the remaining interviewees, 55% highlighted some suggestions for the cost department such as:

- (a) "Introduce computers"<sup>189</sup> ("technology"<sup>190</sup>)<sup>191</sup> and "excellent use of it"<sup>192</sup>
- (b) "Design accurate planning before taking decisions"<sup>193</sup> and "make the connection and integration between administrations in order to decrease the cost"<sup>194</sup>
- (c) "Evaluate the booking value"<sup>195</sup>, "choose skilled workers"<sup>196</sup> and "train them"<sup>197</sup>
- (d) "Establish cost centres"<sup>198</sup> and "control of the cost element"<sup>199</sup>, "look for the fairest way in cost distribution"<sup>200</sup> and "give higher authority for the cost department"<sup>201</sup>, "it should be seen at the same level as the central administration"<sup>202</sup>

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<sup>188</sup> The GOGCWS had followed the Unified Accounting System since the 1960s.

<sup>189</sup> Accountant in the Cost Department, Accountant in the Participating Accounts Administration, and Accountant of the Statistics Department

<sup>190</sup> Chief of Central Accounts Department and Chief of Balance Sheet Administration.

<sup>191</sup> Observation from questionnaire, regarding the computer based configuration of the cost accounting system in the GOGCWS, 66% of respondents chose a non automated system. On the topic of the principal method of data entry, the majority of respondents 92% chose manual.

<sup>192</sup> Accountant in the Participating Accounts Department, Chief of the Bills Auditing and Stamp Department, Accountant in the Cost Department, Auditing and Accountant in the Cost Department.

<sup>193</sup> The chief of the Balance Sheet Administration.

<sup>194</sup> The chief of the Documentary Credit Department

<sup>195</sup> Accountant in the deduction and Modifications Department

<sup>196</sup> Accountant in the Participating Accounts Administration.

<sup>197</sup> The chief of the Balance Sheet Administration.

<sup>198</sup> Accountant in the Central Accounts Department. This was a very surprising result because it contradicted the analysis of the description of the control structure at the GOGCWS as mentioned previously. But the reason could be that, although the cost centre included in the rules (procedures) of the GOGCWS it disappeared from the routines (activities) of the organisation, and this goes back to the argument regarding the differences between rules and routines highlighted by Burns and Scapens (2000).

There were two observations from this result. Firstly, half of the interviewees (50%) realised that the cost method was not appropriate for the GOGCWS and this was the first step to change. So the question raised again was “*why was there no change?*” (See the answer in section 11.2.4). Secondly, the interviewees were very fearful<sup>203</sup> of talking against the policy of the government (the policy of the GOGCWS).

### 8.6.3 Measuring and estimating product cost

For the present method of measuring product cost *How do you consider the present method of measuring product cost and practice?*, see table 8.8

**Table 8.8: Perception of measuring product cost (N =50)**

Measuring product cost	Managerial level			Total
	High	Medium	Low	
Straightforward and simple	6%	12%	28%	46%
seems a reasonable compromise	2%	---	6%	8%
Needs significant change	6%	4%	2%	12%
Need simplifying	6%	10%	16%	32%
Others	---	---	2%	2%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

Just under half of respondents 46%, chose straightforward and simple. Maybe the reason for this answer was that the cost accounting system depended on historical costs. Furthermore, the documentation of the GOGCWS (organisational rules of the GOGCWS) confirmed that the measuring of product costs depended on the actual (historical) costs. Moreover, the result showed that 44% of respondents stated that the

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In addition to that the interviewees or the respondents sometimes gave their own opinion and other times gave the view of the organisation and this could have created confusion.

<sup>199</sup> Accountant in the Central Accounts Department

<sup>200</sup> The vice chairman for Technical Affairs.

<sup>201</sup> Accountant in the Cost Department.

<sup>202</sup> Accountant in the Cost Department.

<sup>203</sup> Most of the interviewees before they started the interview asked the researcher to keep the interview very confidential otherwise they were concerned they might be dismissed from their jobs.

present method of measuring the product costs needed to change (whether simple or significant) and this answer achieved reliability when the researcher asked the respondents whether a cost system was adequate for their needs (see section 8.6.1). Regarding depreciation methods used in cost accounting system of the GOGCWS, *what depreciation methods are used in your cost accounting system?* The majority of respondents (98%) chose straight line. The perception of depreciation methods used in cost accounting systems of the GOGCWS were consistent with the actual method used.

On the topic of "measuring the cost of resources consumed", *how do you measure the cost of resources consumed?*, the majority of respondents (92%) stated according to actual cost. This answer was similar to the fifth aim of the cost accounting system of the rules (documentation) of the GOGCWS. So, this meant there was no difference between the rules (documentation) of the GOGCWS and the (routines) practices related to measuring the cost of resources based on historical cost.

#### 8.6.4 Water Funding

The perception of competitive intensity of capital and financing for water in the GOGCWS is illustration in table 8.9.

**Table 8.9: Perception of competitive intensity of capital and financing in the GOGCWS (N =50)**

Market Conditions		Competitive Intensity						
			1	2	3	4	5	
1	Availability of funds	Easy to obtain funds	36%	34%	10%	10%	10%	Hard to obtain funds
2	Source of funds	Many sources	14%	56% 204	10%	8%	12%	One major source

Source: Analysis of questionnaire.

<sup>204</sup> Although there was only one major source (the government) for funding (subsidisation) of water in the GOGCWS, it could have been answered this way because there were many institutions and organisations - e.g. the National Investment Bank, The Finance Ministry, Ministry of Planning, The Cairo region, etc, - represented the government. Also, there were a variety of customers such as: domestic, business, public, etc.

This result showed the respondents' perception was that there was no difficulty in funding for water in the GOGCWS (observation from the questionnaire). Comparing this observation with the documentation of the GOGCWS, if the price of filtered water did not increase, the governmental subsidisation would be 737<sup>205</sup> million E.P. annually (during 1999- 2003) (The GOGCWS, no date source given, a: 17). The GOGCWS would borrow this amount of money from The National Investment Bank (at 14% interest) and the result being that subsidisation will be 840 million E.P. The question here is "can the government provide subsidisation for the new investments and replacement, and renew the present system at the same time?" If the answer to the question was no, this meant the government should look at different methods for managing the water industry in the GOGCWS (opportunity cost).

The residents of Cairo had the lowest priced water (The GOGCWS, no date source given, a: 17). This may seem to have been a wise policy but it had some effects. The low price did not provide the GOGCWS with the financial resources to run, maintain and renew the system in order to provide the quantities of good quality water demanded by customers.

In conclusion, it was noted that there was a big problem in the finance and financial resources in the GOGCWS. Furthermore, there was a big difference between what the managers thought about the funding of the water in the GOGCWS and in reality.

## **8.6.5 Cost information, reporting and decision-making**

### **8.6.5.1 Use of cost information**

The question *what statements describe how data from this cost accounting system are primarily used?*, is illustrated in table 8.10

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<sup>205</sup> This means the government subsidised the GOGCWS by more than four and a quarter times their total revenue for 1999/2000 = 172,593,108.01 Egyptian pounds).

**Table 8.10: Using data from cost accounting (N =50)**

Using data from cost accounting	Managerial Level									Total %
	Yes %			No %			I do not know %			
	H	M	L	H	M	L	H	M	L	
To manage an activity or a programme	14	12	20	6	14	32	---	---	2	100
To measure programme performance	10	12	22	10	14	26	---	---	6	100
To determine selling price	---	---	6	20	26	48	---	---	---	100
To value inventory	20	10	42	---	14	8	---	2	4	100
To value cost sales	20	10	42	---	14	8	---	2	4	100
To satisfy legislative requirements	20	24	52	---	2	2	---	---	---	100

Source: Analysis of questionnaire.

This was not unexpected result for the researcher - 72% of respondents stated the data was used to value inventory and the same percentage stated the data was used to value cost of sales. This was because it was similar to the second aim of the cost accounting system which was providing the right basis to evaluate the finished production, uncompleted production and the work under implementation at the end of financial period. The majority of respondents 96% stated the data was used to satisfy legislative requirements (see section 9.2.2.3).

The researcher took the result of the analysis of the questionnaire, which highlighted that the data created from cost accounting was not used to determine the selling price. Further, by asking the interviewees "who determines the price of the water", they stated the selling price was determined outside of the organisation. Furthermore, it was noted that Cairo's governor determined the price of water in Cairo City and every governor determined the selling price of water in his/her city. The question raised here was "why does the governor determine the selling price?" The reason might be the effect of legislation which stated that water utilities in Egypt were subject to the control of both the governor and the Ministry of Housing and Public Utilities (see section 8.1).

On the topic of *to what extent is cost accounting data used in budget formulation?*, see table 8.11

**Table 8.11: Using data from cost accounting in budget formulation (N =50)**

Using data from cost accounting in budget	Managerial level			Total
	High	Medium	Low	
Usually the basis of estimation	20%	24%	46%	<b>90%</b>
Rarely used	---	2%	8%	<b>10%</b>
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

This answer was no different to the information in the documentation of the company, which said that the aim of cost accounting system was to provide accounting information according to the planning budget.

#### 8.6.5.2 Reporting of cost accounting

The question *for what purposes are reports generated from this cost accounting system?*, is illustrated in table 8.12

**Table 8.12: Reporting purposes of cost accounting data (N =50)**

	Managerial Level									Total %
	Yes %			No %			I do not know %			
	H	M	L	H	M	L	H	M	L	
Financial reporting	20	22	52	---	2	2	---	2	---	100
Developing prices	4	2	16	16	24	38	---	---	---	100
Inventory control	10	14	30	10	10	24	---	2	---	100
Managerial control	2	18	26	18	8	28	---	---	---	100
Budget preparation	18	26	50	2	---	4	---	---	---	100
Budget execution	6	10	16	14	16	38	---	---	---	100

Source: Analysis of questionnaire, H =High level, M =Medium level, L =Low level.

This result (94% respondents stated yes for financial reporting) raised the question of whether the accounting system in the GOGCWS was designed to help financial accounting, management accounting or both. In addition, the majority of respondents (78%) stated no in developing prices. By asking the respondents what they meant by developing prices, they explained that costs should be considered when pricing and not necessarily for price to be based on cost.

On the topic of *who uses the reports generated from the cost accounting system?*, see table 8.13

**Table 8.13: Users of cost accounting reports (N =50)**

Users of cost accounting reporting	Managerial level			Total
	High	Medium	Low	
Financial managers	8%	22%	42%	72%
Budget analysts	6%	---	4%	10%
Others	6%	4%	8%	18%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

This result indicated that the accounting system served financial accounting.

Regarding the level at which cost information flowed within the GOGCWS (observation from the interviews), the majority of interviewees (94%) said that the cost information goes to a high level of command. This result was the outcome of the professional hierarchical bureaucracy with which the GOGCWS was consistent.

### 8.6.5.3 Decision-making and cost management

On the topic of using cost information in decision-making in the GOGCWS (observation from the company's documentation) cost accounting helps to set the policy and decision making at all levels (see table 8.14).

**Table 8.14: Use of cost accounting reports in decision-making (N =50)**

Cost information	%
Plays a part in decision making	55
Does not play any part in decision making	32
I do not know	13

Source: Analysis of interviews

By analysing the percentage who answered that cost information plays a part in decision-making, 62%<sup>206</sup> of them answered "I think". This means they were not actually

<sup>206</sup> 62% out of 55% which has shown in table 8.14

sure whether cost information played a part in decision-making, and they stated their answers on the opinion that senior management takes no decisions without looking at cost information.

### 8.6.6 Financial management system and cost accounting system

The question *what financial management systems/functions are integrated with this cost accounting system?*, is illustration in table 8.15

**Table 8.15: Integration between financial management system and cost accounting system (N =50)**

	Managerial Level									Total %
	Yes %			No %			I do not know %			
	H	M	L	H	M	L	H	M	L	
General ledger	20	22	44	---	4	8	---	---	2	100
Programme accounting	18	26	46	2	---	8	---	---	---	100
Payroll	18	20	46	2	6	8	---	---	---	100
Inventory control	6	14	20	14	12	34	---	---	---	100
Property, plant and equipment	16	16	38	4	10	16	---	---	---	100

Source: Analysis of questionnaire, H =High level, M =Medium level, L =Low level.

Table 8.15 shows that the majority of respondents stated that the financial management systems were integrated with the cost accounting system of the GOGCWS. The reason for this answer may be that the GOGCWS followed the Unified Accounting System, which did not distinguish between financial, and cost accounting systems.

From the analysis of the interviews, in answer to the question *are the elements of cost in your cost accounting system reconciled with your general ledger control accounts (e.g. labour to accrued payroll account)?* Just under 44% of respondents answered monthly. Of the remaining respondents 20% answered others, 18% answered quarterly, 16% answered annually and 2% answered no.

### 8.6.7 Distinguishing between direct and indirect costs

From the analysis of the interviews, the majority of interviewees (84%) could not answer the question regarding how overhead costs were managed and allocated within the GOGCWS. Even the interviewees (16%) who answered the question, said they

calculated the total cost for each centre each year and added these costs to the production centres. So, the researcher concluded that no one in the GOGCWS, including staff in the cost department, understood the procedures used in cost management.

In conclusion, the accounting system in the GOGCWS was linked to the financial accounting function and not the management accounting function. There were no substantial changes in the cost methods of the GOGCWS; furthermore, there were no differences between the rules (documentations) and the routines (practices) related to measuring the cost of resources. Cairo's governor determined the price of water in Cairo City (and every governor determines the selling price of water in his/her city). Essentially, the cost system reflects the organisational structure of the GOGCWS. The emphasis across the whole company had been limited to conventional budgetary control with full allocation of overheads.

Cost information went to senior management. Furthermore, cost information served several purposes, perhaps the most important was to satisfy legislative requirements. It can be argued that cost information was not the first element to be taken into consideration to determining the water's price as there was an effect of legislation on cost practice.

## **8.7 Cost management in the GOGCWS**

In cost management literature, (evidence of renewed interest could be seen from the publication and reaction to Johnson and Kaplan, 1987). A great deal of recent cost management literature centred on activity-based costing (Banker and Hughes, 1994; Cooper and Kaplan, 1992; Datar and Gupta, 1994). However, other modern cost management tools such as benchmarking (Elnathan and Kim, 1995), and just-in-time inventory systems (Alles, et al., 1995) have also recently been examined. In order to achieve the aim of this section, it is divided into seven sub-sections.

### **8.7.1 Throughput accounting model**

The use of throughput accounting in the General Organisation for Greater Cairo Water Supply (the biggest water organisation in Egypt can be seen in table 8.16).

**Table 8.16: Use of throughput accounting in the GOGCWS (N =50)**

Planning  and  control  process	Managerial level															Total  %
	Use now %			Plan to use in the future %			Used in the past, but not now %			Not used or planned to use at all %			I do not know %			
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	
Throughput accounting	10	6	---	---	---	---	---	---	---	2	---	---	8	20	54	100

Source: Analysis of questionnaire, H =High level, M =Medium level, L =Low level.

Table 8.16 shows that the throughput accounting model was not used in the GOGCWS. Throughput accounting costs focus on the short term with overheads attributed from product accounting to usage of existing manufacturing bottlenecks. The result of questionnaires relating to throughput accounting was consistent with Dugdale, et al. (1996) who argued that the idea of building up product costs on the throughput accounting principle is probably impracticable (for the principle of throughput accounting, see section 4.1).

### 8.7.2 Benchmarking

Regarding the use of benchmarking in the GOGCWS is illustrated in table 8.17.

**Table 8.17: Use of benchmarking in the GOGCWS (N =50)**

Planning and control process	Managerial level															Total %
	Use now %			Plan to use in the future %			Used in the past, but not now %			Not used or planned to use at all %			I do not know %			
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	
Benchmark -ing	2	4	10	6	---	12	---	---	2	12	20	20	---	2	10	100

Source: Analysis of questionnaire, H =High level, M =Medium level, L =Low level.

The findings of this research (non-uses of benchmarking in the GOGCWS) was consistent with Clark and Merton (1997). They see benchmarking as a tool for management change. There was no change in the management process in the General Organisation for Greater Cairo Water Supply as observed from the interviews.

The core idea of benchmarking was that performance should include three performance measures: (a) cost minimisation (b) cycle time minimisation (c) improvement of quality (see section 4.1). These three concepts were similar to the mission of the GOGCWS which was "To earn the trust and satisfaction of our customers and stakeholders by providing Greater Cairo with sufficient quantity of high quality water at fair price which contributes to the development of society" (Black and Veatch International, 1997: 4).

From the above results of the questionnaires related to benchmarking, its core idea, and the mission of the GOGCWS, a gap was observed between theory and practice. The model of cost management observed at the GOGCWS (or the design of the accounting system) did not give priority to cost management whereas the theory did give priority. The reason for this could have been the effect of the Government on cost accounting. This supported the argument of Geiger and Ittner (1996) which was that mandated government cost accounting systems were positively associated with cost system elaborateness, but were not associated with greater internal use of cost accounting data.

### 8.7.3 Budgeting

Budgeting played a crucial role in the water industry in Egypt, and particularly in the case of the GOGCWS, concerning the use of operational budgeting procedures in the GOGCWS (see table 8.18).

**Table 8.18: Use of Operational and Capital budgeting in the GOGCWS (N =50)**

Planning and control process	Managerial level															Total %
	Use now %			Plan to use in the future %			Used in the past, but not now %			Not used or planned to use at all %			I do not know %			
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	
Operational budgeting procedures	20	24	46	---	---	2	---	---	---	---	---	2	---	2	4	100
Capital budgeting procedures	20	22	42	---	---	2	---	---	---	---	4	---	---	---	10	100

Source: Analysis of questionnaire, H =High level, M =Medium level, L =Low level.

This result showed that the majority of respondents (90%) stated that they used operational budgeting procedures<sup>207</sup>. 84% of respondents stated they utilised capital budgeting procedures<sup>208</sup>. These answers indicated that GOGCWS was highly controlled internally and externally because views were that the budget was an internal and external regulative model and a critical reflection about what the staff were doing (see figures 8.5 and 8.6).

It was valuable to look at whether there was any difference or similarity between rules (documentations), routines (practice) and theory related to the meaning of the budget, preparation and principles preparation.

The budget was a sub-system of the accounting information system and contained the estimation of the financial activities in a comprehensive financial plan. This considered the co-ordination between the objectives, facilities, and probability circumstances (The GOGCWS, no date source given, c: 2). So, in theory it is an effective tool for planning, control and performance evaluation. Furthermore, the budget process helped in making crucial decisions regarding resources<sup>209</sup>, that created goods and services, and supplied data to enable the product managers to manage the planning and control loops around their particular responsibility. So, the researcher observed no difference in the role of the budget between the rules (documentations) of the GOGCWS and the normative theory.

With regard to the description of the annual budgeting process at the GOGCWS, there were stages of budget preparation which are illustrated in figure 8.5.

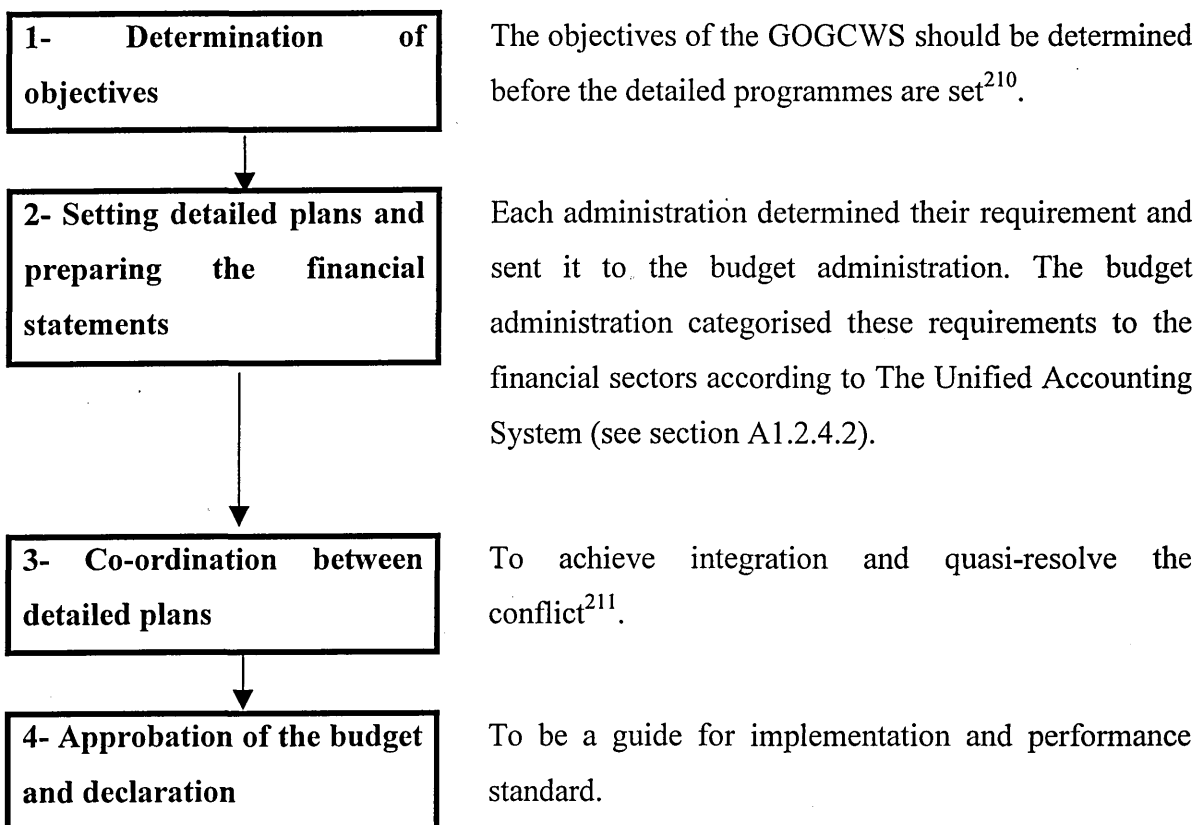
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<sup>207</sup> 2% of respondents (one respondent) answered that there were plans to use this in the future. The reason maybe that she had spent all 25 years of her employment recording in one book (the service requirement) and yet got no a qualification to understand where the information would be used. Another 2% of respondents (one respondent) answered that it has not been used in the past and there are no plans to use it at all. The reason could be that he worked in the Bills Auditing and Stamp department and had no idea about the budget. Of the remaining respondents 6% answered that we do not know.

<sup>208</sup> One respondent answered that there are plans to use this in the future and maybe the reason why is that his experience in work is very limited (4 years only), the nature of his work was only to record some expenses and he had not enough qualifications. Two respondents answered that there are no plans for use at all. One of them worked as the chief of the Bills Auditing Department and the other was the chief of the Bills Auditing and Stamp Department and the nature of work for both of them had no connection with formal planning and control procedures. Five respondents answered that we do not know.

<sup>209</sup> The argument of normative theory.

**Figure 8.5: Organisational model of stages of budget preparation**



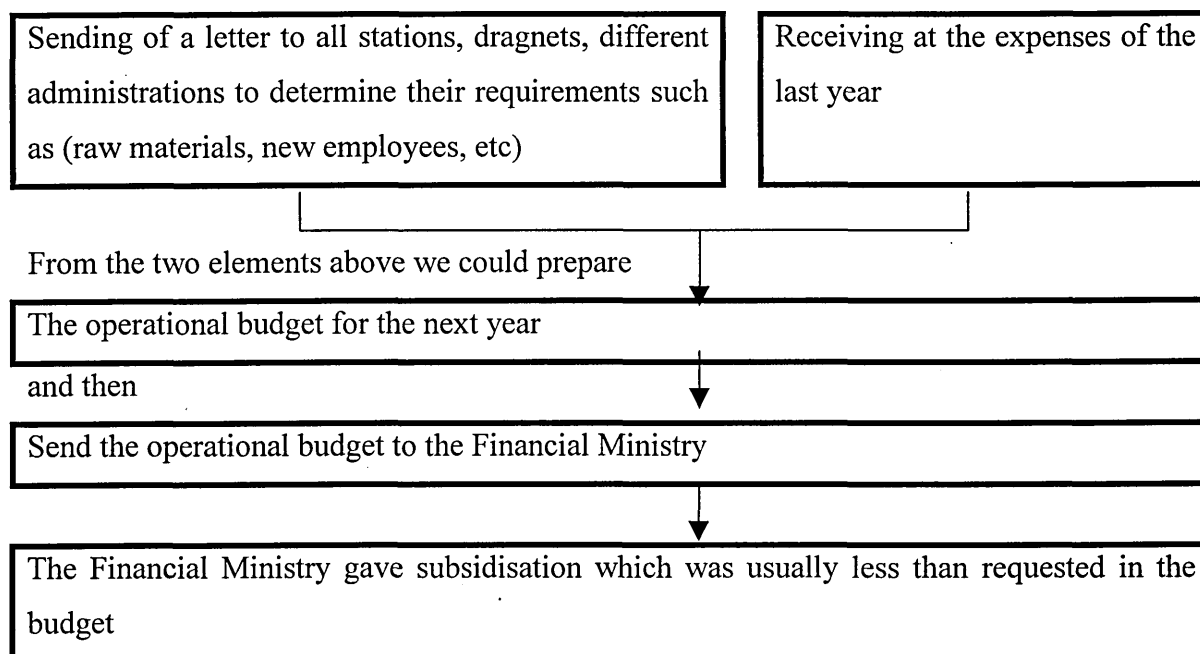
Source: Based on the GOGCWS, (no date source given, b), pp. 2-4

The perception of the interviewees regarding budget preparation was considered. For example, the Chief of Balance Sheet Administration in the GOGCWS said there were some steps in preparing the operational budget, which were explained as follows:

<sup>210</sup> (Source: The GOGCWS, no date source given, b: 2).

<sup>211</sup> For example, the purchasing plan of chlorinate was affected by the program of water production, credit facilities, etc. From another aspect, the purchasing plan affected the program of water production, amount owing to others, the financial position of the organisation and the size of the inventory of chlorinate. So if there was no co-ordination between detailed plans the result might be incorrect. From another aspect, co-ordination between detailed plans might need simplification, because all aspects needed to be carefully considered as each affected the other e.g. the purchasing plan was not compatible with the space available within the organisation.

**Figure 8.6: Stages of operational budget preparation**



Source: Chief of Fixed Assets Department interview.

Regarding the question *how do you describe the annual budgeting process at your company?*, is illustrated in table 8.19

**Table 8.19: Description of the budgeting process in the GOGCWS (N =50)**

Budgeting process	Managerial level			Total
	High	Medium	Low	
Top-down procedures.	8%	10%	10%	28%
Top management set parameters: organisation units prepare budgets: top management adjust/decide.	10%	6%	16%	32%
Bottom-up procedures.	2%	8%	22%	32%
Discussion and participation procedures.	---	2%	6%	8%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

This means the budget process at the GOGCWS had extremely hierarchical in its procedure.

Based on the analysis of the questionnaires and interviews, there was no substantial difference between rules (documentations) of the GOGCWS and the routines (practices)

related to budget preparation. All of them agreed that each administration determined their requirement and sent it to the budget administration.

The final point to highlight were the general principles for preparing the budget. From the documentation of the GOGCWS, questionnaires and the personal interviews, there were five points in the principles for preparing the budget as follows:

- (a) The budget relied on prediction of water based on the historical data of the GOGCWS such as the amount of production and sales of water
- (b) Comprehensive budget
- (c) Division of budget time-scale
- (d) Expression of the budget in financial terms
- (e) The budget was considered<sup>212</sup> as a tool of control

A brief discussion for each principle is given below:

**(a) The budget relied on prediction<sup>213</sup> of water.** The prediction was not guessed. It was dependant on rules and fundamentals such as scientific development, economic elements, the political actions, governmental actions, intentional actions, different legislators and the historical data of the organisation such as the amount of production and sales of water.

The study of prediction could be divided into three stages: the prediction for the immediate term such as the cash budget, the prediction for the short term such as the operation budget and the prediction for the long term such as the capital budget. For instance, the Chief of Commitment (Engagement) Department (Balance Sheet) stated "there are three factors which determine the capital budget (replacement and renewal<sup>214</sup>, completion<sup>215</sup>, new expansions<sup>216</sup>)".

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<sup>212</sup> By the Accounting Central Institution.

<sup>213</sup> Such as the prediction of sales, production, supply, etc.

<sup>214</sup> The replacement and renewal projects related to the existent/current stations.

<sup>215</sup> The completion projects related to the projects needing completion.

<sup>216</sup> The new expansions were those that should consider future financial needs.

**(b) Comprehensive budget.** The budget should contain several aspects such as: sales plan, production plan, investment plan and the finance plan. The Unified Accounting System ensured that the budget should have three aspects (budget in kind<sup>217</sup>, financial budget<sup>218</sup>, and cash budget<sup>219</sup>).

**(c) Division of budget's time.** The budget would be divided into periods (quarterly or monthly) in order to overcome the obstacles which can affect the organisation, such as changes in the economic environment that were not considered in the budget preparation. This required flexibility<sup>220</sup>, which allowed the evaluation of actual performance, enabled the discovery of variance before it increased and action to be taken to prevent future repetition of these obstacles.

In practice, the GOGCWS did not divide the budget into periods. This meant the GOGCWS did not take into consideration any changes that had occurred during the year. This meant there was a gap between the GOGCWS's rules and general principles for preparing the budget and its practical application.

**(d) Express the budget in financial terms.** The aim of this role was to co-ordinate between the sub-budgets as they had difficult measurement units, for instance: the raw material budget was expressed by quantities or weights and the staff budget could be expressed by hours of work. In order to arrive at the final budget form, all these budgets had to be calculated and presented financially.

**(e) The budget was considered a tool of control.** This principle relied on two rules: (1) linking budget estimations by the responsibilities centres (this meant distributing the budget's estimation to the responsible departments and administrations, to find their

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<sup>217</sup> The budget in kind contained the goods requirements, the service requirements and staff. It was called the budget in kind because it expressed by quantities before translating it to cash values.

<sup>218</sup> The financial budget translated the budget in kind to cash frame and it explained the financial plan of the organisation.

<sup>219</sup> The cash budget contained the expected cash payments and payments received during the period of the budget. It helped to study the financial structure of the organisation.

<sup>220</sup> The division of the budget's time helped, due to its flexibility, to review the estimation of the budget each period by less effort and less time in order to meet any changes that were not considered before.

weak and strong points, and then identifying the necessary corrective measures (2) Participation by the responsibility centres in preparing the budget. These two rules worked in practice and that was clear when one of the accountants in Participating Accounts Department stated "each administration determines their requirements and sends it to the responsible administration for preparing the budget and then the estimations of budget are prepared according to this basis".

The budget plan served two main aims (planning and control). There was no benefit from planning if it was not followed by control (The GOGCWS, no date source given, b: 22). Control should pass through three steps

(a) Comparison between actual and planning performance and determining the variances: This was achieved through the budget estimate record. It contained a column for the actual expenditure and a column for the estimated budget so that The Financial Ministry could determine the variance.

(b) Variance analysis: The variances were usually divided into two elements. The quantity element (the difference between the actual sales and the sales plan according to the planned price) and the valorem element (the difference between the planned price and the actual price according to the actual quantities).

(c) Taking actions<sup>221</sup> which were necessary to correct the variances.

The reasons for the variances were:

(a) The amount of activity did not suit the staff (quantity and skills)

(b) Random decrease of the required funds from The Financial Ministry without knowing the needs of the organisation

(c) The lack of standard to measure the efficiency of the use of resources (post estimation)

In conclusion, The GOGCWS was ruled by bureaucracy from both internal and external influences and there was no substantial difference between the rules (documentation) of the GOGCWS and the normative theory related to the role and preparation of the

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<sup>221</sup> After the variances were determined, analysed and responsibility confirmed, then managerial reports were prepared (including suggestions on how to correct the variances) and sent to the responsible levels in order to correct the variances.

budget. On the other hand, there was a gap between the normative theory and the practice of the GOGCWS related to the role of budgets.

The accounting system in the GOGCWS tended to focus wholly on financial accounting and its institutional setting and chose to neglect management accounting. Several studies informed by institutional theory show that the financial controls devised to discipline resource utilisation in public-sector organisations (for example, external financing limits) are little used further down the organisational hierarchy (e.g. Ansari and Euske, 1987; Pettersen, 1995) or assume the relatively symbolic role of legitimising the organisation to funding bodies (e.g. Brunsson, 1989; Czarniawska-Joerges and Jacobsson, 1989).

#### 8.7.4 Activity based costing

ABC was not used in the water industry in Egypt. Regarding the question asked of 37 interviewees in the General Organisation for Greater Cairo Water Supply *could you please tell me about the methods used in your company for measuring product cost?*, see table 8.20

**Table 8.20: Methods used for measuring product cost (N =37)**

73%	stated Full Absorption Costing
22%	stated Activity Based Costing
5%	stated that they did not know

Source: Analysis of interviews

The researcher also checked the validity of the answer of the interviewees by asking in the questionnaire *what is the product/service cost measurement practice in use at your company?*, see table 8.21

**Table 8.21: Methods used for measuring product cost (N =50)**

Methods of cost measurement	Managerial level			Total
	High	Medium	Low	
Full absorption costing model.	12%	18%	40%	<b>70%</b>
Activity-based costing	8%	8%	12%	<b>28%</b>
Others	---	---	2%	<b>2%</b>
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire.

This result raised the question of why 22% of interviewees and 28% of respondents answered activity based costing, when the method used in the GOGCWS for measuring product cost was the full absorption costing model (based on the analysis of the documentation of the GOGCWS). In order to answer this question, the researcher discovered that the 22% of interviewees who answered Activity Based Costing misunderstood what this was. The reason for this misunderstanding could have been the Unified Accounting System which the GOGCWS followed (see section 8.5). This divided production into production Centres (5), Productive Services Centres (6), Marketing Services Centres (7), and Administrative and Financial Services Centres (8). So, it could have been that the reason for these results was that respondents or interviewees thought that when they calculated the cost for each centre alone and then calculated all together, this was Activity Based Costing.

There was no empirical evidence of ABC use in the water company in Egypt. Research was concentrated on one case study however, all water organisations in Egypt are governed by the same law (see section 8.1).

#### 8.7.5 Activity based management

ABM is not used in the GOGCWS in Egypt. The researcher discovered this from the documentation of the GOGCWS and observations from the questionnaire, see table 8.22

**Table 8.22: Use of ABM in the GOGCWS (N =50)**

Planning and control process	Managerial level															Total %
	Use now %			Plan to use in the future %			Used in the past, but not now %			Not used or planned to use at all %			I do not know %			
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	
Activity Based Management	2	---	2	6	2	---	---	---	---	10	2	2	2	22	50	100

Source: Analysis of questionnaire, H =High level, M =Medium level, L =Low level.

This answer was expected because the GOGCWS followed the full absorption cost model. Furthermore, activity based management is extension of activity based costing (see section 4.4) and the result of analysis of the above point (activity based costing)

concluded that there was no empirical evidence of ABC in the GOGCWS. So, the researcher suspected that ABM was not used in the GOGCWS.

### 8.7.6 Strategic Management Accounting (SMA)

Planning and decision-making are a reasonable basis in a stable or semi-stable environment but are more difficult in a dynamic environment. The present environment in Egypt was characterised by dynamic political, economic, social and legal elements. Egypt was transferring from the central national system to the economic market and it was necessary that the organisation should be proficient both managerially and economically. The lack of opposition to these changes and new indicators leads to high risks such as: losing control of the direction of the organisation; the loss of GOGCWS's leadership position because it was considered the biggest water organisation in the developing countries<sup>222</sup>; re-organisation of the organisation by other external influences or making management alternations to achieve change (The GOGCWS, 1996: 7).

Regarding the question *how do you describe the strategy of your company?*, see table 8.23

**Table 8.23: Description of the GOGCWS's strategy**

Description of the GOGCWS's strategy	Managerial level			Total
	High	Medium	Low	
As a unitary organisation.	8%	14%	18%	40%
As a multidivisional organisation.	12%	8%	34%	54%
Others.	---	4%	2%	6%
<b>Total</b>	<b>20%</b>	<b>26%</b>	<b>54%</b>	<b>100%</b>

Source: Analysis of questionnaire

Perhaps the reason for these different answers is that the chief of the fixed asset department and the chief of the cost department said "the GOGCWS has one strategy and this strategy is divided into sub-strategies for each department". Furthermore, Loft (1991) argued that large companies' strategies were trying to dominate the market by driving competitors out (this was not the case for the GOGCWS) or lead to monopoly

<sup>222</sup> Egypt was one of the developing countries. The term "developing countries" has been used not to suggest that such countries can or should be seen as a homogeneous whole, but simply to broadly describe countries which were characterised by relatively low levels of per capita income, possess limited industrialisation and exhibit a constrained infrastructure (Vullimary et al., 1990).

and in turn to bureaucracy and wastefulness. The GOGCWS had a bureaucratic system (see section 8.3)

The strategic planning in the GOGCWS had a process which could be illustrated as follows:

- (a) Planning: the approval<sup>223</sup> of the strategic planning process of the GOGCWS
- (b) Clarifying the formal and informal responsibilities issued for GOGCWS
- (c) Clarifying the mission of GOGCWS and the value's owner benefit
- (d) Evaluating the external environment (power and directions, owners' benefit, competition and co-operating)
- (e) Evaluating the internal environment (resources, performance, and present strategy)
- (f) Determining the strategic subjects which face the organisation such as service level, costs, finance, and management
- (g) Formulating the required strategy to manage all main subjects such as: determining the scientific alternative, obstacles in achieving these alternatives, the main suggestion to overcome these obstacles, planning work for the suggestions and working out a program for the plan
- (h) Setting effective organising strategy for the future

There were different levels for strategic planning such as; high command, medium and executive command.

So far, this analysis has shown that there was no change in cost management model of the GOGCWS. The following sub-section provides evidence of resistance to change of cost management model within the GOGCWS. This resistance to change has been created by the external institutional pressures (the Egyptian government policy).

#### **8.7.7 The Consultants**

Black and Veatch International and its associated sub-contractors carried out a Management, and a Training and Systems Strengthening (MTSS) project under the Institutional Development Component, Cairo Water II. The project covered the period

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<sup>223</sup> There are several institutions which were involved in the approval of the strategic planning process of the GOGCWS such as; Cairo governorate, Finance Ministry (treasury department), Ministry of planning, The Accounting Central Institution, etc.

25 January 1993 through to 31 December 1997. The project was funded by USAID<sup>224</sup>. The aim of the Cairo Water Supply II (the Institutional Development Component), was to provide an organisational and technical support system to the authority. After a project start-up workshop in May 1993, the project was re-focused to prioritise managerial autonomy and financial viability.

The project concluded with several recommendations. Perhaps the most appropriate to this research are as follows: (a) cost would be recovered by a fair, economic price for water, (taking into accounts social concerns and realities) (b) The organisational structure for delivering these economic, high quality services would be decentralised, performance-based and committed to excellence. This value-oriented vision, strategically aligned the GOGCWS with the Egyptian Government's private-sector-led economic development framework. This would enable the utility to direct the water sector away from one funded exclusively by private sector participation.

The consultants (Black and Veatch International) therefore suggested a public ownership of the source of water and private ownership for its distribution. They challenged the cost system of the GOGCWS and offered an alternative mode of cost management for the water industry. This alternative of cost management was based on re-organisation structure of the GOGCWS (see figures A 1.5, A 1.5.1 and A1.5.2).

What happened to all these recommendations? It was found that they were not put into practice. Why? It may be that it was against government policy for the management of the GOGCWS (For more explanation of the above, see section 11.2.4, which focus on the lack of change at the GOGCWS). Recommendations of the consultants (Black and Veatch International) were withheld by the chief-of-legal-affairs of the organisation.

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<sup>224</sup> The U.S. Agency for International Development (USAID) is an independent government agency that controls foreign assistance and humanitarian aid in order to advance the political and economic interests of the United States. Since 1975, the United States has given over \$2.8 billion to urban water and wastewater infrastructure projects. The United States has co-operated with the Egyptian government in programmes to expand water and wastewater infrastructures, to improve the delivery of services, and to ensure that adequate policies are in place to support further development in this area. USAID is currently implementing a water and sanitation programme which is valued at approximately \$1 billion in eleven cities. This funding is for the construction of major new water and wastewater treatment, and conveyance facilities. Water and wastewater activities are implemented in close co-operation with several Egyptian agencies, (including nine economic utility organisations, the Ministry of Housing, Public Utilities, and New Communities).

## 8.8 Conclusion

From the analysis presented so far, it could be argued that GOGCWS contains features of an institutional political perspective discussed earlier in chapter 2. These were as follows: Firstly, it was preoccupied with formal structures and legal systems (see sections 8.1 and 8.2). Secondly, the approach emphasised detailed accounts of particular political systems, resulting in "configurative description", or, in other words, interactive, descriptive accounts of inter linked rules, rights, and procedures (see section 8.3). Thirdly, the approach was conservative in the sense that it emphasised the "permanent and unchanging" (see section 8.6.2). Finally, the work was largely non-theoretical, (i.e. more attention was given to historical re-constructions of specific institutional forms, see section 8.7.3).

This chapter has revealed the complexity of the environment of the Egyptian water industry and the GOGCWS in particular (see section 8.2). In addition, Diab (1999) argued that there are many deficiencies in Egyptian water utilities that can be traced to institutional issues and constraints, largely due to a cumbersome, hierarchical organisation without regulatory oversight. This lack of local autonomy prevents effective and efficient operation of the water or wastewater system (The GOGCWS, no date source given, a: 44). This chapter has highlighted the changes of the economic forms and legal structure of the GOGCWS (see section 8.2.1). From the neo-institutional economic theory perspective, the chapter points out that the GOGCWS has hierarchical structure (see section 8.3). Furthermore, it has illustrated that the GOGCWS is highly controlled (see section 8.4).

This chapter points up the limitation of the aims of the cost accounting system in the GOGCWS (see section 8.6). Moreover, it has highlighted the use of cost information in general and the use of cost information for decision-making in particular, which concluded that cost information has a very limited role in decision-making. The chapter has also illustrated the cost method used in the GOGCWS (full absorption costing) and stressed that the method of cost accounting in the GOGCWS is similar to traditional management accounting not contemporary management accounting (see section 8.7).

The chapter showed that the GOGCWS followed the traditional view which was that costs were best controlled by the department responsible for minimising the variance

between budgeted and actual cost by cost element. The chapter has also suggested alternative modes to cost management to those suggested by consultants, Black and Veatch International, who suggested a public ownership of the source of water, and private ownership for its distribution, but this was not put into practice at the GOGCWS. From the neo-institutional economic theory perspective, the Black and Veatch International recommended that the GOGCWS should move from a hierarchical structure to adopt a hybrid approach.

In conclusion, the GOGCWS lead to monopoly and in turn to bureaucracy and waste. The researcher concludes that the GOGCWS did not have strategic cost management or an economic optimisation cost management policy but might have accounting and control cost management policy. Institutional theorists have tended to view the emergence of organisational control practices as a process of relatively passive adaptation (DiMaggio, 1988; Powell, 1991; Scott, 1995; Czarniawska and Sevón, 1996). More recent research<sup>225</sup> shows that organisations may, under certain circumstances, pro-actively influence their relations to different constituencies.

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<sup>225</sup> Abernethy and Chua (1996) found that the scope for managerial choices and which controls to implement can be significant even where certain constituencies exercise considerable power.

#### 9.0 Introduction

Figure 5.1 had shown the importance of external environment for cost management. This chapter is going to explore the question "Was there a relationship between cost management<sup>226</sup> and P (CI)<sup>227</sup> and P (Un)<sup>228</sup> which relates to the three areas of the external environment (product market, factor market and legislation)? As illustrated in figure 9.1, the first three elements (efficiency, optimisation and strategy) were seen to derive from the interplay of forces in the external environment.

Identifying the factors that drive costs is central to effective cost management (Porter, 1985; Shank, 1989; Shank and Govindarajan, 1992; 1993). "Understanding cost behaviour means understanding the complex interplay of "Cost drivers" at work in any given situation" (Shank and Govindarajan, 1992: 29). 'Cost drivers' research to model cost variability has sparked off an emergence of research literature into the relationships between overhead costs and their hypothesised underlying causes. Several factors are identified, (e.g. complexity and efficiency, Foster and Gupta, 1990); capacity, product and process variables, (Banker and Johnson, 1993; Data et al., 1993); and product mix heterogeneity (Anderson, 1995). Rouse and Putterill (2000) argue that while the above factors are relevant, this list of cost drivers is incomplete. In particular, environmental factors<sup>229</sup> are component explanations of cost variability. They argue that not only has cost management research paid little attention to the impact on costs by environmental factors, it has also been slow to recognise and incorporate theories which underpin other disciplines.

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<sup>226</sup> The objectives of cost management are efficiency (see section 4.1), optimisation (see section 4.4) and strategy (see section 5.2).

<sup>227</sup> P (CI) refers to the perception of competitive intensity, (i.e. the general level of market conditions which make profitability difficult).

<sup>228</sup> P (Un) refers to the perception of unpredictability, (The overall degree of variability from period to period, which make forecasting and planning difficult).

<sup>229</sup> Environmental factors have been incorporated into analyses in research literature (Jesson, et al., 1987; Cook, et al., 1994; Lovell, et al., 1994).

**Figure 9.1: The relationship between cost management and the external environment**

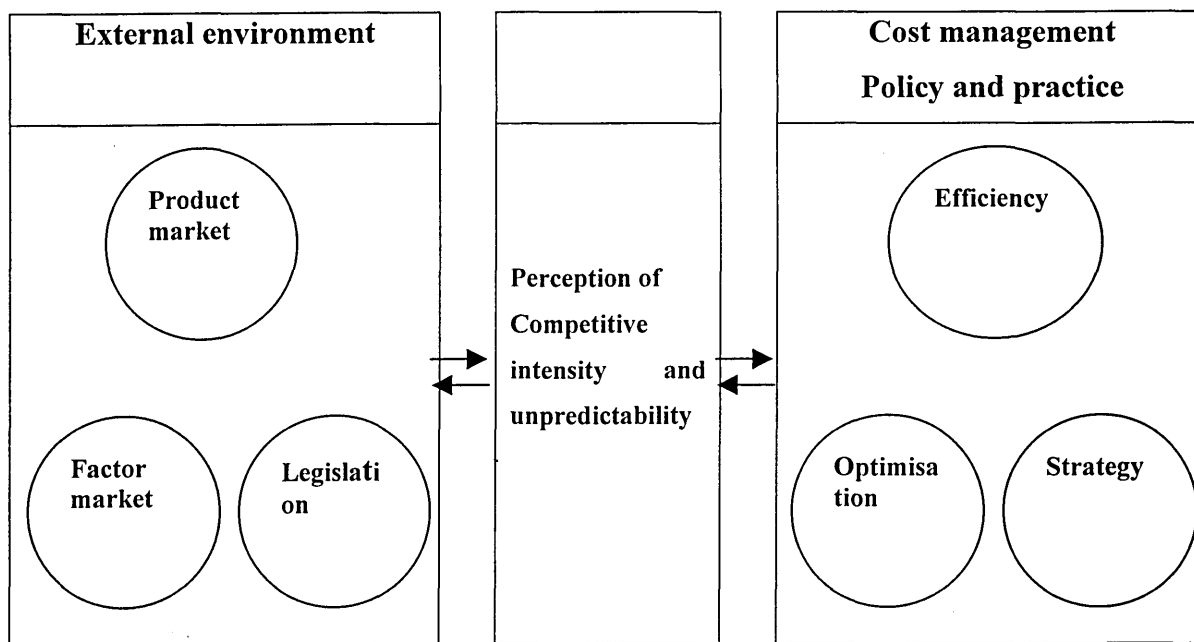


Figure 9.1 builds on Institutional theory (a theory which views organisations as operating within a social framework of norms, values, and assumptions about what constitutes 'appropriate' economic behaviour, Oliver, 1997). According to Pfeffer and Salancik (1978: 3) "a good deal of organisational behaviour can be understood by knowing something about the organisation's environment<sup>230</sup> and the problems it faces for obtaining resources. What happens in an organisation, is not only a function of its internal structure, leadership, procedures, or goals. It is also a consequence of the environment, and the particular contingencies and constraints from that environment".

Powell and DiMaggio (1991: 13) argue that it is important not to see the environment as separate from the company and its organisational processes. The environment can penetrate the organisation, creating ways in which actors view the world and make sense of their organisational activity. The environment creates categories through which organisational activity is constructed. Institutional theory according to Scott (1995) is a

<sup>230</sup> This research argues that the environment of the GOGCWS could explain three main factors: product market, factor market and legislation.

continuation and extension of the intellectual revolution that introduced open systems<sup>231</sup> into the study of organisations.

Scott (1987a) identifies the diversity of institutional sources, (i.e. regulatory structures, governmental requirements, laws, ideologies, educational systems and professions). Hence, the institutional environment is of “a complex and multiple character” (DiMaggio and Powell, 1983; Meyer and Scott, 1983a). Oliver (1991) argues that in dealing with institutions, organisations may use a variety of strategies. These may range from passive conformity, compromise and avoidance, to defiance and proactive manipulation. In other words, organisations invariably conform to their institutional environment. Organisations respond in a variety of ways to the normative, regulatory structure, depending on the situation and its possible consequences (Bergevarn, et al., 1995)

Scott and Meyer (1991: 117) propose the idea of “societal sectors”, to describe the way in which organisational environments are specific and variable, rather than general and uniform. Scott and Meyer (1991) claim that the technical and institutional perspectives are independent dimensions, rather than polarised extremes. Some organisations are subject to both kinds of pressures. Scott and Meyer cite public utilities as an example.

Carruthers (1995) notes that the distinction between the technical and the institutional perspective is frequently overdrawn. He claims that non-profit organisations (such as the GOGCWS and other less competitive environments), have sufficient ‘slack’ to allow institutional effects to come into play. Similarly, Powell (1991: 185, 188) contends that institutional effects are visible even in technical environments, and it can be difficult to separate the two.

Neo-institutionalists would prefer to keep the technical and institutional perspectives as analytically separate dimensions, but the two are often confused. For instance, institutional processes are routinely disguised as technical ones. De-coupling plays an important role in this process. Its institutionally prescribed appearance (via a formal structure), does not compromise actual operations. Researchers such as Brignall and

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<sup>231</sup> Open systems theory modified existing approaches by focusing on the wider environment as it constrains, shapes and penetrates the organisation (Scott, 1992).

Modell, 2000; Abernethy and Chua, 1996; Pettersen, 1995; Ansari and Euske, 1987; Covaleski and Dirsmith, 1983, all argue that a way of dealing with conflicting institutional pressures in public sector organisations, is to de-couple<sup>232</sup> the control systems used at different levels of the organisation.

Cost drivers have been categorised by Shank and Govindarajan (1993) into: (a) structural (scale, scope, technology and complexity) and (b) executional (workforce involvement, plant layout, product configuration and capacity utilisation). Rouse and Putterill (2000) classified cost drivers into: (a) policy environment<sup>233</sup> (b) physical environment<sup>234</sup> and (c) market environment. This classification of cost drivers includes three areas of the external environment - (the product market, the factor market and legislation). The factor market includes raw materials and supply, labour, management, capital and financing, and technology).

In order to understand the complex processes of the Egyptian Water Industry, it was necessary to focus on micro-processes. However, it was impossible to ignore the broader (macro-institutional) dimension. To understand micro-processes it was necessary to recognise the institutional context both within the organisation itself, (i.e. the organisation's rules, routines and institutions) and outside, (i.e. the broader social, economic and political institutions of the organisational field and the society in which the organisation operates) (Burns and Scapens, 2000). This chapter has focused on the micro level (use of cost information at the GOGCW) and the macro level P (CI) and P (Un). These are related to three areas of the external environment: (product market, factor market and legislation).

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<sup>232</sup> De-coupling can be identified as a process of breaking down the structural elements of different parts of the organisation in response to institutional pressures, (in order to comply with prescribed norms, Meyer and Rowan, 1977; Brignall and Modell, 2000).

<sup>233</sup> This includes factors, highlighted by Shank and Govindarajan (1993). Rouse and Putterill (2000) argue that these cost drivers relate closely to the fixed factors or constraints faced by an organisation. Changes to these drivers were not usually a short-run operation arising as they do from internal choices affecting organisational structure and process (p. 369).

<sup>234</sup> The Physical environment, in which the organisation operates, has an "external flavour" and provides difficult challenges for management to improve performance.

This chapter is divided into seven sections. Section one describes how the data was presented and highlights the variables which measure cost management (efficiency, optimisation and strategy). Cost management is seen in relation to CI and Un that is related to the product market, factor market and legislation. Section two gives a descriptive analysis of the data. Section three examines the reliability and validity of the data, by using alpha coefficient and factor analysis. Section four examines the restructured data. Section five addresses the question "Was there a relationship between cost management and P (CI) and P (Un) which relates to the three areas of the external environment (product market, factor market and legislation).

Section six offers a brief discussion of the results. The final section outlines the main conclusions of the chapter.

## 9.1 Data

On the use of cost information, Al-Hazami (1995) identified the three objectives of cost management: efficiency, optimisation and strategy. Cost management practices were measured by using forty-seven items (questions<sup>235</sup>). Fifteen items measured the use of cost information for system maintenance and efficiency. Eighteen items measured the use of cost information for system optimisation. Fourteen items measured the use of cost information for system strategy. A Likert scale<sup>236</sup> was utilised, (ranging from 1 = extremely important to 5 = not important).

The perception of 'intensive competition' and 'unpredictability' relate to the three areas of the external environment<sup>237</sup> (product market, factor market and legislation). The GOGCWS perception of the external environment for (CI) and (Un) were measured using eighty-six items, (forty-three items for P (CI) and forty-three items for P (Un)). Fourteen items measured the product market (seven for P (CI) and seven for P (Un)). Sixty-four items measured the factor market (thirty-two for P (CI) and thirty-two for P (Un)). The factor market is divided into five sub-sectors: raw materials and supply (seven items for P (CI) and seven items for P (Un)). Labour (seven items for P (CI) and

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<sup>235</sup> See section A2.1 (Question 8 in section 3.4).

<sup>236</sup> The range of Likert scale was 1 = extremely important 2 = very important 3 = important 4 = not so important 5 = Not important and 6 = I do not know.

<sup>237</sup> See section A2.1 (Question 1 - the company environment).

seven items for P (Un)). Management (four items for P (CI) and four items for P (Un)). Capital and financing (four items for p (CI) and four items for P (Un)). Technology (ten items for P (CI) and ten items for P (Un)). Eight items measured legislation (four items for P (CI) and four for P (Un)). Respondents were asked to assess various sectors of the company's environment, on the dimensions of P (CI) and P (Un) by using a Likert scale<sup>238</sup>.

There were two questions<sup>239</sup> relating to the GOGCWS environment. In one question respondents were asked to prioritise the significance of environmental sectors (product market, factor market or legislation) by percentage. The second question asked respondents to rank the sub-sectors of the factor market, (including raw materials and supply, labour, management, capital and financing, and technology).

This chapter has focused on the perceptions of the GOGCWS managers. The sample study included all managerial levels. Functional levels were also included in the sample, (i.e. financial, technical and distribution).

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<sup>238</sup> For competitive intensity, the Likert scale ranged from 1 = low to 5 = high. For Unpredictability, the Likert scale was 1 = very predictable 2 = predictable 3 = average 4 = unpredictable and 5 = very unpredictability 6 = I do not know.

<sup>239</sup> See section A2.1 (Questions 2 and 3 - the company environment).

## 9.2 Data analysis one

### 9.2.1 Cost information

#### 9.2.1.1 Use of cost information for efficiency

On the use of cost information for system efficiency, see table 9.1

**Table 9.1: Descriptive analysis of the use of cost information for system efficiency (N =50)**

Cost information role	Significance of cost information use at company					
	Extremely important	Very important	Important	Not so important	Not important	I do not know
To comply with procedures of reporting	16%	40%	38%	4%	---	2%
Basis for audit	12%	38%	34%	2%	10%	4%
Planning of period costs (budgeting)	28%	48%	16%	2%	4%	2%
Management and control of period costs	26%	34%	20%	14%	6%	---
Role of standard costing in assessing performance	10%	40%	18%	14%	18%	---
Identification of corrective measures	14%	20%	26%	20%	20%	---

Source: Analysis of questionnaire

The researcher observed that this result emerged as ‘normative’ perspective (Bjornenak and Olson, 1999: 332). The normative view is related to traditional (technical) management accounting, not contemporary management accounting. For example, in standard costing or budgeting, the normative perspective is invariably based on ex post benchmarks, *not* on forward-looking market prices. The normative pressure is therefore based on historical observations and data, *not* expectations for future forward planning.

Brignall and Modell (2000) argue that an institutional and political process is associated with budgeting (Wildavsky, 1975; Jonsson, 1982; Covaleski and Dirsmith, 1983; 1986). These researchers focus on the bargaining process inherent in public sector budgeting. They differentiate between ‘advocates’ (e.g. lower-level managers, or representatives of certain professional groups), and ‘guardians’ (e.g. senior level staff, and politically-elected officials representing funding-bodies).

Regarding the use of cost information for system efficiency, see table 9.1a

**Table 9.1a: Descriptive analysis of the use of cost information for system efficiency  
(N =50)**

Cost information role	Significance of cost information use at company					
	Extremely important	Very important	Important	Not so important	Not important	I do not know
To achieve targets of production	4%	8%	6%	20%	60%	2%
To achieve large profits	4%	10%	2%	14%	70%	---
To achieve certain financial measurements	10%	6%	6%	22%	52%	4%

Source: Analysis of questionnaire

This result found that the economic perspective does *not* play an important role in shaping the policy of the GOGCWS. However, the political and social element *does* play an important role in shaping the GOGCWS policy.

For a summary of the significance of cost information for system efficiency (at the GOGCWS), see table 9.1b

**Table 9.1b: Reported significance of cost information for system efficiency used at the GOGCWS (N =50)**

<b>Cost information role</b>	<b>Overall mean<sup>240</sup> score<sup>241</sup></b>
Planning of period costs (budgeting)	2.1
Compliance with procedures of reporting	2.4
Management and control of period costs	2.4
Basis for audit	2.7
Role of standard cost in assessing performance	2.9
Identification of necessary corrective measures	3.1
Perceived importance for meeting budgets	3.3
Inventory Evaluation	3.4
To provide a means of communication	3.5
Measuring efficiency of production performance	3.6
To enhance cost reduction programs	3.6
Performance evaluation of management	3.8
To achieve certain financial measurement	4.1
To achieve target of production	4.3
To achieve a large profit	4.4

Source: Analysis of questionnaire

<sup>240</sup> One of the most important ways of summarising a distribution of values for a variable, is to establish its central tendency - (the typical value in a distribution). Where do values in a distribution tend to concentrate? Statisticians are referring to a number of different measures when they talk about averages (such as mean, median, mode, Bryman and Cramer, 1990: 82).

Gould (1991), (a palaeontologist who is well known for his popular writings on science), illustrates the first two of these measures of average when he writes: "A politician in power might say with pride, "The mean income of our citizens is \$15000 per year". The leader of the opposition might retort, "But half our citizens make less than \$10000 per year". Both are right, but neither cites a statistic impassive objectivity. The first invokes a mean, the second a median" (1991: 473).

The Mean is the value closest to all the other values. In order to calculate the mean: Total all the cases divided by the number of cases. Residual from the mean: the difference between each case in a distribution and the mean: if this value is positive, the value is above the mean; if it is negative, it is below the mean (Bryman and Cramer, 1999).

<sup>241</sup> The range of the Likert scale was 1 = extremely important 2 = very important 3 = important 4 = not so important 5 = not important.

### 9.2.1.2 Use of cost information for system optimisation

On the use of cost information for system optimisation, see table 9.2.

**Table 9.2: Descriptive analysis of the use of cost information for system optimisation (N =50)**

Cost information role	Significance of cost information use at company					
	Extremely important	Very important	Important	Not so important	Not important	I do not know
Planned and actual product costs	46%	34%	10%	6%	2%	2%
Importance of a flexible budget for manufacturing cost control	6%	30%	40%	8%	12%	4%
Variance analysis and exception reporting	34%	24%	18%	14%	6%	4%
To stimulate control of conversion cost	26%	38%	14%	4%	14%	4%
Importance of marketing cost analysis	14%	16%	32%	8%	28%	2%

Source: Analysis of questionnaire

From the perspective theory, respondents saw management accounting from a hierarchical view (institutional hierarchy) (see section 5.2.2). Management accounting was seen as an instrument for calculation, implementation, and control that belonged to the tactical and administrative level. Management accounting was only one out of several functional disciplines within the organisation (Ansoff, 1965 and Anthony, 1965).

**Table 9.2a: Descriptive analysis of the use of cost information for system optimisation (N =50)**

Cost information role	Significance of cost information use at company					
	Extremely important	Very important	Important	Not so important	Not important	I do not know
To maintain certain profit margins	6%	2%	4%	10%	74%	4%
Product mix decision	4%	8%	8%	22%	58%	---
Development of better manufacturing methods	6%	8%	6%	20%	60%	---
Importance of product cost as an input to pricing decision	12%	4%	---	12%	70%	2%
Transfer prices for internal services	2%	2%	8%	14%	68%	6%
To enhance equipment productivity	6%	8%	24%	24%	36%	2%
To motivate people to do better	2%	10%	8%	16%	56%	8%
To emphasis throughput rate	10%	10%	2%	28%	46%	4%
Measuring of efficiency and capacity utilisation	4%	16%	10%	26%	40%	4%
To determine economic production	6%	8%	10%	26%	42%	8%
Make or buy decisions	6%	10%	22%	26%	36%	---
Personal development and workforce improvement	2%	16%	12%	10%	60%	---

Source: Analysis of questionnaire

The initial analysis shows that management accounting in the GOGCWS had no new techniques<sup>242</sup>. The GOGCWS followed a 'traditional' management accounting system, not contemporary management accounting. It was clear that the social or political element was more important than the economic element, (if cost information was unimportant to determine economic production or enhance productivity). Analysis from the interviews showed that most interviewees recommended that the price of water be determined 'outside' of the GOGCWS itself.

<sup>242</sup> The new techniques in this thesis, were based on their importance in current management accounting literature (e.g. activity-based costing, activity-based management, target costing, strategic management accounting, transfer prices).

For a summary of the significance of cost information for system optimisation used at the GOGCWS, see table 9.2b below:

**Table 9.2b: Reported significance of cost information for system optimisation used at the GOGCWS (N =50)**

<b>Cost information role</b>	<b>Overall mean score<sup>243</sup></b>
Planned and actual product cost	1.9
Variance analysis and exception reporting	2.5
To stimulate control of conversion cost	2.5
Importance of flexible budget for manufacturing cost control	3
Importance of marketing cost analysis	3.3
Motivating efficiency improvement	3.7
To enhance equipment productivity	3.8
Make or buy decisions	3.8
Measuring of efficiency and capacity utilisation	3.9
To emphasise throughput rate	4
To determine the economic production amount	4.1
Personal development and workforce improvement	4.1
Product mix decisions	4.2
Development of better manufacturing methods	4.2
Importance of product cost as an input to pricing decision	4.3
To motivate people to do better	4.4
To maintain certain profit margins	4.6
Transfer prices for internal services	4.6

Source: Analysis of questionnaire

<sup>243</sup> The range of Likert scale was 1 = extremely important 2 = very important 3 = important 4 = not so important 5 = not important.

### 9.2.1.3 Use of cost information for system strategy

Regarding the use of cost information for system strategy, see table 9.3

**Table 9.3: Descriptive analysis of the use of cost information for system strategy (N=50)**

Cost information role	Significance of cost information use at company					
	Extremely important	Very important	Important	Not so important	Not important	I do not know
To forecast the future	14%	34%	28%	6%	14%	4%
Evaluation of investment projects	10%	30%	20%	18%	20%	2%
Improvement of product characteristics	6%	10%	4%	22%	58%	---
Planned and actual customer	2%	10%	4%	8%	76%	---
Importance of competitor cost analysis	---	4%	2%	2%	92%	---
Market share analysis	4%	6%	---	6%	84%	---
New product development	2%	---	---	6%	92%	---
Market development	6%	2%	2%	4%	86%	---
Importance of product configuration	---	6%	---	4%	90%	---
New product development	2%	---	---	6%	92%	---
Decisions of company strategy	6%	16%	14%	26%	38%	---
Product quality analysis	8%	8%	6%	30%	48%	---
Importance of product configuration	6%	---	---	4%	90%	---

Source: Analysis of questionnaire

The result showed that cost information had no role or a very limited role in shaping the strategy of the GOGCWS. This meant cost management in the GOGCWS was clearly absent. Comparing this result with the rules (documentation) of the GOGCWS (mentioned in section 8.7.6), it showed that the role of accounting was extremely important in supporting the development of strategy. The researcher concluded that there was a 'gap' between the theory and practice of cost management in the GOGCWS.

If cost information was not important for deciding the strategy and competitor cost analysis<sup>244</sup> of the GOGCWS, what factor *did* affect the shaping of strategy policy of the GOGCWS? The researcher observed that political and social elements had more effect than the economic element (see section 10.1.1).

For a summary of the significance of cost information use for system strategy at the GOGCWS, see table 9.3a below:

**Table 9.3a: Reported significance of cost information for system strategy used at the GOGCWS (N =50)**

Cost information role	Overall mean score <sup>245</sup>
To forecast the future	2.8
Evaluation of investment projects	3.1
Decisions of company strategy	3.7
Product quality analysis	4
Importance of technology configuration	4
Improvement of product characteristics	4.2
Planned and actual customer profitability	4.5
Market growth analysis	4.5
Market development	4.6
Importance of product improvement	4.6
Market share analysis	4.7
Importance of competitor cost analysis	4.8
Importance of product configuration	4.8
New product development	4.9

Source: Analysis of questionnaire

The result showed that cost management had a very limited role in strategy at the GOGCWS. This may have resulted from the policy of managing the water in the GOGCWS (for the public sector, see section 7.2.4).

<sup>244</sup> Because Control of the Egyptian water industry was under a monopoly.

<sup>245</sup> The range of the Likert scale was 1 = extremely important 2 = very important 3 = important 4 = not so important 5 = not important.

### 9.2.2 Company environment

As mentioned in section 9.1, this research concentrated on managers perceptions of competitive intensity and unpredictability (related to three areas of the external environment: product market, factor market and legislation, Al-Hazami, 1995). This research adopted institutional theory (as opposed to contingency theory, see section 2.1). However, it is necessary to examine the core idea of each of them. Institutional theory suggests that organisations gain legitimacy by conforming to external expectations of cost management practice, whilst separating their internal activities from externally-focused symbolic systems. Conversely, contingency theory suggests that organisational practices are driven by both the task environment, and the technical nature of the work. The closer the "fit" between technical features of the environment and cost management practice, leads to an increase in efficiency and effectiveness.

#### 9.2.2.1 Product market

Managers' perception of competitive intensity (CI) and unpredictability (Un) of product market was measured by using 14 items (7 for P (CI) and 7 for P (Un)). Regarding the P (CI) of product market in the GOGCWS, see table 9.4

**Table 9.4: P (CI) of the product market in the GOGCWS (N =50)**

Market Conditions		Competitive Intensity							
			1	2	3	4	5		I do not know
1	Market Change (sales)	Declining	8%	2%	32%	48%	8%	Expanding market	2%
2	Competition intensity	Low	100%	---	---	---		High	---
3	Customer variety	One major customer	2%	4%	6%	26%	62%	Large variety	---
4	Profit margins	Narrow	82%	6%	6%	4%	2%	High	---
5	Product innovation	Well established	38%	18%	10%	18%	16%	Always new products	---
6	Nature of competition	Well established competitors	98%	2%	---	---	---	Always new competitors	---
7	Price of products	Stable	28%	30%	16%	14%	12%	Fluctuate prices.	---

Source: Analysis of questionnaire

Concerning the P (Un) of product market in the GOGCWS, see table 9.4a

**Table 9.4a: P (Un) of the product market in the GOGCWS (N =50)**

Market Conditions		Unpredictability					
		Very predictable	Predictable	Average	Unpredictable	Very Unpredictable	I do not know
1	Market Change (sales)	48%	34%	12%	4%	---	2%
2	Competition intensity	96%	4%	---	---	---	---
3	Customer variety	80%	20%	---	---	---	---
4	Profit margins	92%	6%	2%	---	---	---
5	Product innovation	52%	34%	10%	4%	---	---
6	Nature of competition	96%	4%	---	---	---	---
7	Prices of product	78%	18%	4%	---	---	---

Source: Analysis of questionnaire.

#### 9.2.2.2 Factor market

The perception of (CI) and (Un) of Factor market was measured by using 64 items (32 for P (CI) and 32 for P (Un)) (as illustrated in table 9.5). The factor market was divided into five sub-sectors.

**Table 9.5: Measure of factor market**

Sub-sectors of factor market	P (CI) measured by	P (Un) measured by
Raw materials and supply	7 items	7 items
Labour	7 items	7 items
Management	4 items	4 items
Capital and financing	4 items	4 items
Technology	10 items	10 items

A brief descriptive analysis of each sub-sector is given in turn.

### 9.2.2.2.1 Raw material and supply

Regarding the P (CI) of raw materials and supply, see table 9.6

**Table 9.6: P (CI) of raw materials and supply in the GOGCWS (N =50)**

Market Conditions		Competitive Intensity							
			1	2	3	4	5		I do not know
1	Supply	Shortage of supply	---	2%	8%	22%	68%	Over supply	---
2	Source of supply	One major source	10%	8%	8%	40%	30%	Plenty of sources	4%
3	Competition between suppliers	No competition	18%	6%	32%	20%	22%	Intensive competition	2%
4	Cost of raw material	Low	2%	2%	16%	52%	20%	High	8%
5	Delivery time	Short	40%	18%	14%	4%	2%	Long	22%
6	Nature of suppliers	Well established	30%	38%	6%	12%	10%	Always new suppliers	4%
7	Prices of raw material	Stable prices	4%	6%	14%	50%	24%	Fluctuate prices	2%

Source: Analysis of questionnaire

Regarding the P (Un) of raw materials and supply, see table 9.6a

**Table 9.6a: P (Un) of raw materials and supply in the GOGCWS (N =50)**

Market Conditions		Unpredictability					
		Very predictable	Predictable	Average	Unpredictable	Very Unpredictable	I do not know
1	Supply	74%	22%	4%	---	---	---
2	Source of supply	56%	32%	8%	---	---	4%
3	Competition between suppliers	52%	30%	10%	6%	---	2%
4	Cost of raw material	38%	34%	16%	4%	---	8%
5	Delivery time	44%	24%	8%	2%	---	22%
6	Nature of supplier	56%	28%	8%	2%	---	6%
7	Prices or raw material	62%	26%	8%	2%	---	2%

Source: Analysis of questionnaire

The reason for the above result could have been because water in Egypt was under monopoly control, which prevented competition and achieved predictability for raw materials and supply.

#### 9.2.2.2.2 Labour

For the P (CI) related to labour, the result was as shown in table 9.7

**Table 9.7: P (CI) of the labour in the GOGCWS (N =50)**

Market Conditions		Competitive Intensity							
			1	2	3	4	5		I do not know
1	Availability of skilled labour	Shortage	24%	14%	10%	24%	28%	Stable	---
2	Competing employers	Few	72%	16%	8%	---	4%	Many	---
3	Wage rates	Low	6%	8%	74%	12%	---	High	---
4	Trade union	Not militant	28%	10%	24%	28%	10%	Militant	---
5	Labour turnover	Low	74%	16%	8%	2%	---	High	---
6	Labour dependency	Low	4%	8%	2%	12%	74%	High	---
7	Industrial relation	Poor	4%	4%	36%	22%	28%	Good	6%

Source: Analysis of questionnaire

For the result of P (Un) related to labour, see table 9.7a

**Table 9.7a: P (Un) of the labour in the GOGCWS (N =50)**

Market Conditions		Unpredictability					
		Very predictable	Predictable	Average	Unpredictable	Very Unpredictable	I do not know
1	Availability of skilled labour	64%	28%	8%	---	---	---
2	Competing employers	72%	22%	4%	2%	---	---
3	Wage rates	72%	26%	2%	---	---	---
4	Trade unions	46%	50%	4%	---	---	---
5	Labour turnover	68%	26%	6%	---	---	---
6	Labour dependency	80%	16%	2%	2%	---	---
7	Industrial relations	62%	24%	8%	---	---	6%

Source: Analysis of questionnaire

It was observed that the way of managing labour in the GOGCWS created obstacles for efficiency, optimisation or strategy because every worker knew that they would get their salary at the end of each month, and therefore would not change their job.

#### 9.2.2.2.3 Management

Regarding the P (CI) related to management, see table 9.8

**Table 9.8: P (CI) of the management in the GOGCWS (N =50)**

Market Conditions		Competitive Intensity							I do not know
			1	2	3	4	5		
1	Availability of qualified managers	Shortage	48%	14%	16%	10%	12%	Stable	---
2	Salary of management	Low	48%	26%	26%	---	---	High	---
3	Competition for good managers	Low	48%	6%	12%	8%	26%	High	---
4	Staff turnover	Low	4%	---	14%	10%	72%	High	---

Source: Analysis of questionnaire

When asked about competition for "good" managers, the majority of interviewees objected to the word "good", but 52% of interviewees stated that competition was low<sup>246</sup>. This result may have two explanations. One explanation was that while managers did their best, there were regulations which prevented them from achieving what they wanted (institutional theory-regulative structure). The second explanation was that the GOGCWS managers were working in their own interests and not those of the company. The organisation itself gave them no motivation or incentive to work hard. Salaries were high and both managers and workers knew they would get paid regardless of whether they worked or not. This was true of most public sector organisations in Egypt.

<sup>246</sup> 34% of respondents claimed that competition among managers was high. Respondents stated that managers compete with each other in order to gain a high position (but not through their actual work).

Regarding the P (Un) of management, see table 9.8a

**Table 9.8a: P (Un) of the management in the GOGCWS (N =50)**

Market Conditions		Unpredictability					
		Very predictable	Predictable	Average	Unpredictable	Very Unpredictable	I do not know
1	Availability of qualified managers	66%	32%	2%	---	---	---
2	Salary of management	66%	26%	8%	---	---	---
3	Competition for good managers	66%	26%	8%	---	---	---
4	Staff turnover	72%	24%	4%	---	---	---

Source: Analysis of questionnaire

A possible reason for these answers was that the method of choosing a manager was dependent on how many years they had worked in the organisation (not on their qualifications or work). This was made clear when interviewees<sup>247</sup>, suggested that an alternative to privatisation would be "choosing effective workers for leadership".

#### 9.2.2.2.4 Capital and financing

For the P (CI) of capital and financing, see table 9.9

**Table 9.9: P (CI) of Capital and financing in the GOGCWS (N =50)**

Market Conditions		Competitive Intensity							
			1	2	3	4	5		I do not know
1	Availability of funds	Easy to obtain funds	36%	34%	10%	10%	10%	Hard to obtain fund	---
2	Sources of funds	One major source	12%	8%	10%	56%	14%	Many sources	---
3	Cost of finance	Low	8%	6%	16%	28%	36%	High	6%
4	Staff turnover	Low	70%	16%	8%	6%	---	High	---

Source: Analysis of questionnaire.

<sup>247</sup> Accountants in the Participating Accounts Department.

There were influences on the source of funding of Government cost accounting practices. Geiger and Ittner (1996) argue that units relying on 'revolving' funds were more likely to use cost system data (managing activities or programs) than units receiving all of their funding through reimbursement. This could have been true of the GOGCWS. From the initial analysis, it appeared that there was very little focus on using cost information for strategy. There was also a validity between the answers of respondents (who stated that the cost of finance was high) and the actual documentation of the GOGCWS (see section 8.6.4) which showed that governmental subsidisation was 737 million E. P. annually for the GOGCWS. This amount of money would invariably be borrowed from The National Investment Bank at 14% interest, and the result of this would be a subsidisation of 840 million of E.P.

For the P (Un) of capital and financing, see table 9.9a

**Table 9.9a: P (Un) of capital and finance in the GOGCWS (N =50)**

Market Conditions		Unpredictability					
		Very predictable	Predictable	Average	Unpredictable	Very Unpredictable	I do not know
1	Availability of funds	60%	32%	8%	---	---	---
2	Sources of funding	58%	38%	4%	---	---	---
3	Cost of finance	50%	34%	10%	---	---	6%
4	Staff turnover	66%	32%	2%	---	---	---

Source: Analysis of questionnaire.

### 9.2.2.2.5 Technology

For the P (CI) of technology, see table 9.10

**Table 9.10: P (CI) of Technology in the GOGCWS (N =50)**

Market Conditions		Competitive Intensity							
		Low	1	2	3	4	5	High	I do not know
1	Availability of equipment	Shortage	---	2%	2%	26%	66%	Stable	4%
2	Equipment suppliers	One major suppliers	2%	4%	18%	28%	38%	Many	10%
3	Competition for equipment.	No competition	72%	10%	8%	4%	2%	Keen competition	4%
4	Delivery of equipment	Short	16%	14%	26%	10%	10%	Long	24%
5	Equipment failure	Usual failure	20%	26%	18%	4%	4%	Frequent failure	28%
6	Nature of manufacturing technology	Simple	28%	28%	24%	6%	---	Complex	14%
7	Nature of system technology	Simple	54%	14%	20%	2%	4%	Complex	6%
8	Technology development	Negligible change	32%	32%	8%	18%	8%	Common change	2%
9	Equipment obsolescence	Short life	2%	4%	12%	16%	60%	Long life	6%
10	Capital labour substitution	Slow	48%	24%	12%	10%	4%	Fast	2%

Source: Analysis of questionnaire.

It was clear from the above result that there was face validity of the data. For example, on the topic of obsolete equipment, 76% of respondents stated that the organisation's 'equipment' was unchanged, and in their view was likely to remain that way. It was therefore unsurprising when 72% of respondents stated that capital/ labour substitution was slow.

For the P (Un) of technology, see table 9.10a

**Table 9.10a: P (Un) of technology in the GOGCWS (N =50)**

Market Conditions		Unpredictability					
		Very predictable	Predictable	Average	Unpredictable	Very Unpredictable	I do not know
1	Availability of equipment	58%	32%	6%	---	---	4%
2	Equipment suppliers	52%	28%	10%	2%	---	8%
3	Competition for equipment.	50%	34%	8%	4%	---	4%
4	Delivery of equipment	40%	20%	14%	2%	---	24%
5	Equipment failure	38%	22%	8%	4%	---	28%
6	Nature of manufacturing technology	42%	32%	12%	2%	---	12%
7	Nature of system technology	48%	32%	14%	2%	---	4%
8	Technology development	54%	32%	12%	2%	---	---
9	Equipment obsolescence	60%	28%	4%	4%	---	4%
10	Capital labour substitution	56%	32%	8%	---	---	4%

Source: Analysis of questionnaire.

Although 56% of respondents stated that the technology element was the least significant<sup>248</sup> aspect of the factor market, the researcher observed that the technical aspect was much more important than the financial or management aspect (especially in the water industry). This is because the water industry serves fundamental human requirements (see section 8.4).

### 9.2.2.3 Legislation

Legislation represented a third of the external environment. The perception of (CI) and (Un) of legislation was measured by using 8 items (4 items for P (CI) and 4 for P (Un)).

<sup>248</sup> For the rank priority significance of the factor market, 64% respondents stated that capital and financing was the first element. 42% respondents stated that raw materials and supply was the second element. 44% respondents chose labour as the third element. 36% respondents saw management as the fourth element, while 56% respondents stated that technology was the least important element.

On the topic of the P (CI), see table 9.11

**Table 9.11: P (CI) of the legislation in the GOGCWS**

Market Conditions		Intensive Competition							
		Low	1	2	3	4	5	High	I do not know
1	Regulators in the industry	One major regulator	20%	12%	---	16%	52%	Many regulator	---
2	A mount of legislation	Small	22%	18%	2%	18%	36%	Large	4%
3	Nature of legislation	Well established	32%	30%	18%	14%	6%	Frequent change	---
4	Effect of legislation	Negligible	---	---	---	12%	88%	Heavy	---

Source: Analysis of questionnaire.

These results showed the validity of the data. For example, 68% of respondents stated that there were too many regulators in the water industry, and this answer was consistent with the results from the analysis of documentation (see section 8.4). There were many regulators (both technical and financial). Furthermore, 54% of respondents stated that there was too much legislation and this was clear from section A1.2.1.1 (which included general laws and decrees, laws related to management development, etc). In addition all respondents (100%) stated that legislation exerted a strong influence.

For the P (Un) of legislation, see table 9.11a

**Table 9.11a: P (Un) of the legislation in the GOGCWS (N =50)**

Market Conditions		Unpredictability					
		Very predictable	Predictable	Average	Unpredictable	Very Unpredictable	I do not know
1	Regulators in the industry	68%	20%	8%	2%	---	2%
2	Amount of legislation	62%	22%	6%	4%	---	6%
3	Nature of legislation	44%	42%	14%	---	---	---
4	Effect of legislation	76%	24%	---	---	---	---

Source: Analysis of questionnaire.

There has been much institutional accounting research Covaleski, et al., 1993; 1996; Mezas, 1990; Geiger and Ittner, 1996 all focused on external legitimisation in the shaping of accounting practice. Covaleski, et al., (1993) claimed that pressures exerted by the US Federal Government were crucial in the development of a case-mix accounting system in the health industry. Mezas (1990) described how various institutional factors (laws, expectations and professionalism) influenced the formulation of US accounting policies. Geiger and Ittner (1996) studied the influence of sources of funding and legislative requirements on government cost accounting practices. Their hypothesis was that "mandated government cost accounting systems are not associated with greater internal use of cost accounting data". This is particularly relevant to the GOGCWS research study.

The researcher previously held the view that legislation in Egypt played an important role in cost management. This view was confirmed by the respondents ranking of the significance of various sectors of the external environment, (product market, factor market and legislation). The results were as follows:

Seventy two percent of respondents stated that *legislation* was the most important element. 28% stated that the *factor market* was the most important element, whilst no respondents considered the product market as the most important element in the environment sector.

"Was there a relationship between cost management and P (CI) and P (Un) which relates to the three areas of the external environment (product market, factor market and legislation)? A difficulty facing the researcher here was how do we know each scale measures a single idea? For example, how does the researcher know that the set 15 items do actually measure efficiency, etc. In other words, how can we assess the reliability and validity of a construct? In order to answer these questions, the reliability and factor analysis (using SPSS) was conducted as follows

## 9.3 Reliability and validity of construct

### 9.3.1 Reliability

The reliability of a measure refers to its consistency<sup>249</sup> (Bryman and Cramer, 1999: P.64). Internal reliability was important in relation to multiple-item scales. It raised the question of whether each scale was measuring a single idea and whether the items that make up the scale were internally consistent (p.65). Cronbach's alpha<sup>250</sup> is computed in terms of the average inter-correlation among items measuring the concept. Alpha<sup>251</sup> coefficient was used to examine reliability and validity of the constructs. Alpha coefficient provided general support for the constructs and instruments used in this research and also indicated that some refinement may be necessary. Measures of reliability are shown in table 9.12

**Table 9.12: Alpha coefficients of Reliability for the items of cost management (N =50)**

Indicator	Alpha coefficients
<b>Cost practice (reporting)- Different uses of cost information</b>	
Uses of cost information for system maintenance and efficiency	0.82
Uses of cost information for system optimisation	0.89
Uses of cost information for system adaptation	0.91

Source: Analysis of questionnaire.

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<sup>249</sup> This entailed two separate aspects - external reliability and internal reliability. External reliability referred to the degree of consistency of a measure over several times (Bryman and Cramer, 1999: 64). This was not applicable to the GOGCWS research study.

<sup>250</sup> There were two procedures. Split-half and cronbach's alpha could be readily computed in SPSS for estimating internal reliability.

<sup>251</sup> The closer Cronbach's alpha is to 1, the higher the internal consistency reliability. Therefore, reliabilities less than 0.6 are generally considered to be poor, those in the 0.7 range to be acceptable, and those over 0.8 to be good.

**Table 9.12a: Alpha coefficients of Reliability for factor analysis of P (CI) and P (Un) of the GOGCWS environment (N =50)**

<b>External environment</b>	<b>Competitive Intensity</b>	<b>Unpredictability</b>
<b>Product market</b>	-.6405	.3741
<b>Factor market:</b>		
Raw material	.2374	.7753
Labour	-.0612	.6580
Management	.2360	.7074
Capital and financing	.0607	.6151
Technology	.6130	.7732
<b>Legislation</b>	.5221	.7876

Source: Analysis of questionnaire.

Values which were nearer to one indicated greater reliability than values nearer to zero. The measures suggest that respondents answered in a similar way to each indicator of cost management, but in different way to company environment. The next step was to use factor analysis, this was used to examine the reliability and validity of the construct.

### **9.3.2 Factor analysis**

#### **9.3.2.1 Use of accounting for Cost management**

##### **9.3.2.1.1 Use of cost information for system efficiency**

By carrying out a factor analysis<sup>252</sup> of use of cost information for efficiency, the initial step was to compute a correlation matrix for 15 items (see table A2.12). The aim of this

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<sup>252</sup> Factor analysis enables us to assess the factorial validity of the questions which made up the scales (by telling us the extent to which they seemed to be measuring the same concepts or variables). Factor analysis was used for three main purposes: (a) to assess the degree to which items were tapping the same concept (b) To determine the degree to which they could reduce to a smaller set (c) To try to make sense of the bewildering complexity of social behaviour by reducing it to a more limited number of factors. Bryman and Cramer (1999) argue that two uses of factor analysis can be distinguished as (a) Exploratory - in which the relationships between various variables were examined without determining the extent to which the results fit a particular model (b) Confirmatory factor analysis - comparing the solution found, against a hypothetical one.

step was to decide whether to carry out factor analysis<sup>253</sup>. According to the result of a correlation matrix<sup>254</sup>, the researcher thought it worthwhile to conduct a factor analysis.

There were several kinds of methods available on SPSS, such as alpha, image, maximum likelihood factoring, principal components and factor analysis (called principal-axis factoring in SPSS). Bryman and Cramer (1999) claim that the two widely used forms for factor analysis are 'principal component' and 'principal-axis factoring'. The researcher chose the principal component method<sup>255</sup>. The rationale for choosing principal-components analysis, was that it analysed all the variance of a score or variable, including its unique<sup>256</sup> variance.

Table 9.13 illustrates the SPSS output showing the initial factors produced by a principal component analysis (for using cost information for efficiency) and the amount of variance they account for (their 'eigenvalue').

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<sup>253</sup> If there is no significant correlation between these items, they are unrelated and we would not expect them to form one or more factor analysis (Bryman and Cramer, 1999: 273).

<sup>254</sup> Most of the items were significantly correlated at over the 0.05 level (either positively or negatively, with one another, see table A2.12a). They suggested that they might constitute one or more factors.

<sup>255</sup> The difference between 'principle-components' analysis and 'principal-axis' factoring is how they handle unique variance.

<sup>256</sup> Unique variance is a combination of both specific variance and Error variance (for more details on 'variance' see Bryman and Cramer, 1999: 274).

**Table 9.13: Total variance explained for Using Cost Information for Efficiency**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation
	Total	% of Variance	Cumulative	Total	% of Variance	Cumulative	Total
1	4.608	30.718	30.718	4.608	30.718	30.718	3.238
2	1.777	11.845	42.563	1.777	11.845	42.563	2.238
3	1.597	10.649	53.212	1.597	10.649	53.212	2.474
4	1.368	9.120	62.332	1.368	9.120	62.332	2.671
5	1.169	7.796	70.129	1.169	7.796	70.129	1.823
6	.770	5.136	75.265				
7	.733	4.886	80.151				
8	.692	4.615	84.766				
9	.489	3.318	88.084				
10	.468	3.118	91.202				
11	.406	2.710	93.912				
12	.295	1.969	95.881				
13	.278	1.856	97.736				
14	.191	1.275	99.011				
15	.148	.989	100.000				

Source: Analysis of questionnaire.

The next step was to reduce the number of variables. There were two main criteria used for deciding which factors to exclude, - 'Kaiser's Criterion' and the 'Scree'<sup>257</sup> test. This research study followed Kaiser's criterion<sup>258</sup>, which was to select those factors which had an eigenvalue of greater than one (this meant the first five factors were selected for

<sup>257</sup> The Scree test was introduced by Cattell in 1966. In the Scree test, a graph was drawn of the descending variance accounted for by the factors initially extracted (Bryman and Cramer, 1999: 282). The term "Scree", in fact, was a geological one for describing the debris found at the bottom of a rocky slope and implied that these factors were not very important.

<sup>258</sup> The rationale for choosing a Scree test was that the choice of criterion might depend on the size of the average communalities and the number of variables (Bryman and Cramer, 1999: 277). Furthermore, the Kaiser criterion had been recommended for situations where the number of variables was less than 30. The number of using cost information for efficiency was 15 variables, and the average communality was greater than 0.07 (the average communality for using cost information for efficiency was just over 0.07).

using cost information for efficiency. The principal components produced a 'Component matrix' (see table A2.2), which showed the relationship between each item and a factor was expressed as a correlation or loading.

The first factors extracted from the analysis were those which accounted for the maximum amount of variance. As a consequence, what they present might not be easy to interpret, (since items would not correlate as highly with them as they might). In fact, most of the items would fall on the first factor, although their correlation within it may not be that high.

In order to increase the interpretability of factors, they were rotated to maximise the loading of some of the items. A number of ways were developed to rotate factors, Bryman and Cramer (1999) argue that the two most commonly used methods are orthogonal rotation and oblique rotation. Oblique rotation<sup>259</sup> was used. Oblique rotation produced by the oblimin method in SPSS gave three matrixes; - a pattern matrix<sup>260</sup>, the structure matrix<sup>261</sup>, and the component matrix<sup>262</sup> (see tables A2.2, A2.2a and A2.2b). The structure matrix was made up of weights which reflected the unique variance each factor contributed to a variable. This was a matrix generally used to interpret the factors. According to the structure matrix of using cost information for efficiency, the researcher ended up with five factors. For the illustration of these five factors and the items included in each factor, see table 9.13a

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<sup>259</sup> The advantage of orthogonal rotation was that the information the factor provided was not redundant, (since a person's score on one factor is unrelated to their score on another). The disadvantage of orthogonal rotation was that the factors may have been forced to be unrelated, whereas in real life they might be related. This might be less likely with oblique rotation (Bryman and Cramer, 1999: 279).

<sup>260</sup> A pattern matrix consisted of calculations between the variables and the factors (see table A2.2a).

<sup>261</sup> See table A2.2b.

<sup>262</sup> The component matrix showed the correlations between the factors. It was difficult to estimate the amount of variance accounted for oblique factors since the variance was shared between the correlated factors (see table A2.2).

**Table 9.13a: Factors of Use of Cost Information for Efficiency (N =50)**

<b>Purposes of cost information for efficiency</b>	<b>Mean score of efficiency</b>	<b>Factor</b>
1- To achieve certain financial measurements 2- To enhance cost reduction programs 3- Identification of necessary correctives 4- Compliance with procedures of reporting 5- Perceived importance for meeting budgets	<b>3.3</b>	<b>Measurement.</b>
1- Inventory valuation 2- Basis for audit	<b>3.1</b>	<b>Evaluation.</b>
1- To provide a means of communication 2- Measuring efficiency of production performance 3- To achieve large profits	<b>3.8</b>	<b>Accidental variable.</b>
1- Management and control for period costs 2- Role of standard cost in assessing performance 3- Planning of period costs (budgeting)	<b>2.5</b>	<b>Cost efficiency.</b>
1- Performance evaluation for management 2- To achieve production target	<b>4.1</b>	<b>Performance.</b>

Source: Analysis of questionnaire

#### 9.3.2.1.2 Use of cost information for system optimisation

By carrying out a factor analysis using the same steps as followed in the use of cost information for system maintenance and efficiency, the system failed to create a pattern matrix and a structure matrix. The researcher looked for the reason for failure and concluded that it might be that the average of communality was less than 0.70. Hence, Scree test and Varimax<sup>263</sup> rotation with Kaiser normalisation were used (see table A2.3).

<sup>263</sup> According to Varimax rotation, it may not be appropriate to use the significance level of the factor loading since it depends on the size of the sample. There are two ways: Firstly, items or variables which correlate less than 0.3 with a factor, are omitted from consideration. An alternative criterion to use is the correlation above which no item correlates highly, with more than one factor. The advantage of this rule is that factors are interpreted in terms of items unique to them.

The researcher ended up with five factors for use of cost information for system optimisation. An illustration of these five factors and items included in each factor are detailed in table 9.14 below.

**Table 9.14: Factors of Use of Cost Information for Optimisation (N =50)**

<b>Purposes of cost information for optimisation</b>	<b>Mean score of optimisation</b>	<b>Factor</b>
1- Development of better manufacturing 2- Personal development and workforce improvement 3- To motivate people to do better 4- To enhance equipment productivity 5- Importance of marketing cost analysis 6- Transfer prices for internal services	<b>4.1</b>	<b>Human resources and productivity development.</b>
1- Determine the economic production amount 2- To maintain certain profit margins 3- Measuring of efficiency and capability utilisation 4- Importance of product cost as input to pricing decision	<b>4.2</b>	<b>Economic evaluation</b>
1- Variance analysis and exception reporting 2- Planned and actual product cost 3- Importance of flexible budget 4- To stimulate control of conversion cost	<b>2.5</b>	<b>Cost optimisation</b>
1- Motivating efficiency improvement 2- To emphasise throughput rate	<b>3.5</b>	<b>Motivation</b>
1- product mix decision 2- Make or buy decision	<b>4</b>	<b>Decision processes</b>

Source: Analysis of questionnaire

#### **9.3.2.1.3 Use of cost information for strategic objectives**

By carrying out factor analysis using the same steps as followed in uses of cost information for system maintenance and efficiency, the researcher ended up with three factors for use of cost information for system strategy (see table A2.4). An illustration

of these three factors (and items included in each factor), are detailed in table 9.15 below.

**Table 9.15: Factors of Use of Cost Information for Strategy (N =50)**

<b>Purposes of cost information for Strategic objective</b>	<b>Mean score of strategy</b>	<b>Factor</b>
1- Importance of technology configuration 2- Improvement of product characteristics 3- Product quality analysis 4- Decisions of company strategy 5- Market growth analysis 6- To forecast the future 7- Market development	<b>4</b>	<b>Market evaluation.</b>
1- Importance of competitor cost analysis 2- Evaluation of investment projects	<b>4</b>	<b>Investment/competitor or cost.</b>
1- Importance of product configuration 2- Importance of product improvement 3- New product development 4- Planned and actual customer profitability 5- Market share analysis	<b>4.6</b>	<b>Product development.</b>

Source: Analysis of questionnaire.

### **9.3.2.2 Company (The GOGCWS Environment)**

#### **9.3.2.2.1 Product market**

##### **P (CI)**

By carrying out factor analysis using the same steps as followed in uses of cost information for system maintenance and efficiency, the SPSS gave this computer message. "There are fewer than two cases. At least one of the variables has zero variance, or there is only one variable in the analysis. No further statistics will be computed".

Hence the researcher considered all items, which included one factor in the product market (see table 9.16).

**Table 9.16: Factor of P (CI) in the product market (N =50)**

<b>Factor</b>		<b>Raw material and supply (Competition).</b>
<b>1</b>	<b>Product market</b>	1- Market change (sales) 2- Competition intensity 3- Customer variety 4- Profit margins 5- Product innovation 6- Nature of competition 7- Price of products

Source: Analysis of questionnaire.

### **P (Un)**

Factor analysis produced three factors for the product market - unpredictability (see table A2.5). For an illustration of these three factors and items included in each factor, see table 9.16a below.

**Table 9.16a: Factors of P (Un) of the product market (N =50)**

<b>Factor</b>		<b>Mean</b>	<b>Unpredictability</b>	<b>Mean score</b>
<b>1</b>	<b>Price change</b>	<b>1.5</b>	1- Product innovation	<b>1.7</b>
			2- Price of product	<b>1.3</b>
<b>2</b>	<b>Customer/competition</b>	<b>1.1</b>	1- Customer variety	<b>1.2</b>
			2- Nature of competition	<b>1</b>
<b>3</b>	<b>Growth</b>	<b>1.5</b>	1- Market change (sales)	<b>1.8</b>
			2- Profit margin	<b>1.1</b>

Source: Analysis of questionnaire.

### **9.3.2.2.2 Factor market**

#### **9.3.2.2.2.1 Raw materials and supply**

### **P (CI)**

Factor analysis produced three factors for raw materials and supply - competition (see table A2.6). For an illustration of these three factors and items included in each factor, see table 9.17.

**Table 9.17: Factors of P (CI) of raw materials and supply (N =50)**

Factor		Raw material and supply (Competition)
1	<b>Suppliers</b>	1- Sources of supply 2- Competition between suppliers 3- Nature of suppliers
2	<b>Raw materials</b>	1- Cost of raw material 2- Price of raw material
3	<b>Time</b>	1- Supply 2- Delivery time

Source: Analysis of questionnaire.

### **P (Un)**

Factor analysis produced two factors for raw materials and supply - P (Un) (see table A2.6a). For an illustration of these two factors and items included in each of them, see table 9.17a. below.

**Table 9.17a: Factors of P (Un) of raw materials and supply (N =50)**

Factor		Mean	Raw material and supply (unpredictability)	Mean score
1		<b>1.8</b>	1- Sources of supply 2- Competition between suppliers 3- Cost of raw material 4- Nature of suppliers 5- Price of raw material	<b>1.7</b> <b>1.8</b> <b>2.2</b> <b>1.8</b> <b>1.6</b>
2		<b>1.9</b>	1- Supply 2- Delivery time	<b>1.3</b> <b>2.6</b>

Source: Analysis of questionnaire.

### **9.3.2.2.2.2 Labour**

#### **P (CI)**

Factor analysis produced two factors for labour - P (CI) (see table A2.7). For an illustration of these two factors and items included in each of them, see table 9.18.

**Table 9.18: Factors of P (CI) of labour (N =50)**

Factor		Labour (Competition)
1		1- Availability of skilled labour 2- Wage rate 3- Labour turnover 4- Relations between water organisations.
2		1- Competing employers 2- Trade union

Source: Analysis of questionnaire.

### **P (Un)**

Factor analysis produced two factors for labour - P (Un) (see table A2.7a). For an illustration of these two factors and items included in each of them, see table 9.18a below.

**Table 9.18a: Factors market of P (Un) of labour (N =50)**

Factor		Mean	Labour (Unpredictability).	Mean score
1		1.5	1- Availability of skilled labour 2- Wage rate 3- Trade union 4- Labour turnover 5- Relations between water organisations	1.4 1.3 1.6 1.4 1.7
2		1.3	1- Competing employers 2- Labour dependency	1.4 1.3

Source: analysis of questionnaire.

### **9.3.2.2.2.3 Management**

#### **P (CI)**

Factor analysis produced two factors for management - P (CI) (see table A2.8). For an illustration of these two factors and items included in each of them, see table 9.19.

**Table 9.19: Factors of P (CI) of management (N =50)**

<b>Factor</b>		<b>Management (Competition).</b>
1		1- Availability of qualified managers 2- Staff turnover
2		1- Salary of management 2- Competition for good managers

Source: Analysis of questionnaire.

### **P (Un)**

A factor analysis produced all items related to only one factor (see table A2.8a). For an illustration of the items (see table 9.19a).

**Table 9.19a: Factor of P (Un) of management (N =50)**

<b>Factor</b>		<b>Mean</b>	<b>Management (Unpredictability).</b>	<b>Mean score</b>
1		<b>1.38</b>	1- Availability of qualified managers 2- Salary of management 3- Competition for good managers 4- Staff turnover	<b>1.4 1.4 1.4 1.3</b>

Source: Analysis of questionnaire.

### **9.3.2.2.2.4 Capital and financing**

#### **P (CI)**

Factor analysis produced two factors for capital and financing - P (CI) (see table A2.9). For an illustration of these two factors and items included in each of them, see table 9.20.

**Table 9.20: Factors of P (CI) of capital and financing (N =50)**

<b>Factor</b>		<b>Capital and financing (Competition)</b>
1		1- Cost of finance 2- Staff turnover
2		1- Availability of funds 2- Sources of funding

Source: Analysis of questionnaire.

**P (Un)**

Factor analysis showed that all items were related to only one factor (see table A2.9a).

For illustration of the items see table 9.20a.

**Table 9.20a: Factor of P (Un) of capital and financing (N =50)**

Factor		Mean	Capital and financing (Unpredictability)	Mean score
1		1.5	1- Availability of funding	1.5
			2- Source of funds	1.5
			3- Cost of finance	1.8
			4- Staff turnover	1.4

Source: Analysis of questionnaire.

### 9.3.2.2.2.5 Technology

**P (CI)**

Factor analysis produced three factors for technology - P (CI) (see table A2.10). For an illustration of these three factors and items included in each factor, see table 9.21.

**Table 9.21: Factors of P (CI) of technology (N =50)**

Factor		Technology (Competition)
1		1- Availability of equipment
		2- Equipment suppliers
		3- Delivery of equipment
		4- Equipment failure
		5- Nature of manufacturing technology
2		1- Obsolete equipment
		2- Capital labour substitution
3		1- Competition for equipment
		2- Nature of system technology
		3- Technology development

Source: Analysis of questionnaire.

**P (Un)**

Factor analysis produced three factors for technology - P (Un) (see table A2.10a). For an illustration of these three factors and items included in each factor, see table 9.21a.

**Table 9.21a: Factors of P (Un) of technology (N =50)**

Factor		Mean	Technology (Unpredictability)	Mean score
1		1.7	1- Competition for equipment	1.8
			2- Nature of system technology	1.9
			3- Technology development	1.6
			4- Capital labour substitution	1.7
2		2.45	1- Equipment suppliers	1.9
			2- Delivery equipment	2.7
			3- Equipment failure	2.9
			4- Nature of manufacturing technology	2.2
3		1.66	1- Availability of equipment	1.6
			2- Obsolete equipment	1.7

Source: Analysis of questionnaire.

### 9.3.2.2.3 Legislation

#### P (CI)

Factor analysis produced two factors for legislation - P (CI) (see table A2.11). For an illustration of these items, see table 9.22.

**Table 9.22: Factors of P (CI) of legislation (N =50)**

Factor		Legislation (Competition)
1		1- Regulators in the industry
		2- Number of legislation
		3- Effect of legislation
2		1- Nature of legislation

Source: Analysis of questionnaire.

#### P (Un)

Factor analysis showed that all items related to only one factor (see table A2.11a). For an illustration of the items, see table 9.22a

**Table 9.22a: Factor of P (Un) of legislation (N =50)**

Factor		Mean	Legislation (Unpredictability).	Mean score
1		1.6	1- Regulators in the industry	1.5
			2- A mount of legislation	1.8
			3- Nature of legislation	1.7
			4- Effect of legislation	1.2

Source: Analysis of questionnaire.

According to the reliabilities and factor analysis, the researcher ended up with the following factors (see table 9.23).

**Table 9.23: Factors of cost management and P (CI) and P (Un) of the product market, factor market and legislation**

Subject matter			Number of factors
Main	Branch	Sub-branch	
Cost management	Efficiency		Five
	Optimisation		Five
	Strategy		Three
Competitive Intensity	Product market		One
	Factor market	Raw material and supply	Three
		Labour	Two
		Management	Two
		Capital and financing	Two
		Technology	Three
	Legislation		Two
Unpredictability	Product market		Three
	Factor market	Raw material and supply	Three
		Labour	Two
		Management	One
		Capital and financing	One
		Technology	Three
	Legislation		One

Source: Analysis of questionnaire.

These numerous factors hindered the researcher in his attempt to address the question "Was there a relationship between cost management and perception of competitive intensity and unpredictability. It was therefore important to restructure the data as outlined in the next section.

## **9.4 Restructured data**

### **9.4.1 Cost management**

Three factors represented cost management. The first factor represented efficiency, which resulted from the aggregate of 5 factors of efficiency (see table 9.13a). The second factor represented optimisation, which resulted from the aggregate of 5 factors of optimisation (see table 9.14). The third factor represented strategy which resulted from the aggregate of 3 factors of strategy (see table 9.15). The rationale for choosing the aggregate factor for efficiency, optimisation and strategy was because, although factor analysis divided *efficiency* into 5 factors, *optimisation* into 5 factors and *strategy* into 3 factors, - the alpha coefficients of reliability and validity construct (see table 9.12) were very good. Furthermore, the correlation and the significance level were very good between the original items of efficiency (see table A2.12a), and the same was noted for optimisation (see table A2.13a) and strategy (see table A2.14a).

### **9.4.2 The GOGCWS environment**

#### **9.4.2.1 Product market**

One factor for P (CI) of the product market was acceptable (-0.64). This resulted from the aggregate of 7 items (see table 9.16) according to the computer message of the SPSS and the alpha coefficient of these items. Three factors emerged for the P (Un) of the product market as a result from factor analysis (see table 9.16a), because the alpha coefficients were poor and there was no strong correlation between them (see tables A2.15 and A2.15a).

#### **9.4.2.2 Factor market**

##### **9.4.2.2.1 Raw material and supply**

Three factors for the P (CI) of raw material and supply resulted from factor analysis (see table 9.17), because the alpha coefficient was poor (0.24) and there was no strong correlation between them (see table A2.16). One factor for P (Un) of raw material which resulted from the aggregate of two factors came from SPSS (see table 9.17a), because

the alpha coefficients and the level of significance between the items formulating the two factors was acceptable (see tables 9.12a, A2.17 and A2.17a).

#### **9.4.2.2.2 Labour**

Two factors for the P (CI) of labour resulted from factor analysis (see table 9.18) because the alpha coefficient was very poor between the two factors (-0.16), and between the original items (-0.0612). There was also no strong correlation found between them (see table A2.18). One factor for P (Un) of labour resulted from the aggregate between the two factors which resulted from factor analysis (see table 9.18a). The reason for the combination between the two factors was because (although the alpha coefficient was poor between the two factors “0.40”), the alpha coefficient between the original items was acceptable (0.658). There was also a strong correlation and significance between the items formulating these two factors (see tables A2.19 and A2.19a).

#### **9.4.2.2.3 Management**

Two factors for P (CI) of management resulted from factor analysis (see table 9.19) because the alpha coefficient was very poor between the two factors (0.0004) and between the original items (.2360). In addition, there was no strong correlation found between them (see table A2.20). One factor for P (Un) of management resulted from factor analysis (see table A9.19a), because the items had strong correlation and the significance between them (tables A2.21 and A2.21a) and the alpha coefficients between items, were acceptable (0.7074).

#### **9.4.2.2.4 Capital and financing**

Two factors for P (CI) of capital and financing resulted from factor analysis (see table 9.20) because the alpha coefficient was very poor between the two factors (0.0605) and also between the original items (.0607). In addition, there was no strong correlation between them (see table A2.22). One factor for P (Un) of capital and financing resulted from factor analysis (see table 9.20a), because the items had strong correlation and the significance between each of them (tables A2.23 and A2.23a) and the alpha coefficients between the items, were acceptable (0.6151).

#### **9.4.2.2.5 Technology**

Three factors for P (CI) of technology resulted from factor analysis (see table 9.21) because the alpha coefficient was very poor between the three factors (0.2461), and there was no strong correlation or significance between these original items (see tables A2.24 and A2.24a). Three factors for the P (Un) of technology resulted from factor analysis (see table 9.21a), because the alpha coefficient was not acceptable between these three factors (0.5505), and there was no strong correlation or significance between these three factors (see tables A2.25 and A2.25a).

#### **9.4.2.3 Legislation**

Two factors for P (CI) of legislation resulted from factor analysis (see table 9.22), because the alpha coefficient was very poor between the two factors (0.0586) and there was no strong correlation or significance found between the original items (see tables A2.26 and A2.26a). One factor for P (Un) of legislation resulted from SPSS (see table 9.22a) because the alpha coefficient was acceptable between the items (0.7876), and there was a strong correlation and significance between the items which formulate the factor (see tables A2.27 and A2.27a).

#### **9.4.3 New factors of cost management and external environment**

In conclusion, the researcher ended up with several factors. Some of them represented cost management while others represented the P (CI) and P (Un) in the external environment. These related to three areas: the product market, the factor market (raw material and supply, labour, management, capital and financing, and technology) and legislation. The number of these factors was illustrated in table 9.24.

**Table 9.24: New factors of cost management and P (CI) and P (Un) of product market, factor market and legislation**

<b>Subject matter</b>			<b>Number of factors/ Mean score</b>
<b>Main</b>	<b>Branch</b>	<b>Sub-branch</b>	
<b>Cost management</b>	<b>Efficiency</b>		<b>One (3.3)</b>
	<b>Optimisation</b>		<b>One (3.7)</b>
	<b>Strategy</b>		<b>One (3.96)</b>
<b>P (CI)</b>	<b>Product market</b>		<b>One</b>
	<b>Factor market</b>	Raw material and supply	<b>Three</b>
		Labour	<b>Two</b>
		Management	<b>Two</b>
		Capital and financing	<b>Two</b>
		Technology	<b>Three</b>
	<b>Legislation</b>		<b>Two</b>
<b>P (Un)</b>	<b>Product market</b>		<b>Three (1.3)</b>
	<b>Factor market</b>	Raw material and supply	<b>One (1.8)</b>
		Labour	<b>One (1.4)</b>
		Management	<b>One (1.4)</b>
		Capital and financing	<b>One (1.5)</b>
		Technology	<b>Three (1.95)</b>
	<b>Legislation</b>		<b>One (1.5)</b>

Source: Analysis of questionnaire.

## 9.5 Data analysis two

Was there any relationship between cost management and the P (CI) that related to the product market, factor market and legislation? The results were as shown in tables 9.25 and 9.25a.

**Table 9.25: Pearson correlations between Cost practice and perception of the GOGCWS environment related to P (CI) (N= 50).**

Cost management	Product market	Factor market												Legislation	
		Raw material & supply			Labour		Managem ent		Capital & financing		Technology				
		F1	F2	F3	F1	F2	F1	F2	F1	F2	F1	F2	F3	F1	F2
Efficiency	-.276*	.265*	.246*		.290*						.266*			.310*	
Optimisation	-.328*	.299*			.247*					.314*	.357**				
Strategy	-.356**	.269*				-.256*	.242*								

**Table 9.25a: The significance levels of the Pearson correlations between Cost practice and perception of the GOGCWS environment related to P (CI) (N= 50).**

Cost management	Product market	Factor market												Legislation	
		Raw material & supply			Labour		Managem ent		Capital & financing		Technology				
		F1	F2	F3	F1	F2	F1	F2	F1	F2	F1	F2	F3	F1	F2
Efficiency	.026	.032	.042		.021						.031			.014	
Optimisation	.010	.018			.042					.013	.006				
Strategy	.006	.029				.036	.045								

\*\* . Correlation is significant at the 0.01 level (1-tailed).

\* . Correlation is significant at the 0.05 level (1-tailed).

The result showed that there was a negative correlation between the product market and cost management (efficiency, optimisation and strategy). There was a positive correlation between legislation and efficiency, but there was no correlation between legislation and optimisation or strategy. Regarding the factor market, raw material and supply had a positive correlation with cost management (efficiency, optimisation and strategy). Labour had a positive correlation with efficiency and optimisation, but had a negative correlation with strategy. Management had a negative correlation with efficiency, a positive correlation with strategy and no correlation with optimisation. Capital and financing had a negative correlation with efficiency but a positive correlation with optimisation and no correlation with strategy. Finally, technology had a positive correlation with efficiency and optimisation, and had no correlation with strategy.

Was there any relationship between cost management and P (Un) related to the product market, factor market and legislation? The results were as shown in tables 9.26 and 9.26a.

**Table 9.26: Pearson correlations between Cost practice and perception of the GOGCWS environment related to P (Un) (N= 50).**

Cost management	Product market			Factor market						Legislation
				Raw material and supply	Labour	Management	Capital and financing	Technology		
	F1	F2	F3					F1	F2	
Efficiency										
Optimisation				.272*					.318*	
Strategy									.242*	

**Table 9.26a: The significance levels of the Pearson correlations between Cost practice and perception of the GOGCWS environment related to P (CI) (N= 50).**

Cost management	Product market			Factor market							Legislation
				Raw material and supply	Labour	Management	Capital and financing	Technology			
	F1	F2	F3					F1	F2	F3	
Efficiency											
Optimisation				.028					.012		
Strategy									.045		

\*\*. Correlation is significant at the 0.01 level (1-tailed).

\*. Correlation is significant at the 0.05 level (1-tailed).

The result showed that there was no correlation between the product market and cost management (efficiency, optimisation and strategy), and none between legislation and cost management. Regarding the factor market, labour and management, and capital and financing had no correlation with cost management (efficiency, optimisation and strategy). Raw material and supply had a positive correlation only with optimisation and no correlation with efficiency or strategy. Technology had a positive correlation with optimisation and strategy, but had no correlation with efficiency.

## 9.6 Discussion

In conclusion, the researcher found that there was a correlation between the cost practice and perception of the GOGCWS environment (illustrated in tables 9.27 and 9.27a).

Table 9.27: Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 50).

		Factor market				
		Raw material	Technology	Capital investment	Management	Labour
P (CI)		.265*	.266*	•	•	.290*
P (Un)		•	•	•	•	•
P (CI)		.299*	.357*	.314*	•	.247*
P (Un)		.272*	.318*	•	•	•
P (CI)		.269	•	•	.242*	-.256*
P (Un)		•	.242*	•	•	•

• Correlation does not exist + Correlation is significant, positive < 0.5 + or - Correlation is significant, negative < 0.5

Cost Practice	
Efficiency	
Optimisation	
Strategy	

Legislation	
P (CI)	P (Un)
.310*	•
•	•
•	•

Product market	
P (CI)	P
-.276*	•
-.328	•
-.356**	•

Table 9.27a: The significance levels of the Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 50).

		Factor market				
		Raw material	Technology	Capital investment	Management	Labour
P (CI)		.032	.031	•	•	.021
P (Un)		•	•	•	•	•
P (CI)		.018	.006	.013	•	.042
P (Un)		.028	.012	•	•	•
P (CI)		.029	•	•	.045	.036
P (Un)		•	.045	•	•	•

Cost Practice	
Efficiency	
Optimisation	
Strategy	

Legislation	
P (CI)	P (Un)
.014	•
•	•
•	•

Product market	
P (CI)	P
.026	•
.010	•
.006	•

There was a negative relationship between efficiency and the P (CI) related to the product market. There was a positive relationship with the P (CI) related to legislation, raw material and supply, labour, and technology and efficiency. The researcher referred to this as 'technical' rather than 'economic' efficiency (see section 4.1). Furthermore, the P (CI) in relation to legislation, appeared to play a more important role than both the product market and factor market.

There was a negative relationship between optimisation and the P (CI) related to product market. There was a positive relationship with the P (CI) related to raw material and supply, labour, technology, capital investment and optimisation. In addition, there was a positive relationship between optimisation and the P (Un) related to raw material and supply and technology. The researcher observed that the managers tried to achieve results in the organisation, but there were certain rules and controls which hindered them.

There was a negative relationship between strategy and the P (CI) related to product market and labour. There was a positive relationship between raw material and supply, management and strategy. There was a positive relationship between strategy and the P (Un) related to technology. It was clear that technology was the most important aspect because the water service deals with fundamental human requirements.

In short, legislation and the factor market had *positive* pressure of cost management, while the product market had *negative* pressure of cost management. It was important to examine the relationship between cost management and the P (CI) and P (Un) that are related to the external environment (from all three managerial levels - senior 'high' level, medium level and junior 'low' level), see tables 9.28, 9.28a, 9.29, 9.29a, 9.30 and 9.30a).

Table 9.28: Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 9)/ managerial level (1= high level).

		Factor market					Legislation		Product market
		Raw material	Technology	Capital investment	Management	Labour	P (CI)	P (Un)	
P (CI)		•	-.895**	•	.918**	-.769*	.799**	•	•
P (Un)		•	•	•	•	•			
P (CI)		.792*	-.792*	•	.832**	-.673*	.944**	•	•
P (Un)		•	•	•	•	•			
P (CI)		.845**	-.778*	-.678*	.823**	-.725*	.923**	•	•
P (Un)		•	•	•	•	•			

• Correlation does not exist + Correlation is significant, positive < 0.5 + or - Correlation is significant, negative < 0.5

Table 9.28a: The significance levels of the Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 9)/ managerial level (1= high level).

		Factor market					Legislation		Product market
		Raw material	Technology	Capital investment	Management	Labour	P (CI)	P (Un)	
P (CI)		•	.001	•	.000	.016	.013	•	•
P (Un)		•	•	•	•	•			
P (CI)		.011	•	•	.005	.047	.000	•	•
P (Un)		•	•	•	•	•			
P (CI)		.004	.014	.045	.006	.027	.000	•	•
P (Un)		•	•	•	•	•			

The perception of the senior level GOGCWS managers was that "legislation, raw material, management and product market, technology, capital investment and labour" all had negative pressure of cost management. The perception of senior managers in the GOGCWS was similar to that of the GOGCWS<sup>264</sup> itself (except that technology, capital investment and labour had positive pressure of cost management).

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<sup>264</sup> Legislation and factor market have positive pressure of cost management. Product market has negative pressure of cost management.

Table 9.29: Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 14)/ managerial level (2= medium level).

Factor market						Legislation		Product ma	
	Raw material	Technol ogy	Capital investment	Manage ment	Labour	P (CI)	P (Un)	P (CI)	P
P (CI)	•	-.634*	•	•	•	•	•	•	•
P (Un)	•	•	•	•	•	•	•	•	•
P (CI)	•	.730**	•	•	•	•	•	•	•
P (Un)	•	•	•	•	•	•	•	•	•
P (CI)	•	.560*	•	•	•	•	•	•	•
P (Un)	•	•	•	•	•	•	•	•	•

• Correlation does not exist + Correlation is significant, positive < 0.5 + or - Correlation is significant, negative < 0.5

Table 9.29a: The significance levels of the Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 14)/ managerial level (2= medium level).

Factor market						Legislation		Product ma	
	Raw material	Technol ogy	Capital investment	Manage ment	Labour	P (CI)	P (Un)	P (CI)	P
P (CI)	•	.015	•	•	•	•	•	•	•
P (Un)	•	•	•	•	•	•	•	•	•
P (CI)	•	.003	•	•	•	•	•	•	•
P (Un)	•	•	•	•	•	•	•	•	•
P (CI)	•	.037	•	•	•	•	•	•	•
P (Un)	•	•	•	•	•	•	•	•	•

The perception of the GOGCWS managers (medium level) was that technology had negative pressure of efficiency, and positive pressure of optimisation and strategy (see table 9.29). However, they did not comment on the product market or legislation, or the remaining elements of the factor market. Comparing this result to the result from the perception of the GOGCWS itself, it did not fully represent the perception of the GOGCWS.

The only response from the junior managers level to perceptions of the impact of the external environment on cost practices, was capital investment had positive pressure of optimisation, and legislation had negative pressure of optimisation, (as illustrated in table 9.30).

Table 9.30: Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 27)/ managerial level (3= low level).

Factor market							Cost Practice	Legislation		Product ma	
Raw material	Technol ogy	Capital investment	Manage ment	Labour	P (CI)	P (Un)		P (CI)	P		
•	•	•	•	•	•	•		•	•		
•	•	•	•	•	•	•		•	•		
•	•	.386*	•	•	•	•		•	•		
•	•	•	•	•	•	•		•	•		
•	•	•	•	•	•	•		•	•		
P (CI)											
P (Un)											
P (CI)											
P (Un)											
P (CI)											
P (Un)											

• Correlation does not exist + Correlation is significant, positive < 0.5 + or - Correlation is significant, negative < 0.5

Table 9.30a: The significance levels of the Pearson correlations between Cost practice and perception of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un) (N= 27)/ managerial level (3= low level).

		Factor market					Cost Practice	Legislation		Product ma	
		Raw material	Technol ogy	Capital investment	Manage ment	Labour		P (Cl)	P (Un)	P (Cl)	P
P (Cl)		•	•	•	•	•	Efficiency	•	•	•	•
P (Un)		•	•		•	•					
P (Cl)		•	•	.047	•	•	Optimisation	.039	•	•	•
P (Un)		•	•	•	•	•					
P (Cl)		•	•	•	•	•	Strategy	•	•	•	•
P (Un)		•	•	•	•	•					

It was necessary to examine the relationship between cost management and the P (CI) and P (Un) (which are related to the external environment), from a functional viewpoint (accounting, technical and administrative (see tables 9.31. 9.32 and 9.33).

**Table 9.31: Pearson correlations between Cost practice and perception of the Chief of Cost Department of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un)/ Mean score - Functional level (accounting)**

Factor market						Cost Practice		Legislation		Product market	
	Raw material	Technology	Capital investment	Management	Labour			P (CI)	P (Un)	P (CI)	P (Un)
P (CI)	2.86	2.7	2.5	3.75	2.14	Efficiency	3.7	4.5	1	2.14	
P (Un)	1.14	2.5	1	1	1.14						
P (CI)	2	2.7	2.5	3.75	2.14	Optimisation	4.55	4.5	1	2.14	
P (Un)	1.14	2.5	1	1	1.14						
P (CI)	2.86	2.7	2	3.75	2.14	Strategy	5.1	4.5	1	2.14	
P (Un)	1.14	2.5	1	1	1.14						

• Correlation does not exist + Correlation is significant, positive < 0.5 + or - Correlation is significant, negative < 0.5

**Table 9.32: Pearson correlations between Cost practice and perception of the Vice Chairman for Technical Affairs of GOGCWS environment (product market, factor market and legislation) related to P (CI) and P (Un)/ (Mean score) - Functional level (technical).**

Factor market					
	Raw material	Technology	Capital investment	Management	Labour
P (CI)	2	2.4	1.5	2.5	2.41
P (Un)	1	1	1	1	1
P (CI)	2	2.4	2	2.5	2.14
P (Un)	1	1	1	1	1
P (CI)	2	1	2	2.5	2.14
P (Un)	1	2.4	1	1	1

Cost Practice		Legislation		Product market
		P (CI)	P (Un)	
Efficiency	1.53	2	1	2.86
Optimisation	1.5	2	1	2.86
Strategy	1.43	2	1	2.86

• Correlation does not exist + Correlation is significant, positive < 0.5 + or - Correlation is significant, negative < 0.5

Table 9.33: Pearson correlations between Cost practice and perception of the Chief of General Chief of Meters Administration of GOGCWS environment (product market and legislation) related to P (CI) and P (Un)/ (Mean scored) - Functional level (administrative)

Factor market						Cost Practice		Legislation		Product market	
	Raw material	Technology	Capital investment	Management	Labour	Efficiency	3.33	P (CI)	P (Un)	P (CI)	
P (CI)	2.6	1.4	1	4	1.9			4.5	1.25	2.29	
P (Un)	1.4	2.1	2	1.25	1	Optimisation		4.5	1.25	2.29	
P (CI)	2	2.1	2	4	1.86			4.5	1.25	2.29	
P (Un)	1.43	1.4	1	1.25	1	Strategy		4.5	1.25	2.29	
P (CI)	2.57	2.1	2	4	1.86			4.5	1.25	2.29	
P (Un)	1.43	1.4	1	1.25	1						

• Correlation does not exist + Correlation is significant, positive < 0.5 + or - Correlation is significant, negative < 0.5

The results showed (the analysis of managerial and functional levels), that legislation is the most important factor affecting cost management. This result could be explained by institutional theory. Institutional theorists argue that pressures to conform to accepted practices, can be particularly powerful in government organisations (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Gupta et al., 1994; Geiger and Ittner, 1996). Since the survival of government units depend primarily on the support of external constituents, (and only secondarily on actual performance, Gupta et al., 1994), conforming to accepted social norms and external requirements is necessary to maintain organisational legitimacy (thereby strengthening support and ensuring continued funding). Scott (1987) argued that in institutional environments (such as government organisations), environmental agents have the authority to impose organisational practices on subordinate units, or specify conditions for remaining eligible for the continuation of funding. Consequently, subordinate organisations are likely to show little resistance to the implementation of mandated practices, but the changes will tend to be superficial and loosely coupled to participant action.

This result could be explained by neo-institutional theory which is a theory "based on the premise that organisations respond to pressures from their institutional environment<sup>265</sup> and adopt structures and/or procedures that are socially accepted as being the appropriate organisational choice" (Carpenter and Feroz, 2001). This shows that the GOGCWS relates to political organisation. This means the GOGCWS's legitimacy is threatened by monopoly. Procedures and management play no direct part in generating resources for the GOGCWS, it is assumed that the customer is not interested in such things but only in the GOGCWS product.

## **9.7 Conclusion**

This chapter identified the perceptions of managers in the GOGCWS regarding legislation, product market and factor market which affect accounting work in the GOGCWS generally, and cost management especially. From a strategic cost management perspective, this chapter elevated environmental factors in importance as

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<sup>265</sup> For a definition of the term "institutional environment" (see section 7.2.5).

major drivers of cost and in particular, highlighted their related interaction with management strategy and policy.

This chapter observed that management accounting in the GOGCWS was based on ex post benchmarks (historical observations), not on forward-looking market prices (expectations for the future). The result was, that management accounting had no new techniques operating in the GOGCWS. Furthermore, management accounting in the GOGCWS was based on a hierarchical perspective (institutional hierarchy). Cost information had no role (or a very limited) role in shaping the strategy of the GOGCWS. In addition, government funds for the GOGCWS had an effect on the use of cost information.

The economic element did *not* play an important role in shaping the policy of the GOGCWS. The political or social element did play an important role in shaping the policy of the GOGCWS. In other words, the GOGCWS represents a specific embodiment of the role "political and legal structures play, in shaping the institutional frameworks within which various organisations operate" (Scott, 1987: 409; March and Olsen, 1989; Bealing, et al., 1996). The analysis also suggests that the GOGCWS adopted institutionalised structures in order to gain legitimacy and social support. This suggestion is not new to institutional theory. It has been suggested by several authors (e.g. Meyer and Rowan, 1977; DiMaggio and Powell, 1983; 1991). Furthermore, the political, social and cultural elements had strong influence on the decision to privatise and regulate the water industry in Egypt.

Social context shaped economic theory, and accounting was both independent of, and connected to economic theory. The way of managing labour in the GOGCWS created obstacles for efficiency, optimisation and strategy. Furthermore, managers of the GOGCWS tried to achieve results, but there were enforced regulations which prevented them from achieving what they wanted (institutional theory- regulative structure). The researcher noted that the most important element affecting the strategy of the GOGCWS was legislation, the factor market and the product market.

## **Chapter 10**

### **External and Internal Environments of the GOGCWS**

#### **10.0 Introduction**

The objective of this research was to understand, describe and explain the role of cost management within the water industry. Institutional theory was adopted as a framework for explaining the role of cost management in the Egyptian Water Industry via a case study of the GOGCWS. Institutional theory focuses on both the external (Covaleski, et al., 1993; 1996; Mezias, 1990) and internal environment (Burns and Scapens, 2000). The aim of this chapter is to discuss the external and internal environment of the General Organisation for the Greater Cairo Water Supply. The chapter is divided into three sections.

Section one examines research evidence from the external environment. It discusses Egyptian government policy in its management of the water industry. It also examines the perceptions of the GOGCWS managers on the issue of privatisation in the water industry. It looks at the supply and demand of water in the Egyptian water services industry.

Section two examines evidence from the internal environment. It outlines the current cost practice used in the GOGCWS. The final section sums up the main conclusions and implications of the previous sections.

## **10.1 The External environment**

### **10.1.1 Government policy**

The Egyptian Prime Minister has said Egypt is committed to economic reform despite the economic slowdown it has suffered over the past two years (XINHUA, 05/02/2002). He confirmed that privatisation would continue. He argued that it helps improve competitiveness. The new Egyptian government signalled that the privatisation process will broaden to include not only state enterprises but also the public utilities and public-sector authorities (Business Middle East, 16/03/2000). However, Egypt's privatisation programme is in no way straightforward and an array of obstacles must be negotiated, many of which are not immediately clear.

The partial privatisation of Egypt's state electricity companies began with a law, passed by parliament and ratified by the president. It allowed the country's eight regional distribution companies to be transferred to a joint stock company. The Egyptian cabinet determined how much capital in the joint stock company would be offered to stock market investors (Modern Power Systems, 98). However, investors were not allowed to exceed 49 percent of the shares in each of the eight companies. The new company was responsible for power generation and buying-power from private projects. It also controlled interconnection between Egypt and its neighbouring countries.

This research does not aim to compare the water industry in Egypt with that of France and England. Rather it aims to offer alternative governance structures for the water industry in different countries (such as the UK where water is provided by a highly regulated market and France where water services is hybrid structure). By holding up other structures as alternatives, the Egyptian water industry may now consider other control mechanisms (such as market or hybrid).

The focus of this research was the water industry in Egypt. As mentioned in section 7.2.5, by Williamson, 1985; 1996; Spicer and Ballew, 1983; Colbert and Spicer, 1995; Dietrich, 2001), the management of the water industry in Egypt was hierarchical. The aim of this section is to examine the perceptions of the GOGCWS managers on the issue of privatisation (a governance structure in the water industry). The results were as shown in table 10.1

**Table 10.1: Perception of privatisation or regulation of the water industry in the GOGCWS. (N =37)**

Privatisation or regulation	Managerial level			Total
	High	Medium	Low	
Object to privatisation	---	10%	32%	<b>42%</b>
Supportive of privatisation	---	10.5%	10.5%	<b>21%</b>
Did not object or agree about privatisation.	3%	3%	5%	<b>11%</b>
Refused to talk about privatisation	3%	5%	18%	<b>26%</b>
<b>Total</b>	<b>6%</b>	<b>28.5%</b>	<b>65.5%</b>	<b>100%</b>

Source: Analysis of interviews.

The interviewees who were opposed to privatisation gave reasons for their objections. Interviewee response has been divided into four categories: Cost, price, control and water requirements. Typical responses included the following:

- Privatisation will lead to a decrease in both salaries and workers<sup>266</sup>.
- Privatisation will lead to price<sup>267</sup> increases and go against public interest<sup>268</sup>.
- Price increases will affect the indigent<sup>269</sup>.
- A price increase would affect the social element<sup>270</sup>.
- It would affect the political position<sup>271</sup>.
- The most important element is the political element<sup>272</sup>.
- Water is an essential life element<sup>273</sup> and life's artery<sup>274</sup>.

<sup>266</sup> Accountant in the Participating Accounts Department.

<sup>267</sup> Accountant in the Cost Department, Accountant in the Cost Department, Accountant in the Cost Department, Accountant in the Central Department and Accountant in the Participating Accounts Administration.

<sup>268</sup> Auditing in the maturities Department.

<sup>269</sup> Chief of Loans Accounts and Documentary Credit Department.

<sup>270</sup> Chief of the Bills Auditing and Stamp Department and Accountant in the Deduction and Modifications Department.

<sup>271</sup> Chief of the Commitment Department.

<sup>272</sup> Accountant in the Cost Department.

<sup>273</sup> Accountant in the Bills Auditing and Stamp Department.

<sup>274</sup> Accountant in the Cost Department.

- The General Organisation for the Greater Cairo Water Supply provides water to 25% of the population in Egypt, so how can we let 25% of the population be under the control of the private sector<sup>275</sup>?
- We cannot have water under anyone's control<sup>276</sup>.

Results from the interviews show that 42% of respondents were opposed to privatisation. This is consistent with the basic premise of institutional theory which posits that "an organisation's tendency is to conform to established norms, traditions and social influences in both their internal and external environments. This conformity extends to their structures and practices (as in the case of the GOGCWS). Institutional theory claims that successful governments are those that gain support and legitimacy by conforming to social pressures" (Carpenter and Feroz, 2001).

It is further argued that these results could be explained in terms of the religious beliefs of the Egyptian people who follow the faith of Islam. In Islam, water laws prohibit the monopoly of water by those nearest the source (International El-Aharam, 2000). Islamic laws forbid those with a plentiful supply of water to keep it as surplus. These laws also prohibit the sale of water (even if it is surplus to requirements). Islamic law forbids the wasting and excessive use of water, and advocates water-cleaning or anti-pollution programmes.

It was noted that at senior managerial level, no one objected to privatisation. Half of the junior managerial levels objected (32%). The senior managerial levels have more of an overview of the management of the organisation and this could account for this result. Senior managers realised the GOGCWS needs to change from a hierarchically-based organisation to one market-based (or a mix between the two). Consultants Black and Veatch International had made similar suggestions (see section 8.7.7).

None of the senior managerial staff were in favour of privatisation. This may be a fear of the consequences of going against government policy. Douglas (1986) argues that individuals see answers as being "right" only if they fit in with institutional thinking.

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<sup>275</sup> Chief of commitment.

<sup>276</sup> Accountant in the Cost Department.

This pressure to conform, prevents employees from giving their own opinions, out of fear that they may conflict with the institution's ethos.

A possible reason for the high percentage of interviewees (26%) who refused to talk about privatisation at all, may have been born out of fear of talking against the policy of the government. It is clear from sections 8.1 and 8.4 that the GOGCWS had a regulative pillar (the third pillar in institutional theory, Scott, 1995; see section 2.3). *Fear* is central to the regulative pillar (North, 1990 and Scott, 1995). Hence institutional pressures may work in constraining the activities of the GOGCWS managers.

21% of respondents who agreed with privatisation in the water industry did not approve of selling the water companies to the private sector. Interviewees wanted to see the Egyptian water industry run on a basis of both privatisation *and* regulation. In other words, they wanted to adopt a hybrid approach similar to that of France, see section 7.2.3). This was observed when The Chief of Statistics Department stated that "Privatisation will increase quality but will also increase price. In order to solve this problem, the ownership of the organisation should be between the private sector and the state, but the greater percentage of ownership should be with the state (over 50%)".

The interviewees, who did not oppose or agree with privatisation (11%), stressed the importance of the social element. This was clear when an accountant in the Costs department stated "It is impossible to privatise the water industry because investors want a profit margin and this means an increase in price". This statement showed there was a very negative view of privatisation in the GOGCWS.

Some interviewees suggested alternatives to privatisation of the water industry. These suggestions were classified into five categories: leadership, regulation and control, cost and price, loss and consumption and privatisation. Typical suggestions were "Leaders<sup>277</sup> chosen should be both judicious and competent"<sup>278</sup>. With regard to regulation and control, respondents suggested restrictions and the calling to account of management at every level, (even the chairman of the organisation<sup>279</sup>). They advocate exercising stricter

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<sup>277</sup> Accountant in the Participating Accounts Department.

<sup>278</sup> Accountant in the participating Accounts Administration.

<sup>279</sup> Chief of the Bills Auditing Department (Collection).

controls on senior management. These should be put into effect rather than merely exist on paper<sup>280</sup>.

On the subject of cost and price, the interviewees suggested a price increase. They recommended obtaining a subsidy from the state to make up the difference between price and cost<sup>281</sup>, (thereby reducing costs through continuous maintenance of equipment and a reduction in water consumption)<sup>282</sup>. The focus of this category was clearly important. This was apparent when the Chief of the Balance Sheet Administration stated, "The only solution is to look at methods which can reduce costs and raise prices".

Regarding loss and consumption of water, respondents suggested reducing the loss of water by following new technology<sup>283</sup>, and putting a meter in each flat would lead to less consumer consumption of water<sup>284</sup>. On the issue of privatisation, respondents suggested privatising distribution, management and collection, but without transferring ownership of the organisation<sup>285</sup>. Conversely, they were against the privatisation of production<sup>286</sup>,

Although this research is based on a single company, the company itself provides water for 25% of the population in Egypt. This research argued that "the social context shaped economic theory, and accounting was both independent of and related to economic theory". Carpenter and Feroz (2001) claim that isomorphic pressures will cause organisations to become increasingly homogenous (within given domains), and lead them to conform to expectations of the wider institutional environment.

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<sup>280</sup> Accountant in the Deduction and Modifications Department.

<sup>281</sup> Accountant in the Planned Budget Department.

<sup>282</sup> Accountant in the Cost Department and another accountant in the Cost Department.

<sup>283</sup> Chief of Loans and Grants Department.

<sup>284</sup> Accountant in the Bills Auditing and Stamp Department

<sup>285</sup> Accountant in the Planned Budget Department.

<sup>286</sup> Chief of the Central Accounts Department.

The Chief of the Documentary Credit Department supported this argument when he stated that "privatisation in the water industry leads to a higher quality and decreases cost by about 50%, but he adds, we should consider the social element". He believes that if management of the water industry in Egypt was privatised (market based), it would be more beneficial. He emphasised the social element which opposed privatisation in the Egyptian water industry.

The importance of the social element is made clear by the argument put forward by Young (1996) and Douglas (1986). Young (1996) contended that individuals draw upon their institutional commitments when recognising problems which require decision-making, (and in suggesting specific proposals as feasible and correct "solutions" to such problems). A social element underlies all thinking and problem-solving. In recognising the social element, Douglas (1986) argues that individuals see answers as being "right" only if they fit in with institutional thinking. This pressure to conform therefore prevents employees from giving their own opinion out of fear that they may conflict with the institution's ethos.

#### **10.1.2 Supply and Demand of water in Egypt**

Demand for water is growing in the 21st century. The most important factor affecting demand of water is the rise in population. For example, the population of Egypt rose from 55 million in 1994 to 63 million in the year 2000. It is expected to increase to 86 million by the year 2025. The demand for water will inevitably increase. The future looks bleak if Egypt does not succeed in formulating and implementing a water policy which can match the limited fresh water supply with increasing demand. The per capita water resources are expected to drop from  $922\text{ m}^3$  per year (1990) to  $337\text{ m}^3$  in the year 2025. This will potentially change the focus from cost management of supply, to cost management of demand. The Ministry of Public Works and Water Resources (MPWWR) in Egypt had highlighted several cases - (especially in the distant regions of the Nile) - where the cost of the desalination of seawater was less than the cost of transferred Nile water. They concluded that the desalination of seawater should be increased. De-salinated water in Egypt was approximately 30 million  $\text{m}^3$ /year (International El-Aharam, 4/3/2000). If the present management practice and cropping patterns continue, it could mean that up to 60 % of agricultural land would not be irrigated.

The main problems facing the water industry of Egypt (see section 7.2.4) and the GOGCWS, is management of water demand. This problem has arisen for several reasons. The increase in population is one such reason. For example, the population of Cairo is 13 million. By 2025, three millions tourists are expected to visit the city per day. This poses a potential problem for the demand on water supplies.

The following example illustrates the potential problems an increased demand for water is likely to produce. In 1968, the population of Giza was 610,000. Today it is one of the largest cities in the world (the GOGCWS, no date source given, a: 17). The population of Shoubra El-Khama was 185,000 in 1968. In 1986 it was 700,000. Today it is the fourth largest city in Egypt (Egyptian Geographic Association, no date source given: 2).

Regarding price, the GOGCWS charges different prices (i.e. business sector rates differ from those of domestic houses). Table 10.2 presents an outline of (1) the purpose of water (2) the rate of each purpose (3) quantities of water and (4) the value of water sold in 1999/2000.

**Table 10.2: Purposes of water and the quantities for the year 1999/2000**

<b>Purpose</b>	<b>Rate</b>	<b>Quantity <math>m^3</math></b>	<b>Value E. P.<sup>287</sup></b>
<b>Houses</b>	<b>.12, .16</b>	900,091,063	115,006,510.72
<b>Fixed rate</b>	<b>.12</b>	5,063,982	607,676.27
<b>Places of Worship</b>	<b>.08</b>	2,639,883	211,190.64
<b>Society clubs</b>	<b>.10</b>	4,654,748	465,474.8
<b>Charitable associations</b>	<b>.15</b>	3,684,640	552,696.00
<b>Health insurance hospitals</b>	<b>.23</b>	1,379,018	317,174.14
<b>Unions</b>	<b>.25</b>	323,970	80,992.50
<b>Bakeries and garages</b>	<b>.28</b>	3,912,553	1,095,514.84
<b>Government factories</b>	<b>.30</b>	1,097,853	329,355.90
<b>Building order</b>	<b>.34</b>	5,055,170	1,718,757.80
<b>Commercial shops</b>	<b>.36</b>	44,158,915	15,897,209.40
<b>Clubs</b>	<b>.50</b>	511,982	255,991.00
<b>Large factories</b>	<b>.60</b>	31,665,959	18,999,575.40
<b>Embassies</b>	<b>.75</b>	977,885	733,413.75
<b>Tourist investment</b>	<b>1.25</b>	12,835,303	16,044,128.75
<b>Water treatment</b>	<b>.10</b>	1,037,487	103,748.70
<b>Investment treatment</b>	<b>.15</b>	1,037,202	155,580.30
<b>Annual fixed rate</b>		181,177	18,117.70
<b>Total</b>		<b>1,020,308,790</b>	<b>172,593,108.61</b>

Source: This information was obtained during fieldwork from the accounts department of the GOGCWS.

The cost of water supply outweighs the revenue of water supply. Taking the cost and average revenue of water houses as an example. The cost per  $m^3 = 0.46$  pence (see section 1.5). By contrast, average revenue per  $m^3$  for houses = 0.16 pence. This meant the uncover cost of supply of water houses =  $0.30 * 900,091,063 = 270,027,318$  E. P.

<sup>287</sup> E. P. means Egyptian pound.

## **10.2 Internal environment**

### **10.2.1 Current cost practice in the GOGCWS**

The management accounting procedure used in the GOGCWS (see tables 9.1 - 9.3a) was consistent with the development of literature in management accounting up until 1970 (see table 3.2). The GOGCWS used budgets (see section 8.7.3) and full absorption costing (see section 8.7.4). Its budget was governed by functional bureaucracy (and contributed to the pursuit of the rationale in the allocation of resources). Furthermore, the emphasis on budgeting and standard costing (see section 9.2.1.1) resulted in increased control within the GOGCWS. Brignall and Modell, 2000; Wildavsky, 1975; Jonsson, 1982; Covalleski and Dirsmith, 1983; 1986 all found that budgeting was associated with institutional and political processes (see section 9.2.1.1)

The budget of the GOGCWS can be described in terms of DiMaggio and Powell's (1983: 563) definition: "Budgeting is one specific form of coercive isomorphism that governments often require for funding". Covalleski and Dirsmith (1989: 585) adopted an institutional perspective to examine the role of power in the budgetary process. They found that the state's budget, (which is the end product of many processes of institutionalisation), is controlled by issues of power and by individuals working in their own self-interests.

Was there dissatisfaction with the conventional costing system at the GOGCWS? Conventional costing systems allocated overhead costs on simplistic measures (such as direct labour, etc). These systems within the GOGCWS ignored overhead costs for calculating the costs of products (Innes and Mitchell, 1995 and Kaplan 1994, see section 4.3). Why was activity-based costing not practised in spite of its many advantages? - (as outlined in section 4.3). It was observed that the main reason that the GOGCWS had no authority or choice in its accounting system was because it was a public sector economic organisation. The Unified Accounting System was applied on an economic organisation within the public sector by law, (incremental model). This goes back to the argument of Carpenter and Feroz (2001), who found that previous governmental accounting research (based on economic theory) ignored how institutional and organisational pressures constrain accounting choice in the public sector.

On the topic of activity-based management (mentioned in section 8.7.5) it was noted that ABM was not used in the GOGCWS because the organisation took the functional view rather than the process view. The functional view sees costs as best controlled by department managers (see section 8.3). Managers were responsible for minimising the variance between budget and actual costs by cost element (see sections 8.7.3 and 8.8). Cost variance analysis in the GOGCWS seemed to be designed in a way which meant managers were responsible for the variances under their control. This meant that the emphasis of the cost model used in the GOGCWS was on efficient use of resources. This is what Hammmer and Champy, 1993; Cooper et al., 1992 and Trussel and Bitner, 1998 call a 'traditional' view of cost management (see section 4.4). In contrast the ABM view sees costs as best controlled by managing the workload, eliminating non-value-added activities and continuously improving value-added activities. This would then be an effective use of resources (Brimson, 1996).

Which methods of cost management were best suited to the GOGCWS? Berry, et al., (1995: 55) found that "the structures of traditional cost accounting (e.g. full absorption costing) fit beautifully with the notion of functional bureaucracy. These structures are a classic case of dis-aggregation of hierarchic elements to lower-order activities".

As illustrated in table 8.30, the GOGCWS focuses on operational and capital budgets. A budget was more than a financial statement. It was a record of how real sources (expressed in monetary terms) allocated different activities. It was observed that the budget process at the GOGCWS followed the incremental model of budgeting. (This observation was based on analysis of documentation<sup>288</sup> and staff perception at the GOGCWS<sup>289</sup>). 'Incrementalism' refers to a particular view of the budget decision-making process (Jonsson, 1982). What occurred during a given period determined what would happen in the future at the GOGCWS. It was expressed as "This year's budget is estimated <sup>290</sup> by the amount spent last year".

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<sup>288</sup> See figure 8.5

<sup>289</sup> See figure 8.6 (analysis of interviews) and table 8.30 (analysis of questionnaires).

<sup>290</sup> This was the case of the GOGCWS (see figure 8.6).

### 10.2.2 Managers' perceptions of cost management

Cost management was defined in this thesis as has three elements, - efficiency, optimisation and strategy. Table 10.3 shows when managers of the GOGCWS were asked, "Do you have cost management for efficiency?" The answer across the board was yes (92%). However, when actual use of cost information for efficiency was analysed, the mean score shows that there *is* use of cost information for efficiency. However, it was very low for optimisation and almost disappeared for strategy.

**Table 10.3: Managers Perception of Cost Information in the GOGCWS**

<b>Cost management</b>	<b>Do you have cost management? (Yes)</b>	<b>The use of cost information for (Mean score<sup>291</sup>)</b>
Efficiency	92%	3.3
Optimisation	76%	3.7
Strategy	70%	3.96

Source: Analysis of questionnaire

The mean scores in the three Likert categories (in table 10.3) appear similar, however, a big difference can be detected between them. It should be noted that this is the average mean score and respondents of the questionnaire numbered only fifty. The average mean score appears to show a difference (i.e. less than 3.5 is 'important' whereas higher than 3.5 is 'not important').

As mentioned in section 9.2.1.1, the use of cost information for efficiency was measured by fifteen items (eight of which had an overall mean score of less than 3.5, six items showed an overall mean score higher than 3.5, see table 9.1b). The use of cost information optimisation was measured by eighteen items. Five items had an overall mean score of less than 3.5, while thirteen items had an overall mean score of higher than 3.5 (see table 9.2b). The use of cost information for strategy was measured by fourteen items. Two items had an overall mean score of less than 3.5 and twelve items had mean score of higher than 3.5 (see table 9.3a).

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<sup>291</sup> The range of the Likert scale was 1= extremely important, 2 = very important, 3 = important, 4 = not so important, 5 = Not important and 6 = I do not know.

Managers' perception of legislation is the most important factor in cost management for the GOGCWS followed by the factor market. Perception of the product market had no impact on cost management at the GOGCWS (see chapter 9). This was unsurprising given that the hypothesis working in this research was: "If managers perceive a competitive, uncertain environment, then cost management will inevitably increase". As it is, the GOGCWS runs efficiently (see section 9.2.1.1). However the company suffered from a lack of change and focus in the organisation itself. The managers had no strategic orientation.

The results (see tables 10.3) show that managers of the GOGCWS realised the accounting system used in the organisation was inadequate. It was observed that many of the suggestions put forward by academics<sup>292</sup> (regarding improvement in management accounting) were similar to those advocated by interviewees within the GOGCWS. For example, Coates and Longden (1989) were among the first to note that computer technology would obviate the need for standard costing systems and make it possible to work entirely on-line with actual costs. Similarly interviewees<sup>293</sup> of the GOGCWS felt "it would be beneficial to introduce computers into the company and make use of them".

### **10.3 Conclusion**

This chapter shows how institutional pressure was worked in shaping management policy of the Egyptian water companies. It was noted the GOGCWS was 'boxed-in' and was not receptive to new ideas.

This chapter highlighted the method of cost management was used in the GOGCWS which was based on budget, full absorption costing and standard costing. It also illustrated there was no change of cost management in the GOGCWS that had been further explained in the following chapter.

The chapter showed that the GOGCWS's managers were not stupid, or ignorant. It also highlighted the managers of the GOGCWS realised the method of cost management

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<sup>292</sup> (Coates and Longden, 1989; Littler and Sweeting, 1989; Hope and Hope, 1995; Cooper, 1996).

<sup>293</sup> Accountant in the Cost Department, Accountant in the Cost Department, Accountant in the Participating Accounts Administration, Accountant of the Statistics Department.

was not relevant and there was a need for change (see section 10.2.2). This chapter illustrated that the GOGCWS focused on the first element of cost management (efficiency) while the two elements of optimisation and strategy were given less attention. This argument will be further developed in chapter eleven.

#### 11.0 Introduction

Chapter ten showed how the GOGCWS focused on the element of cost management (efficiency). The two elements of optimisation and strategy had not previously been addressed by the GOGCWS. It was also highlighted in chapter ten that there was no change of cost management within the GOGCWS. This chapter aims to explain why there was no change in cost management by adopting two propositions. The first suggested that government policy (coercive isomorphism) shaped the limited use of cost management for efficiency, optimisation and strategy. The second proposition assumed that organisations are the 'theatre' in which institutions are visible.

The objective of this research was to understand, describe and explain the role of cost management within the water industry. Institutional theory adds the social and political elements that are typically absent or de-emphasised in the rational instrumental approach, (which guides most of the recent research on cost management, see section 2.1). The aim of this chapter is to discuss the GOGCWS research findings in the light of the theoretical framework that has been adopted. It also relates the findings back to the literature review. The chapter is divided into three sections.

Section one evaluates the theories used to explain cost management. It relates the different theories to the three elements of cost management (efficiency, optimisation and strategy). It finds the existing theories of cost management are inadequate and incomplete (Scott, 1987).

Section two explains the findings of this research. It focuses on the role of accounting within the GOGCWS and the relationship between accounting and GOGCWS decision-making. It examines the accounting system of the GOGCWS<sup>294</sup> from an institutional perspective. The section offers an explanation for the lack of change in the GOGCWS (institutional imprinting) through neo-institutional theory. It examines the effect of the macro environment on the GOGCWS from an institutional perspective. It also links the

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<sup>294</sup> The Unified Accounting System.

GOGCWS to both institutional isomorphism (Carpenter and Feroz, 2001), and the political organisation (Brunsson, 1994).

The final section sums up the main conclusions and implications of the previous sections. It also looks at how this study relates to other studies and the similarities and the differences found therein.

## **11.1 Cost Management**

Cost management is a major theme in management accounting. It acts both as a guideline for the allocation of costs to different cost objects, and as a base for the design of accounting systems (Shillinglaw, 1989). Shank and Govindarajan (1989) defined strategic cost management (SCM) as "the managerial use of accounting information explicitly directed at one of the four<sup>295</sup> stages of the strategic management cycle (Shank, 1989: 50). Cooper and Slagmulder (1998b; 1998c) claimed that enterprise-wide strategic cost management systems require two distinct models. The first model needs to address operational improvement and efficiency, while the second needs to identify the firm's source of profitability. It was observed the two models highlighted by Cooper and Slagmulder had three elements of cost management, namely: efficiency, optimisation and strategy.

Cost management for efficiency has its roots in transaction theory and absorption costing (see section 4.1). As mentioned in section 4.1, there are three ways of utilising cost management to increase efficiency, (i.e. throughput costing, benchmarking and target costing). Some researchers claim that ABC focused on efficiency (Bjornenak and Olson 1999).

It was observed that the control of efficiency in the GOGCWS (via budgeting<sup>296</sup>, the reporting process<sup>297</sup>, standard costing<sup>298</sup> (as part of the design and planning process) led to an emphasis placed on calculation and analysis of variance. These findings support

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<sup>295</sup> These are formulation, communication, implementation and action.

<sup>296</sup> See section 8.7.3.

<sup>297</sup> Reports generated from the cost accounting system, found that the majority of respondents (94%) agreed for introducing financial reporting (for further analysis see section 8.6.5.2).

<sup>298</sup> See section 9.2.1.1.

the argument of Ezzamel, et al., (1994). They found that companies were focusing on improving the technical capabilities of their management accounting system, in order to improve their costs calculation and enhance their efficiency. However, control of efficiency and standard-costing may have become obscured by the attention given to observation and analysis of variance.

Cost management for optimisation has been written from a managerial economic-theory perspective. There are certain models of cost management which can be utilised to achieve optimisation (such as the ABM, see section 4.4). Cost management optimisation research is underpinned by contingency theory (Simons, 1987; 1990; Govindarajan and Gupta, 1985; Shank, 1989, see section 5.2.2).

Optimisation was not a central concern to the GOGCWS (see tables 9.2, 9.2a, 9.2b and 9.27). It was observed that there was a similarity between the cost management method at the GOGCWS (budget and absorption costs), and Anglo-American literature (see section 5.1.2). In Anglo-American literature, costs include quantity components and a value component. Value components can be measured in two ways. The first involves the assignment of payments (in the form of actual or past market prices) to the consumed input factor. (This was how<sup>299</sup> cost was calculated in the GOGCWS). The second approach adds opportunity costs to pagatory costs<sup>300</sup>.

Is there any room for Opportunity costs in the Egyptian Water Industry? Several respondents suggested using water technology<sup>301</sup> (i.e. using technology to provide water resources). This could be achieved by re-cycling drainage water (i.e. making multiple

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<sup>299</sup> For the measurement of cost of resources in the GOGCWS, the majority of respondents (92%) chose actual cost as apposed to other forms of costing (see section 8.6.3).

<sup>300</sup> "Pagatory" costs refer to 'cash payments'.

<sup>301</sup> Egypt was one of the first countries to recycle water. River water has multiple use. It was used in generating power from the High dam, and subsequently for water navigation, tourism, agriculture, drinking and re-use of drainage water. This meant that water was being used several times to achieve utmost utilisation (International El-Aharam, 04/03/2000).

There were two ways to overcome decrease of water resources in future. Firstly, using water technology in agriculture would consume around 85% of water resources (such as irrigation pumps). This would lead to a decreased water consumption of over 50%. This would mean increasing water resources by over 40%. The second way involves the removal of salt from seawater and hard water. The technology developed in this field could bring the cost of de-salination to 2 E.B./ $m^3$ . This poses the question "Is the conveyance of distant Nile water for drinking, economical or not?"

use of it) and using technology for irrigation). The Ministry of Public Works and Water Resources (MPWWR) in Egypt explained how opportunity costs could play a crucial role in the water industry (see section 10.1.2).

Much of cost management strategy research has been written from an industrial-economic perspective. Bellis, et al., (1999) claimed that strategic cost management and strategic management accounting have previously been the focus of researcher interest. Wong (1996) used a case study to illustrate how an activity-based approach to strategic cost management can give management a 'richer' and 'robust' understanding of cost dynamics. Cooper and Slagmulder (1998a) asked, "What is strategic cost management?" They found it to be the application of cost management techniques, which improves the strategic position of the firm thereby reducing costs. Simmonds (1981; 1982; 1985; 1986) suggested adding more relevant market data to management records and a regular reporting system. He emphasised the need for the relative competitive data on levels and trends on prices, costs, profit and volume changes for the firm and its competitors (see section 5.2.1).

Porter (1985) defined ten structural cost drives which may have originated the cost driver concept (see sections 5.1.3 and 5.5). This set of cost drivers was further developed in strategic management accounting literature (see sections 5.2.2 and 5.2.3) (Riley, 1987; Shank and Govindarajan, 1993a). Here cost drivers were divided into two groups: structure cost drivers and executional cost drivers. Most of strategic management accounting research was based on the assumption that behaviour was governed by 'rational economic sense'. However this did not explain the strategy of the GOGCWS (which itself was based on economic, political and social elements).

As mentioned in chapter ten, the focus of the GOGCWS was on efficiency and there was no change in cost management within the organisation. In order to explain why there was no change in cost management in the GOGCWS, two propositions were required. Firstly, government policy (coercive isomorphism) shaped the limited use of cost management for efficiency, optimisation and strategy. Second proposition assumed organisations are the 'theatre' in which institutions are visible.

## 11.2 Explanation of the findings

*Proposition One: Government policy (coercive isomorphism) shaped the limited use of cost management*

### 11.2.1 Role of accounting in the GOGCWS

Dietrich (2001) outlined four different roles of accounting (see section 3.2.1). These were as (a) passive optimiser (b) passive co-ordinator (c) active co-ordinator and (d) active regulator (Dietrich, 2001). It was argued that the role of accounting within the GOGCWS worked as a passive optimiser<sup>302</sup>, because authority in the GOGCWS seemed to be created for constraint<sup>303</sup> purposes, not co-ordination purposes (see section 3.2.1).

Burchell, et al., (1980) outlined their four roles of accounting. These were (a) answer machines (b) assistance through decision-support systems (c) ammunition machines and (d) organisational rationalisation machines. While the four roles outlined above were not necessarily all applicable to the role of accounting within the GOGCWS, nevertheless point (a) answering machines<sup>304</sup> did relate to the role of accounting at the GOGCWS. For example, the accounting system of the company provides a stock control system and credit control routines.

The role of accounting within the GOGCWS could be seen as "a passive optimiser" and "answering machines". There was a similarity between the two. The contract in the GOGCWS was based on a universal "knowledge that", rather than a "learning based" "knowledge how" (passive optimiser). Therefore uncertainty over the objectives at the GOGCWS (and their cause and effect) was very low (answering machine).

### 11.2.2 The Unified Accounting System and Institutional theory

It was observed that the Unified Accounting System contained cognitive, normative and regulative structures (Scott, 1995). The system involved activities that provided stability

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<sup>302</sup> In this instance, information-use at the GOGCWS was described in a "knowledge that" manner (Dietrich, 2001, see section 9.2.1).

<sup>303</sup> An accountant in the Cost Department of the GOGCWS stated that "there has not been any change in the organisational structure of the GOGCWS for 25 years. This does not give any opportunity for the skilled worker to introduce anything new". Similarly, another accountant in the Central Accounts Department claimed that "The organisational structure does not fit with the organisation's mission".

<sup>304</sup> Simon (1960) called this 'structured decision-making'.

and meaning to social behaviour (see section 8.5). On the whole, the Unified Accounting System was essentially a normative structure. It was also observed that the different elements of institutional theory (culture, social structure and routines, see section 2.3) were apparent within the Unified Accounting System. As mentioned in section 2.3, there is no universal definition of "institutional". However, according to Scott (1995) an 'institution' has three pillars: cognitive, normative and regulative,

### ***The Cognitive pillar***

The Unified Accounting System had an accounting index<sup>305</sup> based on three elements: (a) classification of accounts (b) code of accounting and (c) explaining the core idea of each. This shows that the Unified Accounting System contained a cognitive element (which included constitutive rules). These rules involved the creation of categories and the construction of typifications (see section 2.3).

The Unified Accounting System required records at the GOGCWS to be divided into four groups (see section 8.6). The Unified Accounting System took the number code and divided the production into: Production Centre, Productive Services Centre, Marketing Services Centre and Administrative, and Financial Services Centres. This ensured accuracy and ease in the collection of accounting information and its classification (see section A1.2.4.2).

### ***The Normative pillar***

It was observed that the accounting system in the GOGCWS had a core of functional claims (see section 8.5). This was clear from the first objective of the Unified Accounting System (outlined in section 8.5.1). This objective provides the information and analytical tools which are a requirement of planning, execution and control at different levels. The role of accounting in the GOGCWS is a normative structure, because the state enforces the Unified Accounting System onto economic organisations within the public sector (see section 8.5). Therefore, state agencies (i.e. the Accounting Central Institution and the Finance Ministry) exert influence over choice of accounting practice (see section 8.4).

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<sup>305</sup> See section A1.2.4.2.

It was argued that the Unified Accounting System was a normative system (see section 2.3). It defined the objectives (see section 8.5.1) and also designated a way to pursue them (see section A1.2.4.2). The Unified Accounting System could be seen as the source of accounting rules and procedures (routines) operating at the GOGCWS<sup>306</sup>. Although there were changes implemented in the economic forms and legal structure of the GOGCWS (see section 8.2.1), the researcher observed that these changes are what Nelson and Winter (1982) call "evolutionary"<sup>307</sup> change".

### *The Regulative pillar*

It was noted that the Unified Accounting System was a regulative process. This was apparent from analysing documentation of the GOGCWS (see section 8.1). Analysis of the interviews revealed that most of the interviewees felt they had to satisfy requirements of both the Accounting Central Institution, and the Finance Ministry. As mentioned in section 2.3, fear, force and experience were central factors of the regulative process. Fear was a major factor (see section 8.6.2).

It is argued that the Unified Accounting System had a large number of routines. This supports the argument of Nelson and Winter, 1982 (see section 2.3). It was argued that the only way to change the management accounting system at the GOGCWS was by implementing *formal* rules. In other words, in order to change management accounting system at the GOGCWS, the Accounting Central Institution has to implement formal rules for change.

As mentioned in (section 8.5), the GOGCWS was required to and did follow the Unified Accounting System. Institutional theory was adopted to explain accounting choice in organisations, where actors working in their own interests cannot exert influence over choice of accounting practice (Carpenter and Feroz, 2001). At the GOGCWS, this was because the Accounting Central Institution forced the GOGCWS to follow the Unified Accounting System.

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<sup>306</sup> See the relationship between rules and routines in section 2.3.

<sup>307</sup> A similar point was made by Burns and Scapens (2000). They differentiated between 'revolutionary' and 'evolutionary' change. Revolutionary change is a fundamental distribution to existing routines and institutions. Evolutionary change is incremental, with only minor distribution to existing routines and institutions.

### 11.2.3 Institutional imprinting

The focus of management accounting in the GOGCWS was on the scope dimension. This supported the argument of Bjornenak and Olson (1999) (see section 3.2.2). This was evident from analysis of documentation of the budget system (see section 8.7.3). The Unified Accounting System in the GOGCWS had longevity (see section 8.6.2); what Bjornenak and Olson (1999) called 'a continuous view of the system itself'.

In institutional theory literature, this was often referred to as *organisational imprinting* (Kimberly, 1975; Mezas, 1990; Scott, 1987; Stinchcombe, 1965). Organisational imprinting referred to the process whereby organisations maintain certain practices adopted at the time that the organisation was founded. Hence, these organisational practices became accepted as an effective means to account for public monies (see section 8.5). This also applied to the GOGCWS. When state governments dictated accounting practices in their constitutions and statutes in this way, they were offering only one choice of accounting method, (thereby excluding alternative methods). 'Organisational imprinting' for state governments established a social reality of correct procedures to account for public monies. This was apparent in the regulations and statutes of the UAS.

*Proposition Two: Organisations are the 'theatre' in which institutions are visible.*

Government statutes dictated choice of accounting method in Egyptian water companies. This research argued that accounting bureaucrats working within the Egyptian Water Industry carry political influence/power (see sections 8.1 and 8.5). It also argued that Government statutes (decision-makers) had been influenced by their institutionalisation. They exert this power in order to retain outmoded accounting practices.

It was noted that the accounting system of the GOGCWS was consistent with historical<sup>308</sup> institutional theory (see section 2.2). This was confirmed through interviewee feedback<sup>309</sup> where the following responses were common:

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<sup>308</sup> Historical-based analysis was useful for relating what they were trying to maximise and why they emphasised certain goals over others (Thelen and Steinmo, 1992).

<sup>309</sup> See section 8.7.3.

- “The most important indicators for the operational budget are the expenses and revenues of last year”<sup>310</sup>
- “The budget of the last three years is taken as a guide in order to prepare the operational budget”<sup>311</sup>
- “There are certain steps taken in preparing the operational budget, firstly, we look at the expenses of last year”<sup>312</sup>
- “In order to prepare the operational budget and capital budgeting, we look at the balance sheet of the last three years”<sup>313</sup>
- “In order to prepare the budget we look at the expenses and the revenues of last year and add 10%”.

#### **11.2.4 The lack of change at the GOGCWS**

Why was there no change at the GOGCWS? Government policy played an important role here. This was apparent from an analysis of the interviews and questionnaires. Analysis of questionnaire data showed that legislation had a greater effect than the product market and the factor market on cost practice (see table 9.27). The Chief of Commitment<sup>314</sup> stated “I think if there are any plans for changes in cost measurement practice, it would be necessary to get support from the state”. Another interviewee<sup>315</sup> added, “If we want to change the cost method in the GOGCWS, we have to change the regulations”.

Managers of the GOGCWS were aware of the limitations of the Unified Accounting System. Why did they not change it? It was found that managers had no choice of accounting system, and fear made them reluctant to change it. This altered the focus from a micro-process view of the GOGCWS to a macro-process one of the government policy. In other words, it highlighted the effect of the macro on the GOGCWS.

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<sup>310</sup> Chief of Bills Auditing Department (collection).

<sup>311</sup> Chief of Commitment (Engagement) Department (Balance Sheet).

<sup>312</sup> Chief of Fixed Assets Department.

<sup>313</sup> Chief of Balance Sheet Administration.

<sup>314</sup> (Engagement) Department (Balance Sheet).

<sup>315</sup> Auditing (Maturities Department).

Institutional theorists claim that because an organisation (like the GOGCWS) depends on its survival for support of external constituents, it must conform to accept social norms. This reasoning applies to government organisations (Meyer and Rowan, 1977; Meyer et al., 1987; DiMaggio and Powell, 1991, Scott, 1987). These institutionalised expectations were expressed in a broad class of elements. They include rules, blueprints for action, standard operating procedures and impersonal prescription (Meyer and Rowan, 1977, Scott, 1987). Meyer and Rowan (1977) claimed that the formalised co-ordination and control systems of organisational structure, served as "rationalised and impersonal prescriptions which identify various social purposes. This demonstrates institutional conformity as technical, (affecting control) and specifying appropriate means to pursue technical purposes of rationality".

Scott and Meyer (1994) stated that there were two schools of thought on the relationship of environments to organisations. The first saw the environment as a structure of power, (posing problems which the organisations must rectify (Pfeffer and Salancik, 1978, Zald, 1970; 1984). Accounts were thus likely to arise in response to demands made by powerful elements in the environment. The second theory concentrated less on the power of environmental demands for particular products or exchanges, than on the power of the environment as a supplier of cultural material for the organisation. Both views should be taken into consideration.

It has been shown (see section 8.5) that the environment of the GOGCWS constrained managers in their choice of accounting system. Similarly the organisation failed to put into practice any recommendations (i.e. alternatives to the method of cost management, as outlined by consultants). Moreover, there was a tendency to not even disclose such recommendations 'coercive isomorphism'. The second view highlights government policy, (arguing that the water industry in Egypt can be explained in terms of the religious beliefs of the Egyptian people-culture).

This argument offered only a partial insight into water organisations. This argument failed to take into account the inadequate accounting practices of water organisations in Egypt. Previous research had led theorists to shift from a technology-focus (as the primary determinant of structure) to one emphasising the role played by the environment (Meyer and Scott, 1983a). Organisational environments vary in complexity

of resource and power arrangements (Pfeffer and Salancik, 1978). They also differed in the configuration of their wider structures and legitimating rules (DiMaggio and Powell, 1983; Meyer and Rowan, 1977).

Institutional theorists argued that pressures to conform to accepted practices can be particularly powerful in government organisations (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Gupta et al., 1994; Geiger and Ittner, 1996). The survival of government units depended primarily on the support of external constituents, and only secondarily on actual performance (Gupta et al., 1994). Conforming to accepted social norms and external requirements was required to maintain organisational legitimacy. This strengthens support and ensures continued funding.

Scott (1987) claimed that (institutional environments such as) government organisations and environmental agents<sup>316</sup> had the authority to impose their own organisational practices. The GOGCWS for example was required to follow the Unified Accounting System. The government can therefore dictate subordinate units to comply, or even specify conditions for their remaining eligibility for continuation of funding. As a result, subordinate organisations were likely to show little resistance to the implementation of mandated practices. Changes will tend to be superficial and only arise as a result of participant action.

The fact that (there was no change in cost management at the GOGCWS) may be explained by through neo-institutional theory. "Institutional theory was based on the premise that organisations respond to pressures from their institutional environments<sup>317</sup>. They adopted structures or procedures which were socially-accepted as being the appropriate organisational choice" (Carpenter and Feroz, 2001). It was assumed that the customer was only interested in the GOGCWS product. Institutional theory proposed that many elements of formal organisational structure, policies and procedures, arose as a result of societal expectation of what constitutes acceptable organisational practice (Meyer and Rowan, 1977; DiMaggio and Powell, 1983; 1991; Scott, 1987; Bealing et al., 1996).

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<sup>316</sup> (E.g. the Accounting Central Institution in Egypt).

<sup>317</sup> For the term institutional environment (see section 7.2.5).

It was observed that the GOGCWS was what Brunsson (1994) calls a "political organisation"<sup>318</sup>. This observation was built from both an understanding of the term "political organisation" (Brunsson, 1994), and from an analysis of the GOGCWS (outlined in chapters 8, 9 and 10). The political organisation contained a hierarchy in which citizens were the clients or 'principals' (see section 8.3). The political organisation was 'a public utility' (see sections 7.1 and 8.3). An organisation did the task assigned to it but had no intrinsic value if this role disappears (see section 8.2.2). A political organisation claimed its services were useful for everyone in its consistency and was under democratic control. Typically "control" in political organisations was concerned with rules. In political organisations, the (publically-appointed) leadership prescribes the procedures and methods used (see section 8.4).

The GOGCWS was what Brunsson (1994) calls "political-isation". 'Political-isation' occurs when an individual organisation takes on some the characteristics of a political organisation. This included attempts to anchor the organisation in a hierarchy of super-ordinate and comprehensive ideas and values, whilst also addressing the wider public (not merely its own customers). The GOGCWS was essentially a highly political organisation<sup>319</sup>

The "water environment"<sup>320</sup> in Egypt was very complex (see section 8.1). There was pressure for the water companies in Egypt to satisfy legislative requirements (see sections 8.4 and 9.6). The water environment in Egypt was a structure of power, (posing problems which organisations need to rectify, see section 7.2.4). Accounting arose in response to demands made by powerful elements in the environment.

### **11.2.5 Rationale for choosing the Budget incremental model**

As mentioned in section 10.2.1.1, the GOGCWS had adopted an incremental budget model. Why did decision-makers of the GOGCWS follow an incremental model? Why

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<sup>318</sup> A political organisation is "an institution on which most state and municipal organisations are based" (Brunsson, 1994: 324).

<sup>319</sup> A highly political organisation may be attracted by management techniques which focus on results and action (Brunsson, 1994).

<sup>320</sup> See sections A1.2.1.1 and 8.4.

do decision-makers in the GOGCWS follow the budget process as a method of cost management? Institutional theory offers an explanation. The institutional theoretical explanation can be divided into two levels: (a) the macro level (b) the individual level.

At the macro level, the Accounting Central Institution in Egypt exerted a constant institutional pressure for the GOGCWS to use the Unified Accounting System. An incremental budget was one of its tools (see section 8.5). Scott (1987) argued that in institutional environment such as government organisations (like the GOGCWS), environmental 'agents' have the authority to impose organisational practices on subordinates. They can also specify conditions for eligibility of funding. Consequently, subordinate organisations were likely to show little resistance to the implementation of mandated practices (For more discussion of the macro level, see section 8.6).

Regarding the individual level, Douglas (1986) argued that institutions provide conceptual schemas (or analogies) that can be used in the decision-making. In the decision-making process, individuals were faced with the choice of expanding time and energy on difficult problems, or employing existing methods. Institutions often opt to save time and effort in resolving problems. Institutions can thus be seen as 'machines' of decision-making and thought, which are "in danger of turning individual thought over to automatic pilot" (Douglas, 1986: 63). As mentioned in section 11.2.1, the role of accounting within the GOGCWS can therefore be seen as answering machine and passive optimiser.

Attempts to save time and effort *should* be made by institutions, however our reliance upon them to provide analogies and conceptual schemas is not without its costs (Young, 1996). Institutions can systematically direct individual memory, and channel our perceptions into forms compatible with the relations they authorise. They fix processes that are essentially dynamic, they hide their influence, and they arouse our emotions an important issue. They essentially endow themselves with 'rightness'. Any problems are automatically transformed into organisational problems. The solutions they suggest come only from a limited range of experience. If the institution is one that depends on participation, (e.g. the GOGCWS), it should answer the call for "more participation". Institutions are shown to have the megalomania of a computer, "where the whole vision of the world is its own program" (Douglas, 1986: 92).

Institutional thinking may standardise and generalise our framing of particular problems, and limit our ways of conceptualising particular issues. This was apparent with the junior managers at the GOGCWS who objected to the issue of privatisation (see section 10.1.1). In this way, institutions create "shadowed places" (in which nothing can be seen nor any questions asked, Douglas, 1986: 69). While institutions save us time and effort in the decision-making process, they also limit the types of solutions, which are "appropriate". Government policy did not allow the method of cost management suggested by consultants (Black and Veatch International) to be adopted within the GOGCWS. They may stifle our creativity in developing novel approaches to issues. They may also inhibit our ability to recognise particular issues as 'problems' to be resolved.

The "shadowed places" created by institutions emerge in part because individuals draw upon institutions to classify "things" into categories. In categorising and classifying, we draw boundaries around those things that will be influenced, and those that will be excluded from consideration within a particular context (i.e. the UAS). For example, we draw upon our institutions to recognise and classify certain things of an "economic" nature. If institutional commitments suggest that economic things are to be valued more than non-economic things (or vice versa), then the assignment of things as either 'economic' or 'non-economic' imbues them with a particular moral and political content (Douglas, 1986: 63).

### **11.3 Conclusion**

The explanations of the findings of this research centred around two proposition: (a) Government policy (coercive isomorphism) shaped the limited use of cost management for efficiency, optimisation and strategy (b) Organisations are the 'theatre' in which institutions are visible. In other words, the explanation of the findings had moved from an institutional functionalist view (first proposition) to an institutional interpretative view (second proposition)

Cost management (optimisation and strategy) was not a central concern at the GOGCWS (see tables 9.2 - 9.3a and table 10.3). However, technical efficiency was a major concern (see tables 9.1, 9.1a and 9.1b). Although managers of the GOGCWS were aware the accounting system used in the organisation was not ideal, there had been

no change in its system since the 1960s. Managers had no choice of accounting system and fear made them reluctant to change it. Professionalisation of the government accounting community in Egypt (the Accounting Central Institution), creates a constant institutional pressure for the GOGCWS (and other water companies in Egypt, see section 8.5), to use the Unified Accounting System.

The role of accounting within the GOGCWS can be seen as a "passive optimiser" and "answering machines". The focus of management accounting in the organisation is on the scope dimension, and the accounting system employed has longevity (institutional imprinting). This chapter has shown that the accounting system in the GOGCWS adopted an incremental budgeting model, standard costing and absorption costs.

The Unified Accounting System can be seen as an outcome of coercive isomorphism<sup>321</sup>. "Coercive isomorphism" is the way in which organisations (such as the GOGCWS), may be subject to external pressures from general cultural expectations (DiMaggio and Powell, 1983), (e.g. the GOGCWS, or organisations upon which they are dependent, Carruthers, 1995). Similarly, Egyptian government regulations coerce the GOGCWS into adopting the Unified Accounting System.

As mentioned in section 11.2.2, the Unified Accounting System contained cognitive, normative and regulative pillars (Scott, 1995). It was clear from chapters 8, 9 and 10, that the external environment inhibited cognitive learning within the GOGCWS. The effect of the external environment at the GOGCWS, shaped its accounting system. In other words, the institutional pressures dominated the use of accounting in the GOGCWS.

The findings of the research were consistent with the argument advanced by DiMaggio and Powell (1991, 1983) who argue that 'coercive isomorphism' is the way organisations (such as the GOGCWS) may be subject to external pressures as a result of cultural expectations. This also applied to organisations upon which other organisations are dependent (Carruthers, 1995). Similarly, Egyptian government regulations coerced

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<sup>321</sup> DiMaggio and Powell (1991) distinguish between "competitive" and "institutional" isomorphism. Within 'institutional isomorphism', they distinguish between coercive, mimetic and normative isomorphism.

the GOGCWS into adopting the Unified Accounting System. These conclusions (drawn from analysis of the documentation), showed that there were several institutions responsible for financial control in the GOGCWS (such as the Cairo region, the Finance Ministry, the Ministry of Planning and the Accounting Central Institution, see section 8.4.2).

The findings of the research were consistent with (see section 7.2.2.1) the argument put forward by Ogden (1995) who claimed that before privatisation of the UK water industry, accounting emphasised cost-reduction in order to meet Government-determined performance aims (and thereby improve organisational efficiency). Management control in the GOGCWS relates to programmed controls (see section 5.2.2). Data was communicated through formal reporting procedures.

Results of this research concur with the argument of Scapens (1991). Management accounting texts suggested that in many situations, absorption costing cannot provide relevant costs decision-making and control (Scapens, 1991; see section 5.1.1). In practice, absorption costing seems to be the dominating technique in most Western countries (e.g. the U.S.A. Howell, et al., 1987; the U.K. Drury and Tayels, 1994; 2000; Sweden: Ask and Ax, 1992) and socialist countries (e.g. Egypt, see section 8.7.4). It was argued that the methods of management accounting used in the GOGCWS were compatible with the techniques of management accounting adopted in Germany (see table 5.1). For example, the cost method used in the GOGCWS is based on absorption costing, which represented costing practice (a major characteristic of the German tradition).

The findings of this research also support the argument of Hope and Hope (1995: 213) who claim that most organisations remain "tied" to archaic accounting systems and management structures. They stress the need for 'horizontal information systems'<sup>322</sup> and even interviewees<sup>323</sup> in this study called for "a connection and integration between administrations in order to decrease costs" (p. 213).

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<sup>322</sup> Horizontal systems provide managers with a new framework for measuring the 'real' performance of their business. As such, the horizontal information system can bring new methods of cost management into existence (i.e. activity based management).

<sup>323</sup> The chief of Balance Sheet Administration and Chief of the Documentary Credit Department.

Cost accounting in the GOGCWS was similar to what Shark (1943) and Coward (1944) called "konstnadssted"<sup>324</sup>. Coward (1944: 49) argued that "if a manufacturing company follows the conversion of materials in different steps throughout the factory, then it is natural to divide the production process into sub-processes". This was apparent in the GOGCWS (see section 8.4.1.1). It was observed that the cost accounting system in the GOGCWS was not made clear to staff (see section 8.6.7). This relates back to the argument of Brignall, et al., (1991) (see section 5.1.3) who found that cost traceability varies systematically, (being greatest in professional services and least in mass services, such as the water industry, see section 5.1.3).

It was observed that there was a similarity between the method of cost management in the GOGCWS and methods found in Anglo-American literature (see section 5.1.2). In Anglo-American literature, costs always include quantity components and value components. Value components can be measured in two ways. The first involves the assignment of payments in the form of actual or past market prices, to the consumed input factor. (This was similar<sup>325</sup> to how cost was calculated in the GOGCWS). The second approach added opportunity costs to 'pagatory' costs. "Pagatory" costs refer to "cash" payments.

This chapter highlighted the similarities and differences between this study and other studies. However, it did not focus on the contribution to knowledge which is addressed in the following chapter.

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<sup>324</sup> Konstnaddsted is an alternative classification of cost pools. 'Department' is the natural choice for Konstnaddsted.

<sup>325</sup> On the topic of measuring cost of resources in the GOGCWS, the majority of respondents (92%) chose 'actual cost' as opposed to other forms of costing (see section 8.6.3).

## Chapter 12

### Conclusion

#### 12.0 Introduction

The aim of this chapter is to summarise the results of the research and identify its contribution to knowledge. This research has reported on the findings of one case study - conducted in an Egyptian public sector organisation (the GOGCWS). The results and contributions of the research have been presented, analysed and developed in chapters eight, nine, ten and eleven.

This chapter summarises the research and the research findings. It has four sections. Section one presents an overview of the thesis and gives a brief background to the 'knowledge problem' of cost management.

Section two identifies the contributions to knowledge this thesis makes to cost management and management accounting. Some contributions relate to institutional theory and the case study approach.

Section three discusses limitations of this research and offers suggestions for future research.

The final section concludes with comments on the research process and learning experience.

#### 12.1 An overview

##### *Objectives and research questions*

This research endeavoured to understand and explain the role of cost management in the service water industry in Egypt via a case study of the GOGCWS. Cost management was examined from different viewpoints, including (a) accounting (the managerial and economic perspective) and (b) Government policy (social and political perspective).

With this objective in mind, empirical questions to be addressed in this research were:

- What was the cost structure for the provision of an Egyptian water service? (see section 8.6).
- What was the rationale of the water companies for their cost management? (see sections 8.5 and 11.2).
- What methods of cost management were used in the Egyptian water industry? (see sections 8.6 and 8.7).
- What was the role of accounting (its nature and function) in controlling the Egyptian water companies? (see sections 3.1, 8.5 and 11.2.1).

This thesis developed an explanation of an Egyptian water company. The provision of water is an important public sector service, world-wide, with significant economic and social impact (see section 7.1). The motivation to conduct this study arose from both theoretical and practical reasons (see section 1.3).

### ***Cost Management***

Largely rational economic theory and neo-classical theory (the normative view) has been the basis of most cost management research. A major criticism of rational economic theory is that it failed to consider the behaviour of the firm, neglected the social and political context, assumed the imperfect market does not exist and neglected the monopoly market, uncertainty and unpredictability.

There are different approaches in cost management (e.g. the economic approach and the strategic approach, see section 11.1). Much of the empirical research on cost management, (especially in activity-based costing and strategic management accounting), has been based on studies of private sector implementation. This study focused on a public utility (see section 7.1) and *not* the private sector, and hence this made the research difficult. As mentioned in section 6.2.1.3, certain projects seem to have universal sensitivity in developing countries: political power structures and government decision-making processes, social problems that reflect national image. Water is an emotive subject in all of them. Therefore, access to data was difficult given the constraints exerted by Egyptian Government policy.

### ***Theoretical framework***

Institutional theory was adopted as a framework for explaining the observed practice of cost management in the GOGCWS, because it adds the social and political elements that were typically absent or de-emphasised in the rational instrumental approach (which guides most of the recent research on cost management, see section 2.1). Institutional theory focuses on both the *external* (Covaleski, et al., 1993; 1996; Mezas, 1990) and *internal* environment (Burns and Scapens, 2000).

As mentioned in sections 2.1 and 3.3.2, three institutional theoretical frameworks had been used in the accounting literature, - namely old institutional economic theory (Scapens, 1994; Burns and Scapens, 1998; 2000), neo-institutional economic theory (transaction cost) (Williamson, 1975; 1985; 1991; 1996) and neo-institutional sociological theory (Miller, 1994). This research adopted neo-institutional economic theory and utilises new empirical data. This research therefore focused on the regulative pillar and adopted a micro focus (see figure 2.2). The study took a process approach (see section 2.3).

### ***Methodology and method***

This research adopted a hybrid approach (i.e. between inductive and deductive), but mainly an inductive approach. The rationale for choosing a hybrid approach was because the aims of this research were to describe what is going on (i.e. to describe the current cost structure for the provision of water in Egypt); and to understand and explain why it has been put into effect (i.e. the companies' rationale for their choice of cost structure). The research also took a nomalist view (ontology - the rationale for which can be found in section 6.1.2). It also takes a 'voluntaristic'<sup>326</sup> view of human behaviour than which guides contingency research (Child, 1972; Schreyogg, 1980). The voluntaristic view was noticeably absent in early neo-institutional research (DiMaggio, 1988 and Oliver, 1991). This approach followed from more recent advances in institutional theory which call for more-in-depth, interpretative analyses of the dialectic between stability and change (Czarniawska and Servon, 1996).

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<sup>326</sup> 'Voluntaristic' view assumes that human beings are free-willed, act independently of external stimuli and exercise freedom of choice (Burrell and Morgan, 1979).

A case study approach was adopted in this research (see section 6.2.1). It entailed collecting data for an examination of the GOGCWS<sup>327</sup> (see chapters 8, 9, 10 and appendix). A case study is both a process of induction and deduction (see section 6.1.1). The case study is mainly explanatory (theoretical framework), and exploratory in practice. A case study approach is a useful research strategy for both generating and developing the theoretical arguments put forward in this thesis (see section 6.2.1.1).

This methodological position led the researcher to use multiple sources for collecting data (including interviews, questionnaires and company documents of the GOGCWS). Multiple sources of evidence (triangulation, see section 6.2.1.3), were used in order to examine the context of the GOGCWS (Yin, 1984). Semi-structured interviews were carried out. Archival documents were reviewed and press articles, state statutes, and official documents were assessed. A questionnaire was used as the basis for the questioning in interviews, (which were held with all managerial levels). The rationale behind this integration (a method known as 'triangulation'), is that limitations of one method can be counter-balanced by the strength of another (Hoque and Hopper, 1994).

## **12.2 Contribution to knowledge**

This thesis gave an insight into the role of cost management and management accounting practice in the Egyptian water industry.

### **12.2.1 The role of Cost management and Management accounting**

This research was based upon a model of cost management which had three elements of cost management: efficiency, optimisation and strategy. These three elements are found in different theories (Incremental theory, Accounting theory, Economic theory (efficiency), Marginal and Opportunity cost (optimisation) and Strategic Management Accounting (strategy). Few studies have discussed these three objectives. Even these few studies (which focus on these three objectives), use a different theoretical framework, (for example Al-Hazami, 1995 used contingency theory to explain cost policy and practice in UK manufacturing industries).

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<sup>327</sup> Although, Yorkshire Water Company had been stood as an example of UK water system and also the French water but the focus of this research on the Egyptian water industry (the GOGCWS).

This thesis has contributed to our understanding of the role of cost management in the Egyptian water industry, by providing empirical evidence of cost management practice in one organisation. There were no other empirical studies cited in academic literature of Egyptian companies. This research was conducted in a Third world "socialist" country whose environment is different from those of Western developed economies, (on which previous reported research is based). Chapters eight and ten provided an overview of the environment where this research was conducted.

Much of the empirical literature on cost management (especially activity-based costing and strategic management accounting) is based on studies of private sector organisation implementation. This study focused on public utilities rather than the private sector (see section 7.1). It is hoped that it will contribute to knowledge development in this field.

The explanations of the findings of this research centred around two proposition: (a) Government policy (coercive isomorphism) shaped the limited use of cost management for efficiency, optimisation and strategy (b) Organisations are the 'theatre' in which institutions are visible. In other words, the explanation of the findings had moved from an institutional functionalist view (first proposition) to an institutional interpretative view (second proposition)

The research findings of this study support the work of Berry, et al., 1985; Covaleski et al., 1985; Ansari and Euske, 1987; Covaleski and Dirsmith, 1991; Lapsley, 1994; Geiger and Ittner, 1996. They all concluded that a public sector cost accounting system is generally implemented to satisfy government mandates, and is rarely used for internal decision-making and control purposes. The findings of the GOGCWS research are consistent with the argument put forward by Jones and Dugdale (2001) who claimed that management accounting appeared more significant in the UK than in some other countries, (e.g. Japan or Germany, Jones et al., 1993; Jones, 1995). Nevertheless in Egypt, the information constructed through the application of accounting measurements, techniques and criteria does not seem to dominate in decision-making and control. The reason for that is government policy or coercive isomorphism shaped the limited use of cost management for efficiency, optimisation and strategy.

This research argued that the role of management accounting in the GOGCWS relates to technical management accounting (which does not provide useful information for optimisation and strategy 'see table 9.27'). The prescribed roles of management accounting in the GOGCWS emphasised the reporting and control functions within a bureaucratic hierarchy. In order to change the role of management accounting within the GOGCWS, the focus should be on organisational processes (the accounting process), not on organisational units (the accounting department). In other words, the GOGCWS needs to improve performance measurement (see section 4.1 and Beretta, et al., 1998).

### **12.2.2 Institutional theory and case study**

Institutional theory was particularly useful for understanding public sector government (Bealing, et al. 1997). This research found that institutional theory was a theoretical lens with which to view the role of cost management in the GOGCWS. This thesis used institutional theory to explain the rationale of the cost management in the GOGCWS (see section 11.2). Previously, there had been very little empirical evidence of cost management in the Egyptian water industry (e.g. the study of "Black and Veatch International", 1997).

The study examined whether government policy (a coercive institutional) pressure had a greater influence for the choice of accounting system in the GOGCWS. Previous research has utilised institutional theory in order to explain *change* in an organisation. This research adopted institutional theory in order to explain the unchanging and relatively static environment of the GOGCWS. 'Organisational imprinting'<sup>328</sup> which has been used by researchers (Stinchcombe, 1965; Kimberly, 1975; Scott, 1987 and Mezias, 1990). 'Organisational imprinting' for state governments (i.e. the UAS' regulations and statutes), establish a 'social reality' of correct procedures to account for public monies (see section 11.2.3).

This thesis found evidence that the Egyptian government directly influenced methods and systems of cost management at the GOGCWS. Consultants (Black and Veatch International) were only indirectly influential in that they could inform government

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<sup>328</sup> 'Organisational imprinting' refers to the process whereby organisations (such as GOGCWS) tend to maintain certain practices. For example the Unified Accounting System had been in effect since the GOGCWS was founded.

policy, and advise which accounting methods and systems should be employed in the organisation.

It was observed at the GOGCWS, that culture, government policy, structure, institutional pressures, fear and force influenced participant perception and situational and organisational objectives. (These factors are all part of the third pillar which is Regulative in institutional theory, see section 11.2.2). These observations led to the conclusion that cost management practices at the case organisation (the GOGCWS) was influenced by institutional pressures.

Institutional thinking of the Egyptian government policy "standardised" managers perceptions of the GOGCWS' framing of problems. It also limited their ways of conceptualising particular issues. In this way institutions create "shadowed places" (Douglas, 1986; see section 11.2.5). The 'shadowed places' created by institutions emerge in part because managers draw upon institutions to classify things into categories. In categorising, they draw boundaries around those things which will be influenced, and those that will be excluded from consideration. The institutional commitments of the GOGCWS managers, mean that water was valued more (as a commodity) than non-economic things.

Analysis of this research differed from contingency theory (which guides most recent research in cost management). While technical (or contingent) explanations of cost management were not rejected, they were clearly viewed as incomplete (Scott, 1987). Institutional theory adds the social and political elements, which were typically absent or de-emphasised in the rationally instrumental approach. One difference between contingency and institutional theory is that institutional theorists believe organisations respond to external pressures by adopting externally-driven accounting system practices. They do this without evidence that efficiency will increase as a result (DiMaggio and Powell, 1983; Gupta et al., 1994; Abernathy and Chua, 1995). Furthermore, institutional theory had been seen in this research as interpretative theory (not functional theory, i.e. contingency theory).

Institutional theory adds a broader (extra-organisational) institutional dimension to the analysis and discussion of this thesis. The framework also led to a clear understanding of intra-organisational processes of cost management. Through such research, it is

hoped that researchers and managers will better able to anticipate the issues and difficulties involved in cost management.

Burns and Scapens (2000) adopted Old institutional economic theory and used old data (1990, 1993). They focused their attention on the cognitive pillar (see figure 2.2). This research utilises neo-institutional economic theory and uses new empirical data (unlike the studies of Geiger and Ittner, 1996; Burns and Scapens, 2000). This research therefore focuses on the regulative pillar and adopts a micro focus (see figure 2.2). Previous management accounting research (utilising institutional theory) neglected empirical data somewhat (e.g. Scapens, 1994; Brunsson, 1994; Carruthers, 1995; Walker, 1998; Spekle, 2001).

The case study method was used for studying complex social processes within a single organisation (Scapens, 1990). The case itself was both exploratory and explanatory (Spicer, 1992). This thesis has demonstrated how a case study approach has helped improve knowledge of cost management and management accounting.

## **12.3 Limitations and future research**

### **12.3.1 Limitations**

This study had several limitations, (some related to theory, - others to empirical work. Much of this research was written from an economic perspective. Other research exists which examines the different models of cost management (e.g. the ABC, ABM and SMA), but limited research exists regarding the development or constraints of cost management. Values and beliefs are two factors which illustrate the emotional aspect of accounting. This is a neglected feature of the social analysis of accounting. Jones and Dugdale (2001) suggest that emotions are important in understanding accounting.

There were several limitations to the empirical work. For example the research was based on the GOGCWS, - a single complex case study. Had a different case study been selected (e.g. the General Organisation for the Greater Alexandria Water Supply), this may have resulted in a different outcome. However, the legal framework and accounting system of all Egyptian water companies are similar to each other. There are also limitations to using case studies as a research method (see section 6.2.1.3)

There was limited access to the organisation itself, which meant that the investigation focused solely on staff working in the GOGCWS. This limited the research to the perception of only the GOGCWS managers. The policy decision-makers and staff who actually controlled the GOGCWS (such as the Central Accounting Institution) were therefore excluded.

Other problems arose from limited access to data. The problem arose from sensitivity of certain data (as mentioned in section 6.2.1.3). These include the political power structure, government decision-making processes, religious and social problems (which reflect the national image) and the water industry itself. This is not a unique problem when gathering research data. Hvidt (1998) in his research (an analysis of water resource planning in Egypt), found a distinct lack of data available. More data could have been obtained for this research had more information from the GOGCWS had been available. A different case study could have been examined had more time been available for fieldwork, (e.g. the General Organisation for the Greater Alexandria Water Supply<sup>329</sup> 'GOGAWS' could have been cited as an example).

The case material presented in chapters seven, eight, nine and ten represented the researcher's own observations and understanding. Much effort was made to ensure the reliability and validity of the study (see sections 6.2.1.3 and 9.3). There was no attempt to portray the accounts as absolute reflections of events. There is always the possibility that a different researcher, using different methodology and method could arrive at different conclusions.

### **12.3.2 Future research**

The main objective of this research was to develop a theoretical explanation of observations of an organisational setting. The primary focus of this research was mainly intra-organisational, and to a lesser degree, extra-organisational. This requires further research.

Government policy exerted much power and influence on cost management systems in the GOGCWS, and this was clear from the analysis (see chapters seven, eight, nine and

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<sup>329</sup> The researcher had interviewed very few of the staff in the GOGAWS by informal way. He failed to get the access to the GOGAWS.

ten). For example, the recommendations of consultants (Black and Veatch International) which aim to set the market-base rationality for the GOGCWS were rejected by the organisation. This can be explored further in order to understand the reasoning of the policy decision-makers who rejected market-based rationality.

It was argued that there was a lack of change in management and cost management at the GOGCWS (see section 11.2.4). It was found that the environment of the GOGCWS constrained managers in their choice of accounting system. The organisation failed to put into practice recommendations as outlined by the consultants. Moreover, there was even a tendency not to disclose such recommendations (coercive isomorphism). It was noted that government policy of the water industry can be explained in terms of the religious beliefs of the Egyptian people (culture). This latter area needs to be developed through future research.

The study raised essential points about problems in the Egyptian water industry (see chapter 7). Further research can focus on alternative ways of paying for water (such as a rateable value for domestic use and metered value for business use). Future research should address the issue of how price systems can be based on cost in order to focus on cost management (efficiency<sup>330</sup>, optimisation and strategy in the GOGCWS). The research showed clearly how the water system operates in Egypt and the GOGCWS (see section 7.2.4 and chapters 8, 9 and 10). However, the research did not devote enough time to the issue of *which* changes could have been implemented in the Egyptian water system, (see section 7.2). One external factor which could motivate the GOGCWS managers in the acquisition and use of cost management systems, is competition and uncertainty of funding. This area would need further investigation.

## **12.4 Reflections on the learning process**

The research process was a learning exercise for the researcher. Valuable practical research experience was gained in the process. There were problems however with the environment in which the research was conducted. Unlike Western environments (where most research methods literature is based), case-based organisational research by doctoral students and other researchers is noticeably absent in Egypt. 'Secrecy' and lack

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<sup>330</sup> This refers to economic efficiency, *not* technical efficiency.

of confidentiality was also a problem. The biggest problem however was with participant understanding of what the term 'research' actually meant. Hence they were unsure of the type of information that the researcher required. Many participants were initially reluctant to express their perceptions and experiences, and limited themselves to such information as number of employees, etc. This was perhaps attributable to the researcher's inexperience. Could this been anticipated, interviews and discussions could have begun with clear explanations of the type of information required.

There were also problems with participant understanding of some the expressions and terms used. This was particularly a problem with lower level staff. Measures had been taken to ensure that the data collection instrument<sup>331</sup> did not contain commercial, economic or accounting jargon. However in follow-up questions, comments and discussions the researcher did tend to use jargon. The researcher had to explain the meaning of many terms (mainly through examples). This naturally took a considerable amount of time. Some participants also responded in unfamiliar slang, some of which was industry-specific. This problem could have been avoided had the researcher familiarised himself with such terms, before embarking on the fieldwork.

Participation and access were secured through the Egyptian government and the GOGCWS itself. Initially the researcher intended to study two organisations (the GOGCWS and the General Organisation for the Greater Alexandria Water Supply), but this did not prove possible. Many of the organisations, approached could not afford the time or were afraid to talk against government policy. During data and interpretative analysis it was difficult to concentrate on one case at a time. There was interplay between the GOGCWS and Yorkshire Water Company. This interplay, though sometimes cumbersome, was helpful. This illustrates the value of looking at more than one case study, (case studies, which are not necessarily case-comparative).

The research makes a significant contribution to cost management and management accounting literature in Egypt. Previously, there has been little research of this kind. With more studies like this, organisations in Egypt may now become more 'research-friendly'.

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<sup>331</sup> (As reported in Appendix two).

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## **Appendix One**

### **A1.1 Letters of the access for the GOGCWS**

**Sheffield Hallam University**

**Pond St.**

**Sheffield S1 1WB**

**March 13th 2000**

**To. Professor El-Sharkawy.**

**Embassy of Arab Republic of Egypt.**

**London**

Dear Professor El-Sharkawy,

I write with respect to Mr. Yasser Abd-El-Naby; MM 8048

Mr. Abd-El-Naby began his studies at the university in February 1999. The school has recommended that Mr. Abd-El-Naby transfer from M.Phil. to Ph.D. and this will be going to the next university research degree committee (16/2/2000); this follows a presentation and examination of the proposal (Accounting Information System in the water Industry: The case of Cost Management). He is currently undergoing the second and final semester of his research training programme having successfully completed the first semester.

Mr. Abd-El-Naby has managed to build his theoretical framework and his empirical work will be on "The General Organisation for Greater Cairo Water Supply". I wonder if you can help him to get access to this company by no later than the beginning of May 2000 in order to finish his thesis on time (no later than the beginning of September 2001).

**Yours sincerely,**

**Professor Anthony J. Berry.**

**Sheffield Hallam University**

**Pond St.**

**Sheffield S1 1WB**

**April 20th 2000**

**To. Professor El-Sharkawy.**

**Embassy of Arab Republic of Egypt.**

**London**

Dear Professor El-Sharkawy,

I write with respect to Mr. Yasser Abd-El-Naby; MM 8048

I have pleasure in enclosing the fieldwork plan for Mr. Abd-El-Naby's study of "Accounting Information Systems in the Water Industry: The Case of Cost Management".

I estimate that he will need up to four months (at least three months) in Egypt. A considerable amount of preparation has been taken from published sources.

This will be an original and useful contribution to the management of the water Industry in Egypt and the world.

**Yours sincerely,**

**Professor Anthony J. Berry.**

**Decision of the chief of Central institution for General Statistical by empowerment  
No. 652 (Year 2000)**

Relating to the researcher/ Yasser Kamal El-Sayed Abd-El-Naby - who works as assistant researcher in the Institute of National Planning and is a university student in England- to do his field work to obtain a Ph.D. on "Accounting Information System in The Water Industry: The Case of Cost Management"

**The chief of secretariat-general sector**

- \* After seeing the presidential of Egypt issued order (No. 2915 / Year 1964) relating to establishing and organising the Institution
- \* And the decision of the Chief of the Institution (No. 231/ Year 1968) related to statistics, consultations and explorations.
- \* And the acceptance of the chairman of the Institution (07/07/1998) for the empowerment to the chief of secretariat-general sector to approve the decisions relating to security of data.
- \* And the letters of general administration of mission (No. 1186, 60/05/2000), (unnumbered, 60/05/2000)

**Decision**

(1) The researcher/ Yasser Kamal El-Sayed Abd-El-Naby -who works as assistant researcher in the Institute of National Planning and the member of foreign mission in England- to do his fieldwork which is mentioned above.

(2) This research involves the Chairman of the Board of directors, financial manager, cost department manager, accountants, auditors, marketing managers, production managers, some production engineers, consultants of the General Organisation for Greater Cairo Water Supply and the organisations which are involved in setting the pricing policy for water in Egypt. It also involves the people responsible for the control of water organisations in the Accounting Central Institution, the general manager of

public relations in the Ministry of public works and water resources and the ministry of Agriculture. It is conditional that this research is approved by their administration security and the data collected will be used for academic purposes only.

(3) The data will be collected according to the statement which is prepared for this purpose and stamped by the Central Institution for General Statistical (being a 23 page questionnaire), taking up to three months only (from the issue of this decision).

(4) The process of this fieldwork is not allowed to start until this decision is issued.

(5) The researcher should submit two copies of the primary results of this fieldwork to the Central Institution for General Statistical and submit two copies of the final results on completion.

(6) This decision comes into action on the date of issue.

Issued in  
20/06/2000

**Sami Hussan Fauat**

**Arab Republic of Egypt**

**The Central institution for General Statistical**

**Record:** R/ AM/ A 674

**Subject:** .....

**Date:** 21/60/2000

.....

**Attached:** .....

**F. A. O the general manager of the general administration of mission within  
Ministry of Higher Education.**

Goodness greeting and following

Referring to the letters (No. 1186, 60/05/2000) and (unnumbered, 13/60/2000) and its attachments concerning the application for the acceptance for the researcher/ Yasser Kamal El-Sayed Abd-El-Naby - who works as assistant researcher in the Institute of National Planning and is a university student in England- to do his fieldwork for his Ph.D. on "Accounting Information System in the Water Industry: The Case of Cost Management". Also referring to the proposal for above, stamped by the security stamp of the Central Institution for General Statistical, and our letter to you (No. 535, 16/05/2000).

We would like to inform that the Central Institution for General Statistical approves that the researcher can do the fieldwork mentioned above. Attached to the decision of the chief of Central institution for General Statistical empowerment No. 652 (Year 2000) which is a requirement for this role. The researcher should submit two copies of the primary results of this fieldwork to the Central Institution for General Statistical and submit two copies of the final results on completion according to No.5 of the decision.

Many thanks

The general manager for general administration of security.

**Arab Republic of Egypt**  
**Ministry of Higher Education**  
**Mission Department**

**Financial supervision and emissary care**  
**The Administration of emissary cares**  
**Department of Scientific Communication**

**Dear Sir, Chairman of General Organisation for Greater Cairo Water Supply**

Goodness greeting and following

I would like to inform you that Mr. Yasser Kamal El-Sayed Abd-El-Naby -who works as assistant researcher in the Institute of National Planning and is a university student in England studying for a Ph.D. in "Accounting Information System in the Water Industry: The Case of Cost Management "- came to Egypt to do his fieldwork which will involve:

The chairman of the Board of Directors, Financial Manager, Cost Department Manager, accountants, auditors, marketing managers, production managers, some production engineers, consultants of General Organisation for Greater Cairo Water Supply and the organisations which are involved in setting the pricing policy for the water in Egypt.

I would like to inform you that the Central Institution for General Statistical agreed that -in the letter to us No. 535 (19/05/2000) and the decision issued at 20/60/2000 - Mr. Yasser Abd-El-Naby may do his fieldwork by condition which is that this research is approved by your administration security. The individual data is by law confidential and the use of this data will be for academic purposes only. The questionnaire consists of 23 pages and stamps from the Central Institution for General Statistical.

There is also permission to give him the following information: -

- Profit and loss accounts, balance sheet and the planning budget.
- Cost accounts.
- The standards of internal and external control.

- A general view of each department, its roles and aims and knowledge of the communication between each department and others for 30 years.

We hope to facilitate his role and give him the data needed.

Many thanks for your contribution.

24/60/2000

Ehab

**The general manager**

**Abo-El-Wafa El-Tiab Abo-El-Wafa**

## **A1.2 The GOGCWS**

### **A1.2.1 The GOGCWS' law and decrees**

#### **A1.2.1.1 General laws and decrees**

- 1- Law No. 47 of 1978 and its amendments; concerning the State Civil Servants System.
- 2- The executive regulation of Law No. 47 of 1978; issued by Decree No. 2 of 1978 and its amendments of the Civil Service Affairs Committee of the Central Agency for organisation and administration.
- 3- Law No. 43 of 1979 and its amendments concerning the Local Administration System.
- 4- Prime Minister's Decree No. 707 of 1979; promulgating the executive regulations of the local administration system law.
- 5- Law No. 53 of 1979; regarding imposing upon government units and public sector to provide basic data for planning of manpower and vocational training in accordance with employment information forms.
- 6- Prime Minister's Decree No. 1309 of 1979; regarding economic general organisations and financing funds of economic nature.
- 7- Law No. 49 of 1977 and its amendments; regarding leasing and selling places and organising relationship between the lessor and the lessee.
- 8- The executive regulations for the law of organising the relationship between the lessor and the lessee.
- 9- Law No. 106 of 1976 and its amendments; regarding directing and organising construction works.
- 10- Law No. 143 of 1981; regarding desert lands.
- 11- State Minister's Decree No. 198 of 1982; issuing the executive regulations of desert lands law.
- 12- Law No. 26 of 1983; regarding sewers and sanitary drainage systems.
- 13- Law No. 16 of 1985; amending provisions for workers in sewers and sanitary drainage.
- 14- Law No. 12 of 1984; regarding Irrigation and drainage.
- 15- Law No. 48 of 1982; regarding the protection of the River Nile and water ways from pollution.
- 16- Law No. 3 of 1982; regarding developmental planning.

- 17- Law No. 59 of 1979; regarding establishment of new developmental communities.
- 18- Development and Housing Minister's Decree No. 600 of 1982; promulgating the executive regulations for law No. 3 of 1982 re-developmental planning
- 19- Law No. 25 of 1992; amending some provisions of law of directing and organising construction works, law of establishing fund to finance economic housing projects and law of developmental planning.
- 20- Circular letter No. 30 of 1987; regarding authorities and responsibilities included in law 47 of 1978.
- 21- Prime Minister's Decree No. 615 of 1986; regarding maximum wages and in-kind in government units, local administrative units, general organisations and authorities.
- 22- Law No. 27 of 1994, regarding arbitration in civil and trade articles.
- 23- Presidential Decree No. 399 of 1987; regarding agreement of regional Cairo centre for international trade arbitration.
- 24- Law No. 144 of 1988; amending law of the central agency for accounting.
- 25- Presidential Decree No. 129 of 1964; promulgating the law of the central agency for accounting.
- 26- Presidential Decree No. 796 of 1972; regarding formation and responsibilities of the Training High Council.
- 27- Law No. 118 of 1964 and its amendments; regarding establishing the central agency for organisation and administration.
- 28- Presidential decree No. 1085 of 1964; concerning organising and determining responsibilities of the Central Departments of the Central Agency for Organisation and Administration.
- 29- Presidential Decree No. 2915 of 1964; concerning establishing the Central Agency for Mobilisation and Statistics.
- 30- Law No. 54 of 1964; concerning the administrative control organisation.
- 31- Presidential Decree of law No. 35 of 1960; concerning statistics and census.
- 32- Presidential Decree No. 1115 of 1974; concerning the Organisation of the Ministry of Finance.
- 33- Presidential Decree No. 1100 of 1974; determining responsibilities of the State Minister of Local Administration and Public Organisations.

#### **A1.2.1.2 Laws Related to management development program**

- 1- Law No. 47 of 1987 and amendments; concerning the state civil servants system.

- 2- The executive regulations of law No. 47 of 1978; issued by decree No. 2 of 1978 of the civil service affairs committee of the central agency for organisation and administration; and amended by decree No. 75 of 1992 of the State Minister for Administrative Development.
- 3- Decree No. 1 of 1979 of the Minister of Administrative Development; concerning employing experts.
- 4- Decree No. 2 of 1979 of the Minister of Administrative Development; concerning employing foreign experts.
- 5- Decree No. 3 of 1979 of the Minister of Administrative Development; concerning employing workers who carry out temporary works.
- 6- Decree No. 4 of 1979 of the Minister of Administrative Development; concerning employing graduated apprentices.
- 7- Law No. 39 of 1975 amended by Law No. 49 of 1982; concerning qualifying the handicapped.
- 8- Law No. 46 of 1972; concerning the state council.
- 9- Decree for laws No. 19 of 1959; concerning validity of provisions of the administrative prosecution on the general organisations.
- 10- Law No. 145 of 1957; concerning liquidation of Cairo Water Company.
- 11- Presidential Decree No. 577 of 1957; concerning Cairo Water utility Department.
- 12- Law No. 61 of 1963; promulgating the general organisations law.
- 13- Presidential Decree No. 4417 of 1965; concerning transfer of Cairo Water Utility Department to Arab stock Company.
- 14- Presidential Decree No. 1938 of 1968; concerning establishing the general organisation for Greater Cairo Water Supply.
- 15- Presidential Decree No. 33 of 1977; concerning re-organisation of units of organisation and administration in the various agencies.
- 16- Presidential Decree No. 70 of 1981; concerning organising public service departments.
- 17- Presidential Decree No. 625 of 1981; concerning establishing follow-up offices in the state administrative units and the public sector units.
- 18- Law No. 53 of 1979; concerning obliging the governmental and public sectors to provide basic data for planning manpower and vocational training.
- 19- Presidential Decree No. 118 of 1964; concerning establishing the central agency for organisation and administration.

- 20- Presidential Decree for law No. 42 of 1967; concerning delegation of authorities.
- 21- Law No. 115 of 1983; amending some provisions of state civil servants law No. 47 of 1978.
- 22- Decree No. 75 of 1992 of the Minister of Administrative development; amending some provisions of the executive regulations of state civil servants law.
- 23- Law No. 34 of 1992; amending some provisions of state civil servants law No. 47 of 1978.
- 24- Decree No. 337 of 1992 of the head of the central agency for organisation and administrative; concerning re-approval of the comprehensive assessment of the organisation's job with related remarks.
- 25- Law No. 5 of 1991; concerning leadership civil positions in the state administrative units and the public sector units.
- 26- Prime Minister's Decree No. 1596 of 1991; promulgating the executive regulation of law No. 5 of 1991.
- 27- Presidential Decree No. 796 of 1972; concerning formation and authorities of the training high council.
- 28- Law No. 39 of 1975; concerning qualifying the handicapped.
- 29- Presidential Decree No. 2420 of 1971; concerning organising the governmental system.
- 30- Presidential Decree No. 72 of 1975; concerning organising the Ministry of Housing and Construction.

#### **A1.2.1.3 Laws Related to financial viability**

- 1- Presidential Decree for promulgating the central agency for accounting law No. 129 of 1964.
- 2- Law No. 127 of 1981; concerning governmental accounting.
- 3- Law No. 105 of 1992, amending provisions of law No. 127 of 1981 concerning governmental accounting.
- 4- Law No. 308 of 1958 and its amendments; concerning administrative sequestegation.
- 5- Law No. 66 of 1963 and its amendments; promulgating the customs law.
- 6- Minister of Finance Decree No. 101 of 1985; concerning customs release procedures for goods imported for ministers, governmental authorities, general organisations and Public sector companies.

- 7- Minister of Finance Decree No. 316 of 1983; concerning the temporary release system on private riding cars.
- 8- Prime Minister's decree No. 615 of 1986; regarding maximum wages and in-kind in government units, local administrative units, general organisations and authorities, banks and public sector companies.
- 9- Minister of Finance Decree No. 228 of 1985; concerning arbitration system in disputes between good's owners and the customs authority.
- 10- Minister of Finance Decree No. 274 of 1986; amending the principles of the temporary release system.
- 11- Presidential Decree No. 186 of 1986; promulgating organising customs exemptions law.
- 12- Presidential Decree for Law No. 1987 of 1986; concerning nullification of taxes and fees annexed with the customs taxes.
- 13- GOGCWS Chairman's Decree No. 101 of 1976; issuing the financial regulations for the budget and accounts.
- 14- Law No. 35 of 1972; concerning protecting of public money.
- 15- Law No. 105 of 1985; concerning the maximum of wages.
- 16- Prime Minister's Decree No. 615 of 1986; concerning the maximum of wages.

#### **A1.2.1.4 Laws related to TSOM program**

- 1- Law No. 140 of 1956; amended by law No. 56 of 1957; amended by law No. 174 of 1960; and Presidential Decree No. 1356 of 1961; and law No. 209 of 1980; and law No. 187 of 1981; and law No. 129 of 1982; concerning occupying public roads.
- 2- Law No. 84 of 1986; concerning public roads.
- 3- Minister of Manpower Decree No. 53 of 1982; identifying enterprises, safety and vocational health agencies and training authorities.
- 4- Minister of Manpower Decree No. 36 of 1982; concerning forms for statistics of injuries serious accidents and diseases.
- 5- Presidential Decree No. 114 of 1984; concerning formation of consulting agencies for safety and vocational health.
- 6- Minister of Manpower Decree No. 2 of 1985; concerning organising work of the high consulting council for safety and vocational health.
- 7- Law No. 57 of 1978; concerning getting rid of pools and swamps; and preventing excavation works.

- 8- Law No. 38 of 1967; amended by law No. 129 of 1982 concerning public cleanliness.
- 9- Law No. 48 of 1982; concerning protection of the River Nile and waterways from pollution.
- 10- Minister of Irrigation Decree No. 8 of 1983; promulgating the executive regulations for law No. 48 of 1982 concerning protection of the River and waterways from pollution.
- 11- Presidential Decree No. 93 of 1962; amended by law No. 48 of 1982 concerning drainage of liquid waste.
- 12- Law No. 10 of 1990; concerning expropriation of real property for public utility.
- 13- Presidential Decree No. 392 of 1979; organising the Egyptian General Organisation for Standardisation and Production Quality.
- 14- Law No. 106 of 1976; concerning directing and organising construction works.
- 15- Law No. 25 of 1992; amending provisions of law of direction and organising construction works, and law of establishing fund for financing economic housing projects, and law of development planning.
- 16- Presidential Decree No. 431 of 1979; concerning organising the Egyptian Committee for Hydraulics and Water Sources and Enterprises for Irrigation and Drainage.
- 17- Presidential Decree No. of 1986; concerning organising the general organisation for geological survey and mining projects.
- 18- Decree No. 48 of 1968; concerning organising necessary precautions to protect the workers during work from health detriments, work and machines hazards.

#### **A1.2.1.5 Laws related to materials management and procurement**

- 1- Law No. 9 of 1983 and its amendments; promulgating the law on organisation of adjudications and bidding.
- 2- GOGCWS Decree published in the official journal on 7/7/1986 edition 153; promulgating GOGCWS adjudication and bidding regulations.
- 3- Law No. 31 of 1984; concerning some principles for disposal of specific state property.
- 4- Law No. 7 of 1991; concerning some provisions related to the specific state property.
- 5- Administrative Decree No. 84 of 1981; establishing a unit for inventory control.

- 6- Prime Minister's decree No. 137 of 1978; concerning establishing units for Inventory Control.
- 7- GOGCWS stores regulations; issued in accordance with GOGCWS board of directors approval in meeting on 18 October 1975.
- 8- Government stores regulations.
- 9- Legal opinion by the general assembly of the state council in its meeting on 6 May 1985; obliging applying the provisions of the agreement of the American grant (USAID) in matters related to choice of contracting parties and contracting procedures in contrary to provisions of law No. 9 of 1983 and its executive regulations.

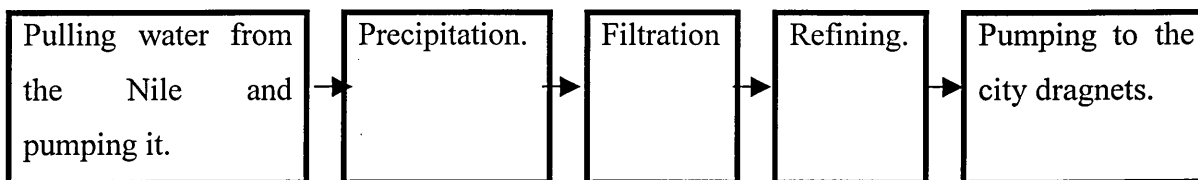
#### **A1.2.1.6 Laws and Decrees related to project management and administration**

- 1- USAID Regulations.
- 2- Law No. 9 of 1988 and its amendments; concerning adjudications and auctions law.
- 3- GOGCWS adjudications and auctions regulations.
- 4- Presidential Decree No. 627 of 1981 concerning establishing Information and Documentation Centres in the State Administrative Agencies and Public Organisations and identifying their responsibilities.
- 5- Presidential Decree No. 4720 of 1979 concerning the system of maintaining state official Documents and method of their publishing.
- 6- Presidential Decree No. 2915 of 1964 and its amendments; Concerning establishing and organising the central Agency for Mobilisation and Statistics.

#### **A1.2.2 Stages of production of fresh water**

The production of fresh water should pass through five main stages. Figure A1.1 shows the stages of production of fresh water.

**Figure A1.1: Stages of production of fresh water**



Source: Based on the GOGCWS (no date source given, c), p. 10- 11.

The following section will give a brief explanation of each stage.

#### A1.2.2.1 Pulling water from the Nile and pumping it

There are some conditions regarding pulled water.

- 1- The pulling should be from flowing (streaming) water not stagnant water by the extension of pipes for the appropriate distance and deep inside the waterway of the Nile.
- 2- The pulling of water should be far away from pollution sources (industrial pollution) or any human crowd on the Nile beach.
- 3- Setting up protective measures on the pulled pipes to prevent any pollutants from the entrance with the pulled water.
- 4- The pulling should be by suitable pump of irrigation water with the designated water quantity of station to produce it.

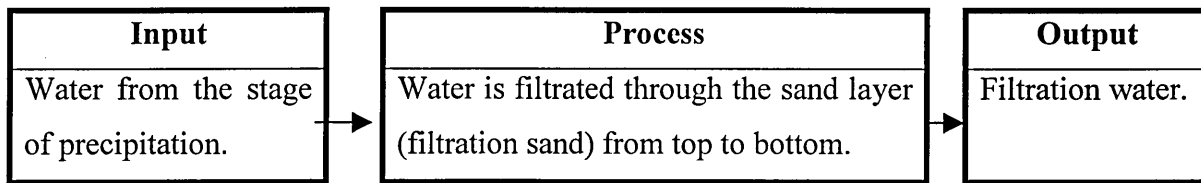
#### A1.2.2.2 Precipitation

In this stage the clarification chemical and preliminary purification (chlorinate) are added and then filtration and finally this goes to the precipitation tank.

#### A1.2.2.3 Filtration

This stage can be illustrated in figure A1.2.

**Figure A1.2: Filtration stage**

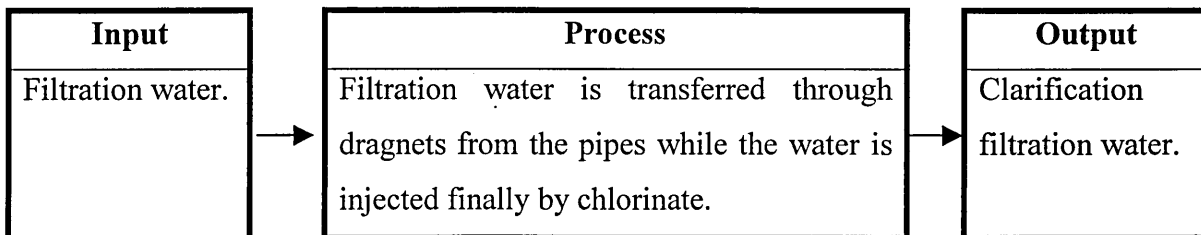


Source: Based on the GOGCWS (no date source given, c), p. 11.

#### A1.2.2.4 Refining

Figure A1.3. will illustrate this stage.

**Figure A1.3: Refining stage**



Source: Based on the GOGCWS (without date, c), P. 11.

#### **A1.2.2.5 Pumping to the city dragnet**

Pumping to the city dragnet is through earth filtration pumps and is pumped to the customer by appropriate pressure which ranges between 60-100 m.

### **A1.2.3 Organisation structure of the GOGCWS**

According to the organisation structure (see figure A1.4), there are 6 central administrations. The following section will illustrate the function of board of directors of the GOGCWS and these 6 central administrations.

#### **A1.2.3.1 The function of the board of directors of the GOGCWS**

The board of directors of the GOGCWS represents the top of the organisation structure and the important functions of it are as follows:

- 1- To suggest the general policy of the institution which the organisation manages according to the scope of the general policy of the state.
- 2- To suggest project development plans and programs for carrying them out.
- 3- To set the internal rules and the decisions related to finance and administration of the GOGCWS and its workers.
- 4- To suggest the tariff of water sold.
- 5- To approve the annual budget plan of the GOGCWS and financial statement.
- 6- To look at the periodic reports which are introduced for following up the work and its financial position.

#### **A1.2.3.2 The functions of the chief of the central administration for projects**

The chief of the central administration for projects is responsible for the supervision of preparation for designs for new projects and vertical or horizontal expansion for present projects.

#### **A1.2.3.3 The functions of the chief of the central administration for stations**

The chief of the central administration for station is responsible for the supervision of the work of the main stations, which is responsible for treatment to clean and filter water. He is also responsible for the supervision of all the requirements to run the station, and maintenance.

#### **A1.2.3.4 The functions of the chief of the central administration for dragnets**

The chief of the central administration for dragnets is responsible for the supervision of the work of the stations, projects for pressure development, operational programs and the maintenance of the dragnets.

#### **A1.2.3.5 The functions of the chief of the central administration for financial affairs**

The chief of the central administration for financial affairs is responsible for the supervision of preparing the financial plan for the GOGCWS and following up the carrying out of it. He is also responsible for preparing the organisation's budget and financial statements.

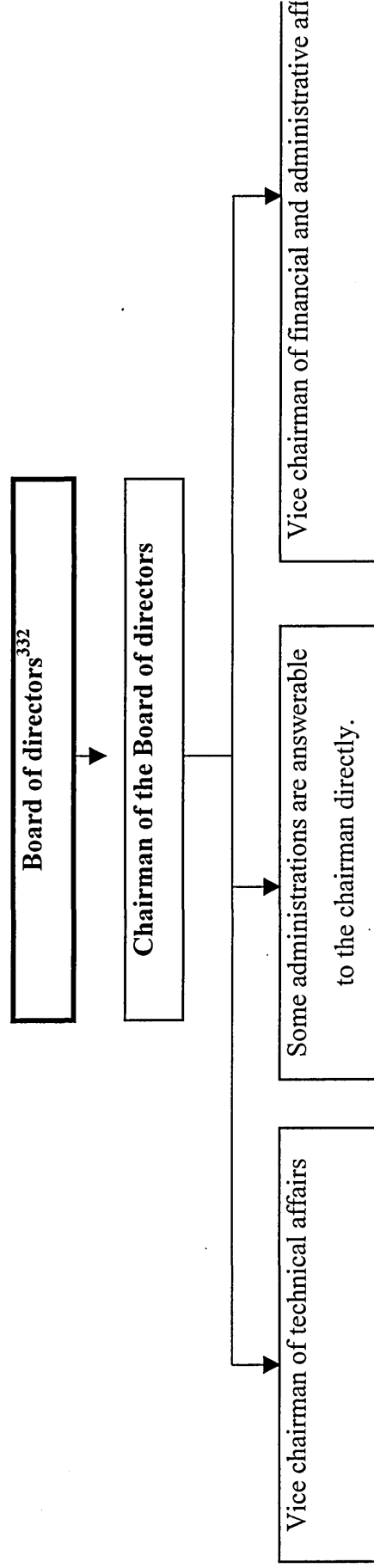
#### **A1.2.3.6 The functions of the chief of the central administration of managerial affairs**

The chief of the central administration of managerial affairs is responsible for the supervision of workers affairs such as; salaries, wages, general secretaries, all administrative aspects and preparing the workers plan for the GOGCWS.

#### **A1.2.3.7 The functions of the chief of the central administration for legal affairs**

The chief of the central administration for legal affairs is responsible for liaising with legal authorities and gives formal (legal) opinions in all subjects that the board of directors enquires about

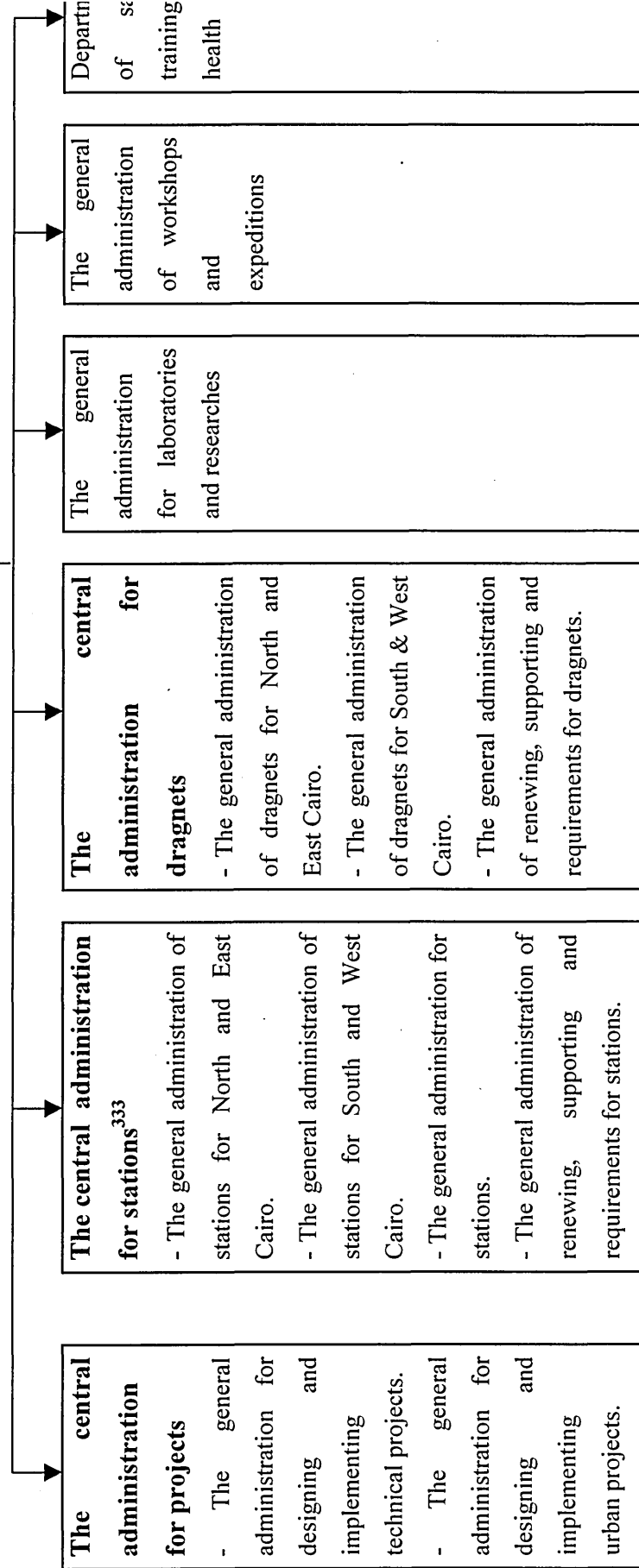
**Figure A1.4: Organisation Structure of the GOGCWS**



<sup>332</sup> The Board of directors consists of (according to the decision of the Egyptian president issued 'no. 1683 year 1968' to establish the GOGCWS and the decision of the Egyptian president issued 'No. 455 year 1974':

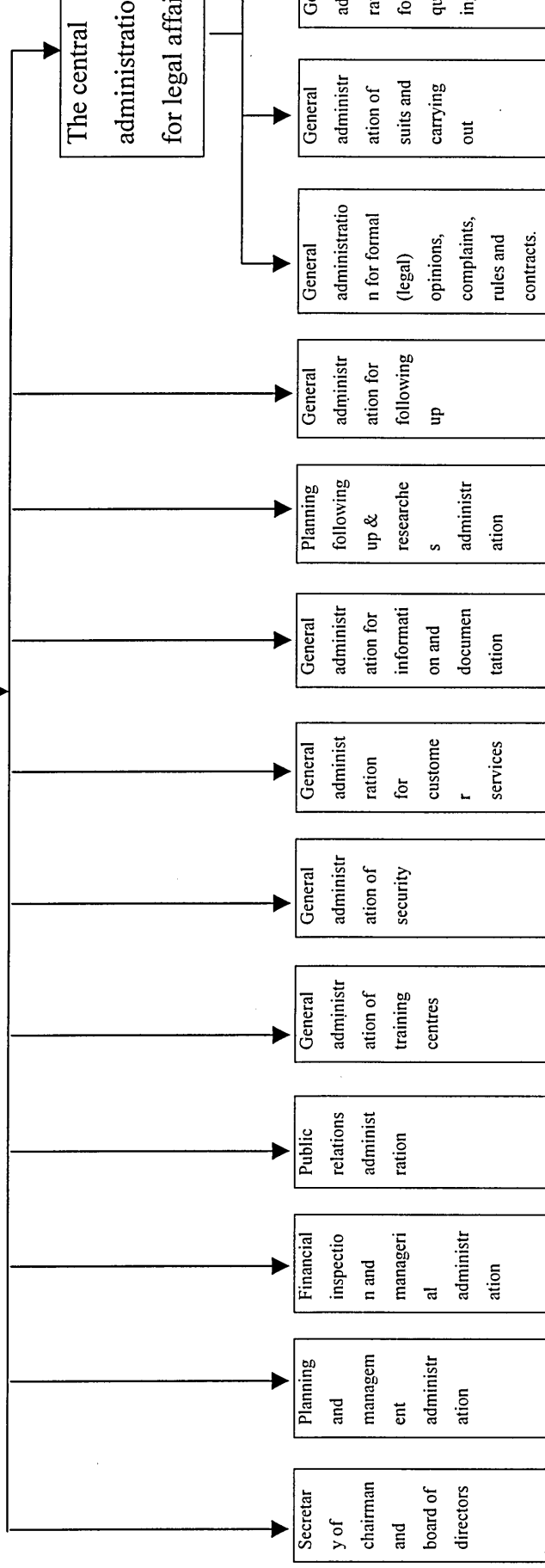
- Chairman of the board of directors and vice-chairman of the board of directors (the Egyptian president appointed them and determined their salary).
- Vice chairman of financial and administrative affairs (according to the decision of the Egyptian president issued No. 455 year, 1974).
- The management consultant advisor of local govern and public organisations.
- The vice chairman of the General Organisation for drinking water.
- The vice chairman of General Organisation for Sewerage.
- The under secretary of financial and economic and foreign trade chosen by their Minister.
- The under secretary of the Ministry of Housing related to the Public utility.
- The manager of housing of Cairo City.
- The manager of housing of Kalubia city.
- The manager of housing of Geza city.
- The deputy of Health Ministry chosen by their minister.
- The projects manager of the GOGCWS.
- The stations manager of the GOGCWS.
- The dragnets manager of the GOGCWS.
- Two professors of universities whose work is connected with drinking water, these two professors are chosen by the Ministry of Education for two years with the possibility of re-appointment.
- Three of the previous chairman of the GOGCWS, who are chosen by the governor of Cairo for two years with the possibility of re-appointment.

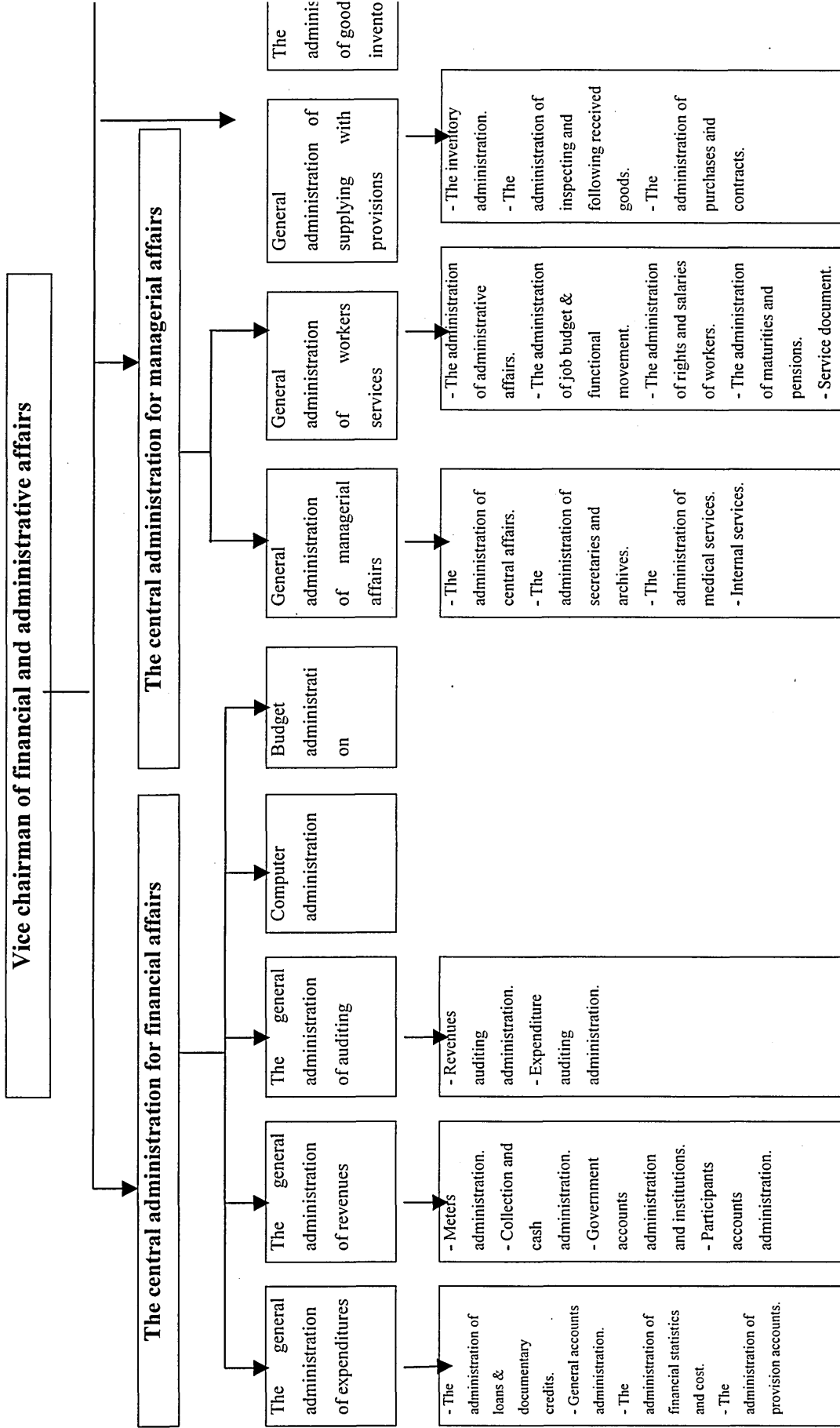
## Vice chairman of technical affairs



<sup>333</sup> The GOGCWS has 13 stations as follows; Ameria drinking water station, Roughd El-Farag drinking water station, Mostured drinking water station, Shoubra El-Kama drinking water station, El-Rouda drinking water station, El-Geza drinking water station, Gezera El-Dahab drinking water station, Embaba drinking water station, El-phustat drinking water station, El-Madi drinking water station, Shamal Hellwan drinking water station, Kaver El-help drinking water station and El-tabien drinking water station (The GOGCWS "without date a": 120).

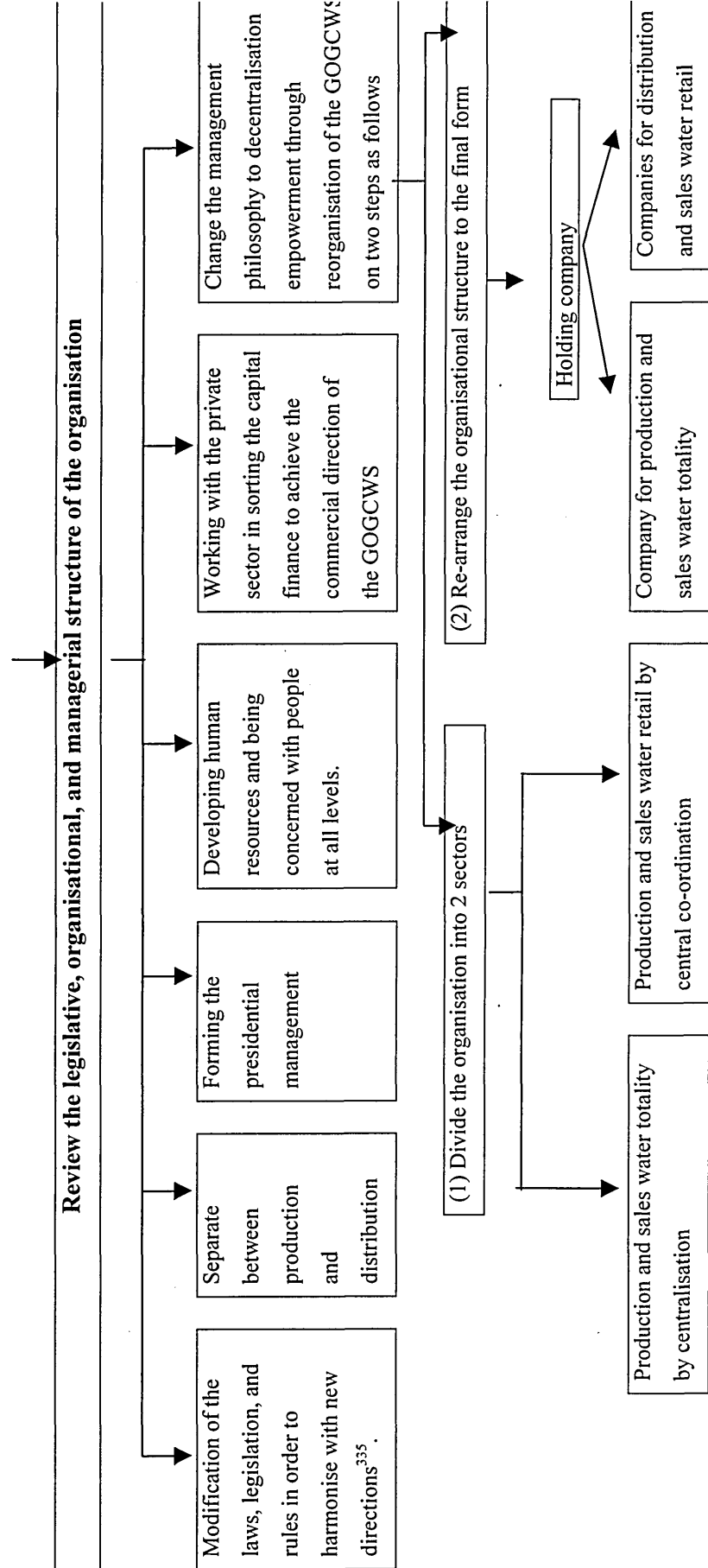
Some administrations are answerable to the chairman directly.





Source: The organisation structure was taken from the administration of organising and management at the GOGCWS.

Figure A1.5: Summary of the suggested solutions<sup>334</sup> for The GOGCWS



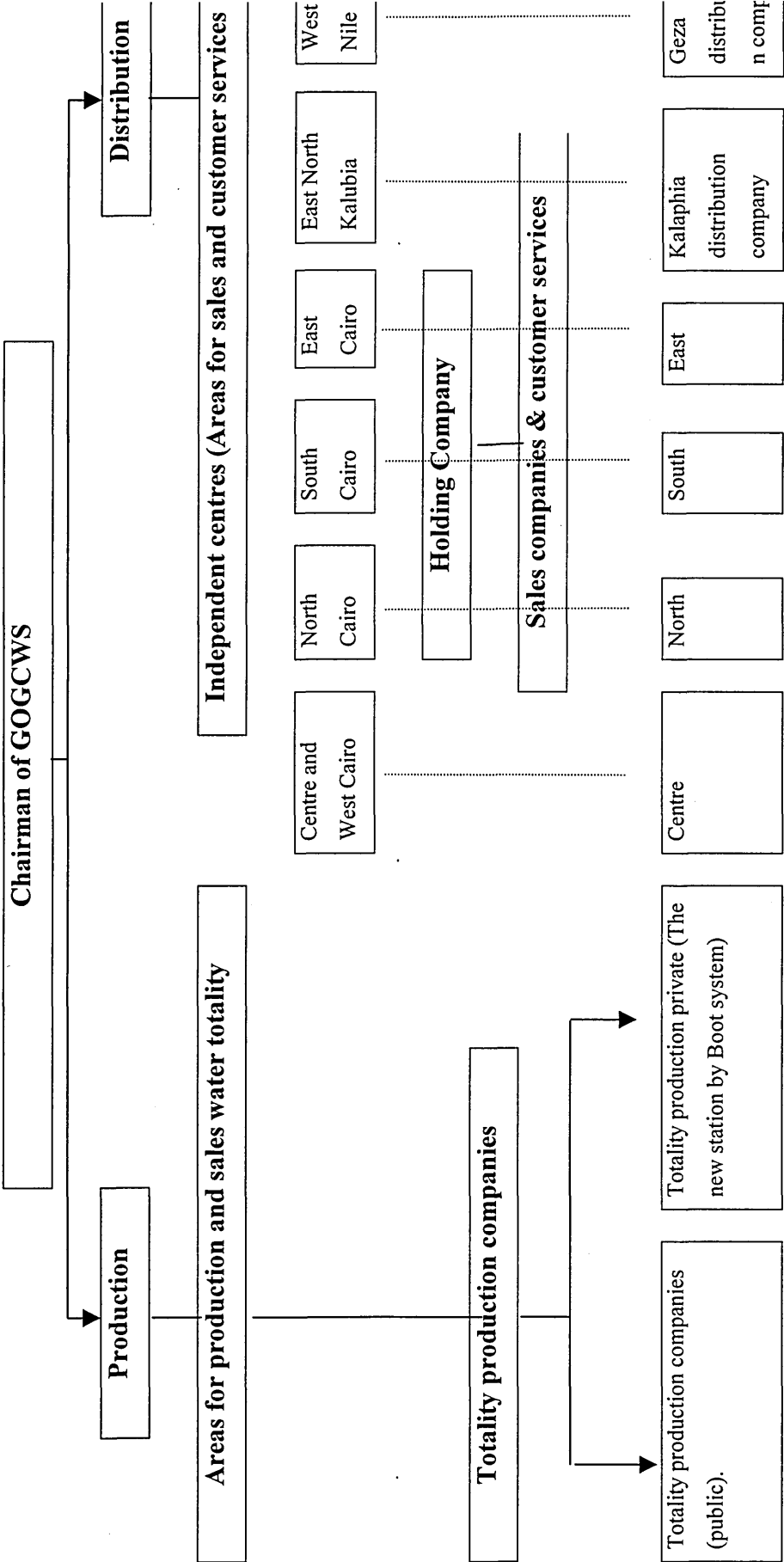
Source: based on the GOGCWS, (no date source given, a), p. 45: 46.

<sup>334</sup> Note: The GOGCWS wrote that these suggestions built on knowing the view of the owners of joint benefits with the GOGCWS through (a) Personal interviews with members of the board of directors, managers, workers, employers of the GOGCWS to find their view and their expectation (b) Interviews with central government, local government, popular committees institutions in Great Cairo City in order to find their expectation for the future of the GOGCWS, (c) Interviews with most important customers to find their evaluation and expectation for the GOGCWS and (d) Sample of domestic customers of different level to find the previous aims. The researcher when he was doing documentation analyses found most of all these suggestions in Black and Veatch International (1997).

<sup>335</sup> Egypt is transferring from the central system to the economic system market.

These stages can be illustrated by the following details in figure A1.5.1.

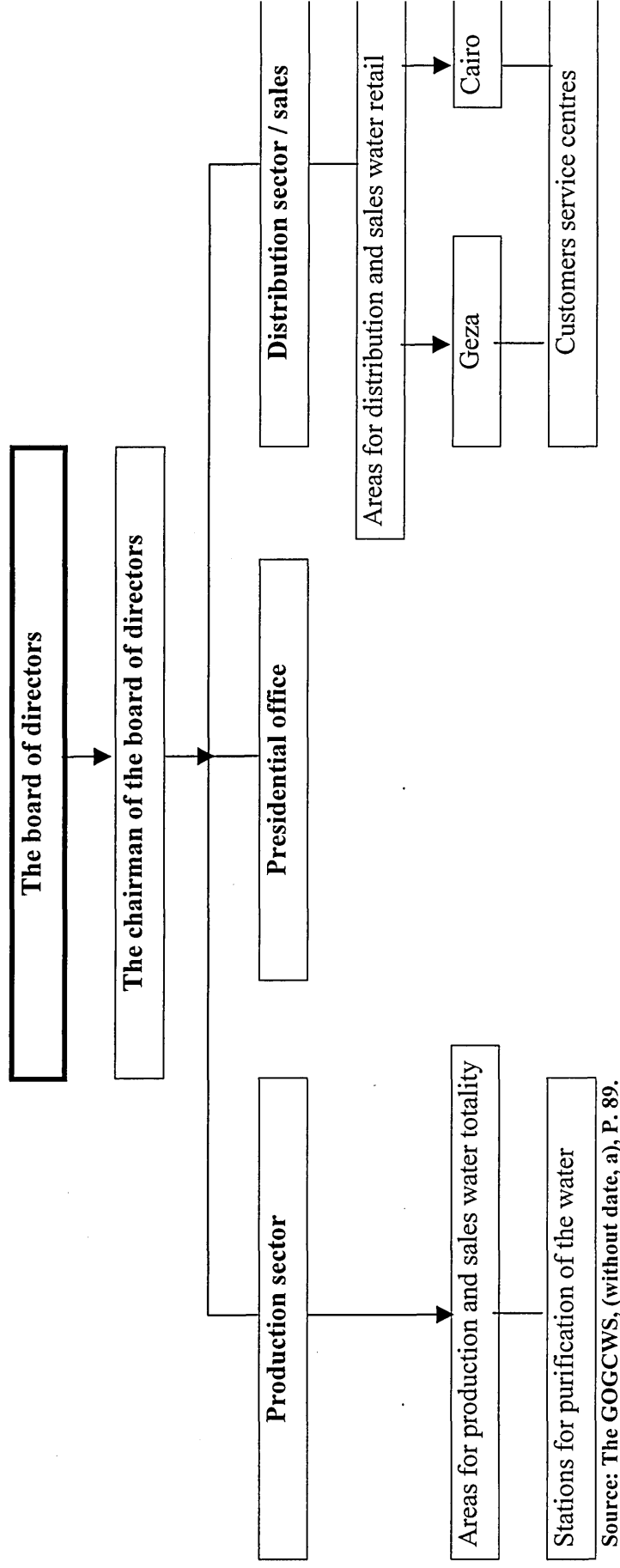
Figure A1.5.1: Scenario of the Greater Cairo



Source: The GOGCWS, (no date source given, a), p. 32.

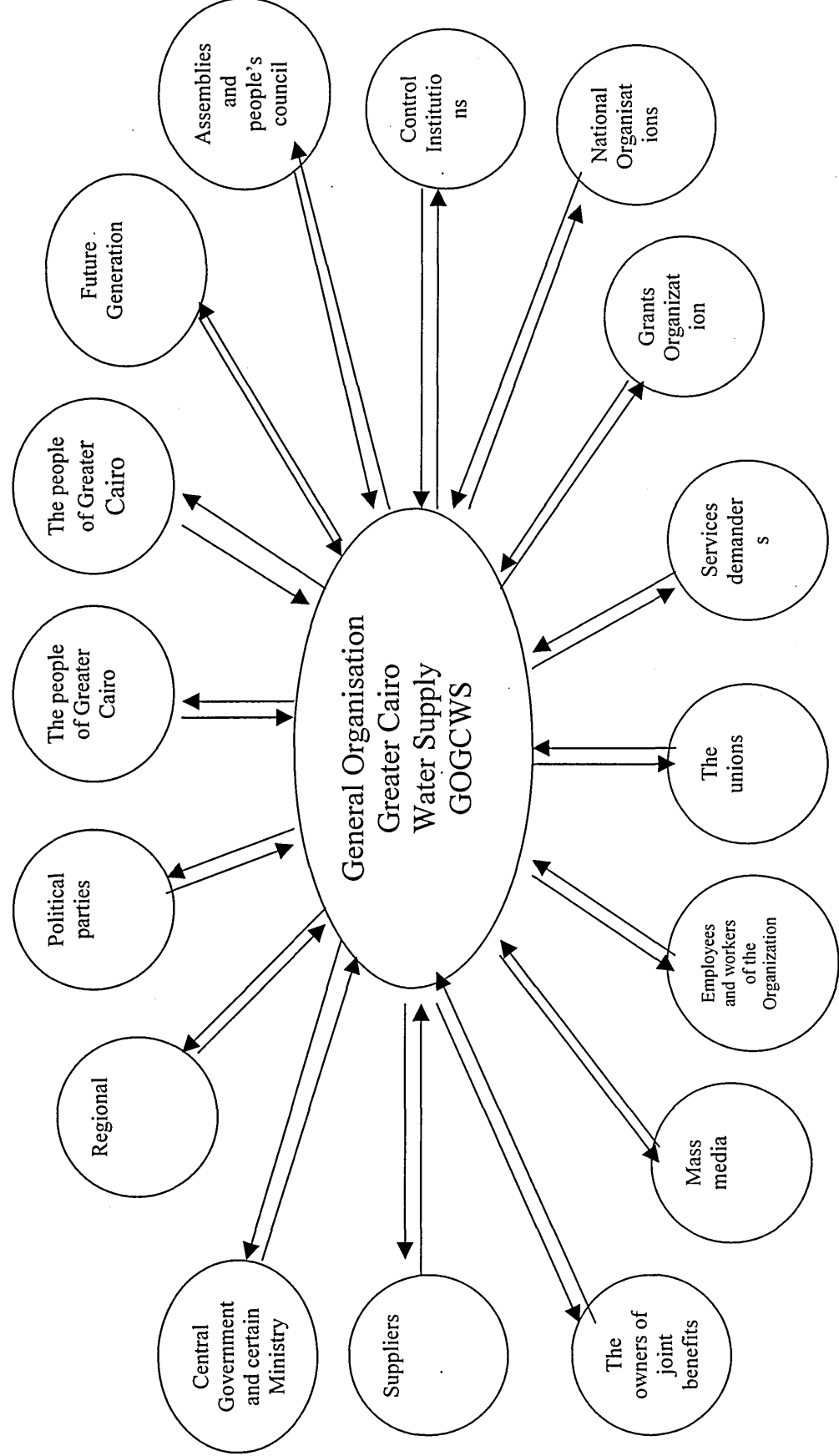
Figure A1.5.2 shows the general plan of the organisation structure at the re-organisation stage.

**Figure A1.5.2: The plan of the organisational structure at the re-organisation stage**



Source: The GOGCWS, (without date, a), P. 89.

Figure A1.6: The environment of the GOGCWS



Source: The GOGCWS, (no date source given, a), p. 24

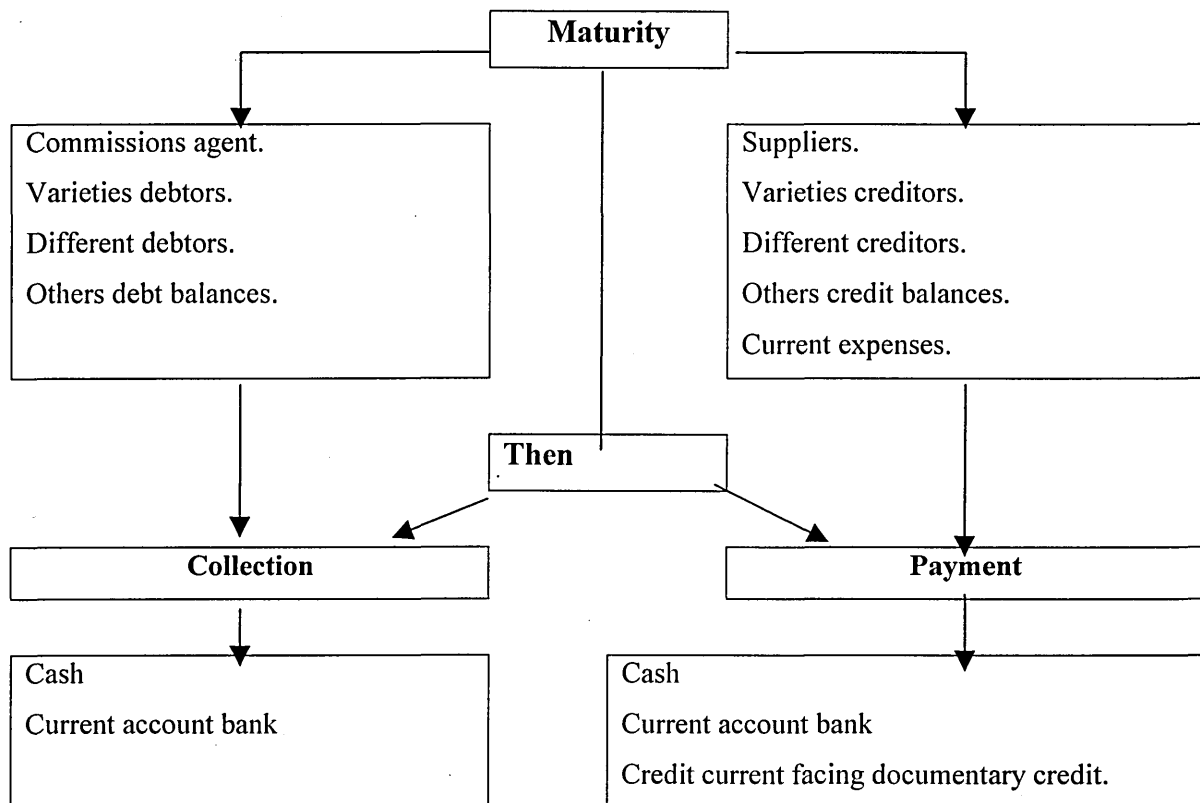
#### A1.2.4 The Unified Accounting System

##### A1.2.4.1: The general rules for recording the economic organisation's transactions according to the Unified Accounting System

1- All records of the economic organisation's transactions are recorded according to the Accounting index to integrate between the accounts of the economic organisation and the national accounts.

2- Separate between the maturity and payment or collection to prepare the cash budget<sup>336</sup>. According to this rule the transaction should be recorded as on credit even if cash and then one of the cash accounts is used when recording the payment or collection as shown in figure A1.7.

**Figure A1.7: The rules of transactions of the Unified Accounting System**



Source: Based on the GOGCWS, (no date source given, b), p. 19.

#### A1.2.4.2 The Accounting index

##### *The aim of the accounting index*

The aim of the accounting index is to help the accounting system to achieve its aim.

<sup>336</sup> Cash budget is one of the statements, which GOGCWS has to prepare.

### ***The basis of the establishment of the accounting index***

There are three bases on which the accounting index is based and these three bases are as follows: (a) classification of accounts, (b) code of accounting and (c) explaining the core idea of each of them.

#### ***A. Classification of accounts***

All accounts which have a connection with the activity of the economic organisation are enumerated and then these accounts are classified into homogeneous groups in order to satisfy the traditional requirements of financial accounting and prepare the national accounts.

Balance sheet accounts are classified to enable the preparation of the financial position and the statement of resources and uses, so we can know the contents of the capital and the financial sources of it.

The result accounts are classified into two groups: uses (expenses) and resources (revenues). The uses are classified as wages, general expenditures and transfers, and the revenues are divided into the current activity revenues and financial investments' interests of transfers. According to this classification the result of the economic organisation can be known (profit or loss).

In addition to the classification of the uses, classification of the accounts depends on the nature of them. It is divided into groups such as: production centres, production services centres, distribution services centres, administrative and financial services centres and capital process centres. This division shows the connection between financial accounting and cost accounting.

#### ***B. Accounts code***

The Unified Accounting System takes the number code to ensure accuracy, ease of accounting direction, collection of accounting information and classification of it. The number code takes six levels as follows (see table A1.1);

**Table A1.1: Accounts code of the level of general accounts**

The code	Accounts
1	Assets.
2	Liabilities.
3	Uses.
4	Resources.
5	Production centres control.
6	Production services centres control.
7	Distribution services centres control.
8	Administration and financial services control.
9	Capital process services control.

Source: the GOGCWS (no date source given, b), P. 15

The first level is the level of general accounting and this level is coded from 1 to 9

The second level - This level represents the general account and is coded by two numbers (starting from 11 to 99).

The third level - This is the subsidiary account and three numbers (111: 999) code it.

The fourth level - This is the branch account and is coded by four numbers (1111: 9999).

The fifth level - This is the minor account and is coded by five numbers (11111: 99999).

The sixth level - This is the analysis account level and is coded by 6 numbers (111111: 999999).

### **C. Explanation of the core idea of the (1) assets and their classification and (2) uses and their classification.**

#### ***Assets and their classification***

##### **Assets 1**

**Fixed assets 11.** These are transferred property or not transferred and tangible or acquisition or produced by the organisation for sales or transferred. Fixed assets include lands, buildings, constructions, installation, roads, machines and equipment.

**Projects on execution 12.** These include the fixed asset in preparation stage.

**Inventory 13.** This has all tangible or non-tangible goods, which the organisation buys for the production process to make complete products, or if the financial period is

finished and they are not completed (uncompleted products). Also it has all goods which the organisation buys to re-sell without any production process.

**Long period lending 14.** These are loans, which the organisation gives to other companies to be repaid over one year.

**Financial investments 15.** These are the investments of the economic organisation in governmental stock and national or international stocks.

**Debtors 16.** This represents the organisation's rights against other organisations resulting from the business activity of the organisation. It includes agent's commissions, receiving payable and varieties debtors.

**Different debts accounts 17.** This represents the organisation's rights against other organisations resulting the non-normal activity of the organisation. It includes different debtors, other debt balances and payable allocation operational revenues.

**Cash in the treasury and banks 18.** It includes two accounts: (a) cash in the treasury. The Unified Accounting System distinguishes between the cash in treasury of the unit and the cash in the subsidiary' treasury of it. And (b) current account bank. The Unified Accounting System distinguishes between money, which is the result of the process, and money, which is the result of capital process.

#### **A1.2.4.3 The book group related to cost**

This represents the records and books, which are used in the administration of financial statistics and cost. These records and books are illustrated as follows

***The records and books related to the fixed assets.*** These include (a) Statistical book which records in it the direct bounds (bills) which comes in daybooks (journal) and the excluded assets from the goods requirements which come from the financial control on inventory administration. (b) Detailed book for the cost of fixed assets and its depreciation. (c) Special book for the distribution of fixed asset on the different stations and production centre for each asset alone.

***The records and books related to wages.*** These are represented by the following records (a) Analytical records for wages to show the detailed wages according to production centres and stations. (b) Social insurance book. (c) Book for individual items. (d) Total wages book.

***The records and books related to goods requirement.*** These are represented by the following: (a) Records for recording the excluded goods requirements and relating to the fixed assets. (b) Book recording within it all items of goods requirements.

***The records and books related to service requirements.*** This includes as follows: (a) Service requirement book, which has, recorded within it, all items of service requirements<sup>337</sup>. (b) Current transferred expenses book. (c) Apportionment current transferred book. (d) Total book which includes the calculation of cost centres for current transferred expenses apportionment current transferred as total.

***The archives book.*** This represents the following books: (a) Cash book daily entry, which has, recorded within it, all cash day-enter, which come from the central accounts administration. (b) A daily entry book which has, recorded within it, all the banks' journals which come from the central accounts administration.

***Other records.*** Represented as follows: (a) Statistical records which have recorded within all data related to the cost of  $m^3$  of the water. (b) Record which has, recorded within it, all data sent to different external organisation.

***Comments of the Central Accounting Institution regarding the book groups***

The cost system lacks some forms and data such as; operation order and cards, average burdening for wages and expenses.

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<sup>337</sup> Service requirements represent the given services from others which are a requirement for the production process, such as expenses of maintenance, expenses of publicity and advertising, hiring out equipment and means of transportation, etc.

## Appendix Two

### A2.1 The Questionnaire and Interview guide

#### Introduction

This is an investigation for the Ph.D. research which I am currently preparing at Sheffield Hallam University (U.K.). The research examines the role of cost management in the Egyptian Water Industry. The Study aims to discover and describe the relationship between cost management and cost structure; the current cost structure for the provision of Egyptian Water Services and the rationale of it; methods of cost accounting that were and are used; and finally, the role of accounting in controlling the Egyptian Water Industry.

#### *The data will be collected through:*

1. Reading and analysing relevant documents: annual reports, financial plans and budgets, progress reports, description of and instruction for cost accounting systems, policy documents- the guide informing managers what they should do when certain things happen-, policies and rules procedures, government rules, 5 years financial statements and other suitable available documents.

2. Personal interviews and questionnaires: this will divide into three phases (steps):

A- The first step: conversation interview will be conducted with planner's/policy decision makers within such as; Ministry of Irrigation (Ministry of Public Works and Water Resources); Ministry of Agriculture; Government advisor; the people who set the price of the water Industry; and finally, conversation interview with the accountants responsible for controlling all the companies of the Water Industry. The aim of this step is to build knowledge basis of the Egyptian Water Industry.

B-The second step: Personal interviews and questionnaires- please see the questionnaires and the interview guide which is attached to this introduction- will be conducted on-site during one or two visits with senior managers, financial directors and managers of cost department of all the Water companies in Egypt.

C- The third step: personal interviews and questionnaires will be conducted during an on-site visit in Great Cairo Water Public Enterprise- A major case study of this research- with relevant persons at various levels of management (senior manager, cost directors, financial directors/ controllers, accounting staff, general marketing manager and general production managers); consultants and engineering's Great Cairo Water Public Enterprise.

Interviewing will be supported by tape-recording which will capture much more than the researcher's memory. Tape-recording will be used where possible provided the interviewee agrees. It is anticipated that the use of a tape-recorder will increase rapport between the interviewer and interviewee.

I should emphasise that the data will be used for academic purposes only and will not be released-under any circumstances- for any other use. Confidentiality will be assured. I appreciate that there are many demands on your time, but the more complete response will ensure a high quality of research.

### **Structure of the questionnaire**

#### *1- General background.*

#### *2- Cost practice*

A. Control structure and responsibility accounting.

B- Planning and control procedures.

C- Product costing (System background - system description - cost recognition and measurement - reporting).

D- Reporting.

#### *3- Cost management policies.*

#### *4- Company environment.*

## General Background

**Section 1: About The Respondent.**

(1) Name of person filling the questionnaire: .....

(2) Job Title: .....

(3) Job Description: .....

.....

(4) Length of time with company: .....

(5) Length of time with company at the present job: .....

**Section 2: About The Company.**

(1) Name of the company: .....

(2) Established date of the company: .....

(3) Business activities in your company: .....

(4) For the last financial year, would you please indicate:

Total sales.	
Total assets.	
No. of employees.	

(5) Who are your customers? Please, describe the company sales to each customer:

Category Of Customer	Company Sales					
	Less than 10%	10-20%	20-40%	40-60%	60-80%	80-100%
Domestic						
Public (schools, hospitals,...)						
Business (agriculture, industry,...)						
Others, Please specify: ..... .....						

**Section 1: Control structure and responsibility accounting.**

Q1: How do you describe the strategy of your company? (Please tick the appropriate box)

- ☐ As a unitary organisation
 ☐ As a multi-divisional organisation
 ☐ As a holding company
 ☐ Other, please specify .....

Q2: How is the company organised? Please tick the appropriate box)

- ☐ According to the nature of products produced
 ☐ According to the nature of geographic areas
 ☐ According to the nature of the production process
 ☐ According to the nature of the markets served
 ☐ Other, please specify .....

Q3: How do you describe the control structure at your company/division? (Please tick the appropriate box)

- ☐ Investment centre
 ☐ Profit centre
 ☐ Contribution centre
 ☐ Cost centre
 ☐ Other, please specify .....

Q4: How does the control structure fit within the organisation structure? (Please tick the appropriate box)

- ☐ A good fit
 ☐ Reasonable fit
 ☐ Problematic fit

**Section 2: Planning and control procedures.**

Q1: Which one of the following formal planning and control approaches are used in your company? (Please tick the most appropriate answer for each process, in the table below:

Planning and control process	is in use now	is planned to be used in the future	was used in the past, but not now	is not used or planned to be used at all	I do not know
Operational budgeting procedures					
Capital budgeting procedures					
Zero based budgeting approach					
Linear programming model					
Transfer pricing model					

Planning and control process	is in use now	is planned to be used in the future	was used in the past, but not now	is not used or planned to be used at all	I do not know
Focus on short run marginal cost model.					
Focus on medium run marginal cost model.					
Focus on long run marginal cost model.					
Product costing (Full absorption costing).					
Product costing (Activity based costing).					
Activity-based management (ABM).					
Throughput accounting.					
Life-cycle costing.					
Value-chain approach to strategic cost management.					
The accounting assessment of competitive position.					
Qualitative performance measures.					
The balanced scorecard.					
Benchmarking of costs against other companies.					
Target costing.					
"Kaizen" cost management (formal, regular cost reduction programmes).					

If you have any comment, please write these comments below:

.....

.....

.....

.....

Q2: Could you tell me about any other existing formal planning and control process used in your division/business unit not mentioned above?

.....

.....

.....

.....

Q3: How do you describe the annual budgeting process at your company? (Please tick the appropriate box)

- |                                              |                                                                                                                          |                                               |                                                                  |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------|
| <input type="checkbox"/> Top-down procedures | <input type="checkbox"/> Top management set parameters: organisation units prepare budgets: top management adjust/decide | <input type="checkbox"/> Bottom-up procedures | <input type="checkbox"/> Discussion and participation procedures |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------|

### Section 3: Product costing.

#### 3.1 System background.

Q1: How was the cost accounting system developed? (Please tick the appropriate box)

- |                                   |                                     |                                           |                                            |                                                       |                                                       |
|-----------------------------------|-------------------------------------|-------------------------------------------|--------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| <input type="checkbox"/> In-house | <input type="checkbox"/> Contractor | <input type="checkbox"/> Software package | <input type="checkbox"/> Customer prepared | <input type="checkbox"/> Borrowed from another agency | <input type="checkbox"/> Others, please specify ..... |
|-----------------------------------|-------------------------------------|-------------------------------------------|--------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|

Q2: Is this cost system adequate for your needs? (Please tick the appropriate box)

- |                                   |                                    |                                               |                                     |                                    |
|-----------------------------------|------------------------------------|-----------------------------------------------|-------------------------------------|------------------------------------|
| <input type="checkbox"/> No needs | <input type="checkbox"/> Few needs | <input type="checkbox"/> About half our needs | <input type="checkbox"/> Most needs | <input type="checkbox"/> All needs |
|-----------------------------------|------------------------------------|-----------------------------------------------|-------------------------------------|------------------------------------|

Q3: Has there been a major revision to the method used in your company for estimating and measuring product cost? For example a shift from FAC to ABC. (Please tick the appropriate box)

- |                              |                             |                                        |
|------------------------------|-----------------------------|----------------------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> I do not know |
|------------------------------|-----------------------------|----------------------------------------|

• Is a major revision planned?

- |                              |                             |                                        |
|------------------------------|-----------------------------|----------------------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> I do not know |
|------------------------------|-----------------------------|----------------------------------------|

• Is a major revision in process?

- |                              |                             |                                        |
|------------------------------|-----------------------------|----------------------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> I do not know |
|------------------------------|-----------------------------|----------------------------------------|

• Has the introduction of the new product costing method led to any of the following changes:

- |                                     |                                                        |                                                 |                                                                                        |                                                |
|-------------------------------------|--------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------|
| <input type="checkbox"/> No changes | <input type="checkbox"/> Changes to production process | <input type="checkbox"/> Changes to product mix | <input type="checkbox"/> Changes in the structure of responsibility and accountability | <input type="checkbox"/> Other, please specify |
|-------------------------------------|--------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------|

Q4: In your view, do you consider the present method of estimating and measuring the product cost and practice as; (Please tick the most appropriate answer)

	Estimation	Measurement
Straightforward and simple		
Seems a reasonable compromise		
Needs significant change		
Needs simplifying		
Other, please specify .....		
.....		

If you have any comment, please write these comments below:

.....

.....

.....

.....

Q5: What is the estimated number of accounting/finance personnel directly involved in operating the cost system?

.....

Q6: What is the computer based configuration of the cost accounting system in your company?

☐ Terminals tied to the mainframe
 ☐ Mostly PC applications
 ☐ System not automated
 ☐ Other, please specify .....

Q7: What are the principal methods of data entry?

☐ Manual
 ☐ Batch interface
 ☐ On-line-mainframe
 ☐ Personal computer-stand alone
 ☐ Personal computer-connected to large PC.
 ☐ Other, please specify .....

Q8: What are the sources of funding for the services/operations to which the cost accounting system relates?

☐ Appropriated
 ☐ Non-appropriated
 ☐ Reimbursable
 ☐ Revolving
 ☐ Other, please specify .....

### 3.2 System description.

Q1: Of what type is this cost accounting system?

☐ Job/worker order
 ☐ Process cost
 ☐ Activity cost
 ☐ Other, please specify .....

Q2: How do you measure the cost of resources consumed? (Please tick the appropriate box)

☐ Actual cost                      ☐ Standard cost                      ☐ Other, please specify .....

Q3: What standards are used for your cost accounting activity? (Please tick the appropriate box)

☐ Agency standards                      ☐ government cost accounting standards                      ☐ Generally accepted accounting principles                      ☐ Other, please specify .....

Q4: What statements describe how data from this cost accounting system are primarily used?

	Describe		
	Yes	No	I do not know
To manage an activity or a program			
To measure program performance			
To determine selling price/ user fee or inter/intra agency service charge			
To value inventory or cost sales			
To satisfy legislative requirements			
Other, please specify .....			

Q5: To what extent is cost accounting data used in budget formulation? (Please tick the appropriate box)

☐ Not used at all                      ☐ Rarely used                      ☐ Usually the basis of estimation

Q6: What financial management systems/functions are integrated with this cost accounting system? (Please check all that apply)

General ledger	
Program accounting	
Payroll	
Inventory control	
Property, plant and equipment	
Other, .....	
Not applicable	

Q7: Are the elements of cost in your cost accounting system reconciled with your general ledger control accounts (e.g., labour to accrued payroll accounts)?

☐ No      ☐ Monthly      ☐ Quarterly      ☐ Semi-annually      ☐ Annually      ☐ Other, please specify

Q8: If you consider that changes is needed with the method of product costing utilised in your company, Please indicate your reasons:

.....

.....

.....

.....

### 3.3 Cost recognition and measurement.

Q1: What is the product/service cost measurement practices in use at your company?

(Please tick the appropriate box)

☐ Full absorption costing model (FAC)      ☐ Activity-based costing model (ABC)      ☐ Direct costing model (DC)      ☐ Marginal costing model (MC)      ☐ Other, please specify .....

Q2: What depreciation methods are used in your cost accounting system?

☐ Straight line      ☐ Accelerated      ☐ Usage related      ☐ None      ☐ Other, please specify .....

Q3: How does the system treat gains/losses upon disposal of assets?

☐ Add to basis of new asset      ☐ Adjustment to depreciation      ☐ Treated as miscellaneous income or expense      ☐ Treated as general and administrative expense      ☐ Other, please specify .....      ☐ Not applicable

Q4: Does your overall cost accounting system have a formalised method of distinguishing between direct and indirect costs?

☐ Yes      ☐ No      ☐ I do not know

If yes, how are they distinguished and measured?

.....

.....

.....

Q5: Does your system have any Service Centres or other intermediate cost pools?

☐ Yes      ☐ No      ☐ I do not know

If yes, how are these cost allocated to overhead cost pools or final cost objects?

.....

.....

.....

Q6: Do you have operational overhead cost pools in your cost accounting system?

☐

Yes

☐

No

☐

I do not know

If yes, how are these costs allocated?

.....

.....

.....

Q7: Do you have General and Administrative cost pools in your cost accounting system?

☐

Yes

☐

No

☐

I do not know

If yes, how are these costs allocated?

.....

.....

.....

Q8: Do you receive allocations of general and administrative expenses from other organisational units?

☐

Yes

☐

No

☐

I do not know

### 3.4 Reporting

Q1: For what purposes are reports generated from this cost accounting system (Please check all that apply).

Financial reporting	
Developing prices	
Inventory control	
Managerial control	
Budget preparation	
Budget execution	
Other, please specify .....	

Q2: Who uses the reports that are generated from the cost accounting system? (Please check all that apply).

☐ Program managers   ☐ financial managers   ☐ Budget analysts   ☐ Operating managers   ☐ Other, please specify

Q3: How many different reports are generated from this system?

.....  
.....  
.....

Q4: How often do the recipients of these reports give you feedback on management decisions made based on data in the reports? (Please tick the appropriate box)

☐ Always   ☐ often   ☐ usually   ☐ rarely   ☐ Never

Q5: To what extent does the present product costing model help you to manage cost within the company/division? (Please tick the appropriate box)

☐ To a very great extent   ☐ To a great extent   ☐ To a moderate extent   ☐ To some extent   ☐ To no extent

Q6: Could you please indicate the extent to which you rely on the information provided under the present product costing model for managerial decision making? (Please tick the appropriate box)

☐ Totally reliable (no error)   ☐ Reliable   ☐ Reliable to some extent   ☐ Unreliable   ☐ Totally unreliable Not at all

Q7: To what extent, if any, do you feel your cost accounting system provides all the information that users of these reports need? (Please tick the appropriate box)

☐ To a very great extent   ☐ To a great extent   ☐ To a moderate extent   ☐ To some extent   ☐ To not extent

Q8: The reporting system provides a series of data relating to cost information. The following statements describe different uses of cost information. In your opinion, please indicate the extent to which you agree or disagree with each of the statements as indication of the importance of the role of cost information play in your company. (Please tick the most appropriate answer for each statements, in the table below).

Cost information role	Significance of cost information use at your company					
	extremely important	very important	Important	Not so important	Not important	I do not know
<b>Uses for system maintenance and efficiency.</b>						
To comply with procedures of reporting						
Basis for audit						
Inventory Evaluation						
Planning of period costs (budgeting)						
Perceived importance for meeting budgets						
To provide a means of communication						
To achieve target of production						
To achieve large profit						
Management and control of period costs						
Role of standard cost in assessing performance						
Measuring efficiency of production performance						
Performance evaluation of management						
Identification of necessary corrective measures						
To achieve certain financial measurement						
To enhance cost reduction programmes						

Cost information role	Significance of cost information use at your company					
	extremely important	very important	Important	Not so important	Not important	I do not know
<b>Uses for system optimisation.</b>						
Importance of flexible budget for manufacturing cost control						
Variance analysis and exception reporting						
Planned and actual product cost						
Motivating efficiency improvement						
To enhance equipment productivity						
To enhance labour productivity						
To motivate people to do better						
To stimulate control of conversion cost						
To emphasis throughput rate						
To maintain certain profit margins						
Measuring of efficiency and capacity utilisation						
Make or buy decisions						
Product mix decisions						
Personal development and workforce improvement						
Development of better manufacturing methods						
Importance of product cost as an input to pricing decision						
Transfer prices for internal services						
Importance of marketing cost analysis						

Cost information role	Significance of cost information use at your company					
	extremely important	very important	Important	Not so important	Not important	I do not know
<b>Uses for system adaptation</b>						
To forecast the future						
Evaluation of investment projects						
Decisions of company strategy						
Improvement of product characteristics						
Product quality analysis						
Planned and actual customer profitability.						
Importance of competitor cost analysis						
Market share analysis						
Market growth analysis						
New product development						
Market development						
Market and competition details						
Importance of product configuration						
Importance of technology configuration						

Any comment:

.....

.....

.....

Q9: In your view, How would you evaluate the cost practices' orientation at your company? (Please tick the most appropriate answer for each statement, in the table below:

Cost information Orientation	Significance of cost information use at your company					
	extremely important	very important	Important	Not so important	Not important	I do not know
Long run concern with cost and revenue information						
Long run concern with little consideration for cost information						
Long run corporate plan guidelines						
Short run concern with target costing						
Short run concern with flexible costing						
Short run concern and efficiency information						
Short run concern and conversion cost						

If you have any comment, please write these comments below:

.....

.....

Q10: What types of information generated by the formal reporting system in your company helps in making decisions? (Please tick the most appropriate box in this table)

Degree of Importance	Extremely important	Very important	Important	Not so important	Not important	I do not know
Quantitative Data						
Qualitative Data						

Q11: Do you have any additional comments about the existing cost practices in your company?

.....

.....

.....

## Cost management policies

### Section 1:

The followings are three perspectives of cost management policies which are based upon time horizons, long, medium and short run. First, please read the definition of each model and then answer the related questions if that model of cost management is used in your company.

### Section A: The strategic cost management policy (SCMP).

<p><b>Definition</b></p> <p><i>"The long term is focused through the notion of strategic cost management policy (SCMP) is a systemic view that refers to the way in which the enterprise "cost structure" is positioned in terms of markets and competition".</i></p> <p>This is partly explored in terms of cost structure, and partly in terms of estimates of long run marginal cost and whether long-run marginal cost can be affected by the logistic system, organisational, technological and market arrangements; e.g., understanding of marginal costs imposed by particular strategic moves.</p>	<p>Q1: Does your company have a SCMP model?</p> <p>Please tick the appropriate box</p> <p style="text-align: center;"> <input type="checkbox"/> Yes    <input type="checkbox"/> No    <input type="checkbox"/> I do not know         </p> <p>If your company has a SCMP model. Please answer the following questions, otherwise go to section B.</p> <p>Q2: Please specify the period horizons which are used in the SCMP model.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 10%;">Years</td> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> </tr> </table> <p>Q3: In what ways does your SCMP model differ from above definition.</p> <p style="text-align: center;"> <input type="checkbox"/> Not at all.    <input type="checkbox"/> There are differences.         </p>	Years	1	2	3	4	5	6	7	8	9	10
Years	1	2	3	4	5	6	7	8	9	10		

If yes. What are they?

.....

.....

## Section B: The Economic optimisation cost management policy (ECMP).

<p><b>Definition</b></p> <p><i>"The medium term is approached from a view of an economic optimisation cost management policy (ECMP): assuming that technology, logistic system, raw material, production and distribution arrangements, organisational and market arrangements are given then".</i></p> <p>ECMP refers to the way of optimising the activity or product mix to ensure an optimal short term performance of the enterprise. This would be based upon attention to marginal revenues and marginal costs over the relevant time period.</p>	<p>Q1: Does your company have a ECMP model?</p> <p>Please tick the appropriate box</p> <p><input type="checkbox"/> Yes    <input type="checkbox"/> No    <input type="checkbox"/> I do not know</p> <p>If your company has a ECMP model. Please answer the following questions, otherwise go to section C.</p> <p>Q2: Please specify the period horizons which are used in the ECMP model</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 10%;">Years</td> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> </tr> </table> <p>Q3: In what ways does your ECMP model differ from above definition.</p> <p><input type="checkbox"/> Not at all    <input type="checkbox"/> There are differences</p>	Years	1	2	3	4	5	6	7	8	9	10
Years	1	2	3	4	5	6	7	8	9	10		

If yes, what are they?

.....

.....

## Section C: The Accounting and control cost management policy (ACMP).

<p><b>Definition</b></p> <p><i>"The short term is approached via the control of efficiency and accounting cost management policy (ACMP). ACMP is the loop of accounting control, process of budgeting and reporting. The cost here would probably be either full absorption costing (FAC), based on tradition methods or based on activity-based costing (ABC)".</i></p>	<p>Q1: Does your company have a ACMP model?</p> <p>Please tick the appropriate box</p> <p><input type="checkbox"/> Yes    <input type="checkbox"/> No    <input type="checkbox"/> I do not know</p> <p>If your company has a ACMP model. Please answer the following questions, otherwise go to section 2</p> <p>Q2: Please specify the period horizons which are used in the ACMP model</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 10%;">Years</td> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> </tr> </table> <p>Q3: In what ways does your ACMP model differ from above definition.</p> <p><input type="checkbox"/> Not at all    <input type="checkbox"/> There are differences</p>	Years	1	2	3	4	5	6	7	8	9	10
Years	1	2	3	4	5	6	7	8	9	10		

If yes, what are they?

.....

.....

**Section 2:**

I am interested in the amount of capital investment expenditure (CIE) that was spent by your company over the last 5 years. Firstly, please write down in the table below the figure (amount) of capital investment expenditure that has been during the last 5 years. Secondly, please indicate how important (significant) relative to your company, under the current situation, is each item of the CIE by making the most appropriate answer in the table below.

Classification Of Capital Investment Expenditure (CIE)	The amount of capital expenditure during the last 5 years	Perceived Relevant Importance to Your Company Under Current Conditions					
		Extremely important	Very important	Important	Not so important	Not important	I do not know
<b>System maintenance Capital Expenditure.</b>							
Major maintenance and replacement of facilities							
Improvement required to carry on the existing business							
Improvement in operational efficiency							
Rationalisation and cost reduction programmes							
Product improvements							
<b>System Optimisation Capital Expenditure.</b>							
Introduction or expansion of new market							
Expansion of the existing process							
Research and development investment							

Classification Of Capital Investment Expenditure (CIE)	The amount of capital expenditure during the last 5 years	Perceived Relevant Importance to Your Company Under Current Conditions					
		Extrem ely import ant	Very import ant	Import ant	Not so import ant	Not import ant	I do not know
Management and development training							
Marketing expenditure							
<b>System adaptation capital expenditure</b>							
Changes in manufacturing process and products							
Changes in manufacturing process and market							
Changes in manufacturing process, market and products							
Changes in market and products							
Changes in organisation (reorganisation)							
Concentration of production in a single site							
Changes in distribution arrangements							
Changes in raw material arrangements							

## Company Environment

The researcher is interested in your company's relationship with various sectors of the external environment. Specially he would like to elicit the degree of "Intensive Competition" and "Unpredictability" facing your company that are related to three areas of external environment: product market, factor market and legislation.

The following is a brief definition of intensive competition and unpredictability:

**Intensive Competition:** The general level of market conditions that makes profitability difficult.

**Unpredictability:** The overall degree of variability from period to period that makes forecasting and planning difficult.

Q1: Please tick the most appropriate answers, in the provided shaded areas of the table below, to indicate the degree of "Intensive Competition" and "Unpredictability" facing your company over the last 5 years. In the case if you do not know, please tick the appropriate box of the table below.

Market Conditions		Intensive Competition							Unpredictability						
		Low	1	2	3	4	5	High	I do not know	Very predictable	predictable	Average	Unpredictable	Very unpredictable	I do not know
<b>Product Market</b>															
1	Market Changes (sales).	Expanding market						Declining							
2	Competition intensity	Low						High							
3	Customers variety.	large variety						One major customer							
4	Profit margins	High						Narrow							
5	Product innovation	Well established						Always new products							
6	Nature of competition	Well established competitors						Always new competitors							

Market Conditions		Intensive Competition							Unpredictability							
		Low	1	2	3	4	5	High	I do not know	Very predictable	predictable	Average	Unpredictable	Very unpredictable	I do not know	
7	Prices of products	Stable						Fluctuate prices.								
<b>Factor Market.</b>																
a	<b>Raw Material and Supply.</b>															
1	Supply	oversupply						shortage of supply								
2	Sources of supply	plenty of sources						One major source								
3	Competition between suppliers	No competition						Intensive competition								
4	Cost of raw material	Low						High								
5	Delivery time	Short						Long								
6	Nature of suppliers	Always new suppliers						Well established								
7	Prices of raw material	Stable prices						Fluctuate prices								
b	<b>Labour</b>															
1	Availability of skilled labour	stable						Shortage								
2	Competing employers	Few						Many								
3	Wage rates	Low						High								
4	Trade union	Not militant						Militant								
5	Labour turnover	Low						High								
6	Labour dependency	High						Low								
7	Industrial relation	Good						Poor								
c	<b>Management</b>															
1	Availability of qualified managers	Stable						Shortage								
2	Salary of management	Low						High								

Market Conditions		Intensive Competition							Unpredictability						
		Low	1	2	3	4	5	High	I do not know	Very predictable	predictable	Average	Unpredictable	Very unpredictable	I do not know
3	Competition for good managers	Low						High							
4	Staff turnover	Low						High							
d	<i>Capital and Financing</i>														
1	Availability of fund	Easy to obtain fund						hard to obtain fund							
2	Sources of fund	many sources						One major source							
3	Cost of finance	Low						High							
4	Staff turnover	Low						High							
e	<i>Technology</i>														
1	Availability of equipment	Stable						Shortage							
2	Equipment suppliers	Many						One major suppliers							
3	Competition for equipment.	No competition						Keen competition							
4	Delivery of equipment	Short						Long							
5	Equipment failure	usual failure						Frequent failure							
6	Nature of manufacturing technology	Simple						Complex							
7	Nature of system technology	Simple						Complex							
8	Technology development	Negligible change						Common change							
9	Equipment obsolescence	Long life						Short life							
10	Capital labour substitution	slow						Fast							

Market Conditions		Intensive Competition							Unpredictability						
		Low	1	2	3	4	5	High	I do not know	Very predictable	predictable	Average	Unpredictable	Very unpredictable	I do not know
<b>Legislation</b>															
1	Regulators in the industry	One major regulator						Many regulators							
2	Number of legislation	Small						Large							
3	Nature of legislation	Well established						Frequent change							
4	Effect of legislation	Negligible						Heavy							
<div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;"> Overall Assessment </div>															

Q2: How do you rank the significance of these three sectors of external environment relative to your company in order to express their importance? Then please attach percentage weights to each sector.

Environment sectors	Rank of priority of significance			Percentage Weighting (%)
	1	2	3	
1- Product Market				
2- Factor Market				
3- Legislation				
				100%

Q3: Given the market factor sub-sectors, how would you rank the 5 sub-sectors within the factor product in order to express their priority and significance?

Factor product	Rank				
	1	2	3	4	5
1- Raw Material and Supply					
2- Labour					
3- Management					
4- Capital and Financing					
5- Technology					

*Thank you for completing this questionnaire.*

**Cost practice**

**Section 1: Control structure and responsibility accounting.**

Q1: Could you please describe the organisation structure of the company?

Q2: How did the existing organisation structure develop?

Q3: Could you please describe the control structure at the company?

Q4: How many responsibility centre do your primary products have to sequentially go through, from purchases to customers?

**Section 2: Planning and control procedures.**

Q1: Could you tell me how the operational business budget is constructed in your division/business unit?

Q2: Could you please tell me how the capital budgeting is constructed in your division business unit?

**Section 3: Cost accounting.**

**3.1 System background.**

Q1: Could you please tell me about the methods used in your company for measuring product cost? For example: Full Absorption Costing Model, Activity based Costing Model, Direct Costing Model, Variable Costing Model, Marginal Costing Model, Target Costing, Throughput Costing,...)

Q2: Were there any significant changes in the cost measurement practice system used in your company over the last five years?

*If yes*, Please tell me about; When did it happen? What was each change? Who was its champion? What is your opinion about each change? And where are others' opinion about it?

*If no*, Are there any plans to change the cost measurement practice? Please describe them.

### **3.2 System description.**

Q1: How many steps (levels) through which these cost information flow within your company?

Q2: Is there any role for consultants who designed your cost management in: -

- maintaining it by reviewing over a specific period of time?
- the day to day managing it?
- proposing changes on it which may be: simple changes; significant changes; complete changes of it.

### **3.3 Cost recognition and measurement.**

Q1: Could you tell me how the overhead cost is (1) managed within your company and/or (2) allocated within your company?

### **3.4 Reporting.**

Q1: What are the types of cost information generated by the formal reporting system in your company? For example, Daily plant book reports; Regular management reports; Ad hoc reports; Combination; Other?

Q2: The reporting system provides a series of data relating to cost information, How do your company take action on the basis of these reports?

## A2.2 Analysis of the Questionnaire

**Table A2.1: The respondents of the questionnaire**

Name		Job title
1	Shapan Ramadan Mohammed	Accountant (Participating Accounts Department).
2	Ali Sadek Mohammed Ali	Accountant (Participating Accounts Department).
3	Gamatat Mustafah Naseer	Accountant (Participating Accounts Department).
4	Momena Tah Mohammed Abd-El-Salam	Accountant (Bills Auditing and Stamp Department).
5	Saeed Ahamed Ahamed	Accountant (Financial Affairs) in participating Accounts Administration.
6	Mustafah Hussein El-Kasbani	Chief of Bills Auditing Department (collection).
7	Sameer Ragab Ahamed	Chief of Bills Auditing and Stamp Department.
8	Nagwa Ahamed Abd-El-Hadi	Chief of Statistics Department.
9	Mohammed Mohammed Ahamed Deyab	Accountant (Deduction and Modifications Department).
10	Adel Taha El-Hadi	Chief of Commitment (Engagement) Department (Balance Sheet).
11	Mohammed Abd-El-Rasheed Abd-El-Al	Chief of Loans Accounts and Documentary Credit Department).
12	Emad Hesén Ebrahim	Accountant (Cost Department).
13	Batah Salah Abd-El-Mawgood	Accountant (Cost Department).
14	Mervat Abd-El-Hameed	Chief of Fixed Assets Department.
15	Zenab El-Sayed Ali Tantawy	Accountant (Cost Department).
16	Fauzia Abdo Marzouk	Accountant (Cost Department).
17	Mohammed Sayed Hassan	Chief of Central Accounts Department.
18	Magda Fareed Sad	Accountant (Cost Department).
19	Maher Ahamed Sayed	Accountant (Cost Department).
20	Mohammed Sayed Hassan	Chief of Cost Department.
21	Bader Abd-El-Shafy Abd-El-Shafy	Accountant (Documentary credit Department).
22	Yasser Mahammoud Ahamed	Chief of Documentary Credit Department.

	Name	Job title
23	Adel El-Bagdadi	Vice Chairman for Technical Affairs.
24	Asem Mohammed Abd-El-Aziz	Auditing (Maturities Department).
25	Samir Mohammed Hassan	Accountant (Planned Budget Department).
26	Marsel William Yakob	Chief of Balance Sheet Administration.
27	Mohammed Mustafah Amin	Chief of loans and Grants Department.
28	Hamadi Abd-El-Hakeem Sharawi	Accountant (Cost Department).
29	Azzam Mohammed Ramdan	Chief of Final Statement of Accounts and Follow-up
30	Ekram Mohammed Hassanen	Accountant (Cost Department).
31	Sadi Flah Sad	Accountant (Central Accounts Department).
32	Mosad Abd-El-Wahed Showra	Accountant (Central Accounts Department).
33	Amal Habeeb Abd-El-Gani	Accountant (Cost Department).
34	Abd-El-Halim Attia Abd-El-Halim	Accountant (Cost Department).
35	Reda Abd-El-Menam Ahamed	Accountant (Cost Department).
36	Khyeria Ahamed Faried	Accountant (Central Department).
37	Medhat Abd-El-Hamid Basywni	accountant (Participating accounts Administration.
38	Magdi Abd-Allah Zaki	Accountant of Statistics Department.
39	Mahasen Ahamed Refaee	Accountant (Participating Accounts Department).
40	Abd-El-Aziz Zaki Abd-El-Aziz	Accountant of Participating Accounts Department (Deduction Department).
41	Ahamed Mosad Mohammed	General Chief Administration of Government and Organisations Accounts.
42	El-Sayed Ramadan Kamal	General Chief of Inventory Administration.
43	Rada Abd-El-Hameed Shatah	General Chief of Purchases and Contracts Administration.
44	Hamdy Mustafah Abd-El-Hameed	General Chief of Revenues Auditing Administration.
45	Hussam Hassan Abd-El-Aal	General Chief of Meters Administration.
46	Emad Abd-El-Halim Ali	Senior Accountant (Cost Department).
47	Ahamed Anwer	Researcher of Planning for Investment Projects.
48	Aesha Ahamed	Chief of Budget and Follow-up Administration.

Name		Job title
49	Mohammed El-Demardash	Chief of the central administration for managerial affairs.
50	Hassan El-Shasfy	Chief of the central administration for stations.

**Table A2.2: Component Matrix<sup>a</sup> for Uses of Cost Information for Efficiency**

	Component				
	1	2	3	4	5
To comply with procedures of reporting.	.705	-8.225E-02	-.229	8.351E-02	-.142
Perceived importance for meeting budgets.	.668	.242	-.134	-.122	6.349E-02
Planning of period costs (budgeting).	.667	-6.567E-02	-.208	.452	-6.288E-02
Identification of necessary measures.	.633	-.245	-.283	-.308	2.977E-02
To achieve certain financial measurement.	.625	-8.903E-02	-.448	-.274	-.290
To enhance cost reduction programmes.	.596	-.296	2.017E-02	-.108	-.423
To achieve target of production.	.587	.360	-1.092E-02	-.197	.363
Measuring efficiency of production performance.	.547	-9.638E-02	.545	-6.974E-02	-.269
To achieve large profit.	.514	.435	.291	-.276	-.298
Basis for audit.	.511	.447	.273	.250	.271
Inventory evaluation.	.242	.772	-.260	.311	-9.951E-02
Role of standard cost in assessing performance.	.425	-.541	.349	.321	4.392E-02
To provide means of communication.	.391	2.811E-02	.685	-.310	.223
Management and control of period costs.	.583	-.229	4.059E-02	.618	.198
Performance evaluation of management.	.414	-.286	-.293	-.316	.641

Extraction Method: Principal Component Analysis.

<sup>a</sup> 5 components extracted

**Table A2.2a: Pattern Matrix<sup>a</sup> for Uses of Cost Information for Efficiency**

	Component				
	1	2	3	4	5
To achieve certain financial measurement.	.863	6.278E-02	-9.695E-02	-8.508E-02	.120
To enhance cost reduction programmes.	.680	-.179	.222	.167	-.168
Identification of necessary measures.	.630	-.106	3.471E-02	3.135E-02	.388
To comply with procedures of reporting.	.561	.164	-2.184E-02	.312	7.096E-02
Inventory evaluation.	2.571E-02	.910	-.168	9.880E-03	-.167
Basis for audit.	-.239	.574	.359	.325	.135
Perceived importance for meeting budgets.	.370	.379	.172	4.428E-02	.261
To provide means of communication.	-.165	-9.526E-02	.856	-8.369E-04	.217
Measuring efficiency of production performance.	.234	-9.090E-02	.684	.204	-.220
To achieve large profit.	.322	.373	.603	-.233	-.164
Management and control of period costs.	-2.677E-02	.127	-6.251E-02	.890	7.991E-02
Role of standard cost in assessing performance.	1.886E-02	-.357	.242	.704	-2.385E-02
Planning of period costs (budgeting).	.334	.283	-.161	.631	-1.793E-02
Performance evaluation of management.	.145	-.173	-6.672E-02	7.170E-02	.883
To achieve target of production.	7.760E-02	.433	.292	-2.393E-02	.488

**Extraction Method: Principal Component Analysis.**

**Rotation Method: Oblimin with Kaiser Normalization.**

<sup>a</sup> Rotation converged in 14 iterations.

**Table A2.2b: Structure Matrix<sup>a</sup> for Uses of Cost Information for Efficiency**

	Component				
	1	2	3	4	5
To achieve certain financial measurement.	.852	.190	7.077E-02	.138	.250
To enhance cost reduction programmes.	.710	-5.386E-02	.347	.354	-2.870E-02
Identification of necessary measures.	.693	3.609E-02	.189	.243	.490
To comply with procedures of reporting.	.675	.276	.175	.473	.219
Perceived importance for meeting budgets.	.516	.486	.324	.233	.385
Inventory evaluation.	.108	.878	-6.958E-02	2.325E-02	-8.647E-02
Basis for audit.	2.517E-02	.616	.462	.392	.231
To provide means of communication.	1.983E-02	3.649E-03	.835	.150	.267
Measuring efficiency of production performance.	.367	1.830E-02	.736	.369	-9.451E-02
To achieve large profit.	.406	.462	.645	-2.409E-02	-3.989E-02
Management and control of period costs.	.224	.184	.135	.889	.194
Role of standard cost in assessing performance.	.188	-.280	.342	.731	5.639E-02
Planning of period costs (budgeting).	.507	.356	6.197E-02	.702	.130
Performance evaluation of management.	.272	-6.421E-02	4.523E-02	.195	.892
To achieve target of production.	.276	.528	.404	.146	.572

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

<sup>a</sup> Rotation converged in 14 iterations.

**Table A2.3: Rotated Component Matrix<sup>a</sup> for Uses of Cost Information for Optimisation**

	Component				
	1	2	3	4	5
Development of better manufacturing methods.	.770	-1.926E-02	.201	.186	.367
Personal development and workforce improvement	.742	.502	9.451E-02	-.119	6.727E-02
To motivate people to do better	.618	.225	4.571E-02	.495	.146
To enhance equipment productivity	.556	.363	-8.440E-02	.203	.309
Importance of marketing cost analysis	.507	.264	.387	.118	.195
Transfer prices for internal services	.420	-.129	.333	.266	-.188
Determine the economic production amount	.372	.762	7.213E-02	8.225E-02	3.263E-02
To maintain certain profit margins	9.662E-02	.671	.225	.556	.154
To measure of efficiency and capacity utilisation	.159	.635	-1.066E-02	4.955E-02	.426
Importance of product cost an input to pricing decision	-3.151E-02	.596	.438	.244	.232
Variance analysis and exception reporting	9.926E-02	-2.174E-02	.844	9.237E-02	7.500E-02
Planned and actual product cost	2.281E-02	.200	.745	7.031E-02	-2.369E-02
Importance of flexible budget	.154	-.127	.547	.363	.427
To stimulate control of conversion cost	.247	.196	.496	.271	-5.716E-03
Motivating efficiency improvement	9.044E-02	2.886E-02	.162	.826	.103
To emphasis throughput rate	.221	.274	.241	.771	3.378E-02
Product mix decision	.1'30	.231	.199	-8.981E-02	.790
Make or buy decision	.243	.198	-.127	.270	.767

Extraction method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalisation.

<sup>a</sup> Rotation converged in 11 iterations.

**Table A2.4: Structure Matrix for Uses of Cost Information for Strategy**

	Component		
	1	2	3
Importance of technology configuration.	.861	-.110	.529
Improvement of product characteristics.	.874	-.349	.532
Product quality analysis.	.822	-6.088E-02	.628
Decisions of company strategy.	.808	4.481E-02	.398
Market growth analysis.	.747	-8.667E-02	.566
To forecast analysis.	.718	-2.435E-02	.132
Market development.	.715	.230	.558
Importance of competitors cost analysis.	.540	-.657	.498
Evaluation of investment projects.	.531	.606	.341
Importance of product configuration.	.434	4.864E-02	.862
Importance of product improvement.	.463	-.146	.838
New product development.	.325	-.259	.791
Planned and actual customer profitability.	.597	-.505	.690
Market share analysis.	.470	-.585	.623

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.5: Structure Matrix for the P (Un) of Product market**

	Component			
	1	2	3	4
Market changes (sales)	.486	-.156	-.516	-.338
Competition intensity	5.729E-02	-5.122E-02	-6.143E-02	.913
Customer variety	.136	-.839	8.325E-02	.203
Profit margins	8.032E-02	2.029E-02	.870	-.105
product innovation	.776	-.228	.208	-.116
Nature of competition	9.488E-02	-.829	-.153	-.172
Prices of product	.790	-2.310E-02	-.135	.132

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.6: Structure Matrix for the P (CI) of Raw Material and Supply**

	Component		
	1	2	3
Supply	-.141	.133	-.861
Sources of supply	-.805	-4.801E-02	.121
Competition between suppliers	.648	.430	-2.903E-02
Cost of raw material	.215	.787	-2.505E-02
Delivery time	.181	-1.319E-03	-.822
Nature of suppliers	-.705	.247	-9.529E-02
Prices of raw material	-.292	.795	-.133

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.6a: Structure Matrix for the P (Un) of Raw Material and Supply**

	Component	
	1	2
Supply	8.756E-02	.817
Sources of supply	.720	.176
Competition between suppliers	.907	.242
Cost of raw material	.585	.360
Delivery time	.417	.721
Nature of suppliers	.832	.199
Prices of raw material	.886	.140

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.7: Structure Matrix for P (CI) of Labour**

	Component		
	1	2	3
Availability of skilled labour	.663	.254	.190
Competing employers	7.429E-02	.176	.785
Wages rate	.477	.379	.223
Trade union	-.365	-.422	.566
Labour turnover	-.750	.108	.246
Labour dependency	7.977E-02	-.830	-8.372E-02
The relationship between water organisations	.655	-.275	-.203

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.7a: Structure Matrix for P (Un) of Labour**

	Component	
	1	2
Availability of skilled labour	.706	.197
Competing employers	.129	-.882
Wages rate	.733	-.398
Trade union	.618	-.514
Labour turnover	.666	-.272
Labour dependency	.417	-.754
The relationship between water organisations	.541	-.144

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.8: Structure Matrix for P (CI) of Management**

	<b>Component</b>	
	<b>1</b>	<b>2</b>
Availability of qualified managers	.822	-4.500E-02
Salary of management	-.592	.624
Competition for good managers	.225	.852
Staff turnover	.692	.264

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.8a: Structure Matrix for P (Un) of Management**

	<b>Component</b>
	<b>1</b>
Availability of qualified managers	.803
Salary of management	.769
Competition for good managers	.613
Staff turnover	.748

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.9: Structure Matrix for P (CI) of Capital and Financing**

	Component	
	1	2
Availability of fund	-.275	.814
Sources of fund	.486	.641
Cost of finance	.696	5.394E-02
Staff turnover	-.625	.116

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.9a: Structure Matrix for P (Un) of Capital and Financing**

	Component
	1
Availability of fund	.867
Sources of fund	.876
Cost of finance	.431
Staff turnover	.781

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.10: Structure Matrix for P (CI) of Technology**

	Component		
	1	2	3
Availability of equipment	.480	.338	.143
Equipment suppliers	.603	-.151	.134
Competition for equipment	6.089E-02	-6.547E-02	.694
Delivery of equipment	.734	-.141	-.194
Equipment failure	.675	.303	.163
Nature of manufacturing technology	.712	-.118	.201
Nature of system technology	.474	6.228E-02	.646
Technology development	8.079E-03	.184	.676
Equipment obsolescence	-4.624E-02	.884	1.296E-02
capital labour substitution	-4.290E-02	.882	.118

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.10a: Structure Matrix for P (Un) of Technology**

	Component		
	1	2	3
Availability of equipment	-4.082E-03	.467	.724
Equipment suppliers	.172	.691	.268
Competition for equipment	.782	.383	3.438E-02
Delivery of equipment	.291	.832	2.885E-02
Equipment failure	.364	.514	-4.703E-02
Nature of manufacturing technology	.443	.782	2.165E-02
Nature of system technology	.857	.392	8.110E-02
Technology development	.681	.254	.335
Equipment obsolescence	.281	-2.804E-02	.881
capital labour substitution	.828	.225	6.204E-03

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Table A2.11: Structure Matrix for P (CI) of Legislation**

	Component	
	1	2
Regulators in the industry	.886	-.195
Number of legislation	.852	-.220
Nature of legislation	.158	.912
Effect of legislation	.598	.355

**Extraction Method: Principal Component Analysis.**

**Rotation Method: Oblimin with Kaiser Normalization.**

**Table A2.11a: Structure Matrix for P (Un) of legislation**

	Component
	1
Regulators in the industry	.878
Number of legislation	.899
Nature of legislation	.630
Effect of legislation	.854

**Extraction Method: Principal Component Analysis.**

**Rotation Method: Oblimin with Kaiser Normalization.**

Table A2.12: Pearson correlations -Level Matrixes for Uses of Cost Information for Efficiency

Correlation	To comply with procedures of reporting	basis for audit	Inventor y Evaluati on	Planning of period costs	Perceive d importa nt meeting budgets	To provide a means of commun ication	To achieve target of producti on	To achieve large profit	Manage ment and control period costs	Role of standard cost in assessin g perform ance	Measuri ng efficienc y of producti on perform ance	Perform ance evaluati on of manage ment	Identific ation of necessar y correctiv e measure s	To achieve certain financial measure ment
To comply with procedures of reporting	1.000	.279*	.113	.544**	.362**	.112	.413**	.205	.350**	.231	.263*	.225	.351**	.528**
basis for audit	.279*	1.000	.401**	.216	.309*	.318*	.377**	.359**	.387**	.132	.238*	.137	.093	.067
Inventory Evaluation	.113	.401**	1.000	.233	.262*	-.135	.317*	.287*	.154	-.235	-.054	-.186	.025	.186
Planning of period costs	.544**	.216	.233	1.000	.506**	.061	.290*	.124	.568**	.309*	.249*	.143	.296*	.340**
Perceived important for meeting budgets	.362**	.309*	.262*	.506**	1.000	.231	.354**	.442**	.228	.088	.265*	.371**	.278*	.432**
To provide a means of communication	.112	.318*	-.135	.061	.231	1.000	.329**	.333**	.018	.247*	.448**	.146	.115	-.002
To achieve target of production	.413**	.377**	.317*	.290*	.354**	.329**	1.000	.322*	.161	.047	.261*	.304*	.396**	.244*
To achieve large profit	.205	.350**	.287*	.124	.442**	.333**	.322*	1.000	.070	.064	.375**	-.031	.245*	.263*
Management and control period costs	.350**	.387**	.154	.568**	.228	.081	.161	.070	1.000	.513**	.283*	.258*	.302*	.144
Role of standard cost in assessing performance	.231	.132	-.235	.309*	.088	.247*	.047	.064	.514**	1.000	.357**	.119	.243*	.144
Measuring efficiency of production performance	.263*	.2388	-.054	.249*	.265*	.448**	.261*	.375**	.283*	.357**	1.000	-.028	.230	.235
Performance evaluation of management	.225	.137	-.186	.143	.371**	.146	.304*	-.031	.258*	.119	-.028	1.000	.429**	.304*
Identification of necessary corrective measures	.351**	.093	.025	.296*	.278*	.115	.396**	.245*	.302*	.243*	.230	.429**	1.000	.579**
To achieve certain financial measurement	.528**	.067	.168	.340**	.432**	-.002	.244*	.263*	.144	.144	.235	.304*	.579**	1.000
To enhance cost reduction programmes	.477**	.168	-.063	.340**	.261*	.192	.076	.304*	.284*	.250*	.366*8	.167	.424**	.410**

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.12a: The significance levels of the Pearson correlations -Level Matrixes for Uses of Cost Information for Efficiency**

Sig. (1-tailed)														
	To comply with procedures of reporting	basis for audit	Inventory Evaluation	Planning of period costs	Perceived important for meeting budgets	To provide a means of communication	To achieve target of production	To achieve large profit	Management and control period costs	Role of standard cost assessing performance	Measuring efficiency of production performance	Performance evaluation of management	Identification of necessary corrective measures	To achieve certain financial measurement
To comply with procedures of reporting	.025	.025	.217	.000	.005	.220	.001	.076	.006	.053	.033	.058	.006	.000
basis for audit	.025	.	.002	.066	.015	.012	.003	.005	.003	.180	.048	.172	.260	.323
Inventory Evaluation	.217	.002	.	.015	.033	.174	.012	.022	.142	.050	.354	.098	.432	.098
Planning of period costs	.000	.066	.051	.	.000	.337	.021	.196	.000	.015	.041	.161	.018	.008
Perceived important for meeting budgets	.005	.015	.033	.000	.	.053	.006	.001	.056	.273	.031	.004	.025	.001
To provide a means of communication	.220	.012	.174	.337	.053	.	.010	.009	.288	.042	.001	.156	.214	.496
To achieve target of production	.001	.003	.012	.012	.006	.010	.	.011	.132	.372	.034	.016	.002	.044
To achieve large profit	.076	.005	.022	.196	.011	.009	.011	.	.315	.329	.004	.414	.043	.033
Management and control period costs	.006	.003	.142	.000	.056	.288	.132	.315	.	.000	.023	.035	.017	.160
Role of standard cost in assessing performance	.053	.180	.050	.015	.273	.042	.372	.329	.000	.	.006	.206	.045	.160
Measuring efficiency of production performance	.033	.048	.354	.041	.031	.001	.034	.004	.023	.006	.	.425	.054	.050
Performance evaluation of management	.058	.172	.098	.161	.004	.156	.016	.414	.035	.206	.425	.	.001	.016
Identification of necessary corrective measures	.006	.260	.432	.018	.025	.214	.002	.043	.017	.045	.054	.001	.	.000
To achieve certain financial measurement	.000	.323	.098	.008	.001	.496	.044	.033	.160	.160	.050	.016	.000	.
To enhance cost reduction programmes	.000	.122	.333	.008	.033	.091	.300	.016	.023	.040	.004	.123	.001	.002

Table A2.13: Pearson correlations -Level Matrixes for Uses of Cost Information for Optimisation

Correlation	Importance of flexible budget	Variance analysis & exception reporting	Planned and actual product cost	Motivating efficiency improvement	To enhance equipment productivity	To motivate people to do better	To stimulate control of conversion cost	To emphasize throughput rate	To maintain certain margins	Measuring efficiency and capacity	Determining the economic production	Make or buy decision	Product mix decision	Personal development & workforce improvement	Development of better manufacturing methods	Importance of product costs in pricing	Transfer prices for internal services
Importance of flexible budget	1.000	.527**	.308*	.407**	.245*	.317*	.410**	.404**	.288*	.194	.151	.332**	.303*	.146	.474**	.378**	.184
Variance analysis and exception reporting	.527**	1.000	.520**	.231	.036	.251*	.281*	.246*	.314*	.156	.073	-.040	.147	.087	.280*	.333**	.295*
Planned and actual product cost	.308*	.520**	1.000	.220	.159	.177	.367**	.317*	.297*	.078	.200	.041	.203	.164	.116	.311*	.228
Motivating efficiency improvement	.407**	.231	.220	1.000	.266*	.402**	.356**	.606**	.437*8	.201	.170	.260*	.102	.083	.258*	.252*	.274*
To enhance equipment productivity	.245*	.036	.159	.266*	1.000	.557**	.198	.330**	.380**	.436**	.443**	.456**	.301*	.512**	.466**	.290*	.080
To motivate people to do better	.317*	.251*	.177	.402**	.557**	1.000	.296*	.530**	.597**	.370**	.422**	.456**	.191	.480**	.573**	.272*	.293*
To stimulate control of conversion cost	.410**	.281*	.367**	.356**	.198	.296*	1.000	.375**	.339**	.091	.327*	.151	.156	.311*	.330**	.371**	.163
To emphasize throughput rate	.404**	.246*	.317*	.606**	.330**	.530**	.375**	1.000	.700**	.179	.353**	.264*	.161	.266*	.482**	.483**	.267*
To maintain certain profit margins	.288*	.314*	.297*	.437**	.380**	.597**	.339**	.700**	1.000	.483**	.582**	.411**	.281*	.322*	.300*	.672**	.127
Measuring of efficiency and capacity utilisation	.194	.156	.978	.201	.436**	.370**	.091	.179	.483**	1.000	.485**	.453**	.337**	.431**	.276*	.402**	-.052
Determine the economic production amount	.151	.073	.200	.170	.443**	.422**	.327*	.353**	.582**	.485**	1.000	.315*	.318*	.640**	.274*	.399**	.176
Make or buy decision	.332**	-.040	.041	.260*	.456**	.456**	.151	.264*	.411**	.453**	.315*	1.000	.606**	.257*	.386**	.257*	.114
Product mix decision	.303*	.147	.203	.102	.301*	.191	.156	.161	.281*	.337**	.318*	.606**	1.000	.312*	.417**	.402**	.041
Personal development and workforce improvement	.146	.087	.164	.083	.512**	.480**	.311*	.266*	.322*	.431**	.640*8	.257*	.312*	1.000	.625**	.378**	.188
Development of better manufacturing methods	.474**	.280*	.116	.258*	.466**	.573**	.330**	.428**	.300*	.276*	.274*	.386**	.417**	.625**	1.000	.237*	.242*
Importance of product costs as an input to pricing decision	.378**	.333**	.311*	.252*	.290*	.272*	.371**	.483**	.627**	.402**	.399**	.257*	.402**	.378**	.237*	1.000	.211
Transfer prices for internal services	.184	.295*	.228	.274*	.080	.293*	.163	.267*	.127	-.052	.176	.114	.041	.188	.242*	.211	1.000
Importance of marketing cost analysis	.276*	.441**	.300*	.249*	.514**	.452**	.371**	.360**	.499**	.368**	.337**	.338**	.286*	.428**	.500**	.284*	.209

\*, Correlation is significant at the 0.05 level (1-tailed).

\*\*, Correlation is significant at the 0.01 level (1-tailed).



Table A2.14: Pearson correlations -Level Matrixes for Uses of Cost Information for Strategy

Correlation	To forecast the future	Evaluation of investment projects	Decisions of company strategy	Improvement of product characteristics	Product quality analysis	Planned and actual customer profitability	Importance of competitors cost analysis	Market share analysis	Market growth analysis	New product development	Market development	Importance of product configuration	Importance of product improvement
To forecast the future	1.000	.369**	.585**	.537**	.364**	.308*	.327*	.226	.293*	.168	.319*	.267*	.219
Evaluation of investment projects	.369**	1.000	.540**	.249*	.421**	.174	.028	.021	.346**	.245*	.470**	.334**	.224
Decisions of company strategy	.585**	.540**	1.000	.582**	.526**	.478**	.399**	.375**	.561**	.292*	.490**	.368**	.407**
Improvement of product characteristics	.537**	.249*	.582**	1.000	.756**	.692**	.579**	.565**	.675**	.380**	.566**	.415**	.516**
Product quality analysis	.364**	.421**	.526**	.756**	1.000	.567**	.442**	.512**	.704**	.375**	.699**	.507**	.526**
Planned and actual customer profitability	.308*	.174	.478**	.692**	.567**	1.000	.598**	.659**	.540**	.500**	.328**	.484**	.653**
Importance of competitors cost analysis	.327*	.028	.399**	.579**	.442**	.598**	1.000	.620**	.462**	.598**	.335**	.336**	.287**
Market share analysis	.226	.021	.375**	.565**	.512**	.659**	.620**	1.000	.287*	.393**	.359**	.534**	.478**
Market growth analysis	.293*	.346**	.561**	.675**	.704**	.540**	.462**	.287*	1.000	.500**	.598**	.269*	.571**
New product development	.168	.245*	.292*	.380**	.375**	.500**	.598**	.393**	.500**	1.000	.232	.569**	.579**
Market development	.319*	.470**	.490**	.566**	.699**	.328**	.335**	.359**	.598**	.232	1.000	.645**	.328**
Importance of product configuration	.267*	.334**	.368**	.415**	.507**	.484**	.336**	.534**	.269*	.569**	.645**	1.000	.653**
Importance of product improvement	.219	.224	.407**	.516**	.526**	.653**	.287*	.478**	.571**	.579**	.328**	.653**	1.000
Importance of technology configuration	.541**	.326*	.589**	.714**	.809**	.532**	.474**	.449**	.637**	.319*	.642**	.465**	.541**

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.14a: The significance levels of the Pearson correlations -Level Matrixes for Uses of Cost Information for Strategy**

		To forecast the future	Evaluation of investment project	Decisions of company strategy	Improvement of product characteristics	Product quality analysis	Planned and actual customer profitability	Importance of competitors cost analysis	Market share analysis	Market growth analysis	New product development	Market development	Importance of product configuration	Importance of product improvement
<b>Sig. (1-tailed)</b>														
To forecast the future		.004	.004	.000	.000	.005	.015	.010	.058	.019	.121	.012	.031	.063
Evaluation of investment projects		.004	.	.000	.041	.001	.113	.422	.441	.007	.043	.000	.009	.059
Decisions of company strategy		.000	.000	.	.000	.000	.000	.002	.004	.000	.020	.000	.004	.002
Improvement of product characteristics		.000	.041	.000	.	.000	.000	.000	.000	.000	.003	.000	.001	.000
Product quality analysis		.005	.001	.000	.000	.	.000	.001	.000	.000	.004	.000	.000	.000
Planned and actual customer profitability		.015	.113	.000	.000	.000	.	.000	.000	.000	.000	.010	.000	.000
Importance of competitors cost analysis		.010	.422	.002	.000	.001	.000	.	.000	.000	.000	.009	.008	.022
Market share analysis		.058	.441	.004	.000	.000	.000	.000	.	.022	.002	.005	.000	.000
Market growth analysis		.019	.007	.000	.000	.000	.000	.000	.022	.	.000	.000	.030	.000
New product development		.121	.043	.020	.003	.004	.000	.000	.002	.000	.	.053	.000	.000
Market development		.012	.000	.000	.000	.000	.010	.009	.005	.000	.053	.	.000	.010
Importance of product configuration		.031	.009	.004	.001	.000	.000	.008	.000	.030	.000	.000	.	.000
Importance of product improvement		.063	.059	.002	.000	.000	.000	.022	.000	.000	.000	.010	.000	.
Importance of technology configuration		.000	.010	.000	.000	.000	.000	.000	.001	.000	.012	.000	.000	.000

**Table A2.15: Pearson Correlation of Level Matrixes for P (Un) of Product Market**

<b>Correlation</b>	Market changes (sales).	Competition intensity.	Customer variety.	Profit margins.	Product innovation	Nature of competition.	Prices of products.
Market changes (sales).	1.000	-.060	.049	-.109	.183	.140	.173
Competition intensity.	-.060	1.000	.153	-.057	-.040	-.042	.094
Customer variety.	.049	.153	1.000	.000	.209	.408**	.038
Profit margins.	-.109	-.057	.000	1.000	.116	-.057	-.032
Product innovation	.183	-.040	.209	.116	1.000	.085	.349**
Nature of competition.	.140	-.042	.408**	-.057	.085	1.000	.094
Prices of products.	.173	.094	.038	-.032	.349**	.094	1.000

\*\* Correlation is significant at the 0.01 level (1-tailed).

**Table A2.15a: The Significance levels of the Pearson correlations of Level Matrixes for P (Un) of Product Market**

<b>Sig. (1-tailed)</b>	Market changes (sales).	Competition intensity.	Customer variety.	Profit margins.	Product innovation	Nature of competition.	Prices of products.
Market changes (sales).	.	.339	.368	.226	.102	.166	.115
Competition intensity.	.339	.	.144	.348	.391	.387	.258
Customer variety.	.368	.144	.	.500	.073	.002	.396
Profit margins.	.226	.348	.500	.	.212	.348	.413
Product innovation	.183	.391	.073	.212	.	.278	.007
Nature of competition.	.140	-.042	.002	.348	.278	.	.258
Prices of products.	.173	.094	.369	.413	.007	.258	.

**Table A2.16: Pearson Correlation of Level Matrixes for P (CI) of Raw Material and Supply**

<b>Correlation</b>	<b>Supply</b>	<b>Sources of supply</b>	<b>Competition between suppliers</b>	<b>Cost of raw material</b>	<b>Delivery time</b>	<b>Nature of suppliers</b>	<b>Prices of raw material</b>
Supply	1.000	-.054	-.043	-.006	.427**	.139	.221
Sources of supply	-.054	1.000	-.422**	-.086	-.101	.391**	.108
Competition between suppliers	-.043	-.422**	1.000	.275*	.105	-.136	.061
Cost of raw material	-.006	-.086	.275*	1.000	.098	-.044	.374**
Delivery time	.427**	-.101	.105	.098	1.000	-.057	-.052
Nature of suppliers	.139	.391**	-.136	-.044	-.057	1.000	.257*
Prices of raw material	.221	.108	.061	.374**	-.052	.257*	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\* . Correlation is significant at the 0.01 level (1-tailed).

**Table A2.16a: The Significance levels of the Pearson correlations of Level Matrixes for P (CI) of Raw Material and Supply**

<b>Sig. (1-tailed)</b>	<b>Supply</b>	<b>Sources of supply</b>	<b>Competition between suppliers</b>	<b>Cost of raw material</b>	<b>Delivery time</b>	<b>Nature of suppliers</b>	<b>Prices of raw material</b>
Supply	.	.356	.385	.484	.001	.169	.062
Sources of supply	.356	1.	.001	.276	.243	.002	.227
Competition between suppliers	.385	.001	1.	.026	.234	.174	.336
Cost of raw material	.484	.276	.026	1.	.250	.380	.004
Delivery time	.001	.243	.234	.250	1.	.346	.360
Nature of suppliers	.169	.002	.174	.380	.346	1.	.036
Prices of raw material	.062	.227	.336	.004	.360	.036	1.

**Table A2.17: Pearson Correlation of Level Matrixes for P (Un) of Raw Material and Supply**

<b>Correlation</b>	<b>Supply</b>	<b>Sources of supply</b>	<b>Competition between suppliers</b>	<b>Cost of raw material</b>	<b>Delivery time</b>	<b>Nature of suppliers</b>	<b>Prices of raw material</b>
Supply	1.000	.096	.150	.061	.221	.087	.089
Sources of supply	.096	1.000	.632**	.263*	.274*	.400**	.562**
Competition between suppliers	.150	.632**	1.000	.404**	.320*	.746**	.751**
Cost of raw material	.061	.263*	.404**	1.000	.374**	.367**	.474**
Delivery time	.221	.274*	.320*	.374**	1.000	.325*	.221
Nature of suppliers	.087	.400**	.746**	.367**	.325*	1.000	.696**
Prices of raw material	.089	.562**	.751**	.474**	.221	.696**	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\* . Correlation is significant at the 0.01 level (1-tailed).

**Table A2.17a: The Significance levels of the Pearson correlations of Level Matrixes for P (Un) of Raw Material and Supply**

<b>Sig. (1-tailed)</b>	<b>Supply</b>	<b>Sources of supply</b>	<b>Competition between suppliers</b>	<b>Cost of raw material</b>	<b>Delivery time</b>	<b>Nature of suppliers</b>	<b>Prices of raw material</b>
Supply	.	.254	.149	.336	.062	.087	.089
Sources of supply	.254	.	.000	.033	.027	.002	.000
Competition between suppliers	.149	.000	.	.002	.012	.000	.000
Cost of raw material	.336	.033	.002	.	.004	.004	.000
Delivery time	.062	.027	.012	.004	.	.011	.061
Nature of suppliers	.087	.002	.000	.002	.011	.	.000
Prices of raw material	.089	.000	.000	.000	.061	.000	.

**Table A2.18: Pearson Correlation of Level Matrixes for P (CI) of Labour**

Correlation	Availability of skilled labour	Competing employers	Wage rate	Trade union	Labour turnover	Labour dependency	Relation between water companies
Availability of skilled labour	1.000	.045	.239*	-.109	-.350**	-.046	.139
Competing employers	.045	1.000	.030	.083	.026	-.084	-.054
Wage rate	.239*	.030	1.000	-.105	-.063	-.075	.180
Trade union	-.109	.083	-.105	1.000	.253*	.105	-.133
Labour turnover	-.350**	.026	-.063	.253*	1.000	-.091	-.407**
Labour dependency	-.046	-.084	-.075	.105	-.091	1.000	.138
The relation between water companies	.139	-.054	.180	-.133	-.407**	.138	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*, Correlation is significant at the 0.01 level (1-tailed).

**Table A2.18a: The Significance levels of the Pearson correlations of Level Matrixes for P (CI) of Labour**

Sig. (1-tailed)	Availability of skilled labour	Competing employers	Wage rate	Trade union	Labour turnover	Labour dependency	Relation between water companies
Availability of skilled labour	.000	.378	.047	.225	.006	.377	.169
Competing employers	.378	.000	.419	.284	.429	.280	.354
Wage rate	.047	.419	.000	.234	.333	.302	.105
Trade union	.225	.284	.234	.000	.038	.233	.179
Labour turnover	.006	.429	.333	.000	.000	.265	.002
Labour dependency	.377	.280	.302	.233	.265	.000	.170
The relation between water companies	.169	.354	.105	.179	.002	.170	.000

**Table A2.19: Pearson Correlation of Level Matrixes for P (Un) of Labour**

Correlation	Availability of skilled labour	Competing employers	Wage rate	Trade union	Labour turnover	Labour dependency	Relation between water companies
Availability of skilled labour	1.000	-.092	.339**	.289*	.244*	.120	.165
Competing employers	-.092	1.000	.219	.405**	.162	.479**	.107
Wage rate	.339**	.219	1.000	.373**	.423**	.478**	.271*
Trade union	.289*	.405**	.373**	1.000	.353**	.323*	.300*
Labour turnover	.244*	.162	.423**	.353**	1.000	.286*	.233
Labour dependency	.120	.479**	.478**	.323*	.286*	1.000	.159
The relation between water companies	.165	.107	.271*	.300*	.233	.159	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\* . Correlation is significant at the 0.01 level (1-tailed).

**Table A2.19a: The Significance levels of the Pearson correlations of Level Matrixes for P (Un) of Labour**

Sig. (1-tailed)	Availability of skilled labour	Competing employers	Wage rate	Trade union	Labour turnover	Labour dependency	Relation between water companies
Availability of skilled labour	.000	.263	.008	.021	.044	.202	.126
Competing employers	.263	1.000	.063	.002	.131	.000	.230
Wage rate	.008	.063	1.000	.004	.001	.000	.028
Trade union	.021	.002	.004	1.000	.006	.011	.017
Labour turnover	.044	.131	.001	.006	1.000	.022	.052
Labour dependency	.202	.000	.000	.011	.022	1.000	.136
The relation between water companies	.126	.230	.028	.017	.052	.136	1.000

**Table A2.20: Pearson Correlation of Level Matrixes for P (CI) of Management**

Correlation	Availability of qualified managers	Salary of management	Competition for good managers	Staff turnover
Availability of qualified managers	1.000	-.362**	.122	.312*
Salary of management	-.362**	1.000	.188	-.142
Competition for good managers	.122	.188	1.000	.147
Staff turnover	.312*	-.142	.147	1.000

\*, Correlation is significant at the 0.05 level (1-tailed).

\*\*, Correlation is significant at the 0.01 level (1-tailed).

**Table A2.20a: The Significance levels of the Pearson correlations of Level Matrixes for P (CI) of Management**

Sig. (1-tailed)	Availability of qualified managers	Salary of management	Competition for good managers	Staff turnover
Availability of qualified managers	.	.005	.200	.014
Salary of management	.005	.	.095	.162
Competition for good managers	.200	.095	.	.153
Staff turnover	.014	.162	.153	.

**Table A2.21: Pearson Correlation of Level Matrixes for P (Un) of Management**

Correlation	Availability of qualified managers	Salary of management	Competition for good managers	Staff turnover
Availability of qualified managers	1.000	.511**	.269*	.510**
Salary of management	.511**	1.000	.356**	.362**
Competition for good managers	.269*	.356**	1.000	.305*
Staff turnover	.510**	.362**	.305*	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.21a: The Significance levels of the Pearson correlations of Level Matrixes for P (Un) of Management**

Sig. (1-tailed)	Availability of qualified managers	Salary of management	Competition for good managers	Staff turnover
Availability of qualified managers	.	.000	.030	.000
Salary of management	.000	.	.006	.005
Competition for good managers	.030	.006	.	.016
Staff turnover	.000	.005	.016	.

**Table A2.22: Pearson Correlation of Level Matrixes for P (CI) of Capital and Financing**

Correlation	Availability of fund	Sources of fund	Cost of finance	Staff turnover
Availability of fund	1.000	.093	-.053	.052
Sources of fund	.093	1.000	.128	-.077
Cost of finance	-.053	.128	1.000	-.087
Staff turnover	.052	-.077	-.087	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.22a: The Significance levels of the Pearson correlations of Level Matrixes for P (CI) of Capital and Financing**

Sig. (1-tailed)	Availability of fund	Sources of fund	Cost of finance	Staff turnover
Availability of fund	.	.259	.358	.359
Sources of fund	.259	.	.188	.298
Cost of finance	.358	.188	.	.274
Staff turnover	.052	.298	.274	.

**Table A2.23: Pearson Correlation of Level Matrixes for P (Un) of Capital and Financing**

Correlation	Availability of fund	Sources of fund	Cost of finance	Staff turnover
Availability of fund	1.000	.707**	.299*	.502**
Sources of fund	.707**	1.000	.188	.585**
Cost of finance	.299*	.188	1.000	.183
Staff turnover	.502**	.585**	.183	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.23a: The Significance levels of the Pearson correlations of Level Matrixes for P (Un) of Capital and Financing**

Sig. (1-tailed)	Availability of fund	Sources of fund	Cost of finance	Staff turnover
Availability of fund	.	.000	.018	.000
Sources of fund	.000	.	.095	.000
Cost of finance	.018	.095	.	.102
Staff turnover	.000	.000	.102	.

**Table A2.24: Pearson Correlation of Level Matrixes for P (CI) of Technology**

<b>Correlation</b>	Availability of equipment	Equipment suppliers	Competition for equipment	Delivery of equipment	Equipment failure	Nature of manufacturing technology	Nature of system technology	Technology development	Equipment obsolescence	Capital labour substitution
Availability of equipment	1.000	.194	.120	.189	.243*	.227	.166	.048	.203	.139
Equipment suppliers	.194	1.000	.138	.443**	.154	.250*	.212	.042	-.149	-.017
Competition for equipment	.120	.138	1.000	-.039	.082	-.011	.244*	.160	-.040	-.016
Delivery of equipment	.189	.443**	-.039	1.000	.322*	.373**	.095	-.067	-.089	-.141
Equipment failure	.243*	.154	.082	.322*	1.000	.404**	.392**	-.019	.129	.204
Nature of manufacturing technology	.227	.250*	-.011	.373**	.404**	1.000	.332**	.159	-.112	-.156
Nature of system technology	.166	.212	.244*	.095	.392**	.332**	1.000	.221	.013	.020
Technology development	.048	.042	.160	-.067	-.019	.159	.221	1.000	.093	.199
Equipment obsolescence	.203	-.149	-.040	-.089	.129	-.122	.13	.093	1.000	.656
Capital labour substitution	.139	-.017	-.016	-.141	.204	-.156	.020	.199	.656**	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.24a: The Significance levels of the Pearson correlations of Level Matrixes for P (CI) of Technology**

<b>Sig. (1-tailed)</b>	Availability of equipment	Equipment suppliers	Competition for equipment	Delivery of equipment	Equipment failure	Nature of manufacturing technology	Nature of system technology	Technology development	Equipment obsolescence	Capital labour substitution
Availability of equipment	.088	.088	.203	.095	.045	.056	.125	.371	.079	.168
Equipment suppliers	.088	.088	.169	.001	.142	.040	.069	.387	.151	.454
Competition for equipment	.203	.169	.001	.393	.287	.470	.044	.133	.390	.457
Delivery of equipment	.095	.001	.393	.001	.011	.004	.255	.322	.269	.165
Equipment failure	.045	.142	.287	.011	.002	.002	.002	.447	.187	.078
Nature of manufacturing technology	.056	.040	.470	.004	.002	.009	.009	.135	.219	.139
Nature of system technology	.125	.069	.044	.255	.002	.009	.009	.061	.466	.446
Technology development	.371	.387	.133	.322	.447	.135	.061	.261	.261	.082
Equipment obsolescence	.079	.151	.390	.269	.187	.219	.466	.261	.000	.000
Capital labour substitution	.168	.454	.457	.165	.978	.139	.446	.082	.000	.000

**Table A2.25: Pearson Correlation of Level Matrixes for P (Un) of Technology**

<b>Correlation</b>	Availability of equipment	Equipment suppliers	Competition for equipment	Delivery of equipment	Equipment failure	Nature of manufacturing technology	Nature of system technology	Technology development	Equipment obsolescence	Capital labour substitution
Availability of equipment	1.000	.251*	.173	.248*	.227	.283*	.056	.052	.423**	.021
Equipment suppliers	.251*	1.000	.128	.483**	.190	.348**	.304*	.348**	.099	.079
Competition for equipment	.173	.128	1.000	.337**	.367**	.360**	.611**	.437**	.121	.526
Delivery of equipment	.248*	.483**	.337**	1.000	.243*	.595**	.327*	.224	-.001	.231
Equipment failure	.227	.190	.367**	.243*	1.000	.343**	.255*	.189	-.022	.271
Nature of manufacturing technology	.283*	.348**	.360**	.595**	.343**	1.000	.458**	.266**	.028	.368
Nature of system technology	.056	.304*	.611**	.327*	.255*	.458**	1.000	.504**	.222	.638
Technology development	.052	.348**	.437**	.224	.189	.266*	.504**	1.000	.357**	.380
Equipment obsolescence	.423**	.099	.121	-.001	-.022	.028	.222	.357**	1.000	.205
Capital labour substitution	.021	.079	.526**	.231	.271*	.368**	.638**	.380**	.205	1.000

\*, Correlation is significant at the 0.05 level (1-tailed).

\*\*, Correlation is significant at the 0.01 level (1-tailed).

**Table A2.25a: The Significance levels of the Pearson correlations of Level Matrixes for P (Un) of Technology**

<b>Sig. (1-tailed)</b>	Availability of equipment	Equipment suppliers	Competition for equipment	Delivery of equipment	Equipment failure	Nature of manufacturing technology	Nature of system technology	Technology development	Equipment obsolescence	Capital labour substitution
Availability of equipment	.039	.039	.115	.041	.057	.023	.348	.359	.001	.442
Equipment suppliers	.039	.	.187	.000	.093	.007	.016	.007	.247	.292
Competition for equipment	.115	.187	.	.008	.004	.005	.000	.001	.201	.000
Delivery of equipment	.041	.000	.008	.	.045	.000	.010	.059	.496	.053
Equipment failure	.057	.093	.004	.045	.	.007	.037	.094	.441	.029
Nature of manufacturing technology	.023	.007	.005	.000	.007	.	.000	.031	.425	.004
Nature of system technology	.348	.016	.000	.010	.037	.000	.	.000	.061	.000
Technology development	.359	.007	.001	.059	.094	.031	.000	.	.005	.003
Equipment obsolescence	.001	.247	.201	.496	.441	.425	.061	.005	.	.076
Capital labour substitution	.442	.292	.000	.053	.029	.004	.000	.003	.076	.

**Table A2.26: Pearson Correlation of Level Matrixes for P (CI) of Legislation**

Correlation	Regulators in the industry	Number of legislation	Nature of legislation	Effect of legislation
Regulators in the industry	1.000	.656**	.031	.303
Number of legislation	.656**	1.000	.025	.268*
Nature of legislation	.031	.025	1.000	.147
Effect of legislation	.303*	.268*	.147	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.26a: The Significance levels of the Pearson correlations of Level Matrixes for P (CI) of Legislation**

Sig. (1-tailed)	Regulators in the industry	Number of legislation	Nature of legislation	Effect of legislation
Regulators in the industry	.	.000	.415	.016
Number of legislation	.000	.	.431	.030
Nature of legislation	.415	.431	.	.154
Effect of legislation	.016	.030	.154	.

**Table A2.27: Pearson Correlation of Level Matrixes for P (Un) of Legislation**

Correlation	Regulators in the industry	Number of legislation	Nature of legislation	Effect of legislation
Regulators in the industry	1.000	.790**	.409**	.620**
Number of legislation	.790**	1.000	.377**	.705**
Nature of legislation	.409**	.377**	1.000	.442**
Effect of legislation	.620**	.705**	.442**	1.000

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

**Table A2.27a: The Significance levels of the Pearson correlations of Level Matrixes for P (Un) of Legislation**

Sig. (1-tailed)	Regulators in the industry	Number of legislation	Nature of legislation	Effect of legislation
Regulators in the industry	.	.000	.002	.000
Number of legislation	.000	.	.004	.000
Nature of legislation	.002	.004	.	.001
Effect of legislation	.000	.000	.001	.