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A CRITICAL EVALUATION OF THE KAOHSIUNG ARENA BUILD OPERATE TRANSFER PROJECT

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ABSTRACT

Major sports facilities such as stadiums are becoming an essential ingredient that changes people's lives. They are conducive to the promotion of national sport, increase the number of sports participants, and lead to the development of sports core and related industries. However, "successful construction" of sports facilities does not guarantee "successful operation". From the 1990s, many governments have tried to alleviate the financial burden of developing infrastructure by using Build Operate Transfer (BOT) approach. Later on, the trend became very popular and major BOT sports facilities also started to rise.

This study is intended to examine the BOT development of major sports venues by a case study of Kaohsiung Arena, including an analysis of the benefits and challenges of such ventures. To achieve this, a pragmatic approach was adopted and mix-method research was carried out including the questionnaires and open-ended face-to-face interviews, followed with participant observation.

The findings indicate: 1.KaohsiungArena is running smoothly so far and this BOT project is helping the local government release their financial burden effectively. 2. Both the city government and the owner of Kaohsiung Arena are pleased with the benefits that have been gained from this project, and the overall customer satisfaction and loyalty are high. 3. The experience of Kaohsiung Arena can serve as a positive reference for the construction of other stadiums in Taiwan. This project can be highlighted conclusively as a positive example for future projects.

The results contribute to the wider knowledge of fundamental issues in the planning and operating of major sports BOT venues, and stress the issues and difficulties in the operation stage. Most important of all, it not only fills the gaps in BOT studies of major sports venues in Taiwan and Asia, but makes recommendations to the future projects that construct large-scale sports facilities by BOT approach in similar socio-political and economic contexts.

Keywords: Build Operate Transfer (BOT), Kaohsiung Arena, Public Private partnerships, Case study, Taiwan

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GLOSSARY

Buy-Build-Operate (BBO)	Transfer of a public asset to a private or quasi-public entity usually under contract that the assets are to be upgraded and operated for a specified period of time. Public control is exercised through the contract at the time of transfer
Build-Own-Operate (BOO)	The private sector finances, builds, owns and operates a facility or service in perpetuity. The public constraints are stated in the original agreement and through on-going regulatory authority
Build-Lease-Operate-Transfer (BLOT)	A private entity receives a franchise to finance, design, build and operate a leased facility (and to charge user fees) for the lease period, against payment of a rent.
Build-Own-Operate-Transfer (BOOT)	A private entity receives a franchise to finance, design, build and operate a facility for a specified period, after which ownership is transferred back to the public sector
Build-Operate-Transfer (BOT)	The private sector designs, finances and constructs a new facility under a long-term Concession contract, and operates the facility during the term of the Concession after which ownership is transferred back to the public sector if not already transferred upon completion of the facility
Design-Build (DB)	The private sector designs and builds infrastructure to meet public sector performance specifications, often for a fixed price, turnkey basis, so the risk of cost overruns is transferred to the private sector.

Design-Build-Finance-Operate (DBFO)	The private sector designs, finances and constructs a new facility under a long-term lease, and operates the facility during the term of the lease. The private partner transfers the new facility to the public sector at the end of the lease term.
Developer Finance	The private party finances the construction or expansion of a public facility in exchange for the right to build residential housing, commercial stores, and/or industrial facilities at the site.
Enhanced Use Leasing or Underutilized Asset (EUL)	An EUL is an asset management program in the Department of Veterans Affairs (VA) that can include a variety of different leasing arrangements.
Finance Only	A private entity, usually a financial services company, funds a project directly or uses various mechanisms such as a long-term lease or bond issue.
Lease/Purchase	A lease/purchase is an instalment-purchase contract. Under this model, the private sector finances and builds a new facility, which it then leases to a public agency. The public agency makes scheduled lease payments to the private party.
Major Sports Venues	In this research, major sports venues are those venues built for very large-scale indoor and outdoor sporting events, such as the Olympic Games and Universiade. The seating capacity of such places is generally more than 10,000, and they will include places for athletes to warm-up as well as related service facilities
New Taiwan Dollar (NTD)	New Taiwan Dollar is the currency of Taiwan

	since 1949. It has been issued by the Central Bank of Taiwan. The common abbreviation is NT$.
Operations, Maintenance & Management (OMM)	A public partner contracts with a private partner to operate, maintain, and manage a facility or system proving a service. Under this contract option, the public partner retains ownership of the public facility or system, but the private party may invest its own capital in the facility or system
Operation License	A private operator receives a license or rights to operate a public service, usually for a specified term. This is often used in IT projects.
Sale/Leaseback	This is a financial arrangement in which the owner of a facility sells it to another entity, and subsequently leases it back from the new owner. Both public and private entities may enter into sale/leaseback arrangements for a variety of reasons.
Sports Arena	This term is used in this research for large-scale, multifunctional, indoor sports facilities. The seating capacity of such venues is usually between 12,000 and 25,000, and they are normally designed for basketball and volleyball games, as well as for hosting exhibitions and concerts
Tax-Exempt Lease	A public partner finances capital assets or facilities by borrowing funds from a private investor or financial institution. The private partner generally acquires title to the asset, but then transfers it to the public partner either at the beginning or end of the lease term.

Turnkey	A public agency contracts with a private investor/vendor to design and build a complete facility in accordance with specified performance standards and criteria agreed to between the agency and the vendor.

A critical evaluation of the Kaohsiung Arena Build Operate Transfer Project

Chapter One Introduction

1.1 Study Context

Major sports facilities such as stadiums are becoming an essential ingredient that changes people's lives (Geraint *et al.*, 2007). For the construction industry, which is the pioneer of economic development, sports facilities are the basis of the development of the sports industry. Major sports facilities can allow the public to enjoy sports games, promote the climate of national sport, and support the development of the occupational sports industry, the sports performance industry, the sports media industry, the sports arena management industry, the sports tourism industry, and the sports information publishing industry (Chou, 2012). They are conducive to the promotion of national sport, increase the number of sports participants, and lead to the development of sports core and related industries. Geraint *et al.* (2007) reported that stadia can help to shape towns and cities more than almost any other building type, and are a key ingredient in the marketing of cities. Although there are many advantages for cities that can be obtained by constructing such buildings, public owned facilities have often had management and operational difficulties. However, "successful construction" of sports facilities does not guarantee "successful operation" of those facilities. According to an investigation of the use after the games in 75 well-known stadiums constructed for mega sports events in 20 countries (Alm, 2012), the "amount of construct expense" of stadiums is not directly or significantly related to "sporting legacy" after the games. In fact, in many stadiums, after the games, there are no occupational sports teams involved and there are few spectators of games and activities. Thus, they encounter financial obstacles and cannot afford sports development. Operation of the stadiums should be evaluated and

considered before construction, and operational plans after games should be reflected in the architectural design of sports facilities in order to increase their future operation niche. The foundation of major sports facilities not only enhances the development of local sports and art activities, but also creates tourist spots in the cities, as Geraint *et al.* (2007: 251) pointed out, *"Stadia have a role in helping to create a vibrant image for a town or a city, and at their best can be used as part of tourism infrastructure and appeal of a city"*. With budget limitations, how cities in different countries continuously implement the development of major sports facilities is an extremely important issue. The current major sports facilities also encounter one important issue: economic effectiveness. In the past, many sports facilities were supported by governments and there was no concern about economic effectiveness. The investment amounts of these construction projects are enormous; however, the collection of profits is slow. Since the following investment channels, design, construction, operation and management should be carefully assessed, cooperation between government and private enterprises is a good solution for the difficulties mentioned above (Ma, 2002). From the perspectives of planning, functions and operation, Lu *et al.* (2008) compared traditional public stadiums with private ones in China, and suggested that the basic concept of private operation is the solution to governments' continuous implementation of arenas. Furthermore, in an analysis of typical gymnasiums in China, they indicated that private operation is urgent in order to improve indoor and outdoor stadiums. Gratton *et al.* (2005) reported that governments around the world have implemented sports related policies to drive economic development and urban regeneration. For example, in the past few years in the UK, such cities as Manchester and Cardiff have used sports stadia to achieve these aims (Davies, 2008).

Different countries have different demands and conditions regarding the foundation of large-scale arenas. The demands depend on different types of sports. In European

countries, under the influence of football, large-scale outdoor stadiums are important. Among Asian countries, Japan places emphasis on the development of baseball and football sports; thus, many large-scale indoor arenas have been constructed. Except for a few stadiums, such as the Sapporo Dome established by the government in 2002 for the FIFA World Cup, most of the arenas are Domes built by professional baseball teams for baseball games (Cheng, 2002). Other indoor sports in Japan include martial arts; thus, the scale of indoor arenas which are not for baseball games have a capacity of 12,000 spectators or less. According to Cheng's (2002) statistics of 51 non-baseball indoor stadiums in Japan, 94.1% of indoor stadiums have fewer than 12,000 seats. In China, indoor stadiums constructed from 1990-2008 mostly have less than 3,000 seats and only the Capital Arena has 18,000 seats, which however, has been founded for more than 30 years and is overused (Ma, 2002).

1.2 What is PPP

In a broader sense, privatization refers to transfer of any government function to the private sector, including governmental functions such as revenue collection and law enforcement. Privatization is the concept of government owned constructions being sold to private enterprises, which are also known as public-private partnerships (PPP) (Akintoye *et al.,* 2003).

Li and Akintoye (2003) noted that governments worldwide have tried to increase the involvement of the private sector in the delivery of public services, with privatization having occurred in over 100 countries, along with an increase in the number of public-private partnership (PPP) projects.

The trend of privatization has become widespread and has been termed the "Privatization Movement" since the 1980s (Zhan, 1994). In order to decrease the government's intervention in general economic activities, countries have tried to

cooperate with the private sector in the area of developing infrastructure. Because of the short term success experienced in the 1980s, many countries started to follow this trend. Likewise, privatization developed into more specific and sophisticated programs called public-private partnerships. In Asia, various countries such as China, Japan, Taiwan, Thailand, Malaysia, and New Zealand have followed this trend. Public-private partnerships also developed very quickly from the 1990s (Akintoye *et al*, 2003). The trend of privatisation reached its peak in 2007 and then exhibited stable development in Asia (World Bank, 2013). According to the Asian Development Bank (2012), Asia's overall national infrastructure investment requirements are estimated to be $8 trillion from 2012 to 2020. Public-private partnerships contracts are considered as a major solution to accelerate the development of these national infrastructures. In fact, most of these cooperative projects used the Build-Operate-Transfer approach (Tam, 1999; Chen and Doloi, 2008; World Bank, 2013; Ministry of Finance R.O.C, 2013). These Build-Operate-Transfer projects are very important for public-private partnership development throughout Asian countries.

1.3 What is BOT

Typically, BOT projects depend on the local laws and regulations, political issues, government policies, and corruption risks. The concession periods are generally between 10 and 50 years, and the private sector provides 10 to 30 percent of the total project cost. During the time that the project proponent operates the facility, it is allowed to charge facility users appropriate tolls, fees, rentals, and charges stated in their contract to enable the project proponent to recover its investment and expenses.

In the Asia-Pacific region, governments from Australia, China, Taiwan and Hong Kong have often used BOT type PPP projects (Chen and Doloi, 2008; Liu *et al.*, 2004; Jefferies and Cook, 2001; Lu *et al.*, 2000; Tam, 1999). Therefore, it is vitally important

for governments and private sector organisations to evaluate the complexities of BOT projects very carefully. In this context, it should be remembered that BOT concessions normally last for 10 to 50 years, meaning that they can have very significant long-term impacts on local economies.

Although the BOT approach seems to be a win-win solution for the host government and private sector in building public infrastructure, it still has many risks, especially in the initial construction and operation stages (Tiong, 1990; Hsu, 2000; Abdulaziz, 2002; Yeo and Tiong, 2010; Syed *et al.*, 2010). It is vitally important to discover the problems and to decrease the risks of BOT projects. Indeed, it is best to learn from real cases and thus to offer strategies for current and future projects.

To quote from Walker and Smith (1995: 16), "The fundamental attraction of BOT is that it not only takes spending off the government, but also brings in the commercial skills of the private sector, both in identifying viable projects and in running them efficiently when they are built." While BOT projects can offer a win-win solution for the government and for private sector enterprises, they are not suitable for every infrastructure development project. Young (2002) reported that in 87 Asian concession projects, 14 have faced one major problem or another. The details of BOT projects vary from country to country, and from project to project, and thus it is important to develop a BOT-based concept framework for major sports venues in Taiwan which can offer the government and private enterprises a greater chance of success.

1.4 Motives for the Case Study of the Kaohsiung Arena

In 1998, in order to encourage people to spend more time and money on leisure activities, the Executive Yuan of Taiwan enacted the 'two days off per week' policy. At the same time, the government also drew up plans to establish new national scenic areas and build more sports arenas or stadia. Because the government aimed to upgrade the

standard of public services, promote the development of social economics, and encourage private participation in infrastructure projects, built-operate-transfer (BOT) projects thus became increasingly important at this time, with "The Enforcement Rules of Law for the Promotion of Private Participation in Infrastructure Projects" being enacted in 2000 to help achieve this (PCCEY, 2002). These rules firstly introduced BOT concept privatisation and focused on thirteen different kinds of infrastructure projects. Later on, other types of privatisation were rapidly developed, called public-private partnership (PPP). Since then, many PPP infrastructure projects which developed along with BOT projects have also been completed around Taiwan. PPP projects differ from case to case, and from country to country, and thus different countries have endorsed different types of PPP models for the development of public services and facilities. According to the Taiwan Public Construction Commission (2009), 82 major PPP projects were signed from 2002 to 2009, 35 of which were for transportation facilities, and, more closely related to this study, 18 were for sports and tourism-related facilities. While successful PPP projects bring many benefits to society, unsuccessful ones may lead to heavy social burdens.

In Taiwan, the central government has also promoted urban regeneration projects, with encouragement given to the local government to construct key sports facilities (Hsaio, 2001). Kao (2000) listed some of the impacts on the urban environment that sports arenas can have, and that the Taiwanese government should carefully consider, such as the noise generated by sports events, traffic congestion and local tax inflation.

Since 2002, Taiwan has been devoted to the development of arenas by PPP. Noticeably, PPP in Taiwan is based on BOT. In 2010, the government planned that in the future, all large-scale arenas would be based on BOT as evaluation of feasibility (PCCEY, 2010). Thus, BOT development of arenas in Taiwan can serve as a reference for other sports facilities in Taiwan and elsewhere in the world which actively

implement arenas by BOT. Noticeably, currently, indoor stadiums in Taiwan are not supported by any professional or regular games. Thus, it is challenging to raise the investment of private funds and maintain the operation after construction. Kaohsiung Arena was founded based on this condition. The outcome of the project will influence the implementation of large-scale arenas by the government in Taiwan by the same measure.

Taipei and Kaohsiung are the largest and second largest cities in Taiwan, and will have four major PPP sports venue projects in the next few years. As Liu *et al.* (2004) noted, the operation of a major sports venue and its impact on local residents is a very important issue, and one that is examined in this study.

The focus on this study is the Kaohsiung Arena, Taiwan. Kaohsiung city is located on the southwest coast of Taiwan (see Figure 1.1). This study aims to serve as a reference for future strategies and the construction of large-scale arenas in the cities of the world by investigating various problems encountered after the foundation of this BOT project.

Figure 1.1 The Location of Kaohsiung City

Source: Adapted from KCG, 2013

To compare with other countries, Taiwan's BOT improvement had a late start in the 1990s (Tsui, 2002), and launched an act to accelerate the improvement from 2000

(PCCEY, 2002). The Taiwanese government then decided to use the BOT approach in projects to drive the expansion of public-private partnerships. Hence, almost every public-private partnership model was initially developed from the BOT model. The BOT approach has been recognised as the most important public-private partnership development of Taiwanese modern privatization.

Although the economic development of Taiwan experienced rapid improvement from the 1990s, the development of sports, cultural and artistic events was limited by the lack of facilities. Before the opening of the Kaohsiung Arena, there were 3 other arenas in Taiwan, all of which are located in the northern part of Taiwan, and two of which cannot host high class events. Kaohsiung Arena (see Photograph 1.1) is the first BOT arena in Taiwan and is situated in an urban area. The success or failure of this BOT project will be worth examining and can offer experience for both current and future projects.

Photograph 1.1 Kaohsiung Arena from Above

Photo by Zon-Huey Bao, 2013

In the past, all major sports facilities in Taiwan were funded entirely by the government, although none were able to break even financially. Although there were a few sports related BOT cases such She-Do Aquatic World and Kangshan College Pool,

the scale and investment were smaller than £800,000 (PCCEY, 2007) and were only limited to swimming pools. Another major BOT project called the Dapeng Bay National Scenic Area BOT project was signed earlier, but the construction stage was delayed and it is still under construction. It is difficult to offer a full range of aspects for BOT research, especially the operational performance. In consequence, Kaohsiung Arena is the first major sports BOT arena in Taiwan, and is currently in the operational stage. It is hoped that both the local government and residents can benefit from this project.

Kaohsiung is the second largest city and is situated in the south of Taiwan, with a population of 1.52 million (KCG, 2010). Kaohsiung Arena is located in a commercial centre in the northern part of the city. There are many parks, shops, hotels, department stores and restaurants around this area. It is the first major sports BOT project in Taiwan. Moreover, with a 15,000 seat capacity, it can be used for many different events. This is a 50-year BOT project, which took 4 years to construct from 2005, before it was officially opened in 2009. The total construction cost was £158 million (25% was funded by the city government). The use of Kaohsiung Arena as a case study will lead to the development of a number of criteria for use with future major BOT sports projects, and can thus aid the government in drafting related development strategies.

The investigation was carried out during the operational stage of the Kaohsiung Arena BOT project, and it should be noted that it is difficult to carry out a comprehensive examination of this stage of a BOT project in only a few years, especially since most major BOT projects have contracts that last for more than 30 years.

1.5 Study Justification

Although some research has been carried out to examine BOT projects to develop major sports venues, most are limited to investigations of the operational stages of such

ventures (e.g., Jefferies, 2006, Jefferies and Ċhen, 2004; Jefferies and Cook, 2001). Although the BOT approach can be a way to relieve government finances, it is not suitable for every project, and each case must be considered on its own merits. Tiong (1990) separated BOT projects into five phases: pre-investment, implementation, construction, operation and transfer, while Walker and Smith (1995) noted that within such projects there are many risks that may arise in the construction and operational stages.

The Taiwanese government aims to build major sports venues in its largest cities, and to use BOT projects to minimize the cost. The first major sports BOT arena in Taiwan - the Kaohsiung Arena - has recently been completed and this project is thus a very important example for the development of major sports venues in other cities. The Kaohsiung Arena is now at the initial stage of operation, and the private company that operates the arena is not only responsible to its shareholders, but also to the Kaohsiung City government. For example, each year it must make the area available free of charge to the public for 20 days, and it was used as one of the main athletic stadiums for the 2009 World Games. The probable problems involved in negotiating with government organizations, and in dealing with government policy change frequently. Many of these issues are significant challenges for both the private company and city government, and this research will examine some of these in later chapters.

Taiwan does not have any indoor professional sports facility management teams. To operate a major sports arena without an annual loss is quite difficult, and this is why the Kaohsiung Arena has two parts – a shopping centre and the arena itself. It is expected that the revenues produced from the shopping centre can make up any losses produced by the arena. This BOT project is a pioneering one in Taiwan, and its success or failure is likely to decide the future of other sports-related BOT project partnerships.

A number of large-scale BOT infrastructure projects, such as the Taipei 101

Financial Building and Taiwan High Speed Railway (THSR) system, have set milestones for this approach in Taiwan, and made it increasingly popular nationwide. Taipei 101 received £400 million in private funding, while the THSR remains the largest BOT project ever undertaken in the world, with almost £8.7 billion of private funding. Lu *et al.* (2000) indicated that around £8 billion will be spent in Taiwan on future BOT infrastructure projects until 2015. Most BOT cases in Taiwan have been focused on transport, energy and tourism; sports BOT projects are important but still largely overlooked. Two notable early BOT project developments in the sport and leisure field are She-Do Aquatic World in Tainan City, which was awarded the Golden Torch Prize for BOT projects, and the National Kaohsiung Agricultural and Industrial Vocational College Pool, which was awarded the Elite Prize by the Ministry of Education. She-Do Aquatic World has achieved considerable cost savings with regard to overhead expenditure and maintenance costs, while the National Kaohsiung Agricultural and Industrial Vocational College Pool provides all faculty and students with a free spa facility and warm-water swimming pool. In fact, these two swimming pools are experimental sports BOT projects, the scale and investment of which are fairly small. This study examines major sports-related BOT projects, such as the Kaohsiung Arena, which was the first major sports BOT project in Taiwan, as the success or failure of this project will significantly affect the development of such projects in the country.

Chen (2007) claimed that the BOT strategy is profitable for each government department, and used the National Marine Museum as a case study. However, there are other issues related to BOT projects which have been ignored, such as the current legal and financial plans associated with such ventures, what responsibility the public sector should take in these projects, how the private sector should cooperate with the government, and how to utilize limited resources and initiate new plans to achieve a greater likelihood of success. Therefore, those issues will be addressed further in this

study.

To sum up, it is important to make BOT more efficient and proactive with advance consideration from the limited but notable experiences with sports BOT. Thus, how to identify the problems and difficulties from real BOT cases is essential for other current and future cases.

1.6 Research Aims and Objectives

In view of the BOT trend, this study is intended to examine the BOT development of major sports venues, including an analysis of the benefits and challenges of such ventures. This will be in the context of Kaohsiung Arena in Taiwan. The overall aim of this research is to explore the BOT approach to infrastructure development, using a case study of Kaohsiung Arena to examine the benefits and challenges of such projects, especially with regard to sports venues.

To accomplish this, the study has 5 specific objectives:

1. To critically review the literature related to BOT procurement routes and the development of BOT sports infrastructure.
2. To examine the issues and challenges that arise between the government and private enterprises during BOT sports projects, through the Kaohsiung Arena.
3. To undertake an analysis of the advantages and disadvantages of BOT from the perspectives of the host government and the private operating company, through the Kaohsiung Arena.
4. To analyse the operational success of the Kaohsiung Arena by investigating customer satisfaction and loyalty.
5. To make recommendations to government and private companies to maximise the beneficial effects of future major sports venues utilising BOT procurement routes.

1.7 Research Methodology

The development of the methodology is detailed in Chapter Three. This study elaborates the adoption of pragmatism which is considered as the most appropriate approach to examine the research objectives. The research designed emphasises the mixed-method approach, using both qualitative and quantitative research methods. It was developed in accordance with the research aims and objectives. The primary data were collected from September 2010 to February 2011, including the questionnaires (390 valid data) and open-ended face-to-face interviews (3 interviewees).

This study analyses the case of Kaohsiung Arena in order to probe into the operational issues of a BOT project and the obstacles encountered in cooperation between government and private enterprises.

1.8 The Scope of Work

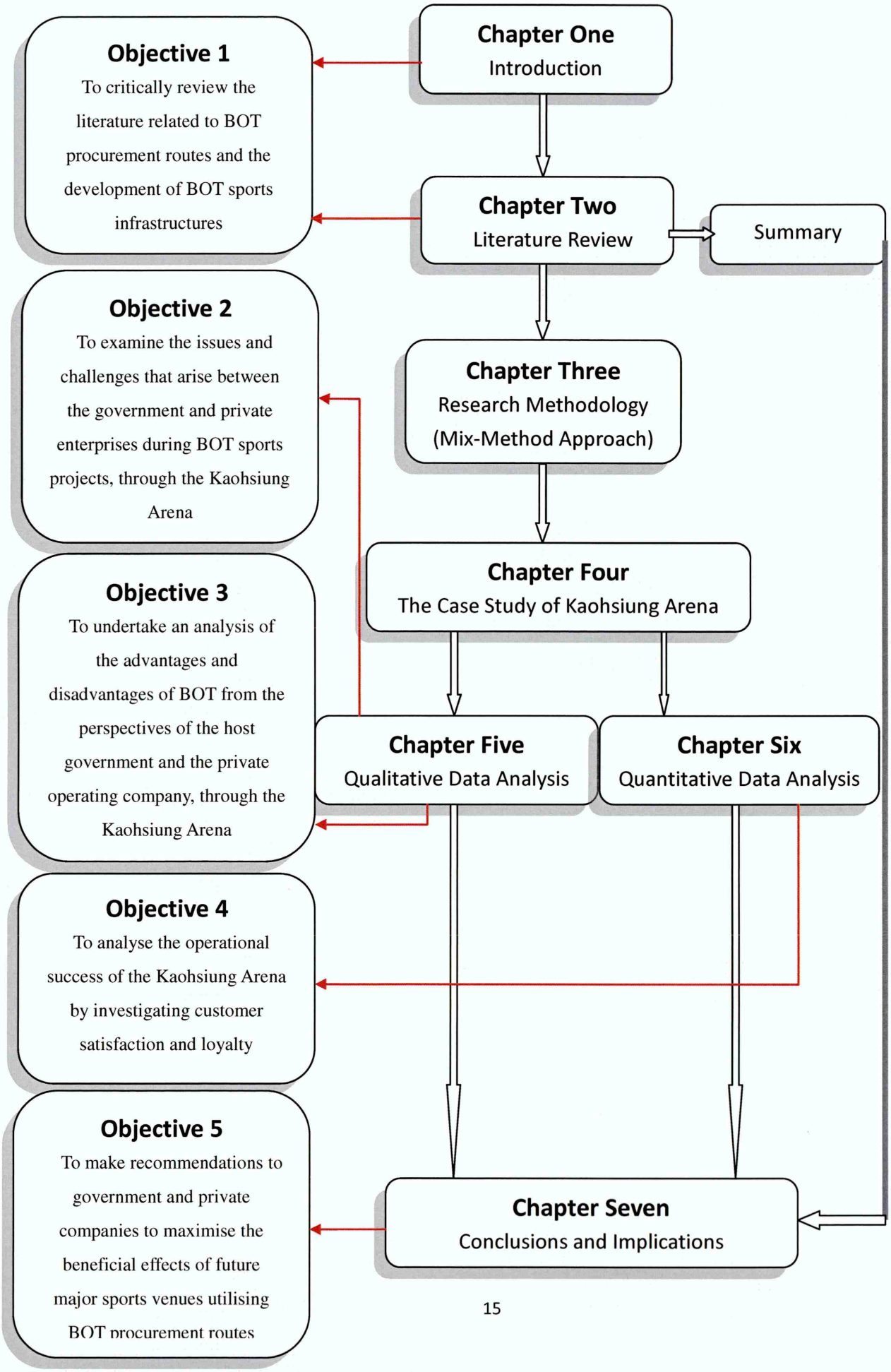
This study improves the understanding of major sports BOT projects. In addition, in order to explore BOT related issues extensively, deeply and from different viewpoints, a case study of Kaohsiung Arena was used in this research. Researchers can not only infer conclusions extensively from the results of using the case study approach, but can also describe the real situation of the research issue. The limitation of exploring this case study is that the investigation can be undertaken only during the several years of operation of this BOT project. The findings can offer ideas to assist other countries in completing the development of such projects. However, the results are still limited to sport BOT arenas in the world. The results should be carefully addressed, especially in terms of culture, politics and government policies. This study represents a case study and while lessons can be learnt the results cannot be widely generalised.

1.9 Structure of the Thesis

This research is presented in seven chapters. Chapter One explains the rationales and motives of the study. Then, Chapter Two reviews the literature, and provides an overview of BOT projects. With the review of advantages, risks and development of BOT projects, this chapter will draw a conclusion regarding BOT projects. Next, Chapter Three reviews the research methodology and details of the methods, while Chapter Four details the case study of Kaohsiung Arena, including relative classifications and laws for sports facilities in Taiwan. In addition, Chapters Five and Six present and analyse the results of Kaohsiung Arena. Lastly, Chapter Seven cross compares the results, summarises the research findings and draws conclusions. Furthermore, Figure 1.2 provides an overview of the structure of this thesis, and where the research objectives have been achieved in this research. Research objective 1 is located in Chapters One and Two, which review the literature and the development of sports BOT infrastructures; Chapter Five examines and analyses the BOT issues addressed in research objectives 2 and 3; Chapter Six reflects the operational success of research objective 4, and then Chapter Seven recommends BOT-based strategies, which achieves research objective 5.

Based on the research aims, this study expects to not only help to improve the understanding of major sports BOT projects, but also to make a number of useful suggestions to aid current and future major sports BOT projects. This thesis also includes recommendations, limitations and future directions.

Figure 1.2 Structure of the Thesis



Chapter Two Literature Review

The preceding review of public-private partnerships provides a comparison of the different PPP variants, with an emphasis on BOT development and its related issues. The key points from this chapter are listed below:

- Section one reviews the features and importance of public-private partnerships. This section starts with the source of PPP, followed by a discussion of the most commonly used PPP types in the world and PPP development in Taiwan.
- Section two reviews Build-Operate-Transfer projects, and discusses the BOT phases, advantages and risks.
- Section three emphasises the importance of customer satisfaction and customer loyalty for the sports industry, and the link between customer satisfaction and customer loyalty.

2.1 Public-Private partnership

Since the 1990s, many governments have tried to alleviate the financial burden of developing infrastructure (Walker & Smith, 1995). For example, the British government implemented a plan called the Private Finance Initiative (PFI) with which it sought to help the economy (HM Treasury, 2000). It hoped to increase the desire of private companies to spend money on public infrastructure by cooperating with the government. For similar reasons, Japan and many European countries also started PFI projects in 1997 and 2003, respectively (Wu, 2009). All these countries expected that, by cooperating, the government and private sector could help alleviate the financial burden of developing infrastructure. In Taiwan, the government has faced the global economic crisis and inflation as well, so the government policy has changed direction to attract public infrastructure investment by private funding (Wang *et al.*, 2009).

The concept of privatization was first raised by Drucker (1969), who used the word "reprivatization". Later, the word "privatization" was used by Poole in 1976 in Reason Magazine, and it was included in Webster's New Collegiate Dictionary for the first time in 1983 where it was defined as "The incidence or process of transferring ownership of business from the public sector (government) to the private sector (business)" (Webster's Online Dictionary, 2013). Privatization refers to transfer of any government function to the private sector, and is the concept of government owned constructions being sold to private enterprises. Privatisation was later on called public-private partnerships (PPP) (Akintoye *et al.*, 2003). Savas (1987) proposed three types of privatization: divestment, delegation, and displacement. The purposes of privatization are to reduce investment in infrastructure, to increase private ownership, and to satisfy people's needs. De Ru and Wettenhall (1990) argued that privatization can also be called 'corporatization' or 'commercialization', which is the government selling of state enterprises, shares and assets to private companies.

The trend of privatization has been widespread and termed the "Privatization Movement" since the 1980s. It was led by American President Reagan and British Prime Minister Thatcher (Zhan, 1994). In order to decrease the government's intervention in general economic activities, these countries reduced both the activities of public services and the ownership of assets, and many private sector enterprises took over a part of the services and infrastructure from the government. Because of the short-term success experienced in the 1980s, many countries started to follow the steps of these pioneering countries. Privatization developed into more specific and sophisticated programs called public-private partnerships or "PPP".

Generally speaking, PPP is the concept developed by public works. Besides the increase in finance, it can also accelerate the implementation of public buildings. Therefore, it is treated as a win-win model for the two parties to obtain benefits.

Although the concept has not been developed for long, it has been widely adopted by countries around the world. It is inferred that many countries, more or less, encounter obstacles when developing public buildings and so they search for a suitable solution. PPP is one of the most common improvements. Before the agreement between government and private companies, the most important issues are sharing of risk, consistency of governmental policy, transparency of contract and credit of loan.

In the UK, the HM treasury (2000: 10) defined public-private partnerships as three different types of arrangement:

1. The introduction of private sector ownership into state-owned businesses, using the full range of possible structures, with sales of either a majority or a minority stake.
2. Private Finance Initiatives (PFI) and other arrangements, where the public sector contracts to purchase quality services on a long-term basis to take advantage of private sector management skills are incentivized by having private finance at risk.
3. Selling government services into wider markets and other partnership arrangements where private sector expertise and finance are used to exploit the commercial potential of government assets.

In these three types of PPP, PFI is the most common form used in the UK for the delivery of infrastructure and related services. Section 2.1.3 offers an in-depth review of the PFI development process.

In the USA, the government drew up the three basic principles for public-private partnership investment (U.S Department of Treasury, 2011: 2):

1. Maximizing the impact of each taxpayer dollar: Using government financing in partnership with private investments, to make the most of funds.
2. Shared risk and profits with private sector participants: To ensure that private sector participants invest alongside the taxpayer.
3. Private sector price discovery: To reduce the likelihood that the government will

overpay for these assets, private sector investors competing with one another will establish the price of the loans and securities purchased under the program.

The European PPP Expertise Centre (EPEC, 2011: Guidance) also defined five typical features of public-private partnership:

1. A long-term contract between a public contracting authority and a private sector company.
2. The transfer of certain project risks to the private sector.
3. A focus on the specification of project outputs rather than project inputs.
4. The application of private financing to underpin the risks transferred to the private sector.
5. Payments to the private sector that reflect the services delivered.

Although different countries have different explanations of public-private partnerships, they all have similar definitions. The United Nations Development Programme (2013: 1.1) has a broad definition of PPP which is "*used to describe a spectrum of possible relationships between the government and other organisations that are not government to carry out a project or provide a service*".

The community has a direct role to play in such an arrangement as a beneficiary, expressing the price the community would pay for an acceptable level of service, and an indirect role to play in shaping policy for the urban environment." Cartlidge (2006: 1) also gave public-private partnerships an extensive definition: "*a long term relationship between the public and private sectors that has the purpose of producing public services or infrastructure.*"

Although the definitions of PPP projects are not exactly the same in different areas or countries, generally speaking, a PPP is "a period of investment relationship between government and enterprises; these relationships are especially in public infrastructure or services."

Akintoye *et al.* (2003: xix) noted that "Public-private partnerships (PPP) in facilities development involve private companies in design, financing, construction, ownership and operation of a public sector utility or service". This joint approach allows cooperation between the public sector and private sector for the construction of infrastructure projects. Malhotra (1997) debated that governments involved in public-private partnerships (PPPs) have to be concerned with issues such as the transparency of the process, the competitiveness of the bids, appropriate allocation of risk, developer returns commensurate with risks, government guarantees, and credit enhancement. Sidney (1996) also argued that PPP involves the investment of private risk capital to design, finance, construct, operate and maintain a project for public use for a specific term. The use of PFI/PPP projects has been widespread. For example, in the UK, there were more than 640 Public Finance Initiative (PFI) projects until March, 2012 (HM Treasury, 2012[a]). PFI is one of the PPP models that is a very popular approach for attracting private investment in the UK. Martin (1996) observed that hundreds of thousands of housing units have been developed by PPP projects in the USA. In Asia, the trend arose in the late 1980s and has continued to grow. Chatterjee (1996) reported that in the 1980s and 1990s the number of Asian concession projects increased sharply, exceeding 150 projects by 1995. Later on, from 1995 to 2011, the PPP projects achieved stable development, with investment exceeding US$10 billion per year (World Bank, 2013). It must be noted that PFI is a type of PPP in which the majority of the finance is provided by the private sector. Hence, PFI has often been abridged when studies discuss PPP projects. Further details of PFI will be discussed in section 2.1.4 below.

Traditionally, PPP projects aim to improve "value for money" in infrastructure provision (PPIAF, 2012); this is also the core value of PPP/PFI projects pursued by the British government (HM Treasury, 2012[b]).

With the prevalence of privatization, nowadays, the governments of many countries are developing more well-planned public infrastructure, in order to better manage and provide services for the public. For instance, governments purchase transportation services for the public, without having the ownership of the railways. As suggested by the theory of privatization, the private sector is more efficient than the public sector. For the same resources, the creativity and techniques of the private sector are more likely to satisfy the needs of the government and the public. As for the public sector, the disadvantages in different countries are similar, resulting in the need for privatization reform.

In conclusion, PPP is a concept whereby a government cooperates with private companies in the issues such as design, financing, construction, ownership and operation of a public utility or service. Capital and employment of private companies are more flexible and the operation is more active than in the public sector. Therefore, the performance tends to be more significant. However, when assessing investment projects, private companies have many concerns such as amount of investment, operation year limit, finance limit, return rate and consistency of government policy, which will influence their investment intention.

2.1.1 Basic types of PPP

Different countries have different categories of PPP types. There are more than 20 different types of PPP in the world. For example, the United Nations Economic Commission (2008: 2) listed 10 commonly used PPP agreements as in Table 2.1 below:

Table 2.1 Commonly Used PPP Agreements in Europe

PPP Agreement	Definition
Buy-Build-Operate (BBO)	Transfer of a public asset to a private or quasi-public entity usually under contract that the assets are to be upgraded and operated for a specified period of time. Public control is exercised through the contract at the time of transfer.
Build-Own-Operate (BOO)	The private sector finances, builds, owns and operates a facility or service in perpetuity. The public constraints are stated in the original agreement and through on-going regulatory authority.
Build-Own-Operate-Transfer (BOOT)	A private entity receives a franchise to finance, design, build and operate a facility for a specified period, after which ownership is transferred back to the public sector.
Build-Operate-Transfer (BOT)	The private sector designs, finances and constructs a new facility under a long-term Concession contract, and operates the facility during the term of the Concession after which ownership is transferred back to the public sector if not already transferred upon completion of the facility.
Build-Lease-Operate-Transfer (BLOT)	A private entity receives a franchise to finance, design, build and operate a leased facility (and to charge user fees) for the lease period, against payment of a rent.
Design-Build-Finance-Operate (DBFO)	The private sector designs, finances and constructs a new facility under a long-term lease, and operates the facility during the term of the lease. The private partner transfers the new facility to the public sector at the end of the lease term.
Finance Only	A private entity, usually a financial services company, funds a project directly or uses various mechanisms such as a long-term lease or bond issue.
Operation & Maintenance (O & M)	A private operator, under contract, operates a publicly owned asset for a specified term. Ownership of the asset remains with the public entity.
Design-Build (DB)	The private sector designs and builds infrastructure to meet public sector performance specifications, often for a fixed price, turnkey basis, so the risk of cost overruns is transferred to the private sector.
Operation License	A private operator receives a license or rights to operate a public service, usually for a specified term. This is often used in IT projects.

Source: Adapted from United Nations Economic Commission for Europe (2008:2)

In addition, Table 2.2 lists other PPP agreements that are commonly used in the United States (NCPPP, 2013) such as Operations, Maintenance & Management (OMM); Design-Build-Maintain (DBM); Design-Build-Operate (DBO); and Lease/Purchase and Turnkey, each of which have different characteristics. Despite this, governments still try to improve public infrastructure and service at different levels, from a simple contract such as Operation License, DB and Lease/Purchase, to a very complicated agreement like BOT, DBFOM and DBFO.

Table 2.2 Commonly used PPP Agreements in America

PPP Agreement	Definition
Operations, Maintenance & Management (OMM)	A public partner contracts with a private partner to operate, maintain, and manage a facility or system proving a service. Under this contract option, the public partner retains ownership of the public facility or system, but the private party may invest its own capital in the facility or system.
Design-Build-Maintain (DBM)	A DBM is similar to a DB except the maintenance of the facility for some period of time becomes the responsibility of the private sector partner.
Design-Build-Operate (DBO)	A single contract is awarded for the design, construction, and operation of a capital improvement. Title to the facility remains with the public sector unless the project is a design/build/operate/ transfer or design/build/own/operate project.
Design-Build-Operate-Maintain (DBOM)	An integrated partnership that combines the design and construction responsibilities of design-build procurements with operations and maintenance.
Design-Build-Finance -Operate-Maintain (DBFOM)	The responsibilities for designing, building, financing, operating and maintaining are bundled together and transferred to private sector partners.
Developer Finance	The private party finances the construction or expansion of a public facility in exchange for the right to build residential housing, commercial stores, and/or industrial facilities at the site.
Enhanced Use Leasing or Underutilized Asset (EUL)	An EUL is an asset management program in the Department of Veterans Affairs (VA) that can include a variety of different leasing arrangements.
Lease-Develop-Operate (LDO) Build-Develop-Operate (BDO)	Under these partnerships arrangements, the private party leases or buys an existing facility from a public agency; invests its own capital to renovate, modernize, and/or expand the facility; and then operates it under a contract with the public agency.
Lease/Purchase	A lease/purchase is an instalment-purchase contract. Under this model, the private sector finances and builds a new facility, which it then leases to a public agency. The public agency makes scheduled lease payments to the private party.
Sale/Leaseback	This is a financial arrangement in which the owner of a facility sells it to another entity, and subsequently leases it back from the new owner. Both public and private entities may enter into sale/leaseback arrangements for a variety of reasons.
Tax-Exempt Lease	A public partner finances capital assets or facilities by borrowing funds from a private investor or financial institution. The private partner generally acquires title to the asset, but then transfers it to the public partner either at the beginning or end of the lease term.
Turnkey	A public agency contracts with a private investor/vendor to design and build a complete facility in accordance with specified performance standards and criteria agreed to between the agency and the vendor.

Source: Adapted from National Council for Public Private Partnerships (2013) official website:

http://www.ncppp.org/howpart/ppptypes.shtml

Although PPP classification in the previous countries is not entirely the same, the names and content can be divided into the following three categories:

1. By private facilities and manpower, the government provides a service to the public through facilities, such as PFI, Sale/Leaseback, Tax-Exempt Lease. The advantage is that the government can save the time needed to collect the land and plan the construction. It can provide public facilities and services by private enterprises without the budget of enormous building capital.
2. The government authorizes the operation of facilities to private enterprises. In some authorized projects of facilities, government can acquire royalty income. In other cases, they should subsidize the operational expense to provide public service, such as Operation License, O&M, Finance Only, OMM and Develop Finance mentioned above. The advantage is that it can rely on professional competence and flexibility of private operational teams to solve the problem of shortage of governmental manpower.
3. The government only provides land and requirement for buildings. Investors plan and construct the projects. After the operation for a period of time, they return them to government or have the possession of facilities and usage right of land after the deadline of operation. They are not supervised by government. It includes BOT, BBO, BOO, BOOT and BLOT and the advantage is that private enterprises can reinforce operational efficiency. The government does not undertake total building capital; besides, it can shift investment risk to private enterprises.

PPP is popular in many countries around the world, the definitions and details may vary. In order to probe into the real meaning of PPP, the definition of "partnership" is first discussed. It generally includes two views. One is that the government and private sector invest in the project and undertake the risk. The other is that the government only

signs a long-term contract with the private sector enterprise and has partnership. The UK was the first country to implement PPP progressively on a broad scope. Rodney and Clark (2000) classified the current types of PPP in the UK into three types: 1) concession: after the private enterprise completes the construction, it charges the users; 2) private companies provide services, and the public sector regularly pays the private companies; 3) joint venture: the government and private sector invest in the projects and undertake the risk together.

In Europe, according to the UNDP (2013), the broadest definition of PPP includes six main types. These types are service and management contracts, lease, concession, Build-Operate-Transfer (BOT) arrangements, or a complete transfer of ownership through divestiture (Table 2.3). This matches the Asian Development Bank's (2008) definition except for divestiture, because divestiture is only used in England and Wales. In addition, the ADB (2008: 41) also defines joint venture as one type of basic PPP and it is an *"alternative to full privatization in which the infrastructure is co-owned and operated by the public sector and private operators."*

Table 2.3 PPP Types and Description

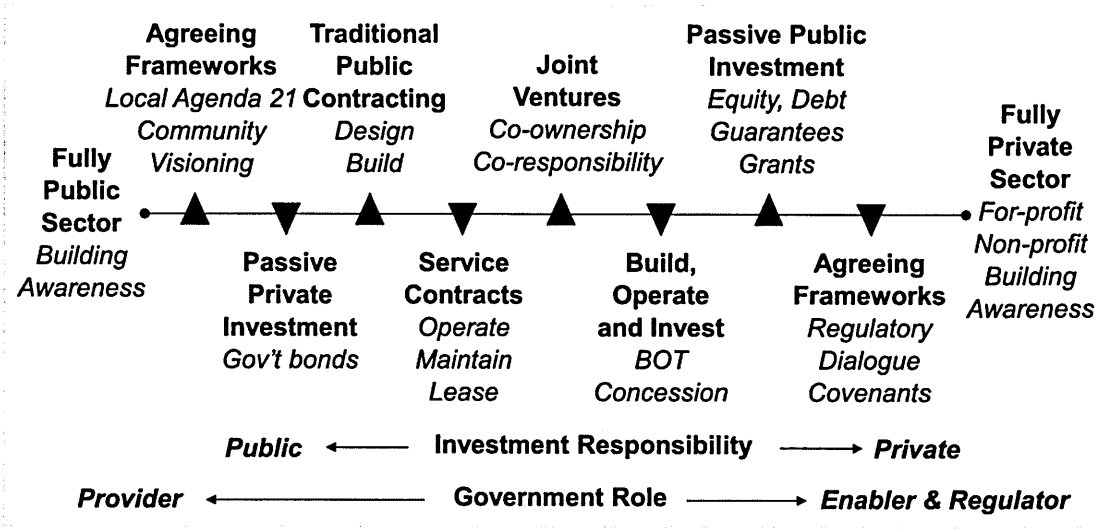
Main PPP options	Description
Service Contract	A simple contracts awarded to private companies for particular tasks, such as installing or reading meters, monitoring losses, repairing pipes or collecting accounts.
Management Contract	A more comprehensive form of service contract, under which the public authority appoints a private contractor to manage all or part of its operations.
Lease	A service utility leases the full operation and maintenance of its facilities within an agreed geographic area to a private operator for a period of time.
BOT	The private sector typically designs, constructs and operates facilities, and provides services to municipal or government-owned service utilities.
Concession	Combine elements of operation leases for existing assets and BOT contracts for Greenfields.
Divestiture	Gives the private sector full responsibility for operations, maintenance and investment. (Only used in England and Wales)

Source: Adapted from United Nations Development Programme (2013), Toolkit for Pro-Poor Municipal PPPs

Figure 2.1 shows the broadest definition of PPP types and the degree to which government and the private sector are involved (UNDP, 2013). In this figure, PPP procurement projects are also characterized by the degree to which they are fully public or fully private. Basically, these models are not exactly the same in all countries.

According to the previous PPP classification of UNDP, the definition of UNDP on PPP can be from simple draft, partnership and even memorandum (service contract) to multiple complicated rental relations (Concession). However, the classification can be treated as a kind of hierarchical relation, from simple to complicated levels.

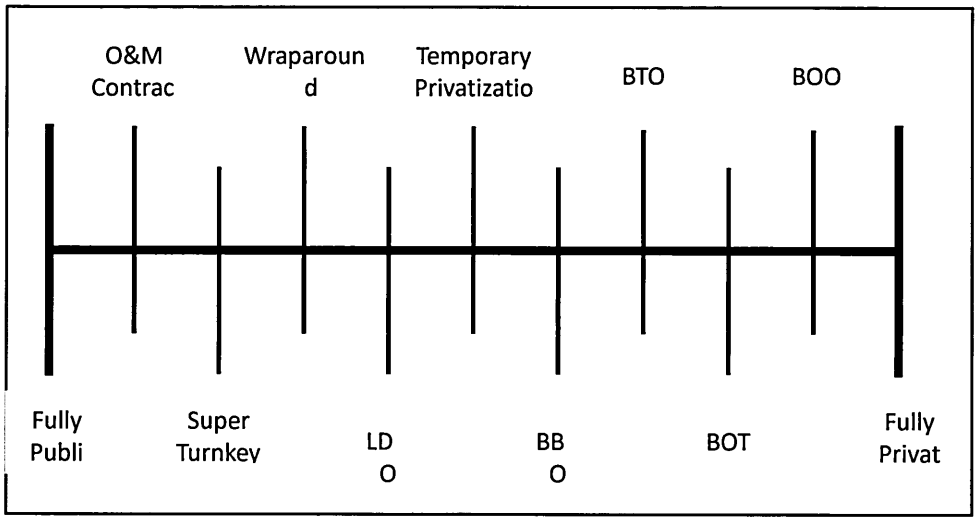
Figure 2.1 The Broadest Definition of PPP Types



Source: Adapted from UNDP Public-Private Partnerships for the urban development Toll 11-1, 2013

To compare with Figure 2.1, it shows the spectrum of possible relationships between public and private service providers. It is partly matched with the degree structural continuum of public-private-partnerships presented in Figure 2.2, Both of them characterised the PPP by using the degree of privatisation.

Figure 2.2 The Structural Continuum of Public-Private-Partnerships



Source: Adapted Jong-Ho, 1998 (as cited in Abdulaziz, 2002)

2.1.2 How PPPs Can Help

Huang (2005: 171) suggested that the advantage of PPPs is that they help to overcome the following drawbacks of traditional public infrastructure: inefficiency, low productivity, poor quality of goods and labor, continuous loss of profit for government and enterprises, redundant personnel, outdated management, lack of competitiveness, and ineffective use of resources. There is a fact behind this. Many governmental activities are monopolized and they lack the incentive of efficient resource use and economy. There is no punishment for inferior performance. Of course, this is not the case for all governments. However, the above disadvantages influence each other and are common. After 1990, following the UK model, governments in different countries started implementing PPP, which helped to improve the drawbacks of traditional public infrastructure. The advantages of PPP are summarized in the following table.

Table 2.4 How PPPs can help

PPPs can Help	Source
➢ Mobilisation of private capital ➢ As a tool for greater efficiency	Asian Development Bank (2008: 3)
➢ To improve the delivery of basic services to all citizens ➢ To offer an alternative to full privatisation by combining the advantages of both sectors	PPPUE (2013: online toolkit for Pro-Poor Municipal PPPs)
➢ PPPs can mobilize additional sources of funding and financing for infrastructure. ➢ PPPs can help improve project selection, subjecting assumptions to the market test of attracting private finance. ➢ Countries with relatively long PPP histories have found that PPPs manage construction better than traditional procurement, with projects coming in on time and on budget more often. ➢ PPPs can also help to ensure that adequate maintenance keeps assets in a serviceable condition.	PPIAF (2012: 15)
➢ Enhancing government's capacity to develop integrated solutions. ➢ Facilitating creative and innovative approaches ➢ Reducing the cost of implementing the project ➢ Transferring certain risks to the private project partner ➢ Attracting larger, and potentially more sophisticated, bidders to the project. ➢ Accessing skills, experience and technology.	Akintoye et al. (2003: 7)
➢ Greater certainty of contract value before construction. ➢ Functional brief finalized prior to tendering ➢ Achieving value for money. ➢ Enabling greater transfer of risks. ➢ Opportunity to fashion innovative solutions ➢ The PPP constructor can participate in the design phase of the project. ➢ Payment for the services is dependent on delivery of facilities and services to an agreed standard.	Grimsey & Lewis (2007: 173)

Based on the previous statements, implementation of PPP construction helps the government to save expenditure on public infrastructure, increase the service quality of public infrastructure, transfer risk, improve innovation, enhance talent and reinforce managerial efficacy. Regarding different types of public infrastructure and service, the involvement of government reduces while that of private enterprises increases. In other words, the government can reduce its direct involvement in the construction and service

of public infrastructure, and integrate and enhance the quality and quantity of public infrastructure. However, although PPP is significantly useful for governmental implementation of public infrastructure, it has potential disadvantages. For example, Miller and Floricel (2001) analyzed PPP projects and found that when the terms of contracts of PPP projects are longer, the risk and uncertain factors would be higher. The risks include political factors, progress of construction and stalling and/or termination of projects. This study summarizes the potential strengths and weaknesses of the different types of PPP by ADB (2008: 29-42), as shown below.

Table 2.5 The Potential Strengths and Weaknesses of the Different Types of PPP

	Potential strength	Potential weakness
Service Contract	1. It is usually most suitable where the service can be clearly defined in the contract, the level of demand is reasonably certain, and performance can be monitored easily. 2. It provides a relatively low-risk option for expanding the role of the private sector. 3. It can have a quick and substantial impact on system operation and efficiency, and provides a vehicle for technology transfer and development of managerial capacity.	1. It is unsuitable if the main objective is to attract capital investment.
Management Contract	1. The key advantage of this option is that many operational gains that result from private sector management can be made without transferring the assets to the private sector. 2. The contracts are also relatively low cost as fewer staff are dispatched to the utility from the private operator. 3. Management contracts can also be seen as interim arrangements, allowing for modest improvements while more comprehensive contracts and structures are developed.	1. There is a risk that the management contractor does not enjoy the autonomy or the authority required to achieve deep and lasting change.
Lease Contract	1. The key advantage of this option is that it provides incentives for the operator to achieve higher levels of efficiency and higher sales. 2. The private partner provides a fee to cover the cost of using the assets.	1. The contractors' revenues are derived from customer payments and, hence, the question of tariff levels becomes increasingly sensitive.
Concessions	A key advantage of the concession arrangement is that it provides incentives to the operator to achieve improved levels of efficiency and effectiveness since gains in efficiency translate into increased profits and return to the concessionaire.	1. The complexity of the contract required to define the operator's activities. 2. The long-term nature of the contracts present difficulties in anticipating events over a 25-year period.
BOT	1. BOTs have been widely used to attract private financing to the construction or renovation of infrastructure. 2. BOT agreements tend to reduce commercial risk for the private partner because there is often only one customer, the government.	1. It can be difficult to link the increases in production brought about by a BOT with commensurate improvements on the demand side. 2. While initial capital construction costs may be reduced through the private sector's experience, 3. private debt may be an expensive substitute for public financing.
Joint Venture	It is real partnerships of the public and private sectors that match the advantages of the private sector with the social concerns and local knowledge of the public sector. 2. All partners have invested in the company and have an interest in the success of the company and incentives for efficiency.	1. The government's dual roles as owner and regulator can lead to conflict of interest. 2. It has a tendency to be directly negotiated or to follow a less formal procurement path, which can lead to concerns about corruption.

Based on the figure above, PPP is neither absolutely good nor bad. After clarifying the basic types of PPP, when governments make decisions on privatization, they need to select the most appropriate PPP. This research compares the options of PPP from the UNDP (2013) and ADB (2008) reports in Table 2.6 below. The government has to make allocations for functions, including asset ownership, operations and maintenance, capital investment, commercial risk and project duration.

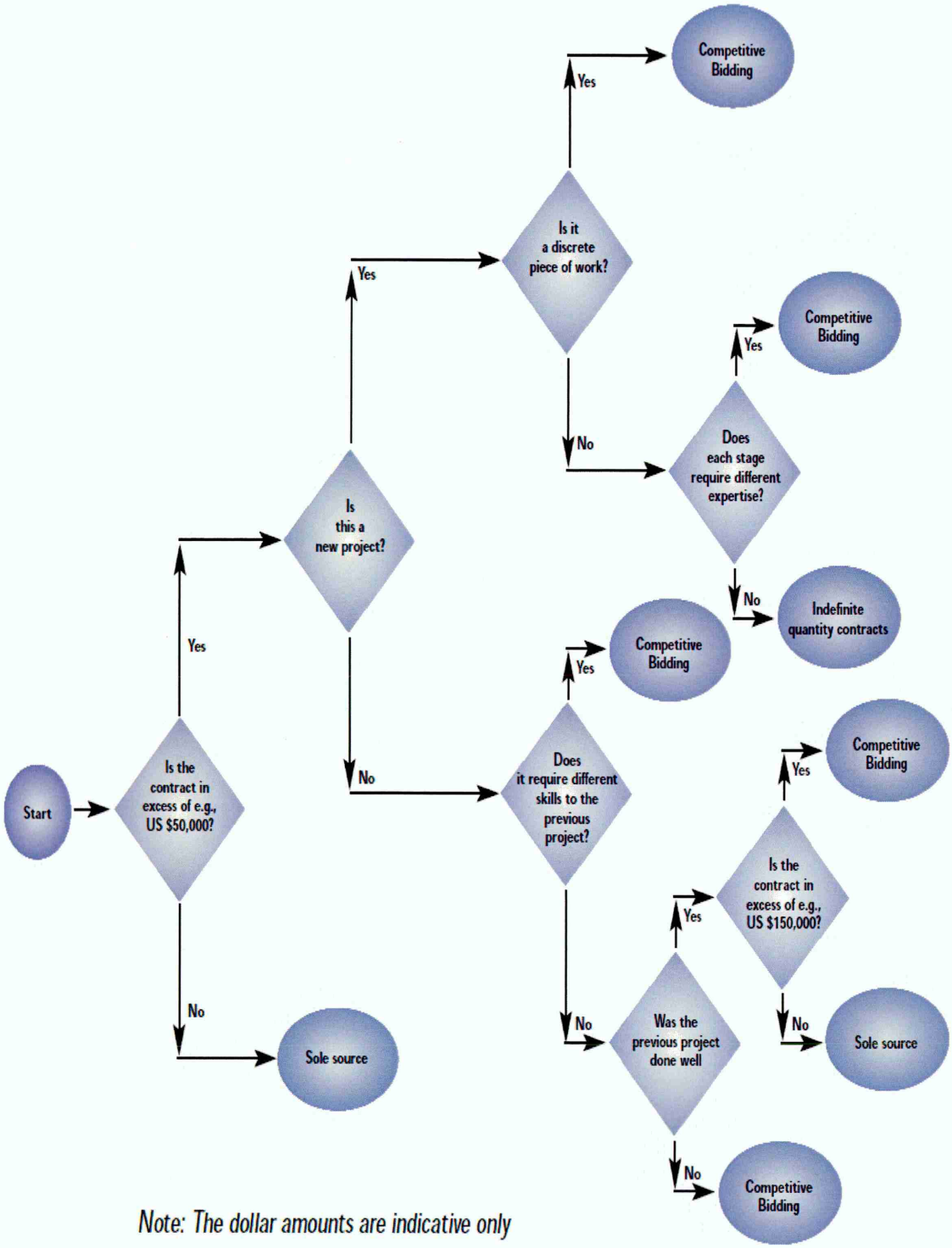
Table 2.6 Options for PPPs

Feature / Type	Asset ownership	Operations & maintenance	Capital investment	Commercial risk	Duration (in years)
Service Contract	Public Public	Public and private Public	Public Public	Public Public	1-2 1-3
Management Contract	Public Public	Private Private	Public Public	Public Public	3-5 2-5
Lease	Public Public	Private Private	Public Public	Shared Shared	8-15 11-15
BOT	Private Public/Private	Private Private	Private Private	Private Private	20-30 Varies
Concession	Public/Private Public/Private	Private Private	Private Private	Private Private	25-30 25-30
Divestiture	Public	Private	Private	Private	Indefinite

The black text shows the UNDP comparison, and the blue shows the ADB comparison.

PPIAF (2001) used figures to clearly explain the selection of PPP as a reference for governments in different countries. The figures are similar to Table 2.6, and aim to clarify the asset ownership when selecting PPP. This research summarizes the different types of PPP and compares the outcomes with the findings. The process of selecting PPP models is shown in Figure 2.3 below.

Figure 2.3 Choosing the Appropriate Type of PPP



Source: Adapted from PPIAF (2001:24)

2.1.3 Public Private Partnerships and Private Financial Initiate (PFI)

Since the 1990s, the United Nations and World Bank have started to incorporate the private sector (including multinational corporations) in the cooperation framework for infrastructure engineering and management via the PPP model. The two organisations hope to introduce the technology, capital and efficiency of the private sector to build infrastructure in developing countries (Benedicte and Desmond, 2007). The various issues such as tax revenue shortfalls, a lack of public-sector efficiency, and economic slowdowns over recent years have made the Taiwanese government realize that traditional public financing is no longer sufficient to meet the rapidly rising demand for public facilities. At this juncture, the US and many EU countries have been promoting PPP projects. The Taiwanese government is actively seeking cooperation with private enterprises, in order to keep up with the pace in the US and Europe. In the UK, the government was under financial stress due to the expansion of national welfare policies since the 1980s, and so kick-started privatization. Beginning in the 1990s, the UK sank into a recession and suffered from high unemployment. To boost the economy, the UK government proposed PFI (private finance initiatives) to encourage the private sector to finance public infrastructure projects (Parker and Saal, 2003). This was later developed into a form of PFI project. The UK government hoped to provide public services without increasing public spending via the PFI scheme. Prime Minister Tony Blair changed PFI into PPP in 1995. However, some British scholars did not really differentiate between these two in their analytical works and simply grouped them into PFI/PPP (Greenaway *et al.*, 2007). The main reason is because the private companies offer services in PFI projects, but in the traditional PPP projects, private companies offered assets (Liao, 2005). PFI was included in PPP as a way of private funding of public services. In other words, it is the procurement of services by the government from the private sector. Simply put, the government does not need to fund infrastructure

projects, but to purchase services from the private enterprises who own the assets each year according to contracts. According to HM treasury (2006: 5), "*PFI is an arrangement whereby [there is a] contract to purchase services from the private sector on a long-term basis, often between 15-30 years*". In the PFI scheme, the government only needs to pay for purchases or rent for public services. All the upfront capital expenses, such as design, construction and building maintenance costs are funded by private enterprises. PFI was first proposed by the Conservative Party to introduce private funding into public services and to reduce NCT (New Control Total) paid by the government in 1992 (Liao, 2005). Public spending could be lowered, without compromising public services, because the government does not have to fund the building or maintenance of public facilities. All the funding is provided by the private sector, and hence, none of the spending appears on the OBS (Off Balance Sheet) of the government (Graham, 2003). Also, as PFI projects do not involve any government borrowing, they do not increase the cash requirements of the government (Broadbent *et al.*, 2010). PFI was initiated by the Conservative Party, but the Labour Party continued the initiative after they won the 1997 election. The scheme covered the development of environmental projects, hospitals, transportation construction, schools, prisons, government offices and communities.

The UK government has completed over 800 PFI projects by working with the public sector in the last two decades, and their success has attracted interest from more than 50 countries around the world (Ghobadian *et al.*, 2004). In terms of history and track record, the UK government is the most experienced in PFI projects in the developed world. Although PFI schemes take the upfront financial burden from governments for infrastructure projects, they still need to spend on service procurements in the future. There is still a certain amount of pressure on public finances. However, governments can maintain control over budgets via PFI schemes because PFI contracts

are entered into by individual government agencies and the private sector. Governments are not bound by the contracts of the agencies; they can lower PFI costs by cutting back on implementations (agency budgets). In fact, the UK Treasury Department (HM Treasury, 2012[a]) estimated that in 2012 the departmental capital spending by the private sector would be £2,382 million in the year 2012-2013. Also, the estimated payments of unitary charges under PFI contracts would be £9,312 million.

The PFIs stress "Value for Money" (HM Treasury, 2006). However, the PFI scheme can result in negative effects. For example, Barlow and Koberle-Gaiser (2008) studied six PFI hospital cases and found that the PFI projects increased the operation difficulties and decreased the innovation of the hospital. Ball *et al.* (2002) analysed the government financial statements and pointed out that the government hid the potential debts in the government balance sheet. Hence, the UK government might face a potential increase in debts without notice.

Because the current PFI has many drawbacks, it has been greatly criticised as being too generous to the private investors. In 2012, the PFI reform was first announced by the UK government in its Autumn Statement, and was called PFI2 or PF2 (BBC News, 2012). The PF2 aims to improve the current PFI weakness from five perspectives (HM Treasury[a], 2012: 10), namely, the original PFI procurement was too slow and expensive, it was insufficiently flexible during the operational period, it had insufficient transparency regarding future liabilities, there were inappropriate risks, and equity investors in PFI projects were perceived as having made windfall gains.

As a matter of fact, PFI can neither totally replace the investment nor decrease the investment in infrastructure, but it is still very important to the British government. As the HM Treasury (2012[a]) declares on its website "*The Private Finance Initiative (PFI) is a small but important part of the Government's strategy for delivering high quality public services.*"

Although both PFI and BOT involve private capital in public infrastructure projects, they are different in many aspects. The key difference is that under the PFI scheme, governments guarantee the purchase of public services from private enterprises with annual fees specified in contracts. This means the government and private sector share the risks. BOT projects generate income from users, and the risks are borne by private enterprises. Compared to BOT projects, the PFI scheme involves more issues concerning benefits and rights because governments guarantee the purchase of services. On the other hand, PFI projects are easy to implement as government agencies have the leeway to enter contracts without utilizing government budgets. This is the reason why they have aroused many debates and controversies in the UK, particularly within the Labour Party, the left wing and the labour unions which support the provision of public services by the state.

Under the rapid development of IT technologies, governments and private enterprises are cooperating in a highly complex and closely knit social network. However, the public sector is confronted with many challenges nowadays. Bryson *et al.* (2006) suggested that governments around the world suffer from limited information, insufficient professionalism, and a lack of economic benefits. All these issues highlight the necessity of cooperation between governments and the private sector. However, such cooperation goes beyond the joint efforts of government agencies and private enterprises, and means the establishment of social values and collaboration frameworks.

Since the implementation of PFI in 1992, it has become the most common public investment strategy. The main reason why the British government adopted PFI is to guarantee financial expenditure value and provide public infrastructure and services. To date, the execution of some public investment projects has been inefficient, finance is not transparent, and governmental departments cannot acquire financial expenditure value (Ju, 2013). Due to the disadvantages above, the advantage of PFI has declined and

it has even become a financial burden. Thus, a new policy called PF2 was introduced by the government, with the aim of retaining the advantages and basic framework of the current system and improving on the critical drawbacks (HM Treasury, 2012[b]). The specific actions include the offering of broader finance channels, increasing the transparency of long-term project debts and information of profits, and simplifying administration procedures (HM Treasury, 2012[c]). By doing so, the financial expenditure value of public infrastructure projects can be increased, and a more transparent, simple, concrete and low-risk PFI system can be created. Although it takes time to demonstrate the effectiveness of the implementation of a new system, the British government's active improvement of PFI can be a model for other countries. The private sector can continue playing an important role in PF2, while the governmental sector can be devoted to investment by public assets in order to lead to a win-win state.

The PPP model is classified differently around the world. In the UK it is called PPP or PFI. However, public construction via "public and private partnership" does not simply mean that the government practices public construction by private loan or by the privatization of national business. PPP aims to combine the mission of government with private resources, such as innovative capacity, high-quality public service and professional competence. The common measure is that upon business benefits, private companies assist with governmental planning and construction of public facilities. After completion of the facilities and operation for a certain period of time, the facilities are returned to the government which returns the capital invested by the private firms. The reason that the U.K. and Japan practice PFI is to create the effect of Value for Money. They try to enhance service quality, building efficiency and cost control.

2.1.4 Public Private Partnerships Conclusion

In developed countries such as European countries, The UK and the U.S., the governments are trying to reduce the burden of governmental departments by using private funds. Hence, since an American scholar's proposal of the PPP system in 1969, different countries have tried to introduce private capital and enhance development and operation of public construction. Although they have taken different measures, the key points are largely the same, as shown below:

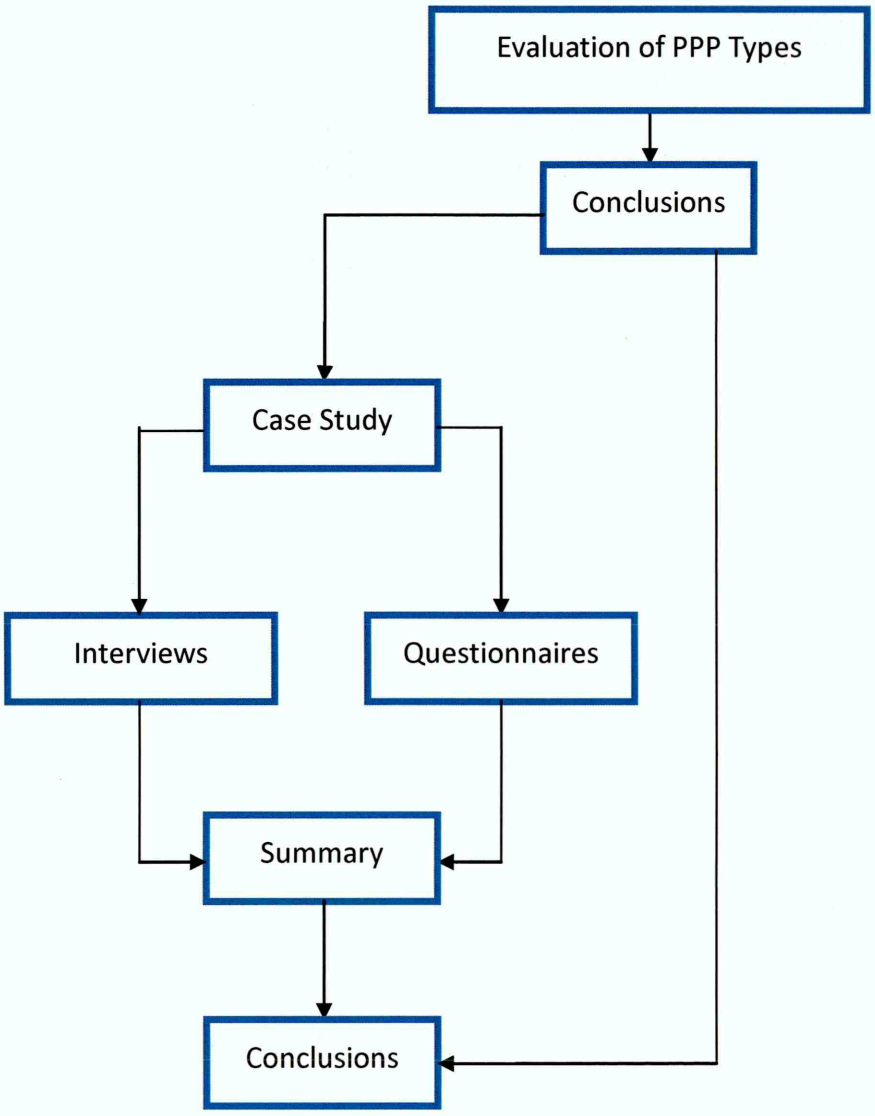
1) The government only provides the land, while the capital is private. After operation for the stated period of time, all assets are returned to the government.
2) The government treats private facilities as places of public service and provides a reasonable return.
3) The government authorizes the constructed facilities to be operated by private companies with the conditions of operational capacity, such as regular rental or construction premium to the government.
4) The government authorizes the facilities with incomplete or negative operation to be reconstructed by private companies. After the operation for a period of time, they are returned to the government.

Generally speaking, when private capital is higher, risk will be higher. Therefore, the operational year limit is longer. On the contrary, when the investment is only in a few building and basic facilities, the operational year limit are usually low, such as 3-5 years.

As mentioned above, even though every country has different classifications of PPP, basically it can be divided into several main types. This study organizes and

analyses all of the PPP types, and discusses the results with a case study. The corresponding procedures are shown in Figure 2.4 below:

Figure 2.4 Corresponding Procedures of this Research



Generally speaking, there are no best or worst PPP types. Governments have to find suitable types for specific cases. Considering the literature reviewed in an earlier section, this research separates the PPP into five types, highlighting the evaluation of PPP types specifically based on the potential strength, potential weakness, asset ownership, capital investment, commercial risk, property ownership and project duration (as shown in Table 2.7.). It should be noted that the PPP types are not exactly the same in all countries. For example, firstly, PFI is not considered as a type of PPP in some world organisations (such as ADP, UNDP), but PFI projects have been widely used, especially in the UK and Japan. Secondly, 'Concessions' are sometimes mixed with BOT projects, as they also share very similar characteristics; concessions are always considered as BOT, especially in Asian countries. An in-depth review of this is provided in section 2.2.

Table 2.7 The Highlights the Evaluation of PPP Types

Types of PPP / Critical Points	Service Contracts	Management contracts	Lease Contracts	BOT	PFI
Potential strength	Low risk and have quick and substantial impact on system operation and efficiency	operational gains that result from private sector management can be made without transferring the assets to the private sector	provides incentives for the operator to achieve higher levels of efficiency and higher sales.	Attract private financing, and improve levels of efficiency.	Provide public services without increasing public spending
Potential Weakness	Unsuitable if the main objective is to attract capital investment.	There is a risk that the project does not enjoy the autonomy or the authority required to achieve deep and lasting change.	The tariff levels becomes increasingly sensitive.	Complexity of the contract, long period contract and private debts may be huge	Procurement process is slow, the transparency of the private company's financial status is hidden
Asset Ownership	Public	Public	Public	Public/Private	Depends on Contract
Capital Investment	Public	Public	Public	Private	Private
Commercial Risk	Public	Public	Shared	Private	Private
Property Ownership (End of project)	Public	Public	Public	Public	Public or private (Depends on contract)
Duration (year)	1-3	2-5	8-15	20-30	20-30

The types and applications of public–private partnerships (PPP) are summarized below:

1. PPP does not mean that the government can spend no or less money on building infrastructure. The essence of the public participating in public infrastructure is that in the event where the government has insufficient funds, a public infrastructure project still manages to be realized earlier, the public still enjoy high-quality public infrastructure, and the public infrastructure project is able to

enjoy premium service standards and efficiency for the duration of its contract period. The most important matter is how to capitalize on civilian capacities to accelerate the establishment and efficiency of public infrastructure, establish partnerships between the public and private sectors, clarify the responsibilities of the government and chartered companies, and sort out issues concerning transfer of risk so that the private sector can also earn reasonable profits through the opportunity of participation in public infrastructure projects.

2. In comparison with other types of public–private partnerships, private finance initiative (PFI) focuses on the delivery of services, and a PFI project receives money from the government based on its operational performance, which not only enhances the private sector's endeavour for the best assets management and deployment, but also results in a condition of these assets, even after the expiry of the contract period. Civilian participation in public infrastructure enables the government to reap fruitful results with a small amount of capital. Generally speaking, a PFI project does a good job of bringing "value for money", which explains its popularity in the United Kingdom since the 1990s.

   The second PFI revolution – PF2, which was proposed by the UK government in 2013 as an attempt for continuous project improvement, can serve as a role model for governments in other countries to emulate as every plan has its limitations, however good the plan already is.

3. Among the PPP types in the preceding paragraphs, BOT and PFI are more likely to attract substantial investments from large private enterprises for further development. In addition, BOT and PFI projects are accompanied by a longer contract period and more risks for private enterprises.

4. The duration of PPPs varies in different countries. For example, Venkata *et al.* (2012) observed 11 BOT projects in India from 1996 to 2008 and found the

duration of these BOT projects was between 5 and 16 years, while in China the BOT durations are longer. Chen and Doloi(2008) compared 40 BOT projects in China from 2000 to 2007 and found that the durations were between 15 and 50 years.

5. The government can carefully choose the types of PPP projects after factoring in different scales of financing, accountability for risk, property ownership, and the term of a contract.

Any of the PPP-type projects could possibly be chosen when a government needs to build infrastructure but has insufficient funds. In order to improve the quality and services of government property, the private sector can offer funds, techniques and experience. For example, especially in stable developing countries, governments have limited funds and lack infrastructure. In this case, BOT procurement would be a good choice to offer an immediate solution to the situation. Due to the many successful PPP cases, the United Nations and the World Bank have started to promote PPP projects. Wu (2009) noted that these two official organisations have the same expectation that, by cooperating, the governments and private sector can accelerate economic development and relieve a government's financial burden, especially in developing countries.

2.1.5 PPP Development in Taiwan

The Taiwanese government has been using the development of public infrastructure as a way of enhancing economic growth and improving living standards. In fact, infrastructure constructions are closely entwined with national development. However, government deficits have been expanding since the 1990s. Spending on social welfare has been on the gradual increase, and public finances available to infrastructure construction have been shrinking. With growing financial strains and limited financial resources, the government has been encouraging joint efforts with the private sector. Wang *et al.* (2009) indicated that private participation in public facilities projects can immediately alleviate government budgets. However, Taiwan is relatively inexperienced in this regard as a late starter compared to other developed countries.

In Taiwan, according to the Act for Promotion of Private Participation in Infrastructure Projects (2001), there were originally 5 types of PPPs: Build-Operate-Transfer (BOT), Build-Transfer-Operate (BTO), Rehabilitate-Operate-Transfer (ROT), Operation-Transfer (OT), and Build-Own-Operate (BOO). These types of PPP projects are similar but not exactly the same in different countries around the world. In Taiwan, the PPP was developed from BOT procurement. A comparison of the differences between BOT and the other types of models is presented below.

The BTO model is different from the typical BOT. Except for the time of transferring ownership of the public construction to the government, their construction models are similar. Currently, in Taiwan, there are no large-scale constructions using the BTO model. The main reason is that, in the BTO model, after the completion of the construction, the property rights will belong to the government. Although the operational years are the same, the construction cannot be adopted for finance or loan. Thus, the implementation is difficult, unless the firms have high annual tax to pay. According to the tax system regulations in Taiwan, there will be full tax credit for

donations. Thus, they will obtain great benefits.

In comparison with the BOT model, ROT involves reconstruction of the original public construction, and the investment amount is less. BOT, on the other hand, means new public construction. The investment amount is high and the construction period is long. Besides, in the ROT model, since private institutions have less investment, the operation periods are shorter. Currently, in Taiwan, the operational years of ROT projects of sports facilities are 3-9 years. The operational period of the first implementation of an ROT project, in particular, was 3-4 years. One year before the expiration, with the approval of the steering committee, excellent firms can be allowed to continue operation upon priority of contract extension.

In the OT model, private institutions do not obtain the ownership of the public construction and do not have to undertake the real construction. It is the most significant difference from the BOT model. The main difference between OT and privatization of public business is that privatization of public business means privatization of personnel, facilities and business operation. OT can only be based on one part of the construction, such as privatization of one facility (e.g., the swimming pool of a sports centre). Currently, in Taiwan, it is easier to implement sports facilities using the OT model, and the results are more satisfactory. Using 12 city sports centres in Taipei City as examples, they are authorised as private institutions. Every year, the total service person-time is 12 million NTD and the managers must pay 5-9 million NTD as the premium of each centre to the Taipei City Government, which not only saves the management and maintenance expenditure of sports centres, but also balances facility resetting and renewal funds. In addition, although the OT model is based on outsourcing operations, the operations steering committee established by the Taipei City Government regularly visits the centres. At present, a few papers shows that the sports centres of Taipei City are generally achieving high customer satisfaction (Liu *et al.*, 2004; Shiu and Liu, 2004;

Chen, 2009).

The BOO model means private enterprises establish public construction on land purchased according to governmental planning. Upon franchised operation, the government allows private operation for a period of time as the return on investment. After the operation period, private enterprises can continue the operation or sell the shares on the capital market without returning the public facilities to the government. In the model, at the beginning, private enterprises have the ownership of the buildings and the land. It is different from the BOT model which transfers ownership of the buildings and the land to the government and allows the government to have the development result. Currently, in Taiwan, only kitchen waste recycling fertilizer plants adopt this system. The most significant difference from complete construction of private enterprises is the breakthrough of the land operation regulations of the base and steering by government by the regulated years. Of the different kinds of PPP, the Taiwanese government prefers the investment by BOT. Although the amount of capital and risks are high, private enterprises do not necessarily have low intention to participate. With BOT, they can have individual planning and building. Therefore, when the government provides favorable land conditions and the operational period is longer, there will be more investment teams. When the government attracts private teams by different methods, a group of professionals is required to assess the project in order to increase the success rate of the PPP.

The Public Construction Commission Executive Yuan (2011) published a checklist which highlights the prior assessments of PPP projects by government agencies. The standard procedures are shown in Table 2.8.

Table 2.8 The Prior Assessments of PPP Projects by Government Agencies

Item	Content requirements	Key criteria
Purposes	1. Policy overviews and implementation proposals	In line with regional plans, comprehensive development goals, long-term targets set by the central government and local construction authorities, and government priorities
	2. Assurance of infrastructure purposes	
	3. Pros and cons of private sector involvement and social benefits	Whether private sector involvement adversely affects services and social benefits of the infrastructure projects

Source: Adopted from Public Construction Commission Executive Yuan, 2011

Since PPP in Taiwan are still in the development phase, and as related governmental departments lack experience, prior assessments can serve as key points for governmental administration personnel in the early evaluation of investment projects in order to select proper plans and enhance the development of PPP.

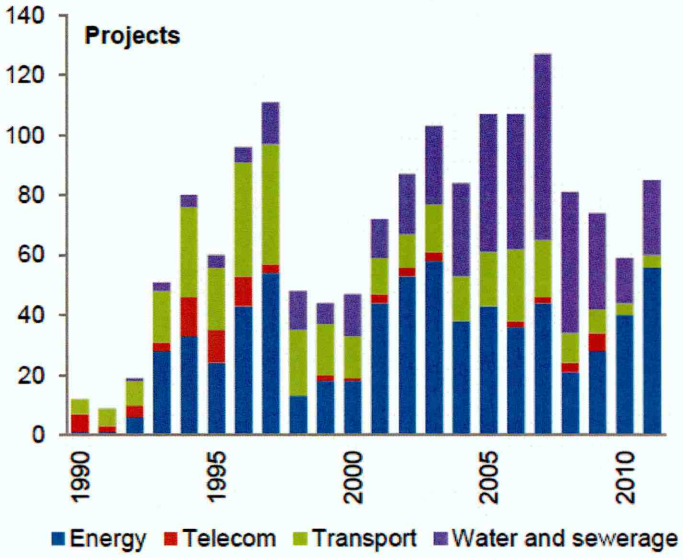
The standard procedures set forth by the Public Construction Commission provide a checklist. However, they do not enlist revenue reductions as a key consideration for financial viability in the evaluation of "whether private sector involvement has adverse effects on services and social benefits of the infrastructure projects", and the "pros and cons of private sector involvement and social benefits regarding the significant impacts of private operations", without the concerns of whether private operation would generate an excessive impact on the operation process, or the explanations of whether the service attributes and social benefits of the infrastructure are included in the loss of the income review during financial analysis.

2.1.6 Public-Private Partnership in Asia-Pacific Countries

Public-private partnerships have been used in various Asian countries such as China, Japan, Taiwan, Thailand, Malaysia, and New Zealand. A study by Li and

Akintoye *et al.* (2003) found that PPP projects in these countries developed very quickly from the 1990s, and almost all of them used the conceptual models of BOO, BOT or BOOT. The World Bank (2013) statistical data below show that the PPP projects in 4 types of important infrastructure reached their peak in the year 2007 and then experienced stable development in the following years.

Figure 2.5 PPP Projects in the World, 1990- 2011



Source: World Bank, Private Participation in Infrastructure Database, 2013

Tam (1999) reported that in Southeast Asian countries, especially Hong Kong and Thailand, over the past decade, a considerable number of PPP projects have been conducted using the BOT approach. Chen and Doloi (2008) noted that after the first successful BOT project in China in 1984, the use of such projects increased very rapidly. This BOT trend in China has remained prosperous, according to the World Bank (2013). There were 63 PPP projects that reached financial or contractual closure in China in 2011, of which 44 were BOT projects. The fact that the BOT trend in China improved so quickly can be attributed to the rapid economic growth and the need for construction. The BOT approach is a fast way for the government to raise funds. Further research has

proved this, for example, Zhao *et al.* (2010) analysed major electric power projects in China, and argued that BOT projects are one of the finance modes to overcome high capital requirements. Based on the literature review, Chen and Doloi (2008) found that BOT driving factors in China are the need for infrastructure development capital and advanced technology, management skills and promoting reform in infrastructure investment and financing.

Furthermore, in Taiwan, the public-private partnerships called for the promotion of private participation starting from 2002. The statistical data from the government organization of the Public Construction Commission (2009) show that of the 61 PPP projects from 2002 to 2008, 38 were BOT cases, while 14 were BOO cases. Up to 2012, 985 PPP projects had been signed, with a total amount of investment of £17,889 million (Ministry of Finance R.O.C, 2013).

2.2 The Concept of Build-Operate-Transfer

The acronym 'BOT' was first used by the Prime Minister of Turkey, Targut Ozal, in 1984 (Walker and Smith, 1995; Bueker, 1988). A few years later, Tiong (1990:316) gave BOT a definition:

"A major start-up business venture where private organizations undertake to build and operate a project, which would normally be undertaken by the government, and return the ownership to the government in a fixed concession period."

The United Nations Economic Commission for Europe (2008:2) defined BOT agreements more clearly:

"The private sector designs, finances and constructs a new facility under a long-term Concession contract, and operates the facility during the term of the Concession after which ownership is transferred back to the public sector if not already transferred upon

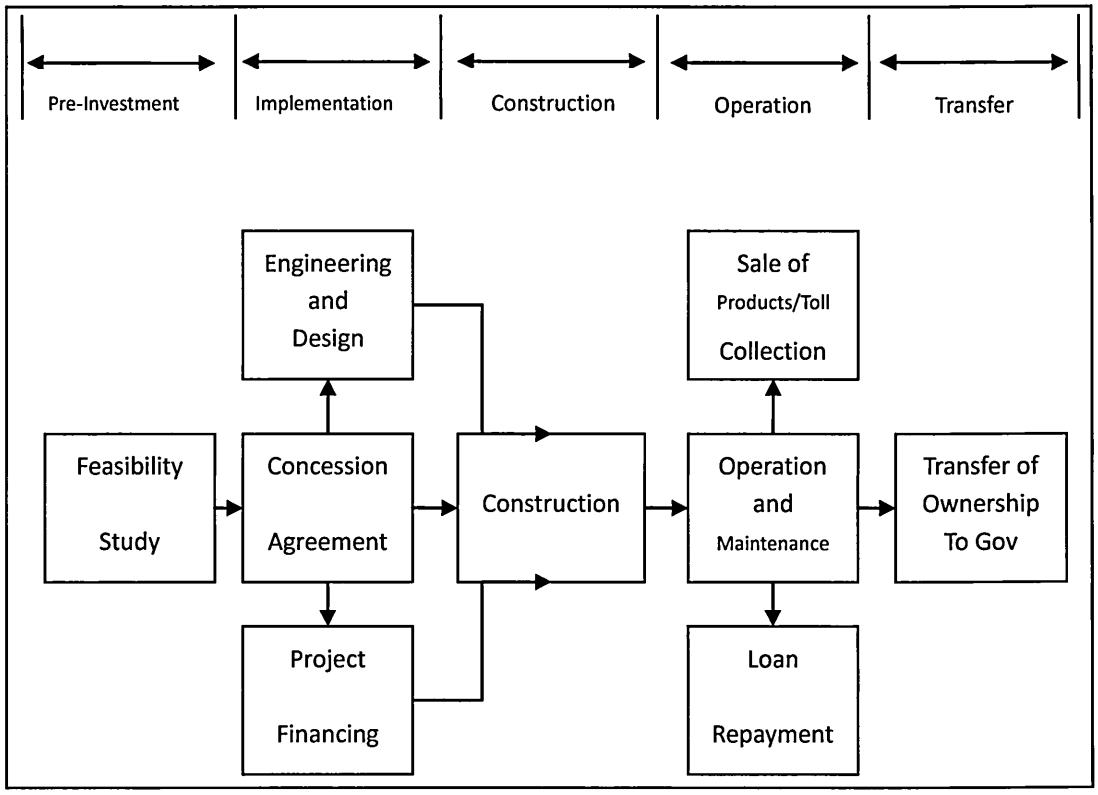
completion of the facility."

In general, the basic participants of a BOT project are the host government, the concessionaire (the private companies which have to receive a concession to build operate and transfer back to the host government) and the funder (such as a bank) (Hu, 1999). Each of them has their own perspective. In a BOT project, these three participants must negotiate until the three sides reach an agreement.

A BOT project is one type of PPP model. Based on the review of BOT cases in Britain, Walker and Smith (1995) listed the following six benefits to the public and government: relief of financial burden, relief of administrative burden, reduction in size of bureaucracy, better service to the public, encouragement of growth, and government being better able to focus on and fund social issues.

The concession period of BOT projects could differ in every case, as it depends on the local laws and regulations, political issues, government policies, and corruption risks. Normally, the concession periods are between 10 and 50 years. As for project financing, the private sector generally provides 10 to 30 percent of the total project cost and seeks loans from banks. The host government may furnish a portion or offer the land (Sidney, 1996). During the time that the project proponent operates the facility, it is allowed to charge facility users appropriate tolls, fees, rentals, and charges stated in their contract to enable the project proponent to recover its investment and operating and maintenance expenses incurred during the project. Tiong (1990) separated a BOT project into five phases (Figure 2.6).

Figure 2.6 BOT Project Phases



Source: Adapted from Tiong (1990)

After the evaluation of the project, the participants have to negotiate in the second phase in order to achieve a win-win situation. The later stages are in construction and operation until the period of the concession is finished, and then ownership is transferred back to the host government.

In the figure above, the first phase is a feasibility study. In this phase, the feasibility and benefits of implementing the BOT must be confirmed, and it must be determined whether it satisfies the requirement of public works. The second phase is implementation. Noticeably, the figure should include pre-bidding preparation of government and investors in this phase. The government should carefully evaluate potential investors' conditions and specifically regulate the scale, time, quality and operational scale of the BOT. The content, cooperation, implementation and fines for violation of the contract in the following three phases should be planned at this phase.

According to Walker and Smith (1995) and Liu *et al.* (2000), the original BOT model was developed into other variants including the Build Own Operate Transfer (BOOT), Build Own Operate (BOO), Design Build Finance Operate (DBFO), Build Lease Transfer (BLT), Lease Renovate Operate Transfer (LROT), and Build Transfer Operate (BTO) models. Table 2.9 shows the details of the possible BOT variants.

Table 2.9 Possible BOT Variants

BOT variant	Characteristic
BOT	A private sector company has the concession to build and operate an arena for a certain number of years, then transfer the ownership back to the government.
BOOT	In a BOT project, if the concession also authorized the private sector to own and rent the certain places attached to the main construction, this can be called a BOOT project.
LROT(ROT)	the public sector company gives permission to refurnish and operate the obsolete buildings in a certain period of time by the private sector groups
BLT	The private sector company builds the infrastructure and then rents it to the public sector; after the lifetime of the concession, the ownership will be transferred to the government.

Source: Adapted from Walker and Smith, 1995; Liu *et al*, 2000

The authors defined these variants mentioned above as BOT concept approach models. In comparison with the BOT model, the BOOT model has the ownership of the subject case. For example, when a private sector has a concession to build and operate an arena for 30 years, this is a BOT project. But, if the concession also authorizes the private sector to own and rent certain places attached to the arena, this is a BOOT project. LROT is also known as ROT (Refurnish-Operate-Transfer), which is when the public sector gives permission to refurnish and operate the obsolete buildings within a certain amount of time by the private sector groups (Liu *et al.,* 2000). The BLT project model is popular in the USA. In this model, the private sector builds the infrastructure and then rents it to the public sector. After the lifetime of the concession, the ownership

is transferred to the public sector.

The possible BOT variants mentioned above cannot represent all kinds of BOT models. Because the BOT models are very flexible, new ideas and variants are still being continuously developed in different countries as experience accumulates and the approach matures. Huang (1995) reported that in high-income economic countries during the period 1983 to 1995, 51% of the total concession amount value consisted of BOT projects. The BOT concept approach therefore plays a very important role in PPP projects worldwide.

2.2.1 The Advantages and Risks of the BOT Approach

The BOT project is a win-win solution for the host government and the private sector. Many research works have listed the advantages of the BOT approach; the most common BOT advantages are summarized below.

Table 2.8 BOT Advantages

For the host government:
BOT allows the government to build infrastructure at little or no cost.
The host government takes minor risk.
BOT often provides technology transfer and helps the development of the national capital market.
The relief of financial and administrative burden
Reduction in size of bureaucracy
Better service and more effective for the public
Enables the government to accelerate the development of market growth
The capital from the private sector, initiative and know-how can reduce project construction costs, shorten the construction schedule and improve operation efficiency.
The government can better focus on and fund social issues.
For the private sector:
The construction and engineering firms and equipment manufacturers have created a new market for their services and products.
They can purchase the land in adjustment or at no cost.

Adapted from Walker and Smith (1995), Sydney (1996), Hu (1999), and Abdulaziz (2002)

BOT is a complicated system and it takes time for development and negotiation. Moreover, it needs the participation and support of the government. The above are the generally agreed advantages of BOT. In short, the advantages of BOT for the government are that it lowers the construction expenditure and working time of public works as a result of the capital, innovative capability and operational knowledge of private enterprises, it improves operational efficiency, and it transfers investment risk to private enterprises. For private enterprises, it helps lower the cost of purchasing land to develop new markets. For government, when it has financial pressure and significantly needs public works, this can serve as a reference. The advantages of BOT are further

explored in this study through interviews with involved parties. Noticeably, not all BOT projects exhibit the previous advantages, and BOT cannot be applied to all kinds of public works. Contract time and investment funds in BOT are higher. Thus, if the operation fails due to market change during the period of the contract, there will be disputes. Although BOT has the above advantages, governmental departments should carefully analyse their evaluation of such projects.

Although there are many advantages to the BOT approach, there are still many BOT failures around the world. For example, Tam (1999) reported the failed BOT cases of the Second Expressway System and the Bangkok Elevated Transport System in Thailand which were contracted during 1988 to 1991. The main reason for their failure was political instability. From 1990 to 1997, the average length of the seven Thai governments was about one year (Ogunlana, 1997). BOT projects are not a solution in every case, and both the host government and private sector must evaluate a BOT project very carefully in its feasibility stage.

Despite the advantages mentioned above, the BOT projects are still not an elixir in every case. It is a very complex system which needs time to develop and consult, especially regarding financial and legal issues. Furthermore, BOT projects also require the support from government and a suitable political and economic environment. A developing country such as Taiwan faces a severe challenge in making sure if a project is able to be financed or not, referred to as its 'bankability'. This is a critical evaluation aspect for every BOT project.

In a BOT project, the risks can be divided into three stages: initial, construction, and operation. Studies have shown the traditional risks of a BOT project (Tiong, 1990; Yeo and Tiong, 2010; Hsu, 2000; Abdulaziz, 2002; Syed *et al.*, 2010). The main elements of risk are listed in Table 2.11 below.

Table 2.11 Main elements of BOT Risks

Political Risks	Political support-, Taxation, Expropriation/Nationalization, Forced buy-out, Cancellation of concession, Import/Export restrictions, Failure to obtain or renew approvals.
Country commercial Risks	Currency inconvertibility, Foreign exchange, Devolution, Inflation, Interest rate.
Development Risks	Bidding, Planning delay, Approval, Transnational.
Construction/Completion Risks	Delay, Cost overrun, Re-performance, Completion, Force majeure, Loss or damage to work, Liability.
Operation Risks	Associated infrastructure, Technical, Demand and Supply (Volume and Price), Cost escalation, Management, Loss or damage to project facilities.

Different countries or departments have different risk characteristics of BOT projects. Although there are no BOT projects completely the same, based on the main elements of the BOT risks defined in the literature, this study divides the risks into two kinds. The first kind is called 'General Risks', which are usually very difficult to control or are even uncontrollable, as they involve international circumstances, floating of exchange rates, inflation and unexpected change of legislation. The second kind is called 'Project Risks', which are usually more controllable in the plan. They last from the start to the end of a BOT project.

1. General Risks: Political risk is associated with the international circumstances of the BOT host countries and political stability in Taiwan and governmental policy consistency and support. It is usually difficult to control this type of risk. Country commercial risks are associated with the benefits of the contract. It is not easy to predict fluctuation of currency exchange rate and inflation.

2. Project Risk: Development risk is the risk of manpower and materials invested at the early stage of an investment project. For a large-scale BOT project, since the scope assessed is broad, it requires a great amount of time and money. The costs are relatively

expensive. Construction/completion risks include overspending of building costs, delay and stoppage of the project. Since BOT projects are different, the risks will be varied. The scope of operation risks is broad, including incomplete practice of contract, design flaws of BOT projects and wrong judgment of potential competitors and market demand. Although the scope is broad, this type of risk can be avoided in advance and it can be lowered by proper planning of BOT projects.

2.2.2 BOT Project Trends

Most public-private partnership projects in the development of infrastructure around the world address energy, telecommunications, transport, water supply and sewerage projects. The trend to adopt the BOT approach started in Europe in the 1990s (Ribriro, 2000; Merna and Smith, 1994).

According to an United Nations Economic Commission for Europe (2008) report, which analysed the early European BOT experiences with the financing of infrastructure in the 1990s, it was pointed out that most projects ignored the importance of good governance. The report also suggested that good governance in future BOT projects would be indispensable.

In the past 10 years, the trend to use the BOT approach grew rapidly in Asian-Pacific countries, especially in China and Indonesia. In 2012, there were 33 new PPP projects in China, 26 of which were BOT projects. Similarly, there were 14 new PPP projects in Indonesia in the same year, 8 of which were BOT projects (World Bank, 2013). This is high compared with Europe and central Asia, where 60 new projects were signed in 2012, 7 of which were BOT projects (World Bank, 2013). Although there are many BOT cases in the world, the projects still vary from case to case. To minimize the risks, the host governments and the private sector must have sophisticated plans and good operation systems before a BOT project is signed.

2.2.3 BOT Cases Around The World

a) Channel Tunnel

The Channel Tunnel between the United Kingdom and France is a 50.5 kilometre underground rail tunnel that crosses the English Channel and includes two railways and one roadway. The Channel Tunnel started to operate in 1994 with fifty-five (later ninety-nine) concession years. The total cost was approximately £4,900 million, making it the biggest BOT project of the twentieth century. The total cost was almost double its original estimate (Liu *et al*, 2000). Although the British and French governments also promised that no more similar tunnels would be built in the next thirty-three years, the Channel Tunnel is still facing challenges (Dundon-Smith and Gibb, 1994) including competition from cheap ferryboat companies and huge interest. The governments did not help or intervene in the financing process of this project, and the private company is still suffering from great losses (Tiong and Alum,1997).

In this project, the characteristic of the financial structure is that the governments of the UK and France did not provide any funds. Construction risk was totally undertaken by the Eurotunnel Group. Sources of income of the Eurotunnel Group were management of the tunnel, operation of freight and shipping and charges from the railways and shipping companies using the tunnel, such as Euro star, EWS and SNCF. Liu *et al.* (2000) analysed three BOT tunnels from the financial aspect and concluded that in the early stage of the Channel Tunnel project, the fund raising was successful, as it drew many public investments and was supported by banks in different countries. However, since the project was complicated and highly difficult, in the middle of the construction, the width of the carriage was changed, the geological situation was bad, the project management was inferior, the time limit of the project was delayed and construction costs were exceeded. Thus, before the operation, the Eurotunnel Group took on heavy debts. After the operation, the actual volume of freight was not as high as

expected. Passenger capacity and volume of freight were insufficient. They also encountered price competition from rivals of aviation and sea transportation. They thus could not maintain their original prices. Currently, the Eurotunnel Group is still facing heavy debts. Boyle (2011) revealed that the Eurotunnel slumped to an annual loss because of the rise in insurance fees. To sum up, the Channel Tunnel faced a number of difficulties: First, the wrong estimation of total building costs; second, underestimation of potential competitors; and third, economic change leading to increased operating fees.

b) Malaysia North-South Expressway (Lebuhraya Utara-Selatan)

The total length of the Malaysia North-South Expressway is 772 kilometres, from the border of Thailand and Malaysia to the border of Malaysia and Singapore (PLUS, 2013). The Malaysian Government built 334 kilometres first because it could not afford to build the complete expressway. Because of this situation, the government used the BOT approach for the remaining 513.7 kilometres (Hensley and White, 1993). This BOT project started in 1989, with a thirty year concession. The total cost of the project was £1,652.6 million, which is nearly 2.4 times more than the original estimation of £689.2 million (Tsai and Chu, 2003). Hence, this expressway BOT project was forced to stop twice because of insufficient funds. Later on, with the full support of government loans and fixed interest rates, the construction finished in 1994. This was a rare BOT project in that the government intervened in the financing directly; this project also transferred the risks to the government. Due to the underestimation of the investment company, in this BOT project, there was an excess of construction expenditure by 2.4 times. After the government's negotiation, a domestic bank of Malaysia promised two syndication loans worth a total of £1,000 million. Thus, the construction was successfully completed (Wang *et al.*, 2003). Fortunately, the gap between the early estimation of traffic flow and the reality was significant. After its opening in 1994,

revenue from toll fees was totally beyond expectations (Tsai and Chu, 2003).

To sum up, although the Malaysia North-South Expressway made the same mistake as the Channel Tunnel, with both projects underestimating the total building costs, the Malaysia North-South Expressway benefited from the undervaluation of the income from toll fees. The operation company PLUS paid all of its debts before 2005 (Kab, 2012). Now, 11 years after it officially went into operation, it is a successful BOT project. However, without the support of the government, the company would not have been able to complete the project. If the estimation of the investment amount had been accurate, the finance would not have been difficult. This shows the importance of construction expenditure and estimation of profits. In fact, Walker and Smith (1990) predicted that the BOT project of Malaysia North-South Expressway would be successful from multiple perspectives. The conditions include the total support of government, the only highway from north to south and positive cash flow. In fact, the construction fund of the project was wrongly estimated, with the total construction fund 2.4 times the estimation. This caused two periods of suspension of work on the project. Fortunately, the number of users was beyond expectations and the project did not fail. Hence, investment amount and risk of BOT are high. The assessment relies on experienced professional personnel to avoid such errors.

c) Taiwan High Speed Railway

The Taiwan High Speed Railway (345 kilometres) BOT project was signed in 1998 with thirty-five concession years of operation and fifty years of operating the combined commercial facilities (Hsu, 2000). The High Speed Railway officially began operating in 2008 and cost £9,618 million. This is also a controversial BOT project that has been greatly criticised by the public. The government not only lent 50% of the funding from government banks to the private sector, but also invested 25% of the construction cost (Lin, 2009). Hence, almost 75% of the funds was invested by the government. This

conforms to the basic principles of BOT projects. Because of the massive interest that the private company has to pay, this project is still suffering great losses (Chuang et al, 2011). Hsu (2000) reported that the High Speed Railway BOT project in Taiwan was unsuccessful because of the unbalanced way of raising funds which led to the enormous interest costs. Lin (2010) also pointed out the same difficulty that the Taiwan High Speed Rail is facing, that although passenger numbers are greater than the original estimation, the enormous interest expense is still pushing the company towards a cliff. In fact, the Taiwan High Speed Railway just announced that they have been forced to apply to extend the contract duration to 99 years instead of 35 years because they cannot afford to pay the massive interest (Taiwan High Speed Rail, 2013).

Although the Taiwan High Speed Railway project was an early BOT project in Taiwan, it is not an excuse for both government and private sector to shirk their responsibilities. In spite of the government announcing that the investment by the public sector was 20% (Taiwan High Speed Rail, 2013), in reality, the private sector collected funds by financing. Of the 25 banks which provided the financing, most were national banks. At the beginning, since the winner of the bid had a shortage of funds, the construction was suspended. With the assistance of the government, it had 60% of the funds by syndication loan. As a result, this large loan means the company has had to take on a great amount of interest.

d) Wu Ke Song Arena

In order to host the Olympic Games in 2008, China constructed several arenas in Beijing. The first BOT arena was the Wu Ke Song Arena, which was the venue for basketball games during the period of the Olympic Games (Ma, 2002). After the Games, in 2011, MasterCard Worldwide obtained the naming rights and it became the first arena with naming rights after the Beijing Olympics (Yang, 2013). The name was changed to the MasterCard Centre. The investment company of the BOT project was

the Hua Hsi International Group. According to the MasterCard Centre official website (2013), the construction of the arena was launched in 2005 and completed in 2008, and the floor area is 63,429 m^2; it has a seating capacity of 18,000. After the Olympic Games, the authorized operational right was 30 years. China hosted the Olympic Games in Beijing for the first time and after the games did not have the experience to use the arenas. After comparison and negotiation, the Hua Hsi International Group authorized AEG Live to be responsible for their operation. AEG Live is the second largest performance and stadium enterprise in the world and currently manages or operates more than 100 well-known stadiums in the world, and has the stock and operational rights of several American occupational teams (AEG Live, 2013). The Wu Ke Song Stadium investor relied on the rich experience and powerful team of AEG Live. Although AEG Live is an international enterprise, it did not understand the background of Chinese society, and there could be conflict in its involvement (Yang, 2013). As for personnel management, in particular, the communication was not effective. Thus, in March 2010, the authorised BOT company modified the contract and AEG terminated its independent operation of the Wu Ke Song basketball arena and became the operational consultant.

One year after the undertaking of the Hua Hsi International Group, it signed a five-year short-term contract with MasterCard Worldwide which became the naming company of the Wu Ke Song basketball arena. The Wu Ke Song operational company obtained the advantage from the naming of brands and started pursuing the sponsorship of different brands, and created a new profit model and broke through the past difficulty to rely on rentals (Beijinggym, 2013). With the current scale of the MasterCard centre, although the rental of each activity can be hundreds of thousands to millions of RMB, it cannot balance the operation and maintenance costs of the whole stadium. Thus, the Hua Hsi International Group started searching for partners to increase its financial

sources. Besides naming companies, the MasterCard Centre developed three kinds of cooperation: starting partners, partners of exclusive supply and persistent box purchase. Currently, as the general manager Guo (2012) of the MasterCard Centre pointed out, 80% of the revenues of the centre are from naming rights and from sponsors rather than from traditional rentals. As a result, the operation is making a profit. Beijing plans to apply the successful experience of the Wu Ke Song arena to other arenas.

In order to host the Olympic Games, China constructed 31 large-scale indoor and outdoor stadiums (Ma, 2002). However, they were mostly funded by the government and thus, there are the subsequent problems of maintaining their operation. With the improved BOT operation of the Wu Ke Song arena, the Chinese government should start considering the construction of future arenas and operational directions.

After the Beijing 2008 Summer Olympics, the operation of the Olympic stadium has attracted attention. Although AEG was the operator and it upgraded the stadium by considerable investment, due to cultural difference, it terminated the independent operation of the stadium. In comparison with the case in Chapter 4 of this study, AEG successfully operated the Sydney Super Dome BOT project. This is possibly due to the management difference of western and eastern countries. The new local management team sold the naming rights to MasterCard Worldwide. Since then, Wu Ke Song Culture & Sports Center has actively held different types of concerts and large-scale basketball games (such as NBA games). Currently, the operation is satisfactory. According to the latest statistics (Wen, 2014), the current use rate of Wu Ke Song Culture & Sports Center is 70%, among which cultural and entertainment performance accounts for the highest (more than 70%). At present, the commercial performance accounts for 60% in the entire Beijing City.

Summary of BOT cases in the world:

According to the previous cases, BOT encounters the following obstacles:

1. Estimation of construction funds: In many great projects, such as the Channel Tunnel and the Malaysia North-South Expressway, at the beginning, growth of material prices is not precisely estimated and it results in the following problems, such as delay and shortage of capital. Besides, in the operation, they encounter strong pressure of interest.
2. Reasonable estimation of revenues: people tend to be overly optimistic or pessimistic about revenues of public construction. BOT projects usually last for decades and it is difficult to predict various changes in the external environment. Hence, government and private enterprises must authorize consulting companies for precious calculated and simulate the solutions for different situations. In fact, in BOT projects, revenues and costs are undertaken by private enterprises which might only report the advantageous results. Therefore, the government is critical as a supervisor. This is particularly the case in the BOT project of Kaohsiung Arena which combines a commercial space with the arena. In the next section, we will analyze the role of government as supervisor in BOT projects.
3. In sports facilities, the design of the hardware and the following operation are closely related. After the introduction of BOT, integration of function, appearance, quality and operational cost will rely on government's assessment in advance and experience. Therefore, BOT development should rely on actual cases to avoid mistakes and lead to successful execution.

Regarding BOT projects in different countries, as the social and economic conditions may fluctuate over time, it is difficult to find one BOT project that completely matches the expected operation and result. Thus, as for the implementation of BOT projects, besides the evaluation of developers, the assessment of professional

teams hired by governmental departments is also important. Since the projects are significantly or relatively adjusted in the periods of operation, the articles in a BOT development contract will include detailed items of negotiation and arbitration. During the period of operation, when two parties have conflict or the adjustment goes beyond the scope of the original contract, the two parties can make modifications of a reasonable scope.

2.2.4 The BOT Development in Taiwan

Although the first BOT-like project in Taiwan was a railway project from 1836 to 1895 (Tsui, 2002), the real improvement in BOT projects started in the 1990s. In November 1994, in order to accelerate the development of the High Speed Railway BOT project in Taiwan, the government passed a law, the "Statute for Encouragement of Private Participation in Transportation Infrastructure Projects". In 1995, the government apparatus, the Public Construction Commission Executive Yuan, decided to use the BOT approach in projects to drive the expansion of public-private partnerships. According to PCCEY (2010), there are three types of PPP projects in Taiwan, as listed below:

1. Infrastructure privatisation;
2. Privatisation of state-owned enterprises; and
3. Outsourcing of public business.

Liu *et al.* (2000) pointed out that the PPP projects in Taiwan are not exactly the same as PPP projects in the UK as Taiwan's PPP projects are mostly led by the public sector, while the UK's PPP projects are mostly led by the private sector. In Taiwan, many PPP projects have no private sector fund investment. For example, OT (Operation-Transfer) approach projects do not need private sector financial investment.

In 2000, the Taiwanese government launched an act called "The Enforcement

Rules of Law for Promotion of Private Participation in Infrastructure Projects" in order to encourage the private sector to invest in infrastructure. It defined 13 kinds of infrastructure projects in Taiwan. These projects referred to urban, communication, water conservancy, commercial, power supply, cultural and sports, tourist site, environmental pollution prevention and social welfare facilities plans. Subsequently, public-private partnership projects have flourished in Taiwan.

The 2010 act for PPP projects has made a big improvement in privatizing infrastructure in Taiwan. The Executive Yuan (2011) wanted to attract more investors from all over the world. The new "InvesTaiwan Service Centre" was officially established by the Ministry of Economic Affairs. The main task of this government apparatus is to promote international private investment in public-private partnership projects. The Taiwan government is willing to build a more stable and safe environment for investors. Table 2.9 below shows the budgets of all signed PPP projects in Taiwan from 2002 to 2012 (TMI, 2013). The government signed 985 PPP projects, many in 2010, and spent £4,768 million, which is 35.56% of the total PPP cost in approximately 10 years. This is also proof that since the InvesTaiwan Service Centre has been established, the government has spent more money on PPP projects. The idea of the public sector cooperating with the private sector has become increasingly popular, and the trend is still ongoing. The total amount of government cost reductions is also noticeable. The statistical data in Table 2.12 shows that from 2002 to 2012, the government successfully reduced spending by £17,114 million. Recently, the Ministry of Finance (2013) announced that the PPP projects have created 140,000 job opportunities. Although the government might exaggerate the figures, the statistics have certain reference values. The data include all job opportunities from PPP programs in Taiwan to the present. For instance, according to the report, 2,000 jobs were created by facilities and related business of Kaohsiung Arena. For a BOT project that involves a

large-scale stadium, shopping centre, hotel and food industry, 2,000 jobs is a reasonable estimation. In fact, since the opening of Kaohsiung Arena, business activities in Kaohsiung have shifted to this area, which is demonstrated by the increase in population. According to the Department of Budget, Accounting and Statistics of KCG (2013) data show that from Jan 2007 to June 2013, the population in Kaohsiung was maintained at 1.52 million. But the population around Kaohsiung Arena area gradually increased from 183,705 to 195,367. In brief, the population increased 6.3% in 6 years, and the land price also increased 30% to 60% (Real Estate Development Association of Kaohsiung, 2012). The evidence demonstrates the importance of PPP to the Taiwanese government. According to the Taiwan Public Construction Commission (2009), the statistical data shows that 82 major PPP projects were signed from 2002 to 2009, 36 of which are Build-Operate-Transfer (BOT) projects. The BOT projects are the most common procurement approach in Taiwan.

Table 2.12 The Statistical Data of Public-Private Partnership Projects in Taiwan

Year	The Data were collected from 01/01/2002 to 30/04/2013		
	PPP projects	Total project cost (£ millions)	Total amount of the cost reduced by government during the project period (£ millions)
2002	8	12.77	4.26
2003	36	1329.79	731.91
2004	82	2780.85	5717.02
2005	152	1331.92	1257.45
2006	185	1453.19	1663.83
2007	123	791.49	585.11
2008	70	382.98	419.15
2009	79	1127.66	1908.51
2010	73	4768.06	1997.87
2011	78	853.19	1629.79
2012	99	3057.45	1200
Total	985	17,899	17,114

Source: Adapted from Taiwan's Ministry of the Interior, 2013

Although BOT projects are experiencing stable development in Taiwan, they still face many challenges. For example, firstly, in a government research paper, Lee (2006) argued that the laws and regulations of public private partnership projects are still inadequate in Taiwan, especially with regard to sports-related facilities. The government has to provide specific tax incentives, tax exemptions and preparation rules and regulations for PPP projects case by case. Secondly, as an earlier section discussed, the biggest BOT project in Taiwan (Taiwan High Speed Rail) is still facing a serious financial crisis. The BOT approach is not a solution for every project, and clearly the government needs more time and experience to fine-tune the public-private partnership system. BOT projects have only been developed for thirteen years in Taiwan; thus, compared with other countries, it is still a new concept for the Taiwanese government. The government should examine similar projects carefully before putting new ones into practice.

The Taiwanese government is laden with bureaucratic procedures and this consumes many resources. However, by bringing in business philosophy, resources will be taken care of more carefully. Outsourcing the public facilities will not only reduce the financial burden of the government, but will also help reduce operation costs.

Operation of public policy is based on many agents. For instance, the citizens authorize the officials to manage public affairs through elections. However, for PPP projects, in order to assess participation of private enterprises in public affairs, the government will authorize the consulting companies to evaluate the project or directly authorize the governmental affairs to private enterprises. There will be the following cooperation between Owner and Agent. Section 2.2.7 below discusses the managerial issues of a PPP project.

2.2.5 Government's Role in a BOT Project - Monitoring

In a BOT project in Taiwan, the government always plays the important role of leading the project (Liu *et al.*, 2000; Tsui, 2002). Zhan (1994) pointed out two roles that the government should play in the process of a BOT project. The first is as a BOT project pusher, which is to make a decision about the possibility of using the BOT approach before a public infrastructure facility is built. The second role for the government is to make sure the BOT project is running smoothly; that is to say, the government must monitor the project constantly.

Huang (1998) reviewed BOT cases in European countries, especially from the monitoring aspect, and suggested that in the operation stage of a BOT project, the government should monitor the private company based on issues such as service quality, public security, and facility maintenance. Huang (2001) further noted that in a BOT project in Taiwan, the government must make sure that the private company follows the laws of patent rights, trademark rights, copyright and other rights of expertise. The government must also prevent private companies from gaining benefits in improper ways.

Fong (1997) stressed that the government should not only allow the private sector to have enough freedom in a BOT project, but should also make sure that the public infrastructure is operating well. Fong (1997: 25) listed five basic monitoring principles (see Table 2.13).

Table 2.13 BOT Monitoring Principles

The monitoring system should have clear and definite goals.
The monitoring details should be as complete as possible.
Before a BOT project is signed, make sure the private company can totally accept the monitoring by the government.
The government monitoring team should be independent and have enough resources.
The team should contact the private company regularly.

Source: Adapted from Fong, 1997

In a BOT project, the government plays a very important role in keeping the project targeted to achieve the goal they expect. It also requires good co-operation with the private sector. The details of the co-operation relationship must be clearly set out in the contract.

The government is concerned about public benefits in a BOT project, and so has to monitor and examine the results of the projects in order to gain the maximum benefits. According to UNIDO (1996), there are 16 key success factors of BOT projects, 12 of which are associated with governmental units. This demonstrates the importance of the government in BOT projects. In Taiwan, the government monitors the private companies on the basis of three sources of legal criteria. It includes the central government, the host government and Public Construction Commission, Executive Yuan. When a monitoring issue occurs, the host government and private sector have to coordinate based on these three sources. The details of the legal criteria of governmental supervision of BOT projects in Taiwan are listed below.

A. Rules Related to the BOT monitoring and management by the host government

If during the construction or the operation of the infrastructure project of a private institution there is any serious delay in the work schedule, major defects in quality of the construction work, poor operation, or other grave events, the authority in charge may take the following actions in accordance with the concession agreement, with a

written notice to the private institution concerned:

1. To order the private institution to make improvement within a given period;

2. To suspend part or all of the construction or the operation if no improvement is achieved within the given period or if the improvement is ineffective; provided, however, that the authority in charge shall not suspend the construction or the operation thereof if the financial institution, the guarantor or any other institution designated by the financial institution or the guarantor is approved by the authority in charge to take over the construction and/or the operation thereof;

3. To terminate the concession agreement if after a certain period following the suspension of the construction or the operation as referred to in the preceding Subparagraph or following the take-over by the financial institution, the guarantor or the institution designated by the financial institution or the guarantor, no improvement is achieved (Act for Promotion of Private Participation in Infrastructure Projects, Article 52, paragraph 1).

In the event of the occurrence of any event specified in the first Paragraph, the financial institution or the guarantor may, with the approval of the authority in charge, by itself or designate another institution as may be permissible under applicable laws to, temporarily take over the private institution or continue the construction or the operation thereof (Act for Promotion of Private Participation in Infrastructure Projects, Article 52, paragraph 3).

In the event of the suspension of part or all of the operation under the first Paragraph of the preceding Article, the ceasing of part or all of the operation under the preceding Paragraph, or the termination of the concession agreement, the authority in charge may take proper actions to maintain the operation of the infrastructure project concerned. If necessary, the authority in charge may compulsorily take over the operation of such project. The relevant regulations governing operation take-over shall be prescribed by the central authorities in charge of the relevant industries within one year after this Act is promulgated (Act for Promotion of Private Participation in Infrastructure Projects, Article 53, paragraph 2) .

The authority in charge shall, depending on the character of the infrastructure project and the means of the private investment, state in the concession agreement that the private institution shall submit or deliver in a given timeframe the construction quality management plan, construction progress reports, account books, statements and records, vouchers, financial reports, work data and relevant documents to the authority in charge for audit and inspection (Enforcement Rules of Act, Article 23).

B. Rules Related to the BOT monitoring and management by central government

If during the construction and/ or the operation of the infrastructure project, there is any serious delay in the work schedule, serious defects in quality of work, poor operation, or other grave events and due to the emergency thereof that any delay may jeopardize major public interest or result in present danger, the central authorities in charge of the relevant industries may order the relevant private institutions to cease part or all of the construction or the operation for the relevant infrastructure project, with a notice to each of and the relevant government agencies(Act for Promotion of Private Participation in Infrastructure Projects, Article 53, paragraph 1).

C. Rules Related to the BOT monitoring and management by Public Construction Commission, Executive Yuan

In order to strengthen the cooperation relationship between host government and central government, the Public Construction Commission, Executive Yuan launch an administrative decree to check up the PPP projects related to the collection of, making the public announcement of, and conducting statistics for, the relevant information and data (Act for Promotion of Private Participation in Infrastructure Projects, Article 6, paragraph 2).

The above are the legal criteria of governmental supervision of BOT projects in

Taiwan. Many of them are not specifically indicated, such as exceeding the time limit or construction that does not follow the plan. Although the violation of the contract is a fact, it will not be punished or the investment will not be terminated. In order to avoid the investors' superficial commitment to the contract without actually following it, the setting and steering of rules regarding violation of the contract and associated penalties are extremely important. This relies on the participation of personnel with different professional capabilities, particularly those with legal knowledge.

To conclude, BOT projects in Taiwan are still at an early stage. They lack the legal regulations for governmental supervision and management. Government explores and deals with the projects on a case by case basis, which is extremely inappropriate. For BOT projects which require plenty of time and a large budget, in particular, regulations of monitoring and management should be more complete.

2.2.6 Financial Planning Strategy of BOT

From the perspectives of governments and enterprises, a BOT project must be based on profits for the two parties. However, the government and enterprises focus on different financial indicators. In financial planning, after the government confirms that the project can be based on BOT according to SLR (self-liquidation rate), it first evaluates the NPV (net present value) and IRR (internal rate of return) of the project and terms of return to meet the requirements of private institutions (Jiang, 2002). According to the result of the trial balance, if the BOT project cannot attract private enterprises, it can review the parameters of the original financial planning conditions to "divide" and "match" different flexible combinations (Lin, 2009). The BOT project is adjusted to change the original financial characteristics. Thus, it can have the conditions to attract private investment.

Generally speaking, governments pay attention to the degree of SLR, whereas

enterprises focus on IRR, terms of return and NPV (Brigham and Houston, 2009). When SLR is too low, BOT is not appropriate. The main indicator to calculate SLR is WACC (weighted average cost of capital). Wu (2005: 18) indicated that there is a reverse relationship between WACC and SLR in a BOT project. "*When WACC is higher, it means SLR is lower. When SLR is too low, it means that the BOT project cannot benefit the government since the governmental subsidy is too high.*" From the perspective of enterprises, IRR should be higher and PBY should be shorter. Thus, when evaluating the feasibility of a BOT project, it should focus on the perspective of private investment and operation. Successful feasible projects are based on reasonable return on private investment. When public infrastructure ratified for policy cannot accomplish total self-liquidation, the government can rely on income created by external effects. The government invests in the public infrastructure in order to enhance the incentive for private investment. In a sports BOT project, Jiang (2002) listed a few issues that government has to approve, such as the construction of projects with lower self-liquidation capacity, increasing the profits of private institutions by division and matching of flexible measures, and enhancing the financial feasibility. A sophisticated financial strategy can also minimize the potential risks and costs.

In Taiwan, the law-making concerns of BOT and traditional governmental construction are different; although both are associated with public building, BOT aims to encourage private participation. Therefore, incentives are required to attract investment of private enterprises. Benefits of private enterprises are critical. In addition, the main difference between BOT and traditional governmental buildings is the procedure for selecting the firms. Bidding of traditional government buildings should be confidential. Before the bidding, base prices and bidding companies should not be disclosed. However, BOT is not associated with confidentiality. It is based on announcement of government. Private enterprises can decide to participate according to

their own investment conditions. The government selects the best according to the investment and operation plans proposed by applicants. Therefore, BOT can solve the financial difficulties of government. Besides, by governmental supervision, public buildings constructed by private companies can be operated completely and continuously.

2.2.7 The Relationship between Owner and Agent

The government is the driver of public projects in Taiwan. However, PPP projects are often subcontracted to others for management. In fact, the ownership and management of some PPP projects are separated. Berle and Means (1932) first proposed the concept of the separation of ownership and management in companies. Managers are hired by owners to take care of their interests. However, agents (i.e., managers) are induced by personal gains, and their implementations often deviate from the expectations of the owners. Fukuyama (2004) suggested that agency problems occur due to conflicting goals of managers and owners. Davis and Bruce (2002) emphasized the importance of incentives and mechanism designs in the resolution of agency problems by aligning the interests of agencies with the interests of the owners. In fact, agency problems may also lead to the following problems. Savas (2000) indicated that owners must provide incentives to mitigate speculation because agents hold more information. Owners should bear the costs of monitoring and information acquisition. They will also bear the brunt of losses resultant from the speculative behaviour of agents. Shiu and Liu (2006) argued that agents have advantages of information and often hide key information from the owners. As a result, owners find it hard to observe and effectively monitor agents. Klijn (2002) indicated that if owners are not armed with sufficient professional expertise in management, they often fail to achieve their goals. For example, the contracts may not be closely linked with existing targets; contractual

terms and conditions may not be specific enough; or, there is simply a lack of robust monitoring mechanisms. In terms of the collaboration between the Taiwanese government and the private sector, Shiu and Liu (2006) suggested that the government has stronger bargaining power. As a result, private enterprises are likely to speculate since they are forced to accept terms which do not meet their cost profiles or their expected benefits.

In Taiwan, the government drives the PPP projects. Hence, the government is essentially the owner, and private enterprises are the agents. The interactions between the owner and the agents should be based on contracts. There should be detailed descriptions of the obligations that the private enterprises must perform in these contracts, in order to avoid unfairness in the contractual relationships and project implementations.

The BOT projects in Taiwan have been operating for fourteen years, but the Kaohsiung Arena is the only major sports BOT project on the island. The government is still lacking in experience of developing this approach. Besides, the prices of raw materials are increasing dramatically. The construction cost is very difficult to estimate, especially under a long-term contract. Furthermore, the pending of government policies also makes for high project risk. Hence, private companies have no interest in those BOT projects. As Hu (1999) and Liu *et al.* (2000) pointed out, government commitment is the key factor to attract investment from private companies.

2.2.8 The Definition of Sports Facilities in Taiwan

The government launched an act called "The Enforcement Rules of Law for the Promotion of Private Participation in Infrastructure Projects" in 2000, and later on completed the revision on the 31st of October, 2001. The Public Construction Commission Executive Yuan is responsible for all public-private partnership projects in

Taiwan. These Enforcement Rules are enacted in accordance with article 56 of the Act for the Promotion of Private Participation in Infrastructure Projects (PCCEY, 2002). It has 6 main chapters, which include general principles, land acquisition and development, financing and tax benefits, application and evaluation, supervision and administration, and additional provisions. The BOT enforcement rules (PCCEY, 2002) specify the definition of sports facilities in Taiwan as follows:

1. Indoor/outdoor sports facilities for sports designated by the International Olympic Committee and the Olympic Council of Asia as Olympic sports, with golf-related facilities excluded.
2. Sports and recreation parks designated by the competent authorities of the relevant industries as combining recreational facilities along with two or more sports facilities specified in the preceding Subparagraph.
3. Other indoor/outdoor sports facilities designated by the competent central authorities of the relevant industries.

The definition of sports facilities in Taiwan mentioned above clearly shows that not only sports related facilities but also recreational parks are included. However, the definition of "arena" could have different meanings in different times and backgrounds. In Taiwan, experts have different opinions, but tend to believe that an "arena" is an extension of "gymnasium". Wu (1988) explains that the word arena, which comes from the pit and circular sports place used in ancient Rome, is a large-scale gymnasium. Today, modern countries usually use the term "arena" for those sites with a seating capacity of between 12,000 and 25,000. These kinds of arenas normally hold activities such as basketball, badminton, boxing, concerts, exhibitions and meetings. Arenas are priority sports infrastructure facilities in the development projects of special municipal cities in Taiwan. Wang (1992) considers a "gymnasium" as an indoor physical education room, which can offer a place for exercise or sports games, unhindered by weather.

Zheng (1996) argues that the origin of the word "gymnasium" is the Greek for an open space used for wrestling, boxing, javelin and discus. Guan (2002) pointed out that the categorization of gymnasiums is based on that in the United States and Japan. Large-sized gymnasiums are still in short supply in big cities, especially in the northern, central and southern parts of Taiwan. Therefore, an arena was defined as a larger gymnasium with a seating capacity of between 12,000 and 25,000.

Recently, the government department, the Sports Affairs Council, Executive Yuan (2008), finally classified 6 kinds of "indoor sports facilities". The classifications and functions are listed in Table 2.14 below. This is a more detailed and sophisticated classification in which the functions and seating capacity have been included.

Table 2.14 The Classifications and Functions of Indoor Sports Facilities

Classification	Functions	Seating Capacity
Dome	Baseball, American football, Exhibition	>25000
Arena	Basketball, Volleyball, Ice sports, Gymnastics, Martial Arts, Assembly and Concerts	12000-25000
Gymnasium	Regional scale Basketball, Volleyball, Badminton, Sports training and Assembly	4000-7000
Field House	Track and field sports and football	0-3000
Sports and Recreation Centre	A combination of inside sports facilities	0-3000
Canopy Field	Very basic sports facility with roof but no walls	0

Source: Adapted from Sports Affairs Council, Executive Yuan,2008

2.3 Customer Satisfaction and Customer Loyalty

Customer satisfaction and customer loyalty are very important indices for enterprises or organisations. This study intends to probe customer satisfaction with and loyalty to the arena. It is expected that the results can be combined with other sources to help shape the research objectives.

2.3.1 The Definition of Customer Satisfaction

The concept of customer satisfaction was first proposed in 1965 by Cardozo. Then in the 1980s, research started to flourish after the US government's research on customer satisfaction with the motor industry. Nowadays, customer satisfaction is used widely by many organisations. Hill and Alexander (2006) pointed out that many public sector organisations have used customer satisfaction to measure their success. Although there are many definitions of customer satisfaction, it can be regarded as the link between post-purchase experience and product evaluation (Churchill and Surprenant, 1982; Sprend and Olshavsky, 1992; Ostrom and Iacobucci, 1995; Madrigal, 1995). Hill *et al.* (2007:31) offered the view of customer satisfaction as being "a relative concept encompassing the customer's expectations as well as the performance of the product". Oliver (1997:8) defined satisfaction as "the customer's fulfilment response. It is a judgement that a product/service feature, or the product/service itself, provided a

pleasurable level of consumption-related fulfilment, including levels of under- or over-fulfilment".

Hill and Alexander (2006: 2) gave customer satisfaction a shorter definition:

"Customer satisfaction is a measure of how your organisation's total product performs in relation to a set of customer requirements."

2.3.2 The Importance of Customer Satisfaction

Consumer satisfaction has been used to evaluate the quality, purchase decision and service performance of a product (Anderson and Sullivan, 1993; Cronin *et al.,* 1992). Many firms also use consumer satisfaction to predict brand image and consumer loyalty. Engel *et al.* (1986) found that customer satisfaction was important because it mostly affected returning customers and brand image, and, for a company, keeping old customers is more important than attracting new customers. Hill *et al.* (2007) argued that in recent years, customer satisfaction has become the key organisation goal, especially for growing industries. The evaluation of customer satisfaction has been a very important way of increasing competitive advantage in the service industry. Oliver (1997) argues that evaluating and monitoring customer satisfaction scientifically is a critical strategy for increasing the service level of a company.

In the sports industry, Greenwell (2002) argued that in consumer services such as spectator sports, the customer is the best judge of the quality of the service, and that other standards of quality may be immaterial. Greenwell *et al.* (2008) also noticed that consumer satisfaction can help to investigate how a sports organization is dealing with its customers. Ramchandani and Taylor (2011) stated that customer satisfaction is one of the performance aspects of the sport and leisure industry, and that measuring the performance of government organisations by customer satisfaction is especially important. There is no doubt that evaluating customer satisfaction is a very useful way

of identifying and improving performance in the sports industry. This research will address consumer satisfaction with regard to the Kaohsiung Arena. In this case, this is a BOT arena connected with a shopping centre and a hotel. The customers can be separated into many kinds of sources, but the target customers are those who have attended events hosted in the Kaohsiung Arena.

2.3.3 The Definition of Customer Loyalty

Customer satisfaction and customer loyalty are not the same thing. Hill and Alexander (2006) argued that customers may stay with a supplier through habit or inertia without feeling loyal to it. Soderlund (2006) defined customer loyalty as the level of continuity in the customer's relationship with a brand or the services provided. Jones and Sasser (1995) categorised customer loyalty into three components:

1. Intent to repurchase: The willingness of customers to purchase a product or service again in the future.
2. Primary behaviour: A customer's purchasing history.
3. Secondary behaviour: The customer's willingness to recommend the product or service to other people.

Bowen and Chen (2001) also pointed out three components to measure customer loyalty: behavioural measurements, attitudinal measurements and composite measurements. Howat *et al.* (2008) found that there are two major indicators of customer loyalty: a customer's intention to purchase and a willingness to recommend the service to other perspective customers. This is similar to other research on customer loyalty (e.g., Parasuraman *et al.*, 1985; Gronholdt *et al.*, 2000; Voss *et al.*, 2004; Zeithaml *et al.*, 2006).

2.3.4 The Link between Customer Satisfaction and Loyalty

In recent years, it has become widely accepted that it is less costly to keep existing customers than to win new customers. Hence, measuring the degree of customer satisfaction and loyalty is widely used by many organisations. Hill and Alexander (2006) found that these two factors are used by many organisations in the public sector to measure operational success. Chaudihuri and Holbrook (2001) tried to find the advantages that customer loyalty can bring to an enterprise by reviewing the relevant literature. However, the results of other studies show that there is a high coefficient between customer satisfaction and loyalty (Oliva *et al.,* 1992; Anderson and Sullivan, 1993; Heskett *et al.*, 1994). Several studies have also supported the notion that consumer satisfaction would be reflected in consumer loyalty (Engel, 1986; Fornell *et al.*, 1996; Ruyter *et al.*, 1997). Dick and Kunal (1994) believe that customer loyalty is customer behaviour and repurchase intention, while Reichheld and Sasser (1995) think that high customer satisfaction causes high customer loyalty, and Szwarc (2005) pointed out that customer satisfaction and loyalty do not work independently but need to be measured and managed in a holistic way. Hill and Alexander (2006) described the importance of these two factors for organisations more specifically. They state that customer satisfaction has been invested in heavily and has become the key operational goal for many organisations. Furthermore, loyalty schemes have proliferated in the retail sector and are now moving into the business sector.

Other studies have different opinions about customer satisfaction and customer loyalty. Fay (1994) believes that high quality products/services can have high customer satisfaction, but high customer satisfaction cannot influence customer loyalty. Fredericks and Salter (1995) argued that customer loyalty is more important than customer satisfaction, whereas Cronin *et al.* (1992) think that good customer satisfaction does not necessarily bring good customer loyalty.

Although these studies that have attempted to explain the connection between customer satisfaction and loyalty cannot come to an agreement, there is no doubt that customer satisfaction and loyalty are two very important elements to understand the business situation of a company.

2.4 Summary

This literature review has presented the source of Build-Operate-Transfer projects, identified the broad terms of public-private partnerships and highlighted the importance of customer satisfaction and loyalty.

BOT is one of the trends of privatization. Public construction established using the BOT model is the systematic reform of property rights from public departments to the private sector. Based on the theory of privatization, this study probes into the source of BOT and indicates the related models of different countries' privatization efforts. In Taiwan, BOT development is the opposite from in Europe and the US. A plan of public administration and private management in Taiwan was enacted in 1999 when the above advanced countries were making great efforts in the implementation of BOT. Thus, at the beginning, in the plan of public administration and private management, the development of the BOT model was more rapid. Based upon the BOT model, different types of public-private partnerships were developed.

The BOT has two main risks – general risks and project risks:

With limited funds, the government intends to enhance the establishment and efficiency of public construction using the force of the market. However, there is a certain degree of risk. This study divides BOT risk into general risk and project risk. At the early stage of planning, government and firms should assess the risk carefully and confirm the problem-solving capability for the potential risk. In BOT plans, the government tries to pass the risk to private firms which try hard to shed the

responsibility. Thus, they will waste time on disputes regarding risk sharing and future cooperation.

Although BOT projects are not the same, they have the same structure and principles:

All BOT projects are not completely the same, but they all share similar principles and develop from the same framework. Thus, each project should be based on precise contract regulations. The development and integration of related legal documents and related articles and conditions are associated with the success of BOT projects. At the early stage of the implementation of the project, it is suggested that the host government hire professional legal consultants and carefully examine the content of the contracts.

It is important to study past BOT cases:

In Taiwan, BOT development is still at an early stage. With the limited scale of the capital market, the minimum cost and maximum benefit are expected. Therefore, it is important to study past cases: 1) year limit of the franchise term: when the year limit is long, there will be more unknown operational risks. When the franchise term is short, firms' investment intentions will be lower; 2) limit of finance: the limit will influence the firms' payment capability. In many cases, limit of finance is high in total investment amount. Thus, the firms undertake the pressure of debts. Their bad operation might be undertaken by banks with creditors' rights; 3) related measures: governmental subsidy and favourable taxes. There are different situations in different BOT projects which can be used as a reference.

Government should carefully evaluate a BOT arena case from different aspects:

Recently, many countries have been suffering from the global economic crisis, and

many large-sized public infrastructure construction projects are facing financial difficulties. How to invest in important government facilities by using private funds has become a very important issue. Although the BOT concept has many advantages, it is still not fit for every case in the world. Generally speaking, in terms of a BOT arena project, the government should carefully evaluate the population, the average income of residents, the location, the public transportation systems, the amount of total investment and the total duration of the contract. Thus, a BOT arena should not benefit only the government but also the residents.

It is important to understand the performance of PPP projects from customers or users perspectives:

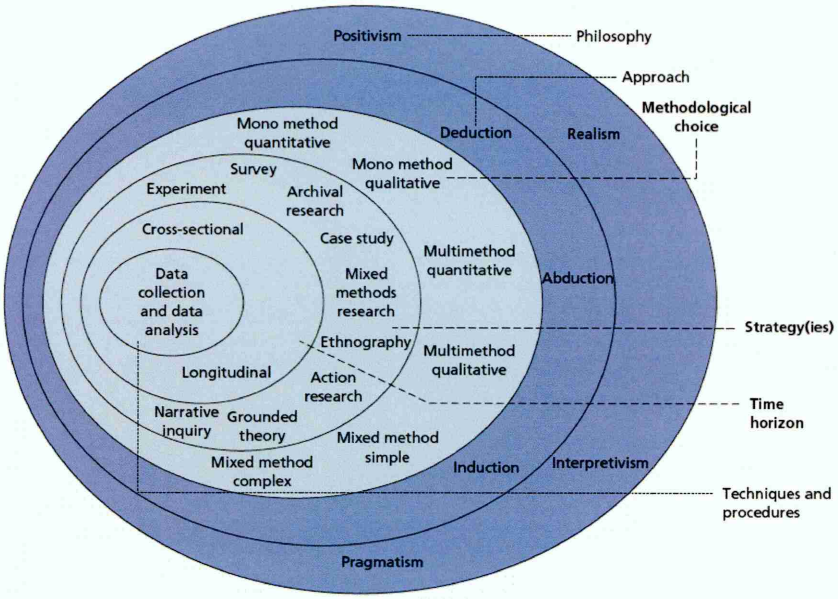
Customer satisfaction and loyalty are very important to discover and to improve the service quality of the sports and leisure industry. It is also a responsibility for the government to know the performance of PPP projects. The government can easily understand how a project is achieved and improve the industry competitiveness from customers' perspectives.

Chapter Three Research Methodology

There are a few sequential steps of the research methodology which were designed by Saunders *et al.* (2007) called the Research Onion. The main elements and layers of the research methodology are shown in Figure 3.1. In the research onion, a research process is carried out. The main steps are the research philosophy, approaches, choice, strategies, time horizons and data collection. In this chapter, the development of the methodology followed the sequence of the Research Onion. It examines the past literature associated with the topic and develops the main research tools. Using both qualitative and quantitative research methods, this study analyses the case of Kaohsiung Arena in order to probe into operational issues in a BOT project and the obstacles encountered in cooperation between government and private enterprises. This chapter details the research design and data management process, which includes the following parts:

- Research Philosophy: epistemological foundations;
- The development of the research design;
- Research design;
- The case study - Kaohsiung Arena;
- Fieldwork process;
- Measurement tool testing; and
- The data analysis plan.

Figure 3.1 Research Onion



Source: Adapted from Saunders *et al* (2009: 158)

3.1 Research Philosophy: Epistemological Foundations

People are eager to explore the truth of unknown questions, and argument is the central core of thinking questions. The 'reasoned arguments' are the most important substance to construct thinking (Kuhn,1991). There is more than one way to comprehend things in society. For example, liberalism and conservatism usually offer different explanations of the same social phenomena. “Paradigms” are the foundations of these different explanations; they offer structures for researchers to organise the observations and inferences. The following sections discuss the research design process of BOT sports venue development from the epistemological foundations of positivism and constructivism.

3.1.1 Positivism

Comte coined the term 'sociologie' in 1822 and inaugurated a new knowledge adventure. His positivism philosophy reflected the stance of the natural scientists

(Saunders *et al.*, 2007). Positivists think society can be analysed and logically understood through the scientific epistemology called 'positivism', which was the early research foundation for sociology. After Comte raised the positivism issue, 'rationality' became increasingly central to the understanding of society (Chen, 2002). Later on, a more sophisticated use of 'positivism' was the attempt to rationally understand irrational human behaviour. Park and Turner (1990) explored how to establish social science by examining the history of the development of American society. Positivists believe that only the statements validated or rejected by experience can have cognitive meanings; hence, they emphasize the social phenomena of science and numbers, more specifically, quantitative research (Gill and Johnson, 2002). Other researchers, however, have challenged this perspective. Phillips and Burbules (2000), for example, criticised positivism from a postmodern viewpoint, arguing that 'rationality' ignored characteristics such as tradition, loyalty and image, which can contend with rationality and decide human behaviour. The 'absolute truth' of positivism has also been criticised for its traditional principle (Creswell, 2003). In the early 20th century, philosophy of science was dominated by positivists, who argued that the sources of knowledge were from exterior to interior and were introduced into the mind from the environment. Human beings simply passively receive the knowledge.

Through the criticisms of positivism, constructivists emerged in the late 20th century and proposed very different views on the sources of knowledge. Traditional positivism prefers quantitative research, which emphasizes the social phenomena of science and numbers (Denzin and Lincoln, 2005). The most important thing is to pass the verification process of hypothesis testing. However, the most ideal verification process should be a controlled experiment like natural science, which means to achieve the internal validity by adding specific stimulus variables to only experimental groups in a controlled situation (Bryman, 2004: 30). This study explores the BOT business

model of sports venues. It is difficult for the researcher to control the social environment and observe the effect of interference of experimental variables as in a laboratory. As a result, for this research, it is suggested not to follow the positivism principle for the research design.

3.1.2 Constructivism

Robson (2002) suggested that according to constructivists, social phenomena are constructed upon reality. Understanding of knowledge is based on actors' perceptions. Knowledge is formed by researchers' active construction, rather than passive receiving of the outcomes. According to Hor (2001), knowledge does not simply explain the truth of the world; it is the legitimation of personal experience. Thus, constructivists tend to approach the world by actors' feelings. Kuo (2009) suggested that the contribution of constructivists was to avoid the conflict between objectivism and subjectivism. They attempted to construct a model of equal interaction between human beings and nature, and reflect active and passive complementary characteristics between human beings and nature in the model. Thus, human beings can actively recognize nature and construct knowledge. Merriam (1988) indicated that research aims to probe into the process of events and actions, with the focus on process instead of result. However, this does not mean that constructivists are not concerned about outcomes; instead, the advantage of qualitative research is to lead to outcomes. Positivists are not good at defining it (Patton, 1990). Constructivism prefers qualitative research; it explains the specific phenomena by subjective perspective or respondents' self-description. Robson (2002) further states that the role of research principles is to help construct the '*reality*' with the researchers.

The constructivism learning theory states that knowledge is an agreed social construction by individuals and others through communication. The learning of science needs to be through conversation and communication, in which people propose different

perspectives to stimulate self-reflective thinking, use different ways to solve problems and clarify the doubts through the process of interactive questioning and argument, and gradually construct the knowledge and form formal science knowledge. Thus, the view of the knowledge formed by constructivism cannot fully satisfy the aims and objectives of this research, especially since constructivism stresses the process more than the results.

Positivism and Constructivism are the foundations of epistemology; they involve knowledge research and how to obtain knowledge. They are different viewpoints on obtaining knowledge which decide the research method. Table 3.1 summarises the differences between positivism and constructivism.

Table 3.1 Different Viewpoints of Positivism and Constructivism

	Source	Viewpoints
Positivism	Raised by Comte, early 19th century	Emphasises the social phenomena of science and numbers; prefers quantitative research.
Constructivism	Raised in the late 20th century	Explains the specific phenomena by subjective perspective or respondents' self-description; prefers qualitative research.

Druckman (2005) pointed out that the positivists tended to explain data from the perspectives of analysts or external observers, while constructivists prefer explaining the specific phenomena from a subjective perspective or respondents' self-description. Thus, positivists prefer exploring knowledge using scientific tools and techniques. When researchers' observations and explanations were not consistent, positivists would rely on convergence. Constructivists relied on their reflections, perceptions and beliefs to approach knowledge; positivists focused on divergence of the phenomena observed and provided and tried to indicate experiential context and multiple facts.

3.1.3 Pragmatism

The concept of pragmatism was first raised by the American philosopher Charles Peircein the late nineteenth century, and then John Dewey brought this concept into the level of social research. Pragmatism believes the most important aspect of knowledge is that it is 'true', and it needs to be useful as well in enabling humans to achieve specific aims (Barnes, 2008). Moore (2004) explained that pragmatism is to completely verify an idea or a hypothesis, and the idea or hypothesis we can verify is undoubtedly always true. Esposito (2012) pointed out that there are two central viewpoints of pragmatism.

1. That all ideas, which are useful, are true.
2. There are only two ways to obtain the truth: the scientific approach and verifying ideas from things.

Pragmatism emphasises social science, research topics and research problems which can all emerge as solutions to core issues (Creswell, 2003). Patton (1990) and Robson (2002) suggested that the mixed-method approach might be a suitable way to achieve the truth. This philosophical knowledge, in contrast with earlier research philosophies, is called the *" third research paradigm"* (Johnson and Onwuegbuzie, 2004: 14).

Robson (2002) stated that the modern pragmatist approach can be appropriate to combine the qualitative and quantitative methods. Thus, in this research, pragmatism can provide a way of thinking how to understand the research problems and obtain suitable solutions to these problems. Creswell (2003:12) explained that pragmatism *"Opens the door to multiple methods, different world views and different assumptions"*, and leads to *"different forms of data collection and analysis in the mixed methods study"*. Liu (2007) suggested that the difference between quantitative and qualitative data is the source of another argument in the field of research. According to Liu, positivists prefer quantitative analysis, whereas constructivists prefer qualitative analysis. Qualitative

researchers suggest that quantitative research findings may miss some invisible phenomena. According to quantitative researchers, quantitative research can allow for the comparison of large populations. This study analyses a major BOT sports arena and intends to apply positivism and constructivism advantages. Thus, the combination of qualitative and quantitative research might be suitable.

Yin (2009: 63) described that mixed-method research derived the methods to share the same research questions and to conduct complementary analyses, in short, *"Mixed-methods research can permit investigators to address more complicated research questions and collect a richer and stronger array of evidence than can be accomplished by any single method alone"*. Patton (1990) pointed out that for most of the pragmatists, the researcher should use many methods to understand the "problem". Tashakkori and Teddlie (1998) suggested that social research should focus on the research problems and the importance of obtaining results with mixed-method research. In discussing the above, emphasis on the mixed-method approach is more appropriate to conduct the development of research design. To integrate the basic principles, Creswell (2003) claimed that pragmatism can:

1. Allow researchers to freely navigate both orientations of qualitative research and quantitative research;
2. Allow researchers to freely choose research methodologies, steps and process according to their needs and objectives; and
3. Gather and analyse data from a wide range of sources.

Towards a Conclusion: Mixed-Method Research:

It is suggested not to follow only one research method, whereas it is recognised that all methods have limitations, but a mixed-method research facilitated greater understanding (Saunders *et al.*, 2007) and was considered appropriate to lessen the bias from a single method.

To sum up, researchers care about facts. Different research methodologies have their own advantages and disadvantages, so combining their respective advantages will be very helpful for satisfying the aims and objectives of this research. A mixed-method approach might therefore be more appropriate. As a result, pragmatism raised the idea of combining the two approaches in a mixed-method way. Shakkori and Teddlie (1998) believed that pragmatism can be the foundation of the mixed-method approach. Maxcy (2003) emphasised that pragmatism offers the best way of the mixed-method approach for social research. With the clear research objectives stated in Chapter 1 above, research methods will be next discussed through the initial scoping research phase. With consideration of the BOT trend, this study is intended to examine the BOT development of major sports venues, including an analysis of the benefits and challenges of such ventures.

3.2 Development of the Research Design

With the research of BOT sports venue development, there are a few current situations which must be considered before the research design:

Although BOT projects have been undertaken worldwide, hitherto there has been no standardised approach to the investigative research that has been designed to examine BOT applications for major sports venues. Similar research on major sports public-private partnership projects has been based purely on literature reviews and documented reports, including the study of management issues concerning a BOOT stadium, as discussed by Chu (1999). Luo (2000) used a qualitative approach to evaluate the operational efficiency of BOT projects. Jefferies (2006) and Jefferies and Cook (2001) used a three-stage semi-structured interview process with senior management from public and private sector stakeholders to investigate the factors critical to the success of major sports venues. Davies's (2005) mixed-method approach

explored sports stadia and property values, while Lin (2009) applied a survey method to the operational issues of a BOT sports facility by examining customer satisfaction.

3.2.1 Qualitative Research Approach:

Qualitative research includes different subjects, areas and ranges, as well as comprehensive relative concepts and hypotheses. According to Flick (2009), the most common methods for qualitative research are ethnography, case study and field research. Chen (2002) defined qualitative research as researchers using themselves as a research tool, to gather data from multiple sources in natural situations, as well as to explore social phenomena from a holistic perspective and to use an inductive method to analyse the data. An explanation of behaviours and meanings is obtained from the interaction with the subjects of the research.

Guba and Lincoln (2005) argued that in qualitative research, different theories, such as the post-positivism theory, critical theory, constructivism and involvement theory, are characterised by conflicting and divergent scenarios. Hence, there is no exact definition of qualitative research. Knoblauch *et al.* (2005) pointed out that there are differing opinions about the origin of qualitative research. Flick (2004) argued that qualitative research values the opinions of participants, so the choice of using a qualitative research method should match the research agenda. All the evidence shows that there is still no standard way of doing qualitative research.

Flick (2009: 473) gave a more general definition for qualitative research as: *"Research interested in analyzing the subjective meaning or the social production of issues, events, or practices by collecting non-standardized data and analyzing texts and images rather than numbers and statistics"*. The qualitative research in the present study lays more emphasis on holistic description. Face-to-face interviews were conducted using a series of open-ended questions. Patton (1990) indicated that a purposive

sampling technique could be used to gain in-depth information. Purposive sampling can ensure that the interviewees are relevant and correlate to this area. In addition, snowball sampling has been used in this study to find potential interviewees. Denscombe (2010) described how in the snowball sampling technique, the interviewees are asked to nominate others as respondents for the purposes of the research. This is also an effective technique for building up a reasonable sample size. For this research, Kaohsiung Arena was selected as a case study because it can offer a unique chance to develop the sports BOT project, and it also shares similar elements with other countries' economic environments. In order to gain an in-depth understanding of this sports BOT project, face-to-face interviews were selected as the best approach in this research. The details of the interviews are in Section 3.5.2 below.

3.2.2 Quantitative Research Approach:

Almost all methods of quantitative research involve digital data. Each of these methods requires different levels of data collection. Chiu (2003) generalized the three most used skills: survey research, correlation research and an experimental approach. In survey research, researchers often focus on one main issue or subject. Fraenkel and Wallen (2000) listed the features of survey research:

- Data are collected by a certain group for the purpose of describing certain aspects or characteristics such as abilities, opinions, attitudes, faiths and knowledge.
- The main way of gathering data is asking questions.
- The data are from one sample, not the entire population.

The survey research approach was used in this study to cross-compare with the qualitative results. This strategy was to suit the research as it allowed the effective collection of a large amount of data (Saunders *et al.*, 2007). The details of the survey process are discussed in Section 3.4.2 below.

3.2.3Towards a Mixed-Method Approach

Johnson *et al.*(2007:123) define the term mixed-method research as:*"Mixed-methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and collaboration".*

Denscombe (2010:144) listed 5 reasons why the mixed-methods approach is considered suitable:

- Improved accuracy;
- A more complete picture;
- Compensating strengths and weaknesses;
- Developing analysis; and
- An aid to sampling.

It is appropriate to use mixed-methods to investigate different aspects of a BOT sports arena, especially for the first major public/private sports arena project in Taiwan. What needs to be emphasised is that the mixed-methods approach can avoid the disadvantages of both qualitative and quantitative research. Brannen (2003) argued that single method studies are insufficient in theory, if not in practice, because the quantitative researcher isolates and defines variables and variable categories, whereas the qualitative researcher begins by defining very general concepts.

The BOT sports arena projects in Taiwan, as in many Asian countries, will be developed through a mixed-methods approach by a detailed scrutiny of the first BOT sports arena project, and will be dependent on the outcomes of this examination. Edwards and Skinner (2009:6) indicated that three outcomes might arise from mixed-method sport management research:

a) Qualitative and quantitative results may 'converge'.

b) Qualitative and quantitative results may relate to different objects or

phenomena, but may be 'complementary' to each other and thus can be used to 'supplement' each other.

c) Qualitative and quantitative results may be 'divergent' or 'contradictory'.

To explore the possible issues related to the operation of a sports BOT arena in Taiwan, qualitative research might be a suitable approach to understanding the real operational issues. However, some issues need to be investigated by obtaining opinions from users. Denscombe (2010) argued that surveys are most effective when the researcher requires factual information related to specific groups. Therefore, the survey research is an appropriate method for gathering the supporting data. Thus, combining the qualitative and quantitative results can lead to the best understanding of the real situation of a sports BOT arena.

However, the present study is explicitly limited to investigating the BOT operation of major sports venues in Taiwan. Previous research has examined the BOT operation in terms of critical success factors and had to rely on in-depth analysis. However, that approach is not suitable in this case because the researcher cannot rely on a single research method and the research subject in case study research.

To investigate the issues likely to occur in BOT operations in this research, it is inappropriate to use a single method. Edwards and Skinner (2009) suggested that a combination of qualitative and quantitative methods usually provides information at different levels of sociological description, and that the study of actual worldwide cases has led to the identification of different approaches; for example, interviewing representative specialists and gathering quantitative data.

There is no doubt that these techniques have offered different solutions to effectively examine the operational issues within BOT sports facilities. However, in this study it is important that the issues are explored extensively, deeply and from different

viewpoints. After due consideration, a mixed-methods approach was therefore considered preferable for the following reasons:

- If the data were collected from a questionnaire survey, they might not accurately reflect any possible problems between the public sector and the private sector.
- The result may be limited if only specialists' opinions were gathered.

From the above, it was concluded that a mixed-method research approach was suitable for this study and that the data were to be collected using both qualitative and quantitative research methods.

To sum up, a mixed-methods approach is justified for this research; both the qualitative and quantitative methods offer different perspectives for investigating the BOT Arena projects.

This study significantly relies on the researcher's perspectives. According to Fraenkel and Wallen(2000),all researchers have biases and thus their observations differ. Therefore, researchers use many techniques to examine the perspectives in order to avoid arriving at misleading conclusions. The most common measure is the triangulation technique which collects data using different tools (Kuo, 2009). When a conclusion can be supported by the data collected through different tools, the validity of the conclusion can be enhanced. The mixed-method approach can benefit from triangulation data sources (Saunders *et al.,* 2009). Similarly, Patton (2002) makes it clear that triangulation can strengthen a study by the use of combined methods. Stake (1995) stresses that researchers cannot rely on a single research method for a case study with richness of context. For the reasons mentioned above, this research adopted the triangulation technique to cross-check findings. Therefore, the data were collected from several sources, namely face to face interviews, documentary reports, site observations and cross-checking with the survey results.

3.2.4 The Single Case Study Approach

In the pragmatist philosophy, Denscombe (2010) brought up that a variety of sources of data should be a part of investigation in a case study approach. This approach is used when the group design and common research tools are not fit for one particular study. Yin (2012:4) defines a case study as *"An empirical inquiry about a contemporary phenomenon, set within its real-world context -especially when the boundaries between phenomenon and context are not clearly evident"*. Yin (2009:8) suggested that three kinds of research can consider using the case study approach:

1. When the questions emphasise 'how' and 'why'.
2. The researcher only has limited control over the research object.
3. The research is focused on the issues happening 'now' rather than 'before'.

Many social research studies have separated research objects into specific groups, but sometimes the group design is not perfectly fit for research. According to Fraenkel and Wallen (2000), especially when the commonly used tools are not suitable, researchers have to develop a research design for one specific case study, which is a phenomenon of a particular time and place. Schwandt (1997) mentioned that case study characteristics are specific, related to a particular environment, and are inferential.

According to Huang (1994), researchers can infer conclusions extensively from the results of using the case study approach, and the approach can describe the real situation of the research issue. Edwards and Skinner (2009) stated that the case study method is often used in sports management research. In this method, the features of qualitative research are of particular interest with respect to broader issues and the development of appropriate explanations. Sarantakos (2005) argued that the case study approach employs many diverse methods, and Finn *et al.* (2000) found that it usually needs to combine quantitative and qualitative data. On this basis, a case study involves a comprehensive strategy, with both qualitative and quantitative approaches.

Little attention has been devoted to the operation of BOT sports facilities and, as detailed above, how to profitably operate a BOT arena. This is a problem that the government has yet to resolve. Therefore, the lessons learnt in this study will significantly contribute to a greater understanding of the sports BOT approach in Asia. As Yin (2009: 47) pointed out *"One rationale for a single case is where the case represents an extreme case or a unique case"*.

Following the discussions above, it is very important to find a BOT arena as a case study in Taiwan which can best provide the experience to other BOT arenas. The Kaohsiung Arena is the first of its kind: that is, a BOT sports project combining commercial amenities with an arena in Taiwan. Furthermore, the following reasons show why the Kaohsiung Arena was chosen for this research as a case study:

a) All major sports facilities in Taiwan were 100% funded by the government; none have been financially viable in the past. The Kaohsiung Arena is the first major BOT sports venue where there is a partnership arrangement between the government and the private sector. The innovative sports arena project will be a very good case study to help determine whether a partnership approach is successful.

b) Due to a lack of finances, traditionally, most public-owned facilities are poorly maintained, and the maintenance is very expensive. In some western countries, there are many examples of the private sector operating public facilities and effectively controlling costs, maximizing performance and enhancing the quality of services, and this case study will examine whether the sports BOT facility is a viable way of improving the traditional public owned facilities.

c) There is only one professional sport in Taiwan: baseball. As baseball requires an area larger than that provided by the Kaohsiung Arena, a professional sports team cannot run the facility. Therefore, the issue of operating a BOT Arena will

be examined to provide a reference for future major sports projects.

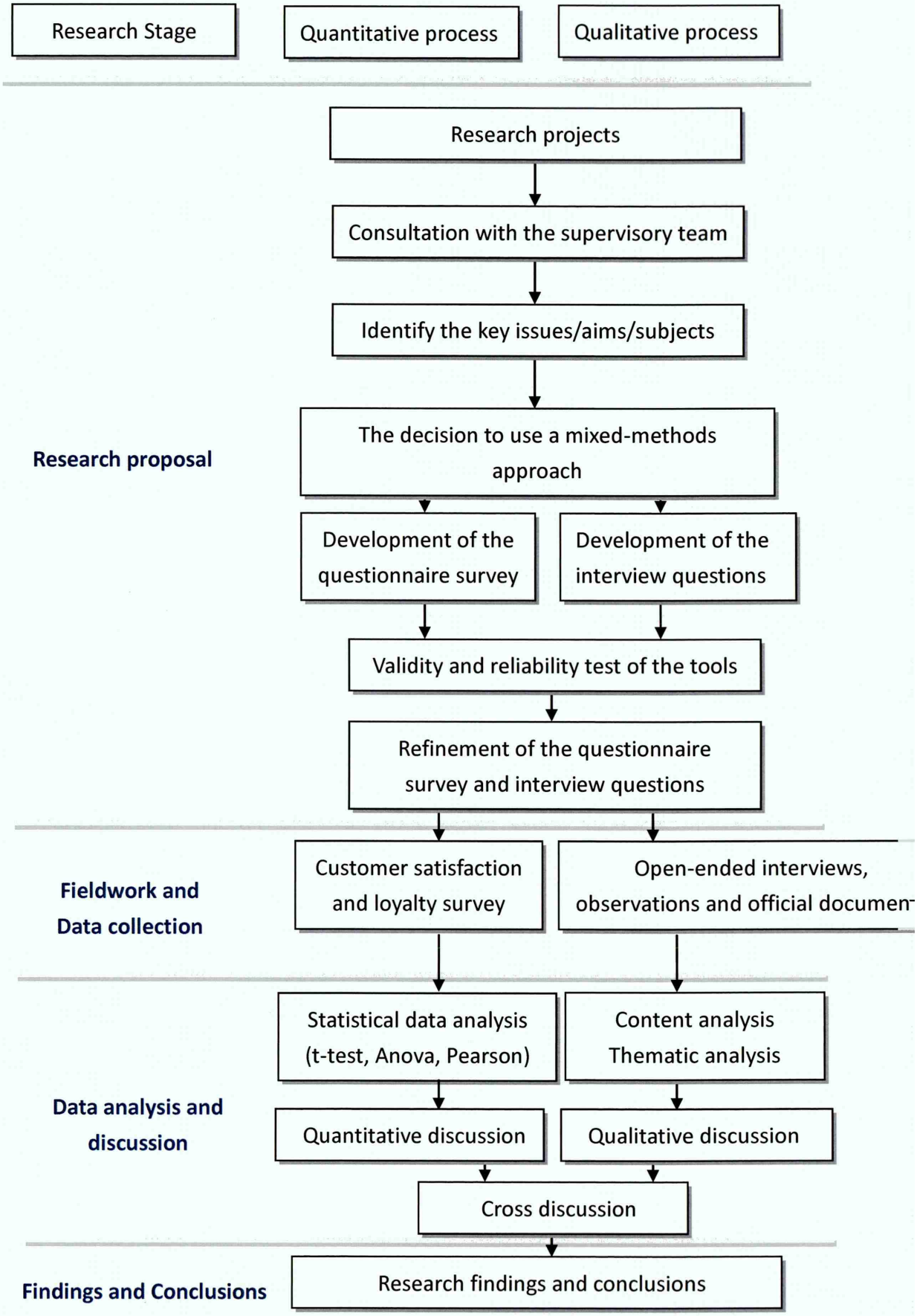
d) The Taiwanese government is planning to construct similar BOT cases in the northern and central parts of Taiwan, where sports arenas will be combined with commercial spaces, as per the Kaohsiung Arena. The profitability and viability of the Kaohsiung Arena is a critical factor in deciding the future of sports arena projects in Taiwan.

e) Major sports facilities are important for those cities that need to improve their sports, cultural and artistic events. In this research, through a case study of Kaohsiung Arena, the advantages, disadvantages and problems of such a sports BOT project are explored. It can offer a good example for other cities in the world, especially those cities which need to build a major sports facility but are facing financial difficulties.

3.2.5 The Process Undertaken in This Research

The research process undertaken is illustrated in Figure 3.2. The initial interest in the operation of a major BOT sports venue was developed into the identification of specific issues. This was followed by a literature review and, after consultation with the supervisory team, the key issues/aims/subjects of the study were formulated. A mixed-methods research study was performed to collect the data, and from the data analysis, conclusions were devised methodically.

Figure 3.2 The Process Undertaken in this Research



3.3 Data Collection

The primary data were collected from September 2010 to February 2011, including the questionnaires and open-ended face-to-face interviews. Both of these methods will be discussed in the following sections.

3.3.1 Interviews:

This research required a qualitative approach, and so open-ended interviews were carried out, followed by participant observation. According to Arksey and Knight (1999), interviews have several advantages:

a) Qualitative interviews are a way of uncovering and exploring the meanings that underpin people's lives, routines, behaviours and feelings.
b) Interviews allow answers to be clarified, unlike self-completion questionnaires.
c) Interviews, especially qualitative interviews, allow understandings and meanings to be explored in depth.
d) Qualitative interviews examine the context of thought, feeling and action, which can be a way of exploring relationships between different aspects of a situation.

The focus of this interview was to understand not only the likely types of problems in BOT projects, but also the benefits and advantages gained by government and private enterprises when using the BOT approach.

3.3.2 Exploratory Interviews:

In the past, most of the large events in Taiwan were held in stadiums, which were mostly outdoor stadiums of small size. The only two 15,000-seater sports facilities in Taiwan are both located in northern Taiwan; one is on a university campus (privately sponsored) and the other is in Taoyuan City (a simple arena without the facilities

required for sports competitions). Both of them were built over 25 years ago without proper planning. These two arenas are no longer sufficient for modern-day requirements. Starting in 2000, the Taipei City Government facilitated the construction of a 15,000-seater arena with its own funds using the OT model. Kaohsiung City was also in urgent need of an arena. In fact, the Kaohsiung City government originally approved the construction of a modern arena (with 50% funds from the central government and 50% from the city government) and the design was near completion. However, this project was terminated due to opposition from Kaohsiung City Council concerning the site selection. The Kaohsiung City Government later changed the site plan and drove the construction as a BOT project. The result is the first BOT arena project in Taiwan, i.e. Kaohsiung Arena. This project has had a profound impact on subsequent construction of arenas and similar public facilities.

There were some BOT projects for the construction of sports facilities in Taiwan in the past. These examples include the National Kangshan Agricultural & Industrial Vocational College Pool in Kaohsiung, and the sports and recreational zone in Dapeng Bay. The swimming pool project was small in comparison to this project. Although larger in construction budget, the Dapeng Bay project has been seriously delayed and has not reached its planned scale yet. Both of these two sports BOT projects have been operating for years. The exploratory interviews regarding these projects can help to understand the real problems, difficulties and current situations of sports BOT projects in Taiwan and also help to shape the questions for the formal interview.

a) Sample

The Kaohsiung Arena is the only BOT procured arena in Taiwan. With consideration of the geographical position and legislation issues, two leisure-related BOT cases were chosen as the exploratory interview target. The reasons are described below:

1. Dapeng Bay BOT Project is the first case of sports and recreational tourism industry in Taiwan, with high base investment and investment amount. However, when signing the contract with the development company at that time, the government lacked experience of such projects. The articles related to violation of the contract and penalties are ambiguous; thus, the development progress has been seriously delayed. The experience should be reviewed. This study treats this project as a pre-interview and exploration of an actual BOT plan.

2. Although the investment amount of the National Kangshan Agricultural & Industrial Vocational College Pool projectis low, it is the first case of cooperation between a school and private enterprise. This project solved the problem of funds, and avoided operational obstacles. The project has served as a model for other schools.

Two senior managers from Dapeng Bay National Scenic Area and National Kangshan Agricultural & Industrial Vocational College Pool were interviewed in Taiwan in March 2009. Patton (1990) indicated that a purposive sampling technique could be used to gain in-depth information about a case. Based on the research question, the decision was made to select two exploratory interviewees. The exploratory BOT cases are as follows:

1) The Exploratory Interview BOT Project Case One

i) BOT Case: Dapeng Bay National Scenic Area

Project started in 2004

Duration: 50 years

Cost: £397 million (Government); £200 million (Enterprise)

Dapeng Bay National Scenic Area was set up in November 1997. In 2000, the government combined Liouciou Specific Scenery Area with the Dapeng Bay district. It is situated in the southwest coast and at the borders of Donggang township and Linbian township. It is the biggest lagoon on the southwest coastline of Taiwan. The water area

is about 3,500 meters long from east to west, and around 1,800 meters wide from south to north, making a total area of 532 square hectares. The average depth is about two to six meters. There used to be a large-sized oyster bed in the Donggang area. Appendix II shows the details of the project.

2) The Exploratory Interview BOT Project Case Two

i) BOT Case: National Kangshan Agricultural & Industrial Vocational College Pool (for specifications see Table 3.2)

Project started in 2004

Cost: £950,000 (Government); £950,000 (Enterprise)

Duration: 25 years

Table 3.2 The specifications of the National Kangshan Agricultural & Industrial Vocational College Pool

Pool size(m)	25*12 m
Pool number	2
Gym	1
SPA Facilities	Yes
Water slide	5m height
Parking area capacity	70 cars
Staff	12-15

c) Transcribing the Data

Transcription was a vital part of the organization and management of the data. It is the production of a written account of the interview (Arksey& Knight, 1999). The researcher read the transcript and field notes of the interviews, and categorized the data into themes connected with the BOT issue. The qualitative survey used Chinese. The whole interview process was recorded on audio tape and translated into English after the data were transcribed. The whole interview process took around thirty minutes. This study employed in-depth interviews as the method of data collection, using a series of open-ended questions that were developed to explore the issues relevant to the research

question. To test the internal validity of the qualitative data, the interviewees were asked to read the interview transcripts to corroborate whether their views were accurately conveyed. The interviewees also deleted a few parts of the interview transcript due to concerns of classified commercial information.

d) Summary of Results of the Exploratory Interviews

The exploratory interviews can be summarised as follows (for a full analysis see Appendix II):

i) The connection between government and enterprise plays an important role in a BOT project. The government has to supervise the construction process. In the Dapeng Bay BOT project, the manager thought there was too much government monitoring. The manager of the swimming pool had the opposite reaction.

ii) The legislation issues involved in a BOT project are very complicated. The manager of Dapeng Bay BOT project hoped the government could provide more legislative assistance on issues such as jet skis and bank loans.

iii) The manager of Dapeng Bay BOT project listed three real problems that had occurred. First, the global economic crisis. As a project manager of leisure activities, he thought that this was not uncommon across his industry. Second, this is a very big project, which involves a wide range of specialized fields, and professional staff are not easy to find. Third, the government did not follow the fundamental construction schedules.

iv) There are three management difficulties: communication with government, the legal aspects and pressure from local residents.

v) In operating the Dapeng Bay BOT project, the manager believed that this is a unique BOT leisure project in Taiwan; he has to investigate other cases abroad.

vi) The two management difficulties of the swimming pool were funding and legislation.

vii) In BOT case 1, from the company's perspective, the government gained many advantages; the government does not have to manage this project, only monitor it,

which saves a lot of human resources and "know-how". Moreover, this project decreased the unemployment rate for the local government. As for the company, this project is still in the initial stage of a fifty-year contract. The only benefit according to the manager was the enhancement of the company's image.

viii) In BOT case 2, from the chairperson's perspective, the school gained two advantages. It now has indoor pools and the enterprise has to regularly pay rent to the school.

The manager of Dapeng Bay BOT project suggests that the operational obstacles are caused by many factors, including recreational trends and lack of examples of investment cases. In fact, such enormous investment projects cannot be simply assessed by the enterprise. Although an evaluation committee approved the investment project, the following investment planning relies on the participation of a great number of professional personnel. If the enterprise has no intention to invest in costs at an early stage due to slow return of funds and only expects the expansion by partial parts of this BOT project, the government will not be satisfied. The investment project will be forced to be delayed.

Regarding the current evaluation of BOT projects in Taiwan, first, the evaluation committee is established. After the investment project is selected, the evaluation committee will be dismissed. The construction is then managed and monitored by the government. After the formal operation, the construction supervision committee is established. Members of the evaluation committee and supervision committee are not the same. Their understanding of the details of projects is inconsistent and there can be differences. Besides, after the construction of a project, the government will assign the personnel, usually public officials, for its supervision. They are not totally familiar with the knowledge related to engineering, finance and operation. Moreover, few personnel

are assigned. Regarding the negotiation of the problems, they have to report them to a higher level, which is inefficient. If it is restricted by laws, it will take months or even years. This is the outcome of the lack of experience in administration. According to this BOT contract, two parties indicate the items and schedules for the government; however, it does not suggest the compensation or the remedial measures when the project is delayed.

The swimming pool investment project was the first case of a school swimming pool BOT project in Taiwan. Until now, there has been no second case. Although the scale of the fund is not large, common swimming pools are still under the pressure of funds and operation. At present, PPP of school swimming pools in Taiwan is based on simple OT projects. The terms of contracts are shorter and the investment funds are fewer. Each term lasts for 3~5 years. The firms have higher intention of investment. If the project has a more experienced operational team and different types of professional personnel, it will more effectively control costs and increase profits.

Based on the investment projects above, both small and large scale, the firms have operational obstacles. This is the reason for the complexity of BOT projects. In Taiwan, in particular, for many BOT projects, the investment amounts are enormous and the operational terms are long. Private enterprises invest more funds and thus it is more risky. Without careful assessment and comparison, the investment projects can fail.

e)A Brief Conclusion of the Exploratory Interviews

This study found that there has been too much government supervision of this Dapeng Bay BOT project. Zhung's (2004) discussion of public welfare BOT projects noted that the government's supervision should be like a support role because it would give the enterprise more space to develop. From this viewpoint, the local government should give more space to the enterprise by following the construction schedule. Jan

(2006) reported that governments could become corrupt because of an incapability to supervise, or because those affiliated with the government attempt to maximize their gains from privatization. This demonstrates that the degree of supervision is vitally important to a BOT project in Taiwan.

The interviewee in this research mentioned the relief of financial and administrative burdens. What is noteworthy in this instance is that the interviewee also listed the benefits to the company of having a good image. In this case, the project is still in its initial stage. There is still room for argument about the benefits of BOT projects. According to this research, the government can strengthen its friendship with the enterprise. Besides monitoring, the government should give the enterprise more space to develop.

3.3.3 The Formal Face-to-face Interviews:

Three interviewees were chosen for the following reasons:

1. In recent years, Taiwan has made efforts to implement BOT projects. The evaluation committee members of BOT projects are mostly from academia, while some are from the construction, architecture and engineering circles. Thus, many professors have rich evaluation experience. Interviews with professors are more reliable and can obtain more objective views from their experience.

2. In Kaohsiung City, there is only one sports arena operated by BOT. Kaohsiung Arena is the first case. If revenue and expenditure are not balanced, there will be a significant shortage of funds. Thus, the capabilities and views of operators of private enterprises are important. Revenue and expenditure should be balanced to avoid various operational problems. After three years of operation, the management team of the Kaohsiung Arena has accumulated much experience. By way of interview, this study aims to explore the current obstacles encountered by Kaohsiung Arena for further analysis.

3. The Kaohsiung City Government has an exclusive department to monitor and manage the Kaohsiung Arena BOT project. Thus, the result of the project is associated with that department. The personnel in the department are familiar with the management and operation of Kaohsiung Arena, and thus they are treated as the subjects.

According to these considerations, the decision was made to select interviewees from three sources: senior managers of Kaohsiung Arena, officers from Kaohsiung City Government and scholars who had participated in this BOT project. These three interviewees were all familiar with the Kaohsiung Arena BOT project. The results of the interviews were also compared with the results of the questionnaire survey.

3.3.4 Transcribing the Data:

The qualitative survey was conducted in Chinese and the whole interview process was digitally recorded. In-depth interviewing was employed as the method of data collection, with a series of open-ended questions that were developed to explore issues related to the research question. Like the exploratory interview, in order to test the internal validity of the qualitative data, the interviewees were also asked to read the interview transcript and corroborate whether it accurately conveyed their views. Notes were also made during the interviews.

3.3.5 Formal interviews:

The formal interviews were carried out from 25th of September to 2nd of October 2010. Table 3.3 details the interviews.

Table 3.3 Details of interviews

Interviewee	Time	Place	Note
The consultant of Kaohsiung Arena BOT project (A senior professor).	25/09/2010 10:30-11:10	Office	Recording
A manager of the Kaohsiung Arena operation team.	28/09/2010 17:00-17:40	Office	Recording
A senior government officer of the Kaohsiung arena BOT project team.	02/10/2010 10:00-10:50	Home	Recording

3.3.6 Participant Observation of Kaohsiung Arena:

Although observation was not the major form of data collection, it can still provide helpful information to support the results of the qualitative research. The observations were carried out inside and around Kaohsiung Arena. Photographs of the participant observation of Kaohsiung Arena are featured below:

Photograph 3.1 Kaohsiung Arena Main Entrance and Guest Square

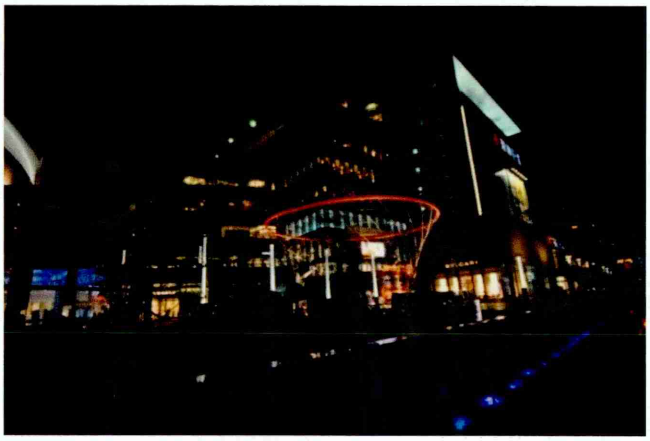
This is a guest square in front of the main entrance of Kaohsiung Arena that can accommodate a large number of customers. There are many small events held in the guest square at night. In this BOT project, due to the legal restrictions in Taiwan, 40% of the square area should be public space. According to the regulation, the square should maintain a vacant lot; however, the management company has coordinated various

events and built temporary performance stages or shop areas, thus attracting many spectators and increasing profits. Photo 3.2 shows another view of the guest square.

Photograph 3.2 Kaohsiung Arena Guest Square

Another view of the guest square

Photograph 3.3 The Combined Restaurant and Shopping Centre in Kaohsiung Arena



Two passageways connect the shopping centre and the arena, one on the fifth floor, another underground. In order to allow the spectators watching the games in Kaohsiung Arena to shop in the mall, the management company connected the mall of the first floor with Kaohsiung Arena. Connecting platforms are built on the second and fifth floors, for crowd evacuation purposes and for stimulating shopping.

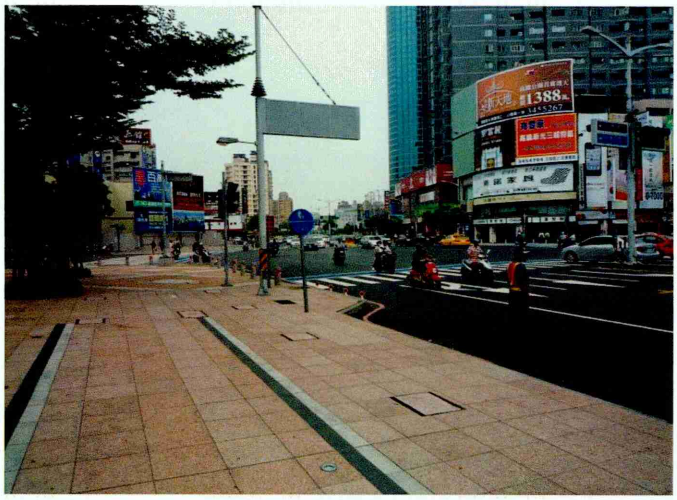
Photograph 3.4 A Sports Event Held in Kaohsiung Arena

Kaohsiung Arena was the main venue for the hosting of the 2009 World Games. Inside Kaohsiung Arena, seats are arranged according to different uses. The roofs are based on exposed steel framework and there is no ceiling. The hanging of equipment is convenient.

Photograph 3.5 Inside Seating View of Kaohsiung Arena

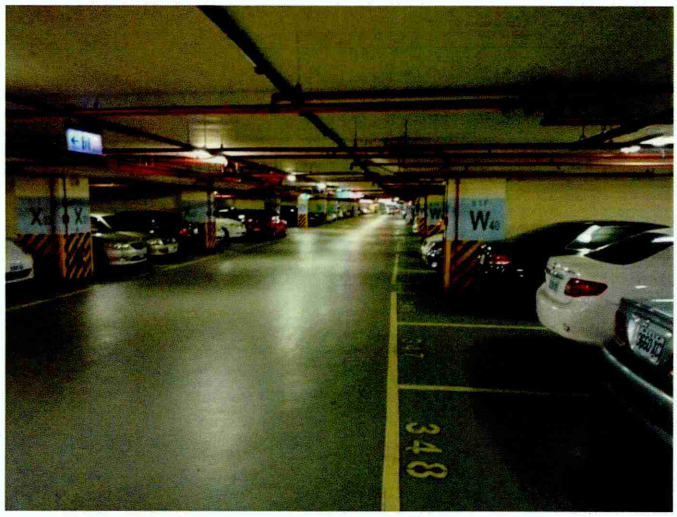
The preparation of Kaohsiung Arena for an exhibition tennis match. The aisles among the stands and corridors are spacious. The audience seated in the top and bottom levels can be evacuated from different entrances and exits to avoid congestion.

Photograph 3.6 Kaohsiung Arena Pedestrian Area



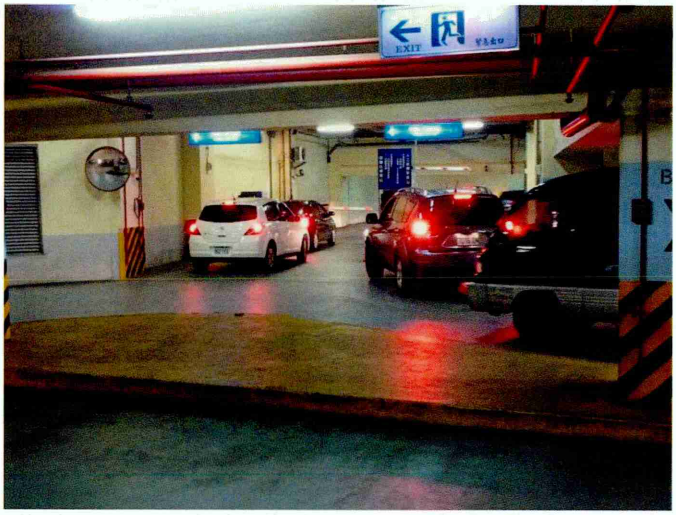
The wide and clean pedestrian area around Kaohsiung Arena - Kaohsiung Arena is not close to the road, thus can avoid crowd congestion on the road and maintain the landscape of the city. In Kaohsiung City, the streets and buildings in the older commercial districts are constructed along the sidewalks; thus, the exits of department stores are close to sidewalks and are crowded. They cause traffic jams. The roads near Kaohsiung Arena are spacious and the buildings on the base are withdrawn from the road. Thus, the public can walk on more spacious sidewalks. Also, in front of the Kaohsiung Arena road is a six-lane main road. This is helpful for the heavy traffic, especially during rush hours.

Photograph 3.7 Parking Space of Kaohsiung Arena



In Kaohsiung Arena, besides the underground parking lot, for business purposes, there is also a parking lot in the basement of the department store. The underground parking lot can be used for anyone who goes to Kaohsiung Arena or the shopping mall. When there are no activities in Kaohsiung Arena, the parking lot will still be occupied. There are 1,465 spaces for cars and 4,174 spaces for scooters in the parking area.

Photograph 3.8 The Parking Space Exit/Entrance



There are many cars blocking the front of the exit/entrance. Although there are 1,465 parking spaces for cars, the exit/entrance experiences heavy traffic.

3.4 Survey

The survey approach used in this research was intended to probe customer satisfaction with Kaohsiung Arena. The purposive sampling technique was used to gather the data. The strategy was suitable for the collection of a large amount of data (Saunders *et al.*, 2007). Balnaves and Caputi (2001) described the time to use surveys as when you cannot directly observe what you want to study. This survey was not designed to answer complex questions. The survey approach also has advantages and disadvantages. In order to have fewer and accurate questions to be answered in the formal survey and to test the validity and reliability of the survey scale, a few techniques need to be applied. These include independent samples t-tests, pilot factor analysis and a reliability analysis (section 3.6.3). Before carrying out surveys, sample size is the question that requires consideration.

3.4.1 Sample Size

a) Sample size for the pilot study survey

The pilot survey sample size is very important to build accurate survey reliability, and most researchers agree that the sample size must be larger than the original questions. Gorsuch (1983) suggested that the pilot survey sample size exceed 100, and that the valid samples be 5 times more than the survey questions. Wu (2009) pointed out that the pilot sample size cannot be smaller than 40; furthermore, for factor analysis, the sample size cannot be smaller than 150. It is also supported by Tabachnick and Fidell (2007) that a sample size of 150 is enough for factor analysis. The details of the pilot samples will be described below in section 3.6.4.

b) Sample size for the formal survey

There are three approaches to calculating the sample size: the statistical, pragmatic and cumulative approaches (Denscombe, 2010). The statistical approach is typically

appropriate but requires a large sample size and is costly. Notwithstanding these limitations, the present research still used a statistical approach to decide the sample size. Sarantakos (2005) highlighted the required sample size according to the population size (Table 3.4).

Table 3.4 Required Sample Size

Population Size	Required Sample Size	Population Size	Required Sample Size	Population Size	Required Sample Size	Population Size	Required Sample Size
10	10	250	152	1,200	291	25,000	378
20	19	300	169	1,500	306	50,000	381
30	28	400	196	2,000	322	75,000	382
50	44	500	217	2,500	333	100,000	383
75	63	600	234	3,500	346	250,000	384
100	80	700	248	5,000	357	500,000	384
150	108	800	260	7,500	365	1,000,000	384
200	132	1000	278	10,000	370	10,000,000	384

Source: Adapted from Sarantakos,2005

Denscombe (2010) also listed the required sample size according to population, arguing that for populations between 100,000 and 10 million, the required sample sizes are 383 to 384. Kaohsiung (KCG, 2010) has 1,527,914 residents. Considering that the number of customers or potential customers is at least 100,000, this research set the suggested sample size as 384.

With the above considerations of research design, sufficient samples of data were required for the research. It was worth spending time avoiding any factors that might affect the results of the research. Analysis according to a small number of surveys is unacceptable.

3.4.2 Research Hypothesis

In recent years, the results of similar cases of measuring customer satisfaction and loyalty of sports facilities in Taiwan are as follows:

a) Chung (2003) investigated the customer satisfaction with seven swimming pools and found that there were significant differences in customer satisfaction for customers of

different age groups and education levels.

b) Li (2004) reported that in a public swimming pool, age, education level and the location of customers have significant differences for customer satisfaction.

c) Lin (2005) carried out a customer satisfaction and loyalty survey in an OT sports centre and found:

1. There were significant differences in customer satisfaction for gender, education level and monthly income of customers.

2. There were significant differences in customer loyalty for gender and education level.

d) Wu (2005) found that there were significant differences in different gender and commute time of customers through a survey of a sports club.

e) Huang (2006) investigated the customer satisfaction of four swimming pools. The results showed that there were significant differences in customer satisfaction for education level and monthly income.

f) Lin(2009) carried out a customer satisfaction and loyalty survey in a sports BOT centre. The results were as follows:

1. In terms of consumer satisfaction, there were differences in the frequency of use, age and education level.

2. In terms of consumer loyalty, there were differences resulting from age group, membership and frequency of use.

Following the customer satisfaction and loyalty research of sport facilities in Taiwan, three sub-parts of the hypothesis have been developed from the customer satisfaction and loyalty to Kaohsiung Arena:

a) H1-1: Customer satisfaction is significantly different by gender.

H1-2: Customer satisfaction is significantly different by age.

H1-3: Customer satisfaction is significantly different by education.

H1-4: Customer satisfaction is significantly different by income.

H1-5: Customer satisfaction is significantly different by travel time.

H1-6: Customer satisfaction is significantly different by transport.

b) H2-1: Customer loyalty is significantly different by gender.

H2-2: Customer loyalty is significantly different by age.

H2-3: Customer loyalty is significantly different by education.

H2-4: Customer loyalty is significantly different by income.

H2-5: Customer loyalty is significantly different by travel time.

H2-6: Customer loyalty is significantly different by transport.

c) H3-1: The customer satisfaction and loyalty of Kaohsiung Arena have a positive correlation.

3.4.3 Consumer Satisfaction and Loyalty Questionnaire Pilot Test:

In this research, a mixed method approach was used to discover the operational issues. The purpose of this consumer satisfaction and loyalty survey was to compare and to examine the results of the face-to-face interviews. A consumer satisfaction and loyalty questionnaire survey was adopted in the current studies. Before the formal survey, a pilot test was conducted to test the consumer satisfaction and loyalty survey. In order to have fewer and accurate questions to be answered in the formal survey, several techniques have to be applied. These include independent samples t-tests(critical ratio, CR value), construct validity (factor analysis) and a reliability analysis (Cronbach's α coefficient).

The initial questionnaires were mostly derived and modified from the recent customer satisfaction and loyalty studies of BOT sports facilities listed in Table 3.5. These studies were mostly focused on the customer satisfaction and customer loyalty at sports venues in Taiwan (Lin, 2009; Chen, 2009; Yip, 2006; Greenwell, 2002), while

others were used to help develop the questionnaires (Pollack, 2009; Chang, 2007; Szwarc; 2005; Kuo, 1999).

For example, Lin (2009) investigated the correlation and differences between customer satisfaction and loyalty of one BOT aquatic centre in Taiwan. This research distributed the questionnaire to customers and received 370 valid responses. The results showed that: 1. Customer satisfaction differs according to age and education; and 2. There were positive correlations between customer satisfaction and loyalty. Chen (2009) researched the relevance among service quality, relationship quality, satisfaction and loyalty at 7 sports centres in Taipei. This research used the survey method and found that customer satisfaction can be influenced by customer loyalty. Chen (2008) analysed the relationship of customer satisfaction and loyalty in 4 leisure and sports facilities in Taipei. The main survey questions of these studies mentioned above were focused on several items such as physical environment, staff and service, quality of equipment, membership, transportation and loyalty.

Besides studies related to investigating the customer satisfaction and loyalty to sports facilities, this research also derived survey questions from other sources. Hill and Alexander (2006) offered the broad objectives for measuring companies' customer satisfaction and customer loyalty, for example, the controllable objectives: staff, service; and the non-controllable objectives: location, interest rate, weather. Szwarc (2005) offered a few factors contributing to customer satisfaction and loyalty, such as company image, customer overall perception of image, recent contact experience, complaint handling, employee behaviour and customer willingness to purchase. Kuo (1999) developed a customer satisfaction measurement model of the service industry from eight kinds of service industry empirical studies, and concluded that 7 factors can affect customer satisfaction in the service industry, namely service content, price, convenience, enterprise image, service equipment, service staff, and service procedure.

Table 3.5 The List of the Initial Questionnaires was Derived from

Research	Author	Year
A Study of consumer satisfaction and loyalty with a case of Built-Operate-Transfer Sports Facility.	Lin, C. I.	(2009)
The Study on the Relevant Among Service Quality, Relationship Quality, Satisfaction and Loyalty – In Taipei Sports Centres.	Chen, L. H.	(2009)
Linking the hierarchical service quality model to customer satisfaction and loyalty.	Pollack, B. L.	(2009)
Consumer Satisfaction toward and Loyalty of Leisure and Sport Facilities.	Chen, S. Y.	(2008)
The Relationship among Customer Satisfaction and Customer Loyalty: An Empirical Study of Taipei City Beitu Sports Centre.	Yip, M. L.	(2006)
The Handbook of Customer Satisfaction and Loyalty Measurement.	Hill, N and Alexander, J	(2006)
Researching Customer Satisfaction and Loyalty-How to Find Out What People Really Think?	Szwarc, P.	(2005)
Assessing the Influence of the Physical Sports Facility on Customer Satisfaction with the context of service Experience.	Greenwell, T. C.	(2002)
The study of customer satisfaction measurement model of service industry.	Kuo, T. P.	(1999)

Before the formal survey, a pilot test was conducted to test the consumer satisfaction and loyalty scale. The range of its sample size varied. Tabachnick and Fidell (2007) recommended that 5 times each item is adequate in most situations. Following that, in this pilot survey, there were originally 28 questions which meant that at least 140 valid samples (28 questions multiplied by 5) should be required to run the statistical test. In consideration of the potential response rate, the pilot survey was distributed to 180 customers of Kaohsiung Arena (with 153 valid responses), and was carried out in December 2010. The details of the survey distribution are listed in Table 3.6. The initial survey was modified by a series of statistical tests.

Table 3.6 Pilot Study Survey Distributed Locations and Valid Data Rate

Date and Time	Locations	Valid Questionnaires and usable return rate
18/12/2010 14:00-17:00	Outside the entrance of Kaohsiung Arena (60)	53 88.34%
19/12/2010 14:00-17:00	Outside the entrance of Kaohsiung Arena (60)	48 80%
25/12/2010 15:30-18:30	Outside the entrance of Kaohsiung Arena (60)	52 86.67%
Total	180	153 85%

This research used purposive sampling to focus on those customers who have previously attended events held in Kaohsiung Arena. The questionnaires were distributed face to face outside the entrance to Kaohsiung Arena. The consumer satisfaction and loyalty questionnaire were separated into three main parts – demographic questions, a customer satisfaction scale and a customer loyalty scale. Besides the demographic questions, there were four sections in the initial survey: satisfaction - physical environment, satisfaction - staff and service, satisfaction – traffic and transportation, and loyalty. There were also two opposite direction questions that were designed to check if the respondents were answering the survey unmindfully. The survey questions related to consumer satisfaction and loyalty to Kaohsiung Arena, and used a five point Likert Scale, ranging from "strongly agree" to "strongly disagree". The five point scale was reversed to calculate the results (strongly agree=5, agree=4, neither agree nor disagree=3, disagree=2, strongly disagree=1). Higher scores reflected an increase in the satisfaction or loyalty of the participants.

With the purpose of having accurate and fewer questions in the formal survey, and to test the validity and reliability of the consumer satisfaction and loyalty scale, a series of statistical techniques had to be applied before the formal survey was produced. These are independent samples t-tests(critical ratio, CR value), pilot factor analysis (construct

validity) and a reliability analysis (Cronbach's α coefficient).

a) Independent samples t-test

The purpose of the independent samples t-test was to discover the critical ratio value (CR value) of each statement, and to delete those pilot survey items that did not achieve the level of significance($p<.05$ or $p<.01$). If the items did not achieve the significance level, it means they cannot really represent the degree of the parameter. It is a reliability test of the pilot survey results. This research used SPSS 17.0 to analyse the quantitative data. After ranking the total sum of each item from the highest to the lowest score, 27% of the highest scores were categorized into Group One. In the same way, 27% of the lowest scores were categorized as Group Two. An item was able to show the level of each participant's feelings if it achieved the significant level. During this procedure, there were 28 items that were subject to the independent samples t-test. One item was deleted because of a failure to reach the significant level-- *'If there was another similar arena nearby, I would not choose Kaohsiung Arena'* ($p=.390$) (Table 3.7).

Table 3.7

Critical Ratio (CR) of Each Item and Cronbach's Alpha if Item Deleted on the Verified Scale

Questions (28)	CR	Cronbach's Alpha if item deleted (Last 27 items)
I am very satisfied with the whole design of this arena	7.769***	.947
I am very satisfied with the facility maintenance of this arena	7.161***	.948
I am very satisfied with the overall cleanliness of the arena	6.679***	.949
I am very satisfied with the ease of access to/from seats	6.935***	.948
The signs are easy to understand	9.019***	.947
Good circulation inside the arena	8.400***	.947
Toilets are well maintained	8.826***	.947
Good function of the screen	8.864***	.947
Good broadcasting system	5.593***	.948
Good lighting system	8.606***	.947
Good A/C quality of the arena	8.442***	.947
Overall, I am very satisfied with this arena	8.046***	.946
Staff are polite	7.805***	.947
Staff knowledge of the venue is good	9.221***	.947
Staff ability of solving problems is good	7.707***	.947
Staff crowd management is good	8.515***	.946
The information given about the activities is plentiful	9.948***	.946
Ease of access to tickets	8.663***	.947
Ease of navigating the events on the official website	8.888***	.946
Traffic flows smoothly in this area	6.142***	.948
Adequate number of places for parking	6.647***	.947
Multiple transport options	5.531***	.948
I will share the arena information with my friends/relatives	5.255***	.947
I will recommend this arena to my friends/relatives	7.213***	.947
I will join future events at this arena	5.291***	.949
[a]If there was another similar arena nearby, I would not choose Kaohsiung Arena	-.863	
I have a sense of belonging in this arena	6.726***	.949
I think Kaohsiung Arena is worth supporting	7.075***	.949

*P<.05, **P<.01, ***P<.001

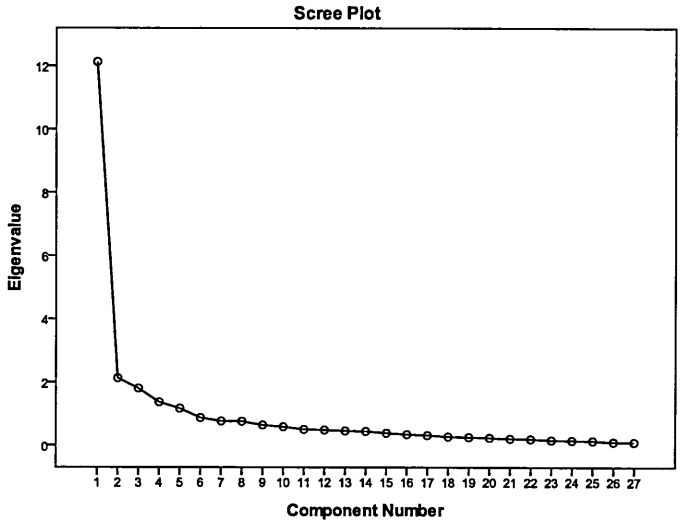
[a]The question was removed because of failing to reach significant level

b) Factor analysis (construct validity)

After conducting a t-test, the next step was to test the construct validity of the pilot customer satisfaction and loyalty survey. The factor analysis approach involves separating a set of questions into groups. It is to tell whether one group is significantly different from another (Pallant, 2010). Using factor analysis on the results, groups of questions are identified that have sufficient commonality to determine the constructs that make up the concept (Black, 1999). Pallant (2010) more specifically described that factor analysis takes a large set of variables and looks for a way the data may be 'reduced' or 'summarized'. There are a few steps to decide the factor groups. The first step is the Kaiser-Meyer-Olkin measure of sample adequacy. This is to justify the suitability for factor analysis. The Kaiser-Meyer-Olkin value is .913, meaning that this scale is suitable for doing a factor analysis as the value is above .6 (Pallant, 2010).

The second step is to determine how many factors to extract. The Scree Plot can help the researcher to decide the numbers of the factor in a survey by looking at the change (or elbow) in the shape of the plot (Pallant, 2010). In Figure 3.3, there is a clear break between the first and second components, and the trend of the Scree Plot becomes flat after 5 components. It is recommended that either 2 or 5 main factors are proper to be categorised in this customer satisfaction and loyalty survey. Considering that 5 factors are better to represent the differences of the survey, five factors were chosen for the formal survey.

Figure 3.3 The Scree Plot of Factor Analysis



The result of the factor analysis of the verified consumer satisfaction and loyalty survey are shown in Table 3.8 below. In the rotated component matrix, the result separated the initial items into five factors: staff and service, physical environment, loyalty, quality of equipment, and traffic and transportation. Compared with the initial scale, the result categorized the *'Multiple transport options'* into a loyalty factor for traffic and transportation. It also added a new factor that draws four items from the physical environment factor. The researcher named the new factor "equipment and quality", which included '*Good lighting system*', *'Good broadcasting system', 'Good function of the screen'* and *'Good A/C quality of the arena'.*

According to the result of the factor analysis, the fifth factor should be deleted in this scale because there are only two items left in it. However, this factor may be helpful when considering some important issues in comparison with the qualitative results. The factor can therefore still be kept and the *'Multiple transport options'* can be moved back to this factor in the formal customer satisfaction and loyalty questionnaire.

Table 3.8 Factor Analysis of the Verified Scale for Kaohsiung Arena

Factor	Factor loading	Variance (Total=68.892%)	Eigenvalue
Factor 1: Satisfaction- staff and service		19.826%	5.353
Staff ability of solving problems is good	.867		
Staff crowd management is good	.839		
Staff knowledge of the venue is good	.802		
Staff are polite	.670		
The information given about the activities is plentiful	.643		
Ease of navigating the events on the official website	.630		
Ease of access to tickets	.622		
Factor 2: Physical environment		16.508%	4.457
The signs are easy to understand	.710		
Toilets are well maintained	.709		
I am very satisfied with the overall cleanliness of the arena	.673		
Good circulation inside the arena	.669		
I am very satisfied with the facility maintenance of this arena	.662		
I am very satisfied with the whole design of this arena	.600		
I am very satisfied with the ease of access to/from seats	.562		
Overall, I am very satisfied with this arena	.557		
Factor 3: Loyalty		13.725%	3.706
I will recommend this arena to my friends/relatives	.819		
I will share the arena information with my friends/relatives	.782		
I will join future events at this arena	.745		
I think Kaohsiung Arena is worth supporting	.603		
Multiple transport options	.559		
I have a sense of belonging in this arena	.545		
Factor 4: Quality of equipment		11.162%	3.014
Good lighting system	.705		
Good broadcasting system	.621		
Good function of the screen	.574		
Good A/C quality of the arena	.564		
Factor 5: Traffic and transportation		7.670%	2.071
Traffic flows smoothly in this area	.863		
Adequate number of places for parking	.845		

C) Reliability analysis

After factor analysis, it is important to find scales that are reliable. A reliability test was necessary in this survey. The Cronbach's α coefficient has been mostly used in Likert scale assessments to indicate 'internal consistency', which reflects the degree to which the items measure the same underlying construct (Wu, 2005). For the scale of the Cronbach's α value, if the value is above .7, it is considered acceptable; however, values above .8 are perfect (Patton, 2010). The collected data (N=153) from the pilot survey and the Cronbach's α of each item are presented in Table 3.9 .The five factors accounted for 68.892% of the variance (α=.949). There is no exact value for how high the Cronbach's α needs to be to achieve the reliability level. Methodology specialists differ on measuring the value. DeVellis (1991) suggested that an item should be deleted if its Cronbach's α value is below .65. Nunnally and Bernstein (1994) also noted that the value should be above .7. The Cronbach's α coefficient in this scale is above .9, which means the internal consistency of the consumer satisfaction and loyalty scale is very high.

In the present study, the lowest Cronbach's α coefficient factor was .773(see Table 3.9), which still falls within the acceptable range. It means the factor in the scale does not require revision. The other values of these factors were .890, .930, .821 and .865.

Table 3.9 The Reliability Analysis of the Verified Scale

Factors	Items	Cronbach α
1. Physical environment	8	.890
2. Staff and service	7	.930
3. Quality of equipment	4	.821
4. Traffic and transportation	3	.773
5. Loyalty	5	.865
Total	**27**	**.949**

3.4.4 The Formal Customer Satisfaction and Loyalty Survey

After the pilot test stage, the customer satisfaction and loyalty questionnaire was revised for the formal survey. *'Multiple transport options'* remained in the same factor but was rephrased. Furthermore, the layout of the survey was adjusted to make it easier for the participants to understand. The original survey was in Chinese. Both the original Chinese and the translated English version are shown in Appendix I.

a) Questionnaire distribution

The survey was distributed on January 8th 2011, January 22nd, January 23rd and February 5th. Table 3.10 details the timing, the locations and the number of questionnaires distributed in Kaohsiung Arena. There were 1,200 questionnaires distributed, and 390 valid samples were collected.

Table 3.10 Timing, Location and Number of Questionnaires Distributed in Kaohsiung Arena

Date and Time	Location	Valid Questionnaires and usable return rate
08/01/2011 14:00-21:30	Inside Kaohsiung Arena (800)	262 32.75 %
22/01/2011 10:00-13:00 23/01/2011 10:00-13:00	Inside Kaohsiung Arena (350)	89 25.42%
05/02/2011 16:30-21:30	Outside the entrance of Kaohsiung Arena (50)	39 78%
Total	1200	390 32.5%

b) Difficulties in data collection

First, during the data distribution stage, difficulties occurred when obtaining permission from the arena operation team and/or the host organizations. The researcher required authorization from both sides. The host event organizations were always worried that the survey distribution would inconvenience their customers. In fact, many

big events do not permit the distribution of surveys inside the arena. The data collection process demanded a great deal of time in negotiations with both sides.

Second, in the original project, the valid questionnaires needed to be gathered by the 8th of August. However, the host event organization changed the procedures for collecting data the night before the event. The survey could only be distributed next to the entrance inside the arena and then be collected after the event. This caused a low data return rate, and furthermore, yielded an insufficient amount of valid data for analysis. Therefore, additional data had to be collected to achieve the robust validity required for research of this scale. Three additional questionnaires were distributed on January 22nd, 23rd and February 5th 2011.

3.4.5Quantitative Data analysis

The quantitative data analysis was undertaken by SPSS 17.0 including descriptive analysis, t-tests, one-way ANOVA and Pearson's correlation.

3.5 Research Ethics:

Research ethics is a very important issue that cannot be omitted during the process of qualitative research. There are a few standard measures which researchers are likely to put in place to minimize the risk of harm. Denscombe (2010) suggested four basic principles:

- participants will remain anonymous;
- data will be treated as confidential;
- participants understand the nature of the research and their involvement;
- participants voluntarily consent to being involved.

First, in this research, all the interviewees are protected, and the collected data were carefully checked to make sure they were not harmful to any participant. Second,

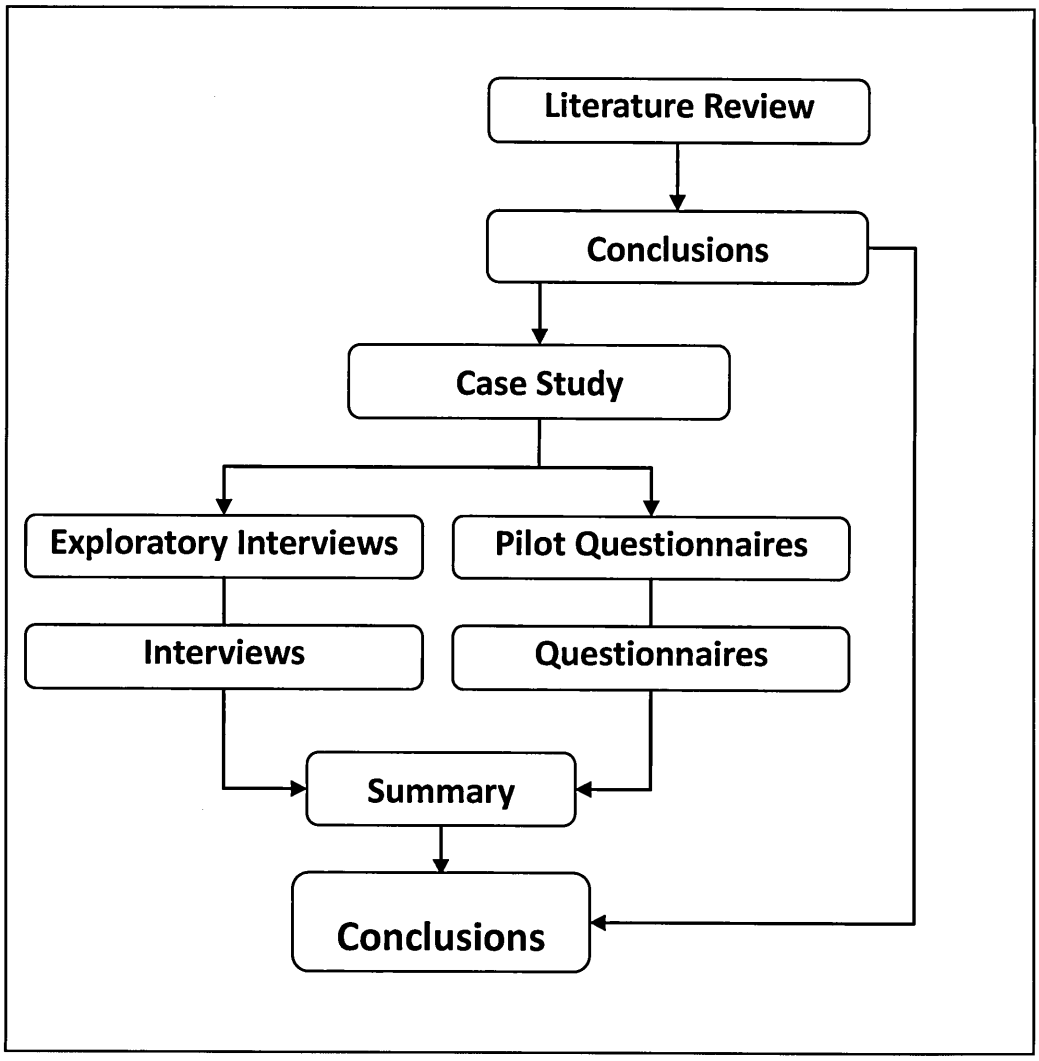
the participants knew the research was relevant to the specific area and all the recording was approved. Third, the participants were allowed to review the content of the interviews. Confidentiality and anonymity issues were also closely examined throughout the research process. This study used a survey research technique to investigate the opinions of customers.

3.6 Research Design Summary:

From the above research process, as previously mentioned, a research plan was designed (see Figure 3.4).

Firstly, the researcher reviewed the literature of BOT and related projects; a conclusion is provided after the literature review. Secondly, a case study of Kaohsiung Arena was decided on. Thirdly, the exploratory interviews and pilot questionnaire were carried out. Fourthly, the formal interviews and questionnaires came next, and both the interview data and the questionnaire survey data were cross-compared. Finally, the conclusions were drawn.

Figure 3.4 Research Design Summary



3.7 Summary of Research Methodology

With the adopted mixed-method research and case study approach, following the description of the details of data collection, this chapter has illustrated the logic of the research design and clarified the justifications to explore the sports BOT project by using Kaohsiung Arena as a case study.

Three face-to-face interviews and 390 valid questionnaires were collected in this research, followed by the site observation. The findings are presented in Chapters Four and Five. The key points from this chapter are listed below:

- The epistemological foundations were analysed using a mixed-methods approach.
- A mixed-methods research approach was adopted, and the data were collected using different techniques.
- The key qualitative techniques was used including interviews, document reports and site observations.
- The justification for the case study and the background information of Kaohsiung Arena are provided.
- A customer satisfaction and loyalty survey was developed from the formal related research and tested by a series of statistical techniques.

Chapter Four Case Study - Kaohsiung Arena

4.1 Introduction

This chapter includes an overview of the Kaohsiung Arena BOT project, sports BOT relative classifications, and examples of other similar scale arenas in Taiwan and Asia.

4.2 The Classifications of Indoor Sports Facilities in Taiwan

In Taiwan, there are 6 kinds of indoor sports facilities, whose functions and seating capacities are listed in Chapter 2, Table 2.5. The specific classifications are listed below:

1. Dome: The word "dome" originally described the round vault forming a roof over buildings or structures. However, there is a trend that many large-scale indoor sports facilities, especially in North-America and Japan which are used for American football and baseball, are also called "domes". The word "dome" became popular for this scale of sports facility (Sheard, 2001), for example, the Sky-Dome in Canada, the Metro-Dome in the United States and the Tokyo-Dome in Japan. These domes usually have a seating capacity of 25,000 to 50,000. The Sports Affairs Council, Executive Yuan (2008) noted that after the Tokyo-Dome in Japan was called the "Big Egg" by the operating company, "Dome" and "Big Egg" became popular names for indoor sports facilities in Taiwan (especially those used for baseball). According to PCCEY (2011), the first BOT sports dome project in Taiwan was signed in 2006, and the inauguration of the dome will be in 2013. This is going to be the first sports dome in Taiwan.
2. Arena: Many large-scale and multifunctional indoor sports facilities are called "arenas" and have a seating capacity of between 12,000 and 25,000. There are four arenas in Taiwan, two of which were built with government funds, and the other two are public-private partnership projects. All of these arenas

are located in/or near city centres and are supported by a good transportation system. The functions are normally designed for basketball, volleyball, exhibitions and concerts (Sports Affairs Council, Executive Yuan, 2008).

3. Gymnasium: The gymnasiums in Taiwan are normally located in schools and universities, and have a seating capacity of between 4,000 and 7,000 (Sports Affairs Council, Executive Yuan, 2008). Liu (2007) mentioned that the arenas and gymnasiums have similar functions in Taiwan, but the scale of gymnasiums is smaller.
4. Field House: The function of a "Field House" is usually for football and track and field training, but in Taiwan, since training for most sports can be done outdoors in winter, such facilities are not popular (Sports Affairs Council, Executive Yuan, 2008).
5. Sports and Recreation Centre: A "Sports and Recreation Centre" in Taiwan normally includes facilities such as a swimming pool, a multifunctional sports court, gym, dancing rooms, martial arts rooms and rock climbing walls (Sports Affairs Council, Executive Yuan, 2008). The Taiwan Association of Sports Management (2011) reported that the 12 sports and recreation centres are well accepted by the residents. Most of these are public-private partnership projects. The government is planning to build more than fifty sports and recreation centres throughout the country using BOT, OT or ROT projects in the future.
6. Canopy Field: This very basic and low-cost sports facility, normally, is a sports field which has an iron shield roof and lighting equipment. The "Canopy Field" has no walls around it, and maintenance costs are usually cheap and affordable for schools and city governments (Sports Affairs Council, Executive Yuan, 2008).

Kaohsiung Arena is classified in the second large-scale and multifunctional indoor sports facility, with a seating capacity ranging from a maximum of 16,300 to a

minimum of 3,000 seats in different kinds of modes. The details are provided in section 4.3 below.

4.3 Kaohsiung Arena

Kaohsiung, situated in the south of the island, is the second largest city in Taiwan, with a population of approximately 1.52 million (KCG, 2010). Kaohsiung Arena is located in a commercial centre in the northern part of the city. There are many parks, shops, hotels, department stores and restaurants in this area, which the city government wants to further develop in the future.

Kaohsiung Arena is the first major sports BOT project in Taiwan. It has a 15,000 seating capacity which can be arranged in six seating layouts for various different events. The concession period is 50 years (including construction and operation), and the site also has a shopping centre, restaurant and hotel. The total cost of the project was approximately £158 million, which was 25% funded by the city government. Stipulated in the contract are the provisions that for at least 20 days a year the Arena has to offer free activities to the public, and it must host sporting events for at least 60 days per year.

Besides Kaohsiung arena, there are two sports arenas in Taoyuan City, which were entirely funded by the government, and one OT sports arena in Taipei City. Table 4.1 below lists the basic information of these four arenas in Taiwan.

Table 4.1 Current Sports Arenas in Taiwan

	Year built	Seating Capacity	Cost	Funding Source
National Taiwan Sport University Arena	1973	Fixed Seats: 11,000 Portable Seats: 4,000	£ 20 million	Donated by a private company
Taoyuan County Arena	1993	Fixed Seats: 7,000 Portable Seats: 8,000	£ 26 million	Funding by Taoyuan County
Taipei Arena	2005	Fixed Seats: 11,000 Portable Seats: 2,485	£ 78 million	An OT project (Funding by Taipei City)
Kaohsiung Arena	2009	Fixed Seats: 9,699 Portable Seats: 5,348	£ 158 million	BOT project (Funding by both Kaohsiung City government and private sector)

Source: 1. Taoyuan City Government official website: http://www.tycg.gov.tw/ch/index.jsp

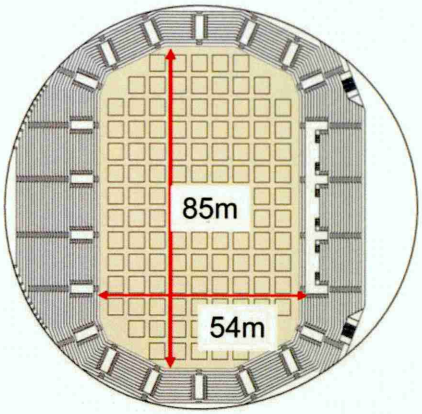
2. Taipei City Government official website: http://www.taipei.gov.tw/

3. Kaohsiung Arena official website: http://www.k-arena.com.tw/

The details of the Kaohsiung Arena BOT project are as follows:

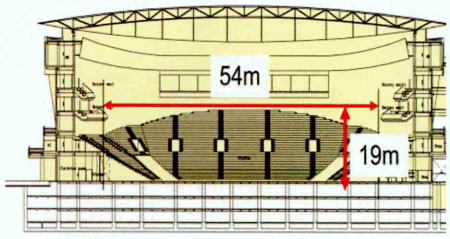
- Project started: 2005
- Project duration: 50 years (construction and operation)
- Cost: 158 million pounds (118 million pounds provided by the private sector)
- Seating capacity: 15,047
- Length: 85m (Figure 4.1)
- Width: 54m (Figure 4.1)
- Height: 19m (Figure 4.2)

Figure 4.1 Kaohsiung BOT Arena Specifications - a



Source: Adapted from Chen Yao Dong, 2008

Figure 4.2 Kaohsiung BOT Arena Specifications - b



Source: Adapted from Chen Yao Dong, 2008

Table 4.2 below shows more information about the capacity of Kaohsiung Arena.

Table 4.2 Capacity and Design of Kaohsiung Arena

Capacity	
Seating	15,047
Parking spaces	1,465 for cars
Parking spaces	4,174 for scooters
Six standard modes for holding various large events	
The total base	45,241 square meters
Floors	10 floors, with three underground

Source: Adapted from Kaohsiung Arena official website: http://www.k-arena.com.tw/

4.4 The Site of Kaohsiung Arena

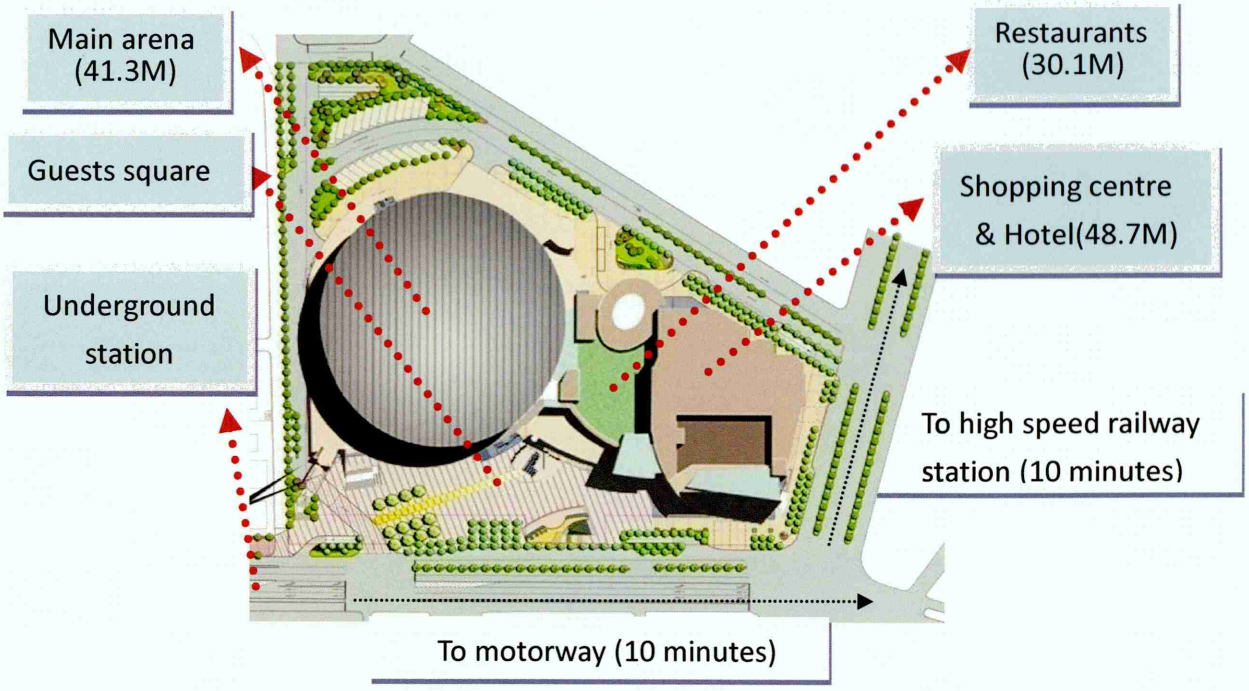
The Arena, which is combined with a shopping centre, is in Kaohsiung city centre, about five minutes' walk from a subway station, and ten minutes' drive to the motorway and high speed railway station (Figure 4.3).

Figure 4.3 Site of Kaohsiung Arena

Source: Adapted from Construction Office, Public Office Bureau, Kaohsiung City Government, at http://ncd.kcg.gov.tw/

An overhead view of Kaohsiung Arena is shown in Figure 4.4. The width of the main arena, restaurants and shopping centre are 41.3m, 30.1m and 48.7m respectively. In front of these buildings is Guests Square, which usually holds small-scale outdoor exhibitions.

Figure 4.4 Overhead View of Kaohsiung Arena



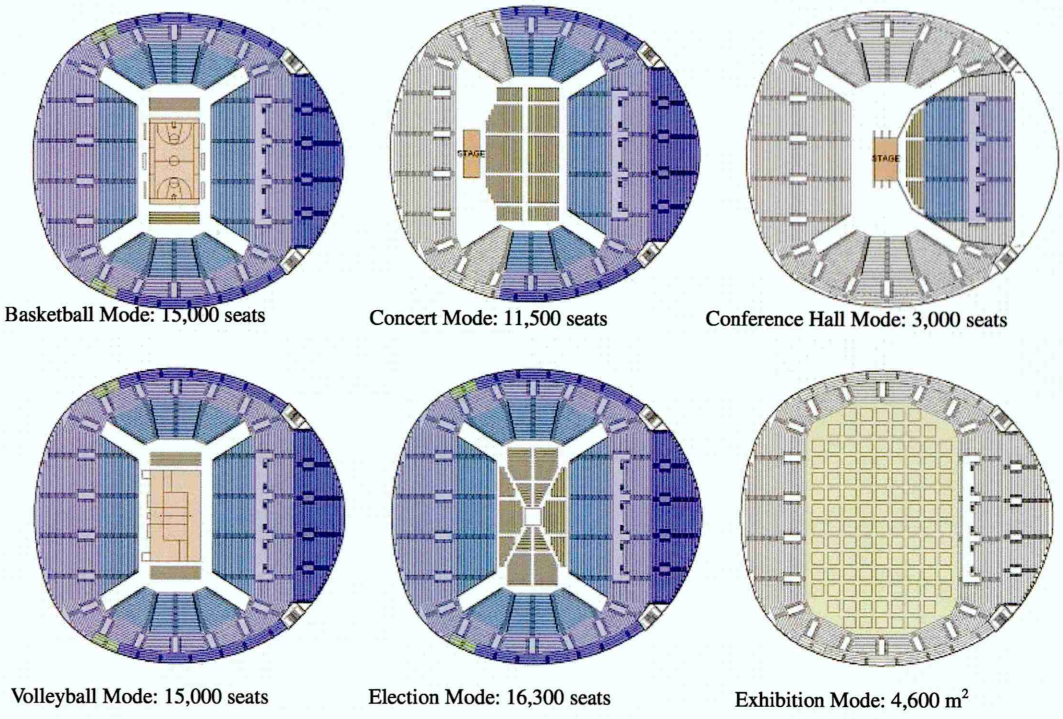
Source: Adapted from Construction Office, Public Office Bureau, Kaohsiung City Government, at http://ncd.kcg.gov.tw/

4.5 The Seating Layout in Kaohsiung Arena

There are six modes of seating layout in Kaohsiung Arena (Figure 4.3). The exhibition mode can offer a total indoor space of 4,600m^2, while the other five modes range from a maximum of 16,300 to a minimum of 3,000 seats, as listed below:

- Basketball Mode: Total 15,000 seats
- Volleyball Mode: Total 15,000 seats
- Exhibition Mode: Total 4,600 square meters
- Election Mode: Total 16,300 seats
- Concert Mode: Total 11,500 seats
- Conference Hall Mode: Total 3,000 seats

Figure 4.5 Six modes of Seating Layout



Basketball Mode: 15,000 seats | Concert Mode: 11,500 seats | Conference Hall Mode: 3,000 seats

Volleyball Mode: 15,000 seats | Election Mode: 16,300 seats | Exhibition Mode: 4,600 m^2

Source: Adapted from Chen Yao Dong, 2008

4.6 The Organising Committee of Kaohsiung Arena

The Kaohsiung Arena BOT contractor outsources the stadium operations to a private company, which specialises in operating sports-related businesses and is run by a general manager. Details of the organisational structure of this company are shown in Chart 3.1, and as can be seen, the general manager oversees four departments, each consisting of a management team of approximately 20 people.

Chart 4.1 Kaohsiung Arena Organising Committee Chart

Source: Adapted from Kaohsiung Arena 2010 official report.

4.7 The Events Hosted in Kaohsiung Arena in 2010

Based on the 2010 Annual Kaohsiung Arena Report, there were 47 different events held in the year 2010 which were held over a total of 222 days. Detailed below in Tables 4.3-4.5 are the different types of events held with the number of days each type of event occupied the Arena.

Table 4.3 Kaohsiung Arena 2010 Events

Types of event	number	days
Sports	7	37
Concerts and performances	13	56
Exhibitions	16	97
Conferences and speeches	6	14
Others	5	18
Total	47	222

Source: Adapted from Kaohsiung Arena 2010 official report.

Table 4.4 Kaohsiung Arena 2011 Events

Types of event	number	days
Sports	11	70
Concerts and performances	15	78
Exhibitions	20	133
Conferences and speeches	7	36
Others	1	4
Total	54	321

Source: Adapted from Kaohsiung Arena 2011 official report.

Table 4.5 Kaohsiung Arena 2012 Events

Types of event	number	days	Tickets Sold
Sports	9	60	87,200
Concerts and performances	12	70	147,000
Exhibitions	16	95	368,000
Conferences and speeches	4	19	85,000
Others	1	1	1,500
Total	42	245	688,700

Source: Adapted from Kaohsiung Arena 2012 official report.

4.8 The Major BOT Sports Projects in Taiwan

From 2002 to 2009, 77% of leisure and tourism PPP infrastructure projects used the BOT approach (PCCEY, 2011), and a few sports facilities were included in these projects. The major sports PPP projects are still not popular in Taiwan. Hsiao (2001) traced the beginning of sports infrastructure in Taiwan, which first started in 1965. However, PPP sports projects have not yet been taken seriously by the government.

The Kaohsiung Sports Arena was the first BOT sports arena. Because there is no professional sports team which can use this scale of arena, this was also the first time that the government tried to work with a private company by offering the commercial area attached to the arena, where they expected the profit gained from the commercial activities to cover the profits lost from operating the arena. This project has 50 concession years (three years of construction, 47 years of operating) and was signed in

2004. The Government hopes that this BOT arena project can reach its expectation target. In addition, if this project is successful, the government is willing to carry out more similar major sports BOT projects in the future. Since 2004, there have been three more major sports BOT projects put forward. One project has already been signed, while the other two are still looking for private companies. Table 4.6 shows the major sports BOT projects and estimated concession years in the past decade in Taiwan (PCCEY, 2011).

Table 4.6 The Major Sports BOT projects in Taiwan

Project	Contract Signed (Date)	Concession (years)	Seating capacity	Total capital cost (£ millions)
Kaohsiung Sports Arena	30/01/2004	50	15,000	158
Taipei Sports Dome	30/12/2006	50	40,000	560
Taoyuan Sports Arena	Not signed yet	70	10,000	N/A
Tainan Sports Gymnasium	Not signed yet	40	4,000	N/A

Source: Adapted from Taiwan Public Construction Commission Executive Yuan , 2011

Although the Taipei Sports Dome BOT project was signed in 2006, it is still under construction. The estimated completion date is the 30th of June, 2014.

The following table lists several BOT arenas from around the world whose functions and scale are similar to those of Kaohsiung Arena.

Table 4.7 The Cases of Major Sports BOT Arenas in the World

Project	Contract from (year)	Concession (years)	Seating capacity	Total capital cost (£ millions)
Beijing MasterCard Centre (Lu, 2009)	2008	30	18,000	42.4
China National Indoor Stadium (Lu, 2009)	2008	30	19,000	65.6
Sydney Super Dome (Jefferies, 2006)	1999	30	20,000	187
Vector Arena (Mansfield, 2005)	2007	40	12,000	51
Penang International Sports Arena (Emmanuel, 20011)	2000	30	13,000	63

Despite there being many similar BOT sports arenas in the world, projects are still understood case by case. Issues such as politics, economic structure, population, popular sports, legislature and the degree of involvement by local government are all different. For example, two major sports BOT arenas in the world are summarised below.

1. The Sydney Superdome BOT Project

The Sydney Superdome was built for the 2000 Olympic Games. It is a multi-use indoor sports arena, which can be used for gymnastics, tennis, basketball, ice hockey, concerts and exhibitions. The project details are listed below:

Operating company: Abigroup company

Project started: 1999

Project duration: 18 months (built) 30 years (operation)

Total Cost: AU$200 million (133£ million)

Seating capacity: 21,000

Car park capacity: 3,400

(Source: Allphones Arena website: http //www.allphonesarena.com.au/Venue_Information/History.aspx)

This arena is located in Sydney Olympic Park in Australia. This park continues to transform from single use facilities for hosting the 2000 Olympics, to multi-use facilities. According to the Sydney Olympic Park Authority (2013), the 430 hectare park

hosts more than 6,000 events per year and combines a stadium, aquatic centre, arena, athletic centre, and museum.

The Sydney Superdome was officially opened in 1999, and managed by AEG Ogden. It is currently ranked in the top 10 arenas in the world. Allphones Arena (2013) statistical data show that the arena hosts 85-100 events per year and can attract more than 10 million visitors, and that customers spend AU$85,000,000 a year on tickets, merchandise and catering. Sydney Superdome first released its naming rights in 2006, and it was called the Acer Arena as it was sponsored by the Acer electronics company. In 2011, the Allphones telephone company purchased the naming rights for the following 5 years and changed the name to Allphone Arena.

2. Penang International Sports Arena BOT project

Penang International Sports Arena (PISA) is an indoor sports arena located in Penang, Malaysia. It is the largest (seating capacity: 13,000) and most comprehensive indoor sports venue in Northern Malaysia (PenEvents, 2013). PISA was officially opened in 1999, and was first built and funded by the Malaysian government. Later on, because the Malaysian government was looking for a better usage of the surrounding area, it was expected to fulfil Penang's aspirations to be an international and intelligent city. Thus, a BOT project was started in 2011 called Penang People's Park. The original PISA became one part of this project. According to Lim (2011), the Penang People's Park BOT project included:

1. Building a new international convention & exhibition centre
2. Refurbishment and rectification works to the existing PISA
3. Refurbishment and rectification works to the existing PISA aquatic centre

The BOT of the above 3 specific facilities would offer a 7 acre park for the public. The key components of this project are listed below:

Project started: 2011

Project duration: 30 years (built and operation)

Total Cost: RM$250 million - RM$300 million (estimation)

Car park capacity: 2,200

The Penang People's Park BOT project is still in the construction phase, and will start to operate in 2015. The state government can use all project facilities free of charge for 42 days in a calendar year. Although Penang's Chief Minister (2011) claimed that the government will bring a modern park for Penang's people for the cost of only RM$50 million to the government, the contract did not clearly estimate the total cost of the project. A potential problem is that the cost was underestimated and the private company is inadequately financed. The company will be forced to borrow money as happened with the Malaysia North-South Expressway project, and will have to repay a big debt in the future.

The above is a description of two BOT Arena cases. In the following, Kaohsiung Arena is compared with current arenas of different countries. At present, in Taiwan, baseball is the only professional sport and we do not have other indoor professional sports. In addition, Taiwan does not have indoor stadiums for baseball games. Thus, the operational model of Kaohsiung Arena is different from that in North America. In other words, it should increase the profits by hosting non-sports activities, such as art performances, concerts and exhibitions.

When different countries construct arenas, they need large bases. They will not use busy business districts, but will be located in the suburbs or special areas. Thus, there is no common business space in the neighbourhood. They mostly provide temporary souvenir and food service in the arenas. Kaohsiung Arena has an operational advantage regarding this aspect. Besides the people in the shopping mall during the activity periods, there are also many consumers in the shopping mall in non-activity periods.

The U.S. and Canada operate arenas with regular professional baseball and ice hockey. With the university league competitions, they have stable profits. Using the well-known LA Staples Centre in U.S. as an example, it is the main stadium of not only

the NBA Lakers, but also the Kings and the Clippers. In other words, the Arena serves as the main stadium for three professional NBA teams. In each year, it holds around 125 days of NBA games.

Until the present, Taiwan does not have the system to sell the naming rights of large-scale sports facilities. Thus, it lacks a main source of revenue. According to the statistics of ESPN (2013) shown in Table 4.8, every year, the system of naming rights brings several hundred thousand to several million USD to arenas in the U.S.

Table 4.8 The Naming Rights Fees for U.S. Arenas

Arena Name	Sponsor	Home Teams	Avg. $/Year
Air Canada Centre	Air Canada	Toronto Maple Leafs, Raptors	$1.5 million
American Airlines Arena	American Airlines	Miami Heat	$2.1 million
America West Arena	America West	Phoenix Suns, Coyotes, Mercury	$866,667
Continental Airlines Arena	Continental Airlines	New Jersey Nets, Devils	$1.4 million
Wachovia Centre	Wachovia Bank	Philadelphia 76ers, Flyers	$1.4 million
Fleetcentre	Fleet Bank	Boston Celtics, Bruins	$2 million
Gund Arena	Owners	Cleveland Cavs, Rockers	$700,000
HSBC Arena	HSBC Bank	Buffalo Sabres	$800,000
Phillips Arena	Royal Phillips	Atlanta Hawks, Thrashers	$9.3 million
Staples Centre	Staples	Los Angeles Lakers, Kings, Clippers, Sparks	$5.8 million

Source: Adopted from the ESPN official website (2013): http://espn.go.com/sportsbusiness/s/stadiumnames

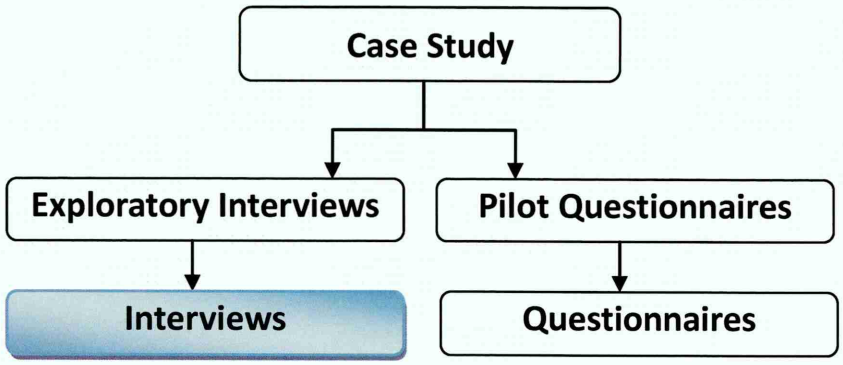
Currently, arenas in Taiwan do not have regular professional games. Thus, they cannot sell box use rights as in the U.S. For example, the Staples Centre (2013) statistical data demonstrate that there are 160 suite boxes which could be leased for $197,500 to $307,500 per year. This brings a large amount of revenue to the Staples Centre.

Overall, this chapter details the background information and other relative issues of

the case study object such as geographic location, sports BOT relative classifications, and examples of other similar scale BOT arenas. The following chapter will analyse the data collected from interviews, observations and official project documents.

Chapter Five Perspectives and Interpretation of Kaohsiung BOT Arena - Qualitative Results

Based on the research design and approach outlined in Chapter Three, this chapter discusses the data collected from interviews, observations and official project documents.



In the exploratory research, the results and suggestions from respondents were used to amend the original questions, in order to construct improved formal interview questions. In the formal interview, three respondents from different backgrounds were interviewed specifically because of their knowledge of the Kaohsiung BOT Arena.

This chapter examines the interview results based on 'content analysis' and 'thematic analysis' and presents the issues discovered when performing the exploratory interview. These issues included the cooperation between government and private sector, the advantages gained from this BOT project, and additional issues raised by the interviewees. Also presented in this chapter is information obtained from official government documents as well as observations obtained during the site visit.

5.1 Types of Interviewees

In the qualitative part of this research, the selected BOT case study required a wide range of interviewees who were very knowledgeable about this specific project.-Each interviewee was asked to suggest other possible interviewees who could provide

important information regarding the Kaohsiung BOT Arena.

The final interviewees were selected from the public sector (i.e., the BOT project team of Kaohsiung City Government), the private sector (i.e., the management team of the Kaohsiung Arena) and academia (i.e., a member of the Kaohsiung BOT Arena Examining Committee). All the interviewees were and continue to be highly involved in the Kaohsiung BOT project.

It should be noted that, although the architects responsible for the design of the Kaohsiung Arena were recommended by interviewees as potential respondents, the researcher was unable to make meaningful contact with them. After several unsuccessful attempts to formally interview a member of the architect's team, the researcher received written information from one of the project's main architects, which has been included in this chapter. This is useful and important in providing a complete perspective of the project based on the input of all parties. Besides, in order to avoid misleading the perspective of the interview results, the triangulation technique was used to cross-compare with the survey and participant observation results (section 3.2.3).

5.2 Section One: Issues Concerning Co-operation between Government and the Private Sector

In this part of the research, concerning the co-operation between the public and private sectors, the results below provide an analysis of:

- The degree of monitoring the enterprise by the government;
- Related legislation enacted for this BOT project;
- The potential problems of this project;
- The operational difficulties faced in this project; and
- Other additional issues identified by the respondents.

The themes which were identified as particularly relevant to the issues above are

analysed in the following sections. (Table 5.1 provides an overview of data analysis within the BOT co-operative dimension.)

Table 5.1 Framework of the Data Analysis of the Co-operation Issues between Government and Private Sector

Themes	Section
The city government monitored the arena in the appropriate way	5.2.1
The government does not have related legislation made for this BOT project	5.2.2
The potential operation problems in this project	5.2.3
The operation difficulties in this project - Based on the contract	5.2.4
Other additional cooperation issues	5.2.5

5.2.1 The Kaohsiung City Government Monitored the Private Sector in an Appropriate Way

The legal criteria of governmental supervision of BOT projects in Taiwan are discussed in section 2.2.6 and section 4.7. There are 6 legal articles which can be the head of source that are listed in a BOT contract. This is inadequate for complicated BOT projects. It might not be a problem when the private company can make a good profit, as they would be willing to cooperate. However, problems arise when the private company cannot achieve their original expectations.

All three interviewees are of the opinion that the private sector is appropriately monitored by the Kaohsiung City Government, or more accurately, the city government is ensuring that the private sector is following the provisions as specified in the contract.

In a BOT project in Taiwan, the government always plays the important role of leading the project. According to the contract, the private sector has to report to the Kaohsiung City Government at the beginning and the end of each year. The reports must include the details of events held, a six-month financial statement, the maintenance and condition of the facilities of the Arena, and details of the current

marketing strategy.

From the qualitative data obtained, it would appear that, so far, the public and private sectors are co-operating in a constructive partnership, and that the contract has been sufficiently well-defined to prevent the occurrence of potential operational problems.

The manager of Kaohsiung Arena thinks that the government monitored this BOT project appropriately. Based on the contract, the monitoring also included a requirement that the Kaohsiung Arena operational team must provide an operational statement annually:

> *Basically, as for the city government, they do not have too many rules or requests. They did everything based on the contracts... Besides, we have to present two kinds of company annual operation reports at the beginning and the end of the year. The reports include a financial statement, event types, facility maintenance and marketing strategy. Generally speaking, the city government can understand we are facing an economic crisis at this moment. Both city government and our company have to compromise with the other side; we do not have many difficulties to overcome.*
>
> *(Manager of Kaohsiung Arena operation team)*

The government official thinks that they monitored the Kaohsiung Arena BOT project in accordance with the contract. In order to make sure that the Kaohsiung Arena operational team is following the rules, the city government also provided a checklist for the operational team:

The Kaohsiung BOT Arena is basically a cooperative model by government and enterprise, and the operation team must follow the contract and agreement. We monitored this BOT project according to the contract. We also provided a checklist for them which can help them understand if they follow the rules or not. By the way, we ask them to prepare an annual company statement every year. Besides, we must be notified of all events which are hosted in the Kaohsiung Arena as well. We have had a very good partnership so far.

(Member of BOT project team of Kaohsiung city government)

According to the scholar's opinion, if the private company can make a good profit in a BOT project, they would be more willing to cooperate. As for the current situation of Kaohsiung Arena, both government and the private sector are cooperating well. The result is the same as that reported by the other interviewees.

First, I want to say the major sports BOT facilities are still not popular in Taiwan. Our government still has a lack of experience of this kind of project. As I observe in Taiwan, if the private sector does not make enough money from a BOT project, they would try to find a loophole in the contract to make a profit. Furthermore, [they will] try not to cooperate with the local government. Compared with other BOT cases, I find Kaohsiung BOT Arena has had less trouble on both sides. I think they are cooperating quite well.

(Examining committee member of Kaohsiung BOT Arena)

The results from the Kaohsiung Arena are different from those obtained from the Dapeng Bay National Scenic Area BOT Project. In the exploratory interview concerning the Dapeng Bay project, the manager thought that the government monitored them too

much. Besides regular meetings, the local government also hired project consultants to monitor the private sector. As a result of this monitoring, the manager felt that he was under too much stress and felt that he received too much attention.

Of course... yes. There are two monitoring systems. One is monitoring the BOT contract regularly; another is to hold coordination meetings once a month, in order to control our progress of the project. This kind of control we can accept. The government also hired project consultants to monitor us. After all, the government doesn't have so many specialists. We can accept this as well. But we feel pressure that the government wants us to follow their steps. Besides the contract...there is extra monitoring. That really disturbed us.....

(Manager of Dapeng Bay National Scenic Area BOT project)

Regarding the above interviews, the Kaohsiung Arena BOT project has a different outcome from the other two BOT projects. The other two projects entered into contract and took effect shortly after the government introduced the BOT concept. As Taiwan started to implement the BOT in 2002 (section 2.2.5), the two projects lacked adequate experience and professionals at that time, and the contents of the contracts were not comprehensive, thus resulting in conflicting opinions between the government authorities and private enterprises.

The promotion of the BOT projects must be based on the contents of the contract. Especially, the duration of the BOT contract is long. Over the course of the project, the original members involved in the initial stage of the BOT are often not the personnel monitoring the project; thus, discrepancies in understanding and interpretation of the contractual terms may arise. The current approach to address this problem in Taiwan is to establish the arbitration committee for resolving the disputes, with the members

including the government representatives, concessionaire representatives, legal experts, financial experts, and experts and scholars.

5.2.2 The Government Did Not Have Related Legislation Enacted for This BOT Project

The legislation issue in a BOT project needs to be legislated in the early stages of a BOT contract, such as tax preferential terms, government policy and the loan amount. In the early stages of a BOT project, both the government and private sector teams have to consult as many relevant previous projects as they can before they can agree on the initiation of the project.

A sophisticated approach to BOT project management can prevent future potential problems. For example, in the Kaohsiung Arena BOT contract, the government did not forbid the private company to outsource the project to a third party. The city government found that it is difficult to monitor the Kaohsiung Arena sometimes because the concessionaire outsourced the arena operation to a third company, Kegel Sports Ltd. Since a large-scale sports BOT project involves many professional aspects, they may be beyond the knowledge of the professional investment team, such as the professional operation and management of a sports arena. The concessionaire considered entrusting a professional operation team to manage the operation, hoping to improve the operational efficiency. However, when the government supervising authority holds meetings with the concessionaire or when a problem occurs, it discovers that it is unable to directly guide the management team, while the concessionaire and the management team shirk their management responsibilities. Moreover, it was discovered through the interviews that the investment team hopes that the government could provide legal assistance out of commercial interest. In the future, the contents specific to the aforementioned questions need to be more carefully and strictly stipulated in the BOT contract before

the implementation of the project, in order to avoid subsequent disputes arising in the implementation stage. In comparison with other projects, the Kaohsiung Arena BOT project has benefited from the sophisticated approach of the city government, who did not enact specific local legislation for Kaohsiung Arena.

In this BOT project, the city government did not have any specific tax incentives or tax exemptions made for it. This opinion was matched in an early report by Lee (2006) who argued that the PPP laws and regulations made for sports-related facilities are still inadequate in Taiwan.

The city government does not have related legislation enacted for this project so far, but I know there is a related proposal which is being considered by the city council. In this proposal, the councilmen think the Kaohsiung Arena can attract more companies by decreasing the business tax from 5% to 3%. In that way, we can expect that more companies will be willing to host events in this arena. It can also help this area to be more prosperous.

(Manager of Kaohsiung Arena operation team)

This BOT project is fully following the "Enforcement Rules of Act for Promotion of Private Participation in Infrastructure Projects". If any other problems occur during the operation, we will still examine it according to the related laws. We didn't make special laws for them.

(Member of BOT project team of Kaohsiung city government)

Regarding Kaohsiung Arena BOT, they had already done a lot of work on the regulation issue before the project was signed.

(Examining committee member of Kaohsiung BOT Arena)

The results from the respondents regarding the Kaohsiung BOT Arena Project were similar in that they all agreed that the Taiwanese government has not made specific laws for promoting the BOT project. The Dapeng Bay National Scenic Area manager hopes the local government could do more to help with legislative issues such as those concerning the operation of jet skis and obtaining bank loans:

For us, we have already faced this kind of situation. For example, let's talk about jet skis. In a part of our BOT project, we have a very big lagoon area for aquatic activities. We can split it up into many parts. It is just only one small part that we can develop as the jet ski area, but official authorities said "NO"...

...because the banks didn't loan to us so fast. They're afraid they can't get their money back. In the contract of our BOT project, we have to raise money from banks. The government should help us to make deals with the bank...

(Manager of Dapeng Bay National Scenic Area BOT project)

A similar issue has occurred regarding the college pool at Kangshan where the manager would like more legislative help from the local government to resolve tax issues and the national government to resolve pool size and lifeguard ratio issues.

For example, we know the government properties don't have to pay the building tax, but we have to pay it. Of course this is right to pay building tax. But I think the enterprise should get a discount. Let's move to the finance issue; this is also a part of capitalized cost. I think the government can have an economic incentive.

...we have a problem that the Ministry of Education has a new regulation of the pool size and the number of lifeguards. I think this kind of regulation is not suitable for the BOT project enterprise.

5.2.3 The Potential Operation Problems of Kaohsiung Arena

The Kaohsiung Arena is primarily designed as a sports utility which would host sporting events including those for basketball and volleyball. It is not large enough to host any baseball events, although currently there are only professional baseball teams in Taiwan. However, there is an opportunity for Kaohsiung Arena, as Taiwan's government is intending to resume professional basketball games. The current Super Basketball League is now trying to increase the number of teams and number of games (SBL, 2012)

Although in the original project, a part from the profit earned from the commercial area is to cover the running costs of the arena, the operations team is still striving to decrease costs and reduce losses significantly. According to the Kaohsiung Arena Report (2011), the net loss of Kaohsiung Arena in 2010 (as shown in Table 5.2. below) was 3.8 million pounds. This figure does not match the opinion of the manager of the Kaohsiung Arena, as it is nearly double the figure that the manager gave in the interview. It can be inferred that the manager does not fully understand the whole profit gained from other parts of Kaohsiung Arena, for example, the profit gained from the shopping centre, parking space and dining area. On the other hand, it might be a business concern because of vested interests.

Table 5.2 The Profit and Loss of Kaohsiung Arena in 2010

	Net Profit (NT dollars)	Net Profit (£)
Commercial areas	350,151,000	7,003,020
Arena	-193,633,000	-3,872,660
Total	156,488,000	3,129,760

Source: Adapted from Kaohsiung Arena 2010 official report.

...This is an arena especially designed for sports events. But we don't have professional sports teams which can use this kind of scale arena and that is a potential problem I think. The basic running cost of this arena is about 2 million pounds a year. Most of our events are hosted on weekends, other days have no events. It is difficult for us to balance the revenue and expenditure.

The second potential problem is the unpredictable economic depression in Taiwan. We lose money running an entertainment business in Kaohsiung. This is not like Taipei. We lose a lot of customers when the economy is not booming. I think we have pretty high financial risks.

(Manager of Kaohsiung Arena operation team)

The government official thinks that the net loss of the Kaohsiung Arena was expected. In the original plan, the profit from combined business activities can cover the loss from operating the arena:

Generally speaking, this project is quite successful so far. I know it is difficult to operate a sports arena like this, but this is in our original plan. The BOT arena combines with shopping centres, restaurants and a hotel. We expect that the profit of business activities can cover the loss of the arena.

(Member of BOT project team of Kaohsiung city government)

5.2.4 The Operation Difficulties in Kaohsiung Arena Based on the Contract

The city government official and the manager of the arena both mentioned an operational difficulty that is challenging the operation team. To put it precisely, the Kaohsiung Arena, according to the agreed contract, should hold sports events each year for a minimum of 60 days. Unfortunately, as detailed in the Kaohsiung Arena government report (2011), the Arena in 2009 and 2010 hosted sports events on 17 and 37 days, respectively, which is well below the minimum as specified in the contract. In this BOT project, the contract has no clear laws made for penalizing the private company if there are not enough sports events days in a year.

We have a problem here, we should have at least 60 days of sports related events hosted in one year according to the contract. This is very hard for us. We have tried very hard to increase the number of sports events. But we still cannot achieve it. The city government side can understand our situation and agree to give us more time to achieve this goal.

(Manager of Kaohsiung Arena operation team)

Before the Kaohsiung Arena BOT project was signed, both the city government and the private company thought it would be easy to achieve the goal of hosting 60 days of sports events per year, but the real situation was overestimated.

There is a minor problem here. We had a huge ambition to have many sports events held in Kaohsiung Arena before the project was signed. Both the city government

and private companies thought that it would not be difficult to achieve the minimum days of hosting the sports events. The real situation is that the Kaohsiung Arena still cannot reach it. We hope they can make up for this situation soon.

(Member of BOT project team of Kaohsiung city government)

When comparing all the exploratory interviews, it is found that different projects have separate problems; for example, the operational difficulties of Dapeng Bay National Scenic Area are concerned with poor communication with national and local government as well as adverse opinions from local residents, whereas another BOT project concerning the operation of a swimming pool has legislative issues (see 5.1.2). Although there are different problems occurring in different projects, they can be inferred as being the result of one reason - the contract is not fully considered. The government should consult more BOT cases and possible problems in the early BOT phase: pre-investment and implementation (Figure 2.3).

First, the expectations of BOT progress are different; this is quite a big issue. The government wanted our company to follow their schedule, but for us, we have faced the real operation issues...it is very difficult to communicate with the government. The opinions from local residents... sometimes they come through the government, sometimes they come to us directly. This is a difficulty in the operation of this BOT project.

(Manager of Dapeng Bay National Scenic Area BOT project)

5.2.5 The Other Additional Co-operation Issues

The partnership between the city government and Kaohsiung Arena is progressing well at the current stage. However, this partnership was not functioning so smoothly at the beginning of the project. The private sector's funding was insufficient to start this BOT project, and the Kaohsiung City Government did not provide any help for their business flotation. The situation was very tense, and because the government was extremely cautious when considering this investment, one mindless action by them could have jeopardized the success of this project.

> *There is one thing you should know; the Kaohsiung Arena BOT project had financial problems at the initial stage. The private companies didn't have enough funding to start this project. The banks didn't want to offer a loan to the private company. The city government was also very careful about this project. They couldn't launch this project unless the private company had enough funding. Luckily they solved this problem later on. The city government promised that the private company could get more loans from government owned banks. So, this BOT project wasn't originally as successful as we can see now.*
>
> *(Examining committee member of Kaohsiung BOT Arena)*

The Dapeng Bay BOT Project manager listed two problems that occurred when the project became operational. First, the project as part of the leisure industry has been adversely affected by the global economic situation, and as the manager of leisure activities, he thinks this is a common situation that every leisure/sports facility will be facing for some time. Secondly, the government did not complete the fundamental construction schedules on time.

...of course the global economy is depressed. As for the leisure industry, we have to deal with labour intensive issues, fund intensive issues and clearly a slack or busy season...

I think they really did well. But they faced many contractors going bankrupt. A few contract bids failed or broke the contract.

(Manager of Dapeng Bay National Scenic Area BOT project)

The manager of the swimming pool listed two problems that he is facing. These problems are very similar to Dapeng Bay Project. First, like the Dapeng Bay manager, he has been affected by the downturn of the global economy and secondly, he has been adversely affected by the government's delay in forcing the closure of illegal swimming pools, which are endangering the business of legal swimming pools.

Actually, two problems that happened in Dapeng Bay and Kangshan college pool are both in the main element of BOT risks (section 2.2.2). The global economic depression is very difficult to control. Both of these problems can be solved by an agreement to change the specific deals or prepare compensation plans in the original contract (Hu, 1999).

The second problem we have is the global economic depression, but this is the situation that every enterprise has, nobody can avoid this...

The real situation is that many aquatic centres don't have operating licenses. The schools still go to these illegal aquatic centres. This is a shame. I think this could only happen in Taiwan.

(Manager of National Kangshan Agricultural & Industrial Vocational College Pool)

5.3 Section Two: Issues of Operating and Managing Kaohsiung Arena

This part of the research deals with the consideration of the operating and management of the BOT Arena. The results below provide an analysis of the relative management issues. Table 5.3 provides an overview of the data analysis within the BOT project management dimension.

Table 5.3 Framework for Data Analysis within the BOT Arena Project Operating and Management Issues

Themes	Section
A third party is operating and managing the Kaohsiung Arena	5.3.1
The operation difficulties of Kaohsiung Arena	5.3.2
The advantages of operating and managing Kaohsiung Arena	5.3.3
The operation strategies of Kaohsiung Arena	5.3.4

5.3.1 A Third Party is Operating and Managing the Kaohsiung Arena

The Kaohsiung Arena can be separated into three parts: the arena, the restaurants, and the shopping centre. The owners of the Kaohsiung Arena do not have much experience in operating an arena, so in order to increase efficiency they outsourced the arena operation to a company called Kegel Sports Ltd.

Kegel is a professional operation company of sports related facilities, which employs approximately 20 experienced, qualified operational staff who manage the arena. According to the Taiwan Industry Index (2012), Kegel Sports Ltd. was first established in 2007, and has its headquarters in Taipei. It is engaged in managing sports-related facilities. The interviewee from the city government thought that by outsourcing the management of the Kaohsiung Arena, both the Kaohsiung Arena and Kegel shirk their responsibilities sometimes.

...because we are a more experienced and qualified company, the Kaohsiung Arena needs our expertise to operate the arena for them. There are about 20 people in our

management team, which includes a marketing crew, engineering crew, business development crew and coordination crew. Although this is a small organisation, all of our staff have been trained very well. We are also expanding our staff as well; they have to learn a lot of skills before they can officially become a staff member.

(Manager of Kaohsiung Arena operation team)

About the management system in Kaohsiung Arena, I have to say, it is a little bit difficult to supervise them. The private company which signed the BOT project with us is a construction-based company. They do not know how to manage a big arena like this, so they have another contract with another company called Kegel. This causes a few problems sometimes. It is like we can't monitor the arena directly, we have to inform the Kaohsiung Arena first, then they pass the messages to Kegel. Sometimes they just shirk their responsibilities. It is very inconvenient for us.

(Member of BOT project team of Kaohsiung city government)

One interviewee from the BOT Examining Committee has a different point of view about the arena management experiences of the professional Kegel team. He thinks the team is still lacking in experience, but they are trying to achieve better outcomes and to achieve their goals because they are willing to take advice from similar sports arenas in Taipei.

There was only one modern sports arena in Taiwan in the past. So, Taiwan does not have very professional arena management teams like [they have in] the USA. But there is one thing we are happy to see which is that the management team of Kaohsiung Arena is willing to learn many more specialized skills now. They send

staff to Taipei Sports Arena to inspect and learn the experiences from them. We are expecting to see improvement in their achievements in the following year.

(Examining Committee member of Kaohsiung BOT Arena)

The arena operation experience in the past was relatively lacking. Of the four arenas in Taiwan, two are operated by government authorities, while only the Taipei Arena was outsourced for operation. The management team at that time was Kegel Sports Ltd., which is the current operator of Kaohsiung Arena. Kegel hopes to establish its brand image so as to increase the arena utilization rate and revenues. However, as far as the government is concerned, whether Kegel's operation could meet the contract requirements or the expectations of the people is important.

5.3.2 The Operational Difficulties of Kaohsiung Arena

From the city government point of view, Kaohsiung Arena has two potential operation difficulties. Firstly, the fees charged by Kegel for renting the Kaohsiung Arena are a constraint when running events, even though they only have to pay a very basic price. Kaohsiung is much less populated and also much less prosperous than Taipei. The statistical data of the Directorate-General of Budget, Accounting and Statistics, Executive Yuan (2011) show that the average annual salary of Kaohsiung residents was NT 616,487, compared with NT 884,546 in Taipei in the year 2010. According to the Ministry of the Interior (2011), the population of Taipei in 2010 was 6,516,139, whilst the population of Kaohsiung City in 2009 was 1,520,342 (Kaohsiung City and Kaohsiung County were merged in 2010, making a combined population of 2,773,483). The above data could explain why the same events hosted in Taipei Arena always attract many more customers than Kaohsiung Arena. This demonstrates the

advantages of hosting similar events in the Taipei Arena, where a larger attendance would be expected than at the Kaohsiung Arena, even though the price for renting these two arenas is exactly the same. In order to attract more events to be hosted in Kaohsiung Arena, this study suggests that the arena should consider decreasing the rental price.

I think Kaohsiung Arena is facing a potential risk; the standard fee for renting the arena per day is exactly the same standard as Taipei Arena. In comparison with Taipei and Kaohsiung, the cost of living is very different. Also, the property prices in Taipei are probably several times more than Kaohsiung. A lot of the potential enterprise customers would rather choose Taipei Arena than Kaohsiung Arena for hosting events. Moreover, they can choose other smaller-scale places for hosting events instead of Kaohsiung Arena. I think the price they are renting for a day is too high.

Another risk is exactly what they are having now. For the sports events in Kaohsiung city now, it is very difficult to have more than 8,000 spectators, but the seating capacity of Kaohsiung Arena is 15,000. The basic running costs like water and electricity are very high. For example, the city government can have 20 days of renting the arena for free every year. But this is not really free, we have to pay the basic water, electricity and cleaning fees which is about 2,000 pounds a day. After considering the budget, we would rather rent other smaller facilities.

(Member of BOT project team of Kaohsiung city government)

According to the contract, the city government can use Kaohsiung Arena for 20 days free of charge per year. But the government has to pay £2,000 for water, electricity and cleaning. The city government would rather rent other smaller facilities for hosting

events because they think the price is too high. This situation has been interrogated by the councillors who want to know why the city government did not use the arena well (Kaohsiung City Council, 2012). The fees need to be negotiated again as soon as possible.

> *...as for the fees of renting Kaohsiung Arena, it is 11,000 pounds during the event days; 6,000 pounds for setting up the equipment. As you know, we have the contract with the government; they only have to pay 2,000 pounds per day up to 20 days per year.*
>
> *(Manager of Kaohsiung Arena operation team)*

Besides the renting fee of Kaohsiung Arena, the manager also brought up three difficulties they are currently facing. First, the indoor hanging system is not good enough. Second, the lighting system is not sufficient for many events. Third, the storage space should be big enough to place large-sized equipment such as a portable wooden floor and different kinds of sports mats. All of these operation difficulties have happened because an experienced operation team was not involved in the design of the arena. This reduces the practicability when preparing the area for upcoming events. With regard to the hanging system, according to the result of participant observation discussed in section 3.5.7, the roofs are based on exposed steel framework and there is no ceiling inside the arena (Photograph 3.4). There are six hanging systems, which allow the events equipment to be hung conveniently. However, after many events have been held, the management team found that it would be best to increase the number of hanging systems to 20 sets.

> *Since our company did not participate in the design plan of the Kaohsiung Arena, we have faced several operational problems, including: 1) there are only six*

indoor hanging systems inside the arena, which poses difficulties for indoor decoration; it is expected to increase to 20 systems; 2) the lighting is also lacking: many event organisers make complaints about the amount and quality of the lighting; they have had to set up lighting themselves to accommodate activities; 3) The insufficient room restricts the storage. We need more storage space for large equipment and objects for the potential event organizers to use, such as movable wooden floors or sports mats.

(Manager of Kaohsiung Arena operation team)

All different BOT projects have their own operational difficulties. When comparing the Kaohsiung Arena with the Dapeng Bay project, the differences are clearly recognisable. Although this study found that different BOT projects produce different problems, there is a commonality of a lack of detailed and professional assessment during the formation of the contract provisions of the BOT projects due to the conditions and capabilities of the government and private enterprises. Taking the Kaohsiung Arena as an example, the activities held in Taipei Arena were evaluated, but it was only discovered in actual operation that the actual situation was greatly different from what was expected. Take the 2011 Andre Agassi Tennis Tournament as an example. This tournament was held in Taipei Arena and Kaohsiung Arena respectively, but the event held in Kaohsiung Arena caused a loss for the organizer, due to the small audience size. As a result, the same tennis tournament was not held in Kaohsiung in 2012. The term of holding over 60 days of sporting activities as stipulated in the contract is indeed difficult to fulfil. Therefore, special attention to regional differences should be paid in planning large-size BOT projects in the future. The Dapeng Bay BOT project is confronting two problems. First, this is an extremely large BOT project, which employs a wide range of specialised and professional staff who are difficult to recruit.

Second, the manager believes that the Dapeng Bay project is a unique BOT leisure project in Taiwan. Therefore, he has to examine similar cases abroad. However, comparisons are difficult as these projects are operating in different political situations and are subject to different rules, regulations, economic systems and environmental situations, and thus he finds it is usually very difficult to find appropriate solutions to Dapeng Bay's problems.

> *To be honest, there is a special situation we are facing, which is umm... human resources. This is a very big BOT project, which needs a lot of specialists from different areas, such as financial evaluation, land development, law, construction and different kind of licenses.*
>
> *...this is the biggest leisure BOT project in Taiwan. We have no successful cases to follow. We are doing a one off project in Taiwan. So we are trying to learn from several cases that happened in other countries. But still, it's not so useful all the time...*
>
> *(Manager of Dapeng Bay National Scenic Area BOT project)*

5.3.3 The Advantages of Operating and Managing the Kaohsiung Arena

When the interviewees were discussing the operational and management issues of the Kaohsiung BOT Arena, they used the Taipei OT Arena as a comparison. Both arenas are similar in scale and function. In fact, two of the interviewees noted several advantages that the Kaohsiung Arena has over the Taipei OT Arena, which were the multiple and effective choices to travel to the arena and the combined commercial areas, such as the shopping mall and restaurants.

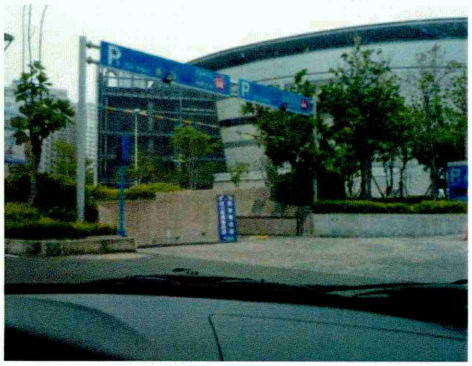
One interviewee suggested that access by road into the Kaohsiung Arena was never a problem because of the many entrances allowing access to the very large parking area. This is also found to be the case by the researcher when visiting the site as recorded in the photographs (5.1, 5.2, 5.3 and 5.4) below.

Another interviewee noted that the access from the Kaohsiung Arena underground station is very easy and is attractive to business. Statistical data from the Kaohsiung Rapid Transit Corporation (2011) shows that of the 37 underground stations in Kaohsiung, the arena station is in the top five busiest.

Photograph 5.1 The Entrances to the Car Park of Kaohsiung Arena

Photograph 5.2 The Entrances to the Car Park of Kaohsiung Arena

Photograph 5.3 The Entrances to the Car Park of Kaohsiung Arena



Photograph 5.4 The Entrances to the Car Park of Kaohsiung Arena

There are a few advantages of operating Kaohsiung Arena. First, the traffic condition is not as busy as Taipei Arena; there is an underground station just in front of Kaohsiung Arena. There are also a few ways to access the parking lots for Kaohsiung Arena. That offers these customers multiple and effective options or getting to the arena. They can choose the underground, drive cars, ride motorcycles or take a bus. So far as we know, we haven't received any complaints from the residents who live nearby.

Another advantage is... the arena is combined with commercial areas such as restaurants, coffee shops and a shopping centre. If the arena has events, the customers wouldn't come at the same time. This is equivalent to releasing the traffic load of this area. I think this is what we have observed so far.

(Examining committee member of Kaohsiung BOT Arena)

There was a big concert at Kaohsiung Arena last Saturday night, and there were about 8,000 concertgoers. The traffic situation was very good both before the concert started and after it finished. I arrived at the arena two hours before the concert started; the restaurants were full of people. But I think the traffic condition was still very good.

Another thing is, the underground station which is near Kaohsiung Arena is a very busy station in Kaohsiung underground. The station is also playing a very important role for the arena.

(Member of BOT project team of Kaohsiung city government)

5.3.4 The Operation Strategies Employed by Kegel in the Kaohsiung Arena

There are three basic operation strategies used by Kegel in the Kaohsiung Arena. A few strategies can help to check the progress of the project. For example, an annual customer satisfaction and loyalty survey is a good way to examine the progress of Kaohsiung Arena. In this study, the results of the customer satisfaction and loyalty survey show that the Kaohsiung Arena is currently doing very well. This will be discussed further in Chapter Six. Furthermore, the company also has to very carefully evaluate if the plans will endanger the benefits to government or residents.

- To gain and maintain a good reputation in order to increase the popularity of Kaohsiung Arena. A good reputation can help acquire more business and ensure returning customers. After 15 months of operating the Kaohsiung Arena, it has become easier to attract potential customers.
- To increase their revenue by imaginatively extending business activities within the arena and optimising the floor space. For instance, a part of the arena has been rented to a workout centre.

- To maintain a good relationship with the local authorities in order to help reduce potential problems. The Kaohsiung underground (MRT) extends their operation hours and adds extra trains whenever there is a big event. Similarly, because of the good relationship Kegel has with the police authorities, extra officers have been deployed to disperse crowds efficiently and to direct traffic to and from the Arena.

There is one thing I would like to say is that our popularity is better than before. That means, it is not so hard to find business, the business will find us. I am very happy to say that after 15 months of operating this arena, we can see the increase in our popularity. You know, Kaohsiung Arena is just like a brand...
Apart from the arena, we are trying to use the combined facilities to add to our profit. For example, there is one part of the arena which has been rented to a workout centre. Another thing is... have you seen the long covered corridor at the second floor when you walk in? We are going to run coffee shops there during the night. This is what we are doing at this moment; we are trying to make the most of the space as best as we can.

We also have very good relationships with Kaohsiung underground and police authorities. Kaohsiung underground for example, every time we have big events, they extend the operation hours and add extra trains for us. The stream of people can be evacuated quickly. As for the cooperation with the police authorities, they add more police officers for traffic control every time we have a major event.

(Manager of Kaohsiung Arena operation team)

5.4 Section Three: Issues Surrounding the Involvement of the Kaohsiung City Government in the Operation and Management of the Kaohsiung Arena

In the exploratory interview, the private sector interviewees complained about the government's cooperation, monitoring and legislation. They believe that the private sector provided local government with many advantages, but local government did not fulfil their responsibilities completely. In this part of the research, the interview results are from the government representatives.

5.4.1 Interrogation by City Councillors

In the Kaohsiung Arena project, 40 million pounds were invested by the city government, and another 118 million pounds were invested by the private sector (section 4.2). This is a very important project for this city and as a result of this it is in the public spotlight. The city councillors also gave this project extra attention, and the BOT project team of Kaohsiung City Government has already been interrogated many times and has also had to provide written reports to justify that the government's decision to proceed with this project was correct, and that the expected benefits from this BOT project have been realised. The issues mentioned above can be proved by the newspaper reports. For example, Wang (2011) reported that the city government officer has been interrogated on the lack of sports events held in Kaohsiung Arena.

We've been interrogated by a few councillors; they were always concerned about the money that the city government invested. Yes, they questioned why we spent 40 million pounds on this project; they want to see a good outcome. We have already offered them a lot of background materials of Kaohsiung Arena. But we still have to deal with them carefully.

(Member of BOT project team of Kaohsiung city government)

5.4.2 The Request from People Connected with the Employment in Sporting Activities

The Kaohsiung Arena was designed for indoor sports events such as basketball, volleyball, ice skating, badminton and tennis. None of these sports have professional teams in Taiwan. Generally speaking, most sports events that have been hosted in Kaohsiung have had 3,000 to 6,000 spectators. The income from ticket sales is not even enough to pay the rent of Kaohsiung Arena.

> *There is another issue in the Kaohsiung Arena; we have received so many requests from people who work in sports-related areas. They think this arena is especially for sports events, but the thing is...they can't afford it. They hope we can decrease the fee for renting the Kaohsiung Arena, otherwise, we would request a smaller stadium with seating capacity of between 3,000 and 6,000 to be built.*
>
> *(Member of BOT project team of Kaohsiung city government)*

5.4.3 To Increase the Number of Sports Events in Kaohsiung Arena

Based on the contract, the Kaohsiung Arena needs to host at least 60 days of sports events per year, but so far they have failed to do so. In addition, the city government did not use their 20 'free of charge' days. The Examining Committee member of this BOT project offered a solution to both the arena operation team and city government concerning the problem of needing to increase the number of sporting events. He suggested that the city government can provide their 'free of charge' days to sports-related businesses that are willing to host events in Kaohsiung Arena. Therefore, all three parties can gain advantages from this plan.

Kaohsiung Arena failed to host at least 60 days of sports events per year. I think the city government should take some of the blame for it. According to the contract, the city government has 20 days of free use of the arena, but they didn't use it all either. I am thinking another way to solve this problem is that the government can offer a few of their free days for the sports-related events. That is to say, this is a win-win situation for both the city government and Kaohsiung Arena.

(Examining committee member of Kaohsiung BOT Arena)

5.5 Section Four: The Benefits Gained by Government and Private Sector from the BOT Project of Kaohsiung Arena

In this part of the research, consideration is given to the BOT benefits or advantages gained by both the government and the private sector. The results below provide an analysis of 'benefits and advantages gained by the government' and 'benefits and advantages gained by the private sector'. The themes which are particularly relevant to the issues above are analysed in the following sections. Table 5.4 provides an overview of data analysis within the BOT benefits gained by Kaohsiung City Government and the Kaohsiung Arena.

Table 5.4 Framework for Data Analysis within the Benefits Gained by Government and the Private Sector

Themes	Section
The benefits gained by the government	5.5.1
The benefits gained by the private sector	5.5.2

5.5.1 The Benefits Gained by the Government

The Kaohsiung Arena BOT project benefits the government in the lists below. The results fit with the literature review in terms of the most common BOT advantages listed in section 2.2

- The City Government does not have to invest large amounts of money in order to have a very good sports arena. According to section 4.2, the total cost of the project was approximately £158 million, which was 25% funded by the city government. Briefly, this BOT project saved £118 million on construction costs.

First, as we know, the public infrastructure was built mostly by government. This is not about making money; it is about increasing the welfare of people. But a lot of facilities end up like discarded factories. Then we realized that a long-term plan for building public infrastructure is also very important. In this project, the city government only has to spend a little bit of money and it turned a sterile piece of land into a very prosperous area.

(Member of BOT project team of Kaohsiung city government)

- The government gained tax from a BOT project instead of spending money on its daily operation. This can be proved by the KCG (2011) report, as Kaohsiung Arena paid approximately £5 million in income tax in the year 2010, as will be discussed further below. Besides, Kaohsiung Arena is also helping the city's development. The Department of Budget, Accounting and Statistics of KCG (2013) data show that from Jan 2007 to June 2013, the population in Kaohsiung was maintained at 1.52 million. But the population around Kaohsiung Arena area gradually increased from 183,705 to 195,367. In brief, the population increased 6.3% in this area in the last 6 years. There is a trend that residents have been moving to this area with time, and the land price also increased 30% to 60% (Real Estate Development Association of Kaohsiung, 2012).

..... *we have more tax from this area. Fifth, the arena, combined facilities and*

many business activities around this area also raised the progress of the city development.

(Manager of Kaohsiung Arena operation team)

- The Arena aids the city government in gaining positive feedback from Kaohsiung city residents, for example, after hosting the 'World Games'. This can be proved by the customer satisfaction and loyalty results discussed in Chapter Six.

I think there are a few benefits gained by the government. We know if this is not a BOT project, the government would have to spend a lot of money to build this kind of facility. Now they are saving a lot of money and can still have the facility. The first event held in this arena was the World Games. This is a very famous international sports competition.

(Manager of Kaohsiung Arena operation team)

- Many job opportunities were created around this area following the official opening of the arena, and it was officially operating. This can be proved by government reports. According to the report of the KOC Information Bureau (2013), Kaohsiung Arena successfully created 4,000 job opportunities, exceeding the original estimation of 2,360.

..... this arena offers a very modern facility to the residents in Kaohsiung, and the city government also gained a good reputation from this arena. ..... there are many job opportunities created because this arena triggered business in the areas nearby.

(Member of BOT project team of Kaohsiung city government)

- Kaohsiung City Government can collect much higher business and property taxes from Kaohsiung Arena. Based on the Kaohsiung City government report (2011), Kaohsiung Arena paid NT 243,914,000 (approximately £5 million) in income tax in the year 2010. Besides, it has also increased £196 million in economic value of output so far (KOC Information Bureau, 2013).

We are running a business here; there is no doubt we will pay a huge amount of tax to the city government. With this BOT project, the city government is earning money instead of losing money.

(Manager of Kaohsiung Arena operation team)

..... we have more tax from this area. The arena, combined facilities and many business activities around this area have also raised the progress of the city's development.

(Member of BOT project team of Kaohsiung city government)

The benefits that were gained by the Kaohsiung City Government (presented above) are similar to the benefits which the government received from the Dapeng Bay BOT project. The government does not manage this project; rather it only monitors it, thus saving costs regarding human resources, and in particular, the costs associated with employing highly qualified specialists. Moreover, this project decreased the local unemployment rate.

I think the answer is yes. For government, first, they don't have to do this project themselves, they only monitor it. It saves a lot of human resources and 'know-how'.

Second, according to the spirit of this BOT project, the government asked us to employ the staff from the local area, so we decreased the unemployment rate for the local government.

(Manager of Dapeng Bay National Scenic Area BOT project)

From the above comments it can be seen that the government gained significant benefits from these BOT projects. In the BOT project concerning the Kaohsiung college pool, the comments also support governmental benefits. From the manager's point of view, the college gained two advantages. One was that it acquired very good indoor swimming pools. Additionally, it does not need to pay any money for the facility maintenance and staff; instead, the operating company has to pay rent to the college.

... [our previous] swimming pools were in the open air – outdoor. Besides, the school didn't have any lifeguards. The school janitor has to clean and check the pools. The school didn't even have enough money to buy sodium hypochlorite. Also, the school didn't have enough funds to maintain clean pools. After signing the BOT project, we offered a very good indoor swimming environment for the students. They don't have to worry about if it is raining or not. Moreover, we have to pay the rent to the school regularly.

(Manager of National Kangshan Agricultural & Industrial Vocational College Pool)

5.5.2 The Benefits Gained by the Kaohsiung Arena

There is no doubt that the first goal of Kaohsiung Arena is to make a profit. However, all the interviewees were of the opinion that the owners of the Kaohsiung Arena have gained a good reputation and better company image.

...about the benefits for us, I think as a small island like Taiwan, none chimney industry will be more and more in the future; our company is one of them. In our long term goal, this BOT project will be very good for our company to improve our business in the future. Can you imagine how many similar arenas will be built in China in the near future? The experience of running Kaohsiung Arena will be a very good chance for extending our business in the future.

(Manager of Kaohsiung Arena operation team)

The benefits which are gained by the Kaohsiung Arena, from my point of view, I think there are two. One of them is money; I think they are doing very good business at this moment. Another one is... they are running the arena, shopping centre, hotel and restaurant together; this also increases the reputation of their company in a positive way.

(Member of BOT project team of Kaohsiung city government)

The perceived benefits to the Kaohsiung BOT Arena are very similar to those of the Dapeng Bay BOT project. According to one manager, this project is still in its infancy because the contract is to run for the next fifty years. The only benefit that has been gained so far is from the beneficial enterprise image, which has resulted in an enhanced company image for the owners.

For us, so far, I think our enterprise image has increased. Most of our cases were in China; our president of this company always invested in the golf industry. But we are a Taiwanese company; a lot of people didn't know that before this BOT project. I think if we can be successful in this case, it is an advantage for future investment.

(Manager of Dapeng Bay National Scenic Area BOT project)

5.6 Summary of Interview Results

This section summarises the results of the opinions the interviewees presented regarding the current situation of Kaohsiung Arena and the proceeding sections according to four main subjects. Firstly, the following table summarises the opinions gathered from the interviewees' points of view. It includes the advantages, current and potential problems, potential competitors and future opportunities.

Table 5.5 The Opinions Gathered from the Interviewees' Point of View

Kaohsiung Arena	
Advantages	1. Surrounding area is in the city development scheme, which includes high-level residential areas, a large-sized park, a new underground (MRT/subway) route, and a wide pedestrian precinct (close to underground station, High Speed Railway station and Motorway) 2.There is no other indoor facility which can host high class cultural and artistic events for more than 1,820 spectators in Kaohsiung. 3.The arena is integrated with various commercial facilities including a shopping centre, dining centre, hotel, and offers plenty of parking lots. 4. Kaohsiung City Government gained positive feedback after hosting the 'World Games'. The Kaohsiung Arena also shares a good reputation as the opening ceremony place.
Current and potential Problems	1. The main purpose to build Kaohsiung Arena is to promote sports development, but the operation team still cannot achieve 60 days of sports events as agreed. 2. Kaohsiung Arena indoor hanging and lighting systems are not sufficient, and the storage space is not big enough for the large-sized equipment.
Potential Competitors	1. Most sports events hosted in Kaohsiung have 3,000 to 6,000 spectators. These events may be hosted in other smaller indoor sports facilities in the future. 2. Kaohsiung City is going to have another indoor high class cultural and artistic centre in 2014 (8,000 seats).
Future Opportunities	1. Taiwan is preparing to resume a professional basketball league. 2. In order to promote cultural and artistic activities, Kaohsiung City launched a series of acts to help the city to increase events from three government organizations, the bureaus of cultural affairs, education and tourism, from 2009 (KCG, 2009).

1. The Co-operation Between Government and the Private Sector

a) The Kaohsiung City Government monitored the private sector in the appropriate way, and the public and private sectors are co-operating in a constructive partnership. Furthermore, the contract has been sufficiently well-defined to prevent the

occurrence of potential operational problems.

b) The government does not have related legislation enacted for this BOT project. In comparison with other projects, the Kaohsiung Arena BOT project has benefited from the city government which has not enacted specific local legislation for Kaohsiung Arena, but constructed and agreed to a workable contract at the development stage of the project.

c) There is one potential operation problem of Kaohsiung Arena: It is not large enough to host events for any of Taiwan's professional sports teams. The Kaohsiung Arena cannot support baseball events, which is a disadvantage for the operations team.

d) The operation team is currently facing one difficulty. According to the agreed contract, Kaohsiung Arena should hold sports events each year for a minimum of 60 days. Unfortunately, they are well below the minimum as specified in the contract.

e) The partnership between city government and Kaohsiung Arena is progressing well at the current stage. However, this partnership did not function so smoothly at the beginning of the project.

2. The Operating and Management of Kaohsiung Arena

a) The owners of the Kaohsiung Arena do not have much experience of operating an arena, so in order to increase efficiency they outsourced the arena operation to a company called Kegel Sports Ltd.

b) Kaohsiung Arena is constrained when running events due to ticket admission prices. Kaohsiung is a lot less populated and also a lot less prosperous than Taipei, but the price for renting Kaohsiung Arena and Taipei Arena is exactly the same.

c) Although in the original project, a portion of the profit earned from the commercial area is to cover the running cost of the arena, the operation team is still striving to decrease its costs and reduce its losses significantly.

d) There are a few advantages of operating and managing the Kaohsiung Arena. First, the access into Kaohsiung Arena was never a problem because of the many entrances allowing access to the very large parking area. Secondly, the access from the Kaohsiung Arena underground station is very easy and is attractive to business. Third, Kaohsiung Arena is combined with a shopping mall and restaurants that attract more customers.

e) There are three basic operation strategies used by the Kaohsiung Arena operational team which are, to gain and maintain a good reputation, to increase their revenue by imaginatively extending business activities, and to maintain a good relationship with the local authorities.

3. Involvement of the Kaohsiung City Government in the Operation and Management of the Kaohsiung Arena

a) The city councillors gave this project extra attention and the BOT project team of Kaohsiung City Government has already been interrogated many times.

b) Two years after the official opening of the Kaohsiung Arena, the feared traffic congestion has never materialised.

4. The Benefits Gained by Government and the Private Sector from the BOT Project of the Kaohsiung Arena

a) The Kaohsiung Arena BOT project benefits the government in five ways: spending less money, not needing to operate the arena, gaining positive feedback, creating job opportunities, and raising more tax.

b) Besides making a profit, the private sector of Kaohsiung BOT Arena has also gained a good reputation and better company image.

5.7 Discussion

This section analyses and interprets the results of the interviews focusing on the issues of Kaohsiung BOT Arena. The key points of the discussion are as follows:

1. Kaohsiung Arena BOT project successfully brings a lot of advantages to the city government, and the private sector is also operating well so far.

Before the Kaohsiung BOT Arena project, most of the arenas had to be operated by the local government, so they had to come up with funds for the budget. The BOT arena helps the local governments release their financial burden effectively.

Taiwan's government has limited the total number of civil servants, so it cannot be increased any more. When a new public infrastructure facility is built, the local government cannot increase the number of civil servants to manage it. They have to assign civil servants from another government department. The BOT project also offers a solution to this circumstance.

Because the BOT projects in Taiwan brought a lot of advantages to the government, the Executive Yuan (2011) announced that every major public infrastructure facility should consider the possibility of using the BOT approach. This approach is therefore becoming increasingly important to Taiwan's Government. In the past, the major sports facilities in Taiwan were designed by government organisations. The operational team always took over these sports facilities after the construction was completed. The operational teams never had the chance to coordinate with the architecture teams, which caused many problems when the sports facilities came to the operational stage. The BOT approach can prevent these problems which arise due to a lack of coordination.

In this BOT project, the total land value is NT 16,286,760,000 (approximately £325.6 million). It is impossible for the private company to buy this section to build a

shopping centre. Through the BOT approach, with the £40 million invested by the government, the private company invested £118 million. It is a win-win situation for both city government and concessionaire.

2. **Kaohsiung Arena benefits residents not only by creating job opportunities, but also by promoting the local prosperity.**

Kaohsiung Arena created 4,000 job opportunities for local residents. It is in a new and developing area in Kaohsiung City. This area is in the city development scheme, which includes high-level residential areas, a large-sized park, a new underground (MRT/subway) route, and a wide pedestrian precinct. Besides, with many new restaurants opening around this arena, it is becoming a very prosperous place in Kaohsiung. The Kaohsiung Arena also offers sufficient parking space for the business activities nearby.

Before the Kaohsiung BOT Arena was built, the biggest hall in Kaohsiung City for hosting indoor concerts, cultural and art events could offer a maximum of only 1,700 seats. Although the arena cannot improve sports events as estimated, it has brought many other events to Kaohsiung City.

3. **The private sector is willing to cooperate with government if they can achieve the estimated profit:**

Basically, in a BOT project, if the private sector company achieves the estimated profit, it would be more likely to co-operate with the public sector. For example, in the last year, Kaohsiung City Government wanted to host a major event in the arena which conflicted with the time that another company had already booked. The operational team of Kaohsiung Arena coordinated the company to change the date of hosting their event, and thus the City government was able to adhere to their schedule.

4. **The details of fund raising, outsourcing and legislation issues should be**

evaluated carefully, or even a specialist team should be set up at the beginning of any BOT project.

Before the Kaohsiung BOT Arena project was signed, the City government had a lack of experience of sports BOT projects. They did not have complete project agreement rules, the percentage of shareholders or the details of fund raising projects. This is one reason why the Kaohsiung BOT Arena project was postponed by one year.

According to the signed BOT projects in Taiwan, there were no regulations forbidding the private sector to outsource the project to the third party. The Kaohsiung City Government is facing this problem because of a lack of BOT project experience. In the Kaohsiung Arena BOT project, the owner of the Arena outsourced the arena part to Kegel Sports Ltd., which has created a few problems for the Kaohsiung City Government. The City government does not know which company they should communicate with. In the future, this situation should be avoided before the project agreement is finalised.

The manager of Kaohsiung Arena mentioned that one of their business strategies is to increase their revenue by imaginatively extending business activities within the Arena and optimising the floor space. For instance, a part of the arena has been rented to a workout centre, and second-floor space is going to have coffee shops during the evening. Actually, according to the contract of the Kaohsiung Arena BOT project, besides the workout centre, other space in the main body of Kaohsiung Arena cannot be used for any kind of business activity. It is in the grey area of the contract. A BOT contract should be more specific in the future.

5. The challenges facing the Kaohsiung Arena operational team

In the Kaohsiung Arena BOT project, the operational team should host sports events at least 60 days per year, and the City Government also has 20 'free of charge'

days. This is for improving sports activities for Kaohsiung City, but the number of major sports events is still below the goal. Compared with art and entertainment events, sports events are still struggling to attract more spectators. This is also an operational difficulty for the operational team of Kaohsiung Arena.

The business-related activities in Taipei are flourishing when compared to Kaohsiung. The companies would rather host sports, entertainment and exhibition events in Taipei Arena than Kaohsiung Arena, especially when considering that the fee for renting these two arenas is the same. This is also a challenge for the Kaohsiung Arena operational team.

6. Suggestions for the Kaohsiung Arena

Firstly, in Taiwan, the government has not yet released the naming rights for sports BOT facilities. For example, the owner of Kaohsiung Arena, called Hanshin company, still cannot change the name of the Kaohsiung Arena to Hanshin Arena. This is a disadvantage to the private company because if they had the naming rights, the reputation of the company could be more easily enhanced.

Secondly, the Kaohsiung Arena could host international sports events to increase profit; for example it could invite NBA teams to play exhibition games.

7. **Suggestions for the government**

In the past, all of the major BOT sports facilities were funded 100% by the government, so a lot of sports events were hosted almost free of charge. Hence, many people still expect that they can host sports events in Kaohsiung Arena for free, but this is a different concept than before. It costs a lot to operate an arena of this size due to expenses related to water, electricity, staff, maintenance and facility depreciation fees. The function of the arena is different from small-scale gymnasiums. Kaohsiung City government should build small-scale gymnasiums as well for offering local sports events.

According to the Public Construction Commission of the Executive Yuan (2011), the Taipei Sports Dome BOT project was signed in 2006. In this sports Dome, the estimated seating capacity is 40,000; the total capital cost is £580 million. This is a BOT project which is similar to the Kaohsiung BOT Arena, and both of these sports facilities projects were expected to cover the loss from the profit gained by the commercial areas. The first challenge for hosting international sports events in Kaohsiung Arena was the 'World Games' for which the Kaohsiung City Government gained positive feedback after hosting this event. Taipei Sports Dome is estimated to officially open in 2016, and it will be the main facility to host the 'Universiade' in 2017. The Kaohsiung Arena BOT project will be a suitable example for Taipei City Government and the owner of the Taipei Sports Dome.

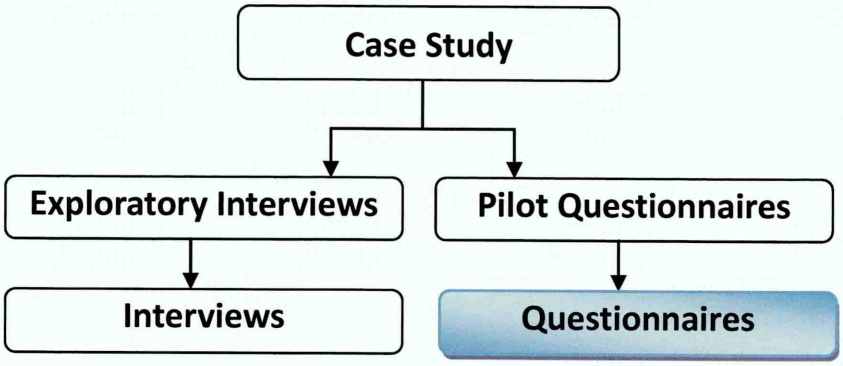
The promotion of a large-scale BOT project is complex, and the assessment process and cooperation by related sectors are also important. First, a detailed assessment should be performed to determine whether the site conditions are sufficient for investment by private enterprises and their willingness to invest. If the profit return of the site is rather slow, the site is adequate to attract private enterprises, and the public facilities are the targets of governmental promotion. The government then needs to give concessions in the aspects of capital funding period and supporting capital. The most common way is to extend the operating period, increase credit lines, and increase the proportion of government investment, which are all feasible solutions. However, even if those conditions still fail to attract private enterprises for investment, the government should not increase the investment to avoid the case of the Taiwan High Speed Rail BOT project, in which the government had to pay a large amount of loan interest. Instead, the government should look for a better site elsewhere or expand the site area of the original location.

Second, as far as the private enterprises are concerned, besides the assessment of the investment conditions, their financial abilities and bank credit lines are also important. The investment team should review the government's investment conditions carefully and assess their capability to make a commitment to the achievable terms and conditions. For instance, the terms regarding the 60 days of sporting events for Kaohsiung Arena still remain a difficult issue to solve. Instead of referring to other projects completely, the investing enterprises should also consider the utilization and consumption capacities of the local area and residents. The findings of this study can provide a more complete reference direction for the Taipei Dome Sports BOT in the future, as well as other major sports facilities to be built in the cities of other Asian countries.

Overall, this chapter analyses the interview results of Kaohsiung Arena, allowing the real operation issues to be discovered. A wider range of issues associated with the customer satisfaction and loyalty of Kaohsiung Arena from customers' viewpoint are presented in Chapter Six, and the results will be cross-compared in Chapter Seven.

Chapter Six Quantitative Data Analysis

Based on the research design (Chapter Three), this chapter details the approaches to the quantitative data analysis, as highlighted in the figure below. The results are presented in sequence to answer the research questions that focus on the research objectives set out in Chapter One. Additionally, the findings of the quantitative results are also offered to support the interview results.



The questionnaires were distributed between January 8th and February 5th 2011. A total of 1,200 questionnaires were distributed at Kaohsiung Arena, resulting in 390 usable samples. The usable return rate is 32.5%. Data analysis was undertaken by applying statistical techniques (SPSS) including descriptive analysis, t-tests, one-way ANOVA and Pearson's correlation. T-tests and One-way ANOVA were used to test the significance of the customer satisfaction and loyalty data, and the Pearson's correlation was to test the correlation between customer satisfaction and customer loyalty. These tests were carried out to answer the research hypotheses below (see section 3.6.2). Three sub-parts of the hypothesis have been developed from the customer satisfaction and loyalty to Kaohsiung Arena:

a) H1-1: Customer satisfaction is significantly different by gender.

H1-2: Customer satisfaction is significantly different by age.

H1-3: Customer satisfaction is significantly different by education.

H1-4: Customer satisfaction is significantly different by income.

H1-5: Customer satisfaction is significantly different by travel time.

H1-6: Customer satisfaction is significantly different by transport.

b) H2-1: Customer loyalty is significantly different by gender.

H2-2: Customer loyalty is significantly different by age.

H2-3: Customer loyalty is significantly different by education.

H2-4: Customer loyalty is significantly different by income.

H2-5: Customer loyalty is significantly different by travel time.

H2-6: Customer loyalty is significantly different by transport.

c) H3-1: The customer satisfaction and loyalty of Kaohsiung Arena have a positive correlation.

The results are shown in the following sections and will be cross-compared with the qualitative results in Chapter Seven.

6.1 Section One: The Profile of Target Customers

The target customers (Table 3.10) were asked to answer several demographic questions, such as gender, age, education, monthly income, type of transport and travelling time. The total number of valid returned questionnaires was 390.

Table 6.1 shows the valid questionnaires and usable return rate of survey distribution, while Table 6.2 details the description of the demographic profiles.

Table 6.1 Valid Questionnaires and usable return rate

Sample Distributed	Kaohsiung Arena	Notes
Total samples distributed	1,200	
Sample return	455	
Usable sample	390	
Overall return rate	38%	
Overall usable sample return rate	32.5%	

a) *Gender:* 42.1% of respondents are male, and female respondents constitute 57.9%

b) *Age:* The majority of respondents are between the ages of 15 and 35 at 67.2%, and those above 36 constitute 32.8%.

c) *Level of education:* 82.1% of respondents were university graduates and above, whilst 17.7% of respondents had not obtained qualifications above senior high school level.

d) *Monthly income:* 80.5% of respondents earned a monthly income of below NT$40,000, while 19.5% earned more than NT$40,001.

e) *Type of transport:* 34.6% of the respondents drove cars to Kaohsiung Arena; 22.6% rode motorcycles/scooters; 21% took the underground; and 21.6% of the respondents chose other types of transport.

f) *Travelling time to Kaohsiung Arena:* 50.8% of respondents spent under 30 minutes travelling to the Kaohsiung Arena; the other 49.2% spent more than 31 minutes travelling.

Table 6.2 Description of Demographic Profiles

	Survey (Customer satisfaction and loyalty)	
	(valid) Frequency	(valid) Percent %
Gender	390	
Male	164	42.1
Female	226	57.9
Age	390	
15-25	127	32.6
26-35	139	35.6
36-45	41	10.5
46-55	40	10.3
56-65	29	7.4
older than 66	74	3.6
Level of education	388	
Primary school	1	.3
Junior high school	6	1.5
Senior high school	62	15.9
University (and college)	244	62.9
Master (and above)	75	19.2
Monthly income (NTD)	386	
Less than 20,000	76	19.7
20,001- 30,000	136	35.2
30,001- 40,000	99	25.6
40,001- 50,000	56	14.5
50,001 and above	19	4.9
Type of transportation	390	
Walk	18	4.6
Bicycle	2	.5
Motorbike	88	22.6
Car	135	34.6
Bus	15	3.8
Underground	82	21.0
Train	16	4.1
Multiple	34	8.7
[a] *Commute time to Kaohsiung Arena*	388	
Under 15 minutes	78	20.1
16- 30 minutes	119	30.7
31- 45 minutes	66	17.0
46- 60 minutes	47	12.1
more than 61 minutes	78	20.1

[a] One GBP is approximately equivalent to 50 New Taiwan Dollars (NTD)

6.2 Section Two: Comparing Differences between Groups

Table 6.3 details the mean score (M=103.87) and standard deviation (SD=14.99) of the Customer Satisfaction and Loyalty Scale. The table shows that the 'physical

environment' (M=3.95) and 'quality of equipment' (M=3.95) are the two factors which most satisfy the customers. Besides, 'staff and service' (M=3.75) rated third, and 'traffic and transport' (M=3.61) had the lowest score in the Customer Satisfaction and Loyalty Scale.

The mean of the 'loyalty' factor is 3.88, which is slightly higher than the total mean of this scale (M=3.83).

Table 6.4 provides details of the descriptive statistics of each item, including the number of factors, mean scores and standard deviations. 'I am very satisfied with the overall cleanliness of the arena' and 'good lighting system' have the most positive customer satisfaction in this scale, while 'traffic flows smoothly in this area' and 'adequate number of places for parking' having the most negative satisfaction in this scale. Besides, the mean of 'overall customer satisfaction' is 4.02. The loyalty factors, 'I will recommend this arena to my friends/relatives' and 'I will join future events at this arena' rated mean scores of 3.99 and 3.85 respectively.

Table 6.3 Descriptive Statistics of the Customer Satisfaction and Loyalty Scale - by factors

Factor	Mean	S.D.	Items Within Each Factor	Mean of Each Item
Physical environment	31.62	3.65	8	3.95
Staff and Service	26.28	4.17	7	3.75
Quality of equipment	15.75	2.20	4	3.94
Traffic and transport	10.83	2.14	3	3.61
Loyalty	19.39	2.83	5	3.88
Total Scale	103.87	14.99	27	3.83

Table 6.4 Descriptive Statistics of the Customer Satisfaction and Loyalty Scales - by item

Factor	Mean	S.D.
Physical environment		
I am very satisfied with the whole design of this arena	3.97	.555
I am very satisfied with the facility maintenance of this arena	4.05	.532
I am very satisfied with the overall cleanliness of the arena	4.08	.628
I am very satisfied with the ease of access to/from seats	3.80	.735
The signs are easy to understand	3.87	.708
Good circulation inside the arena	3.84	.671
Toilets are well maintained	3.99	.704
Overall, I am very satisfied with this arena	4.02	.564
Staff and service		
Staff are polite	3.92	.646
Staff knowledge of the venue is good	3.72	.752
Staff ability of solving problems is good	3.76	.742
Staff crowd management is good	3.72	.743
The information given about the activities is plentiful	3.75	.751
Ease of access to tickets	3.64	.732
Ease of navigating the events on the official website	3.36	.812
Quality of equipment		
Good function of the screen	3.85	.729
Good broadcasting system	3.84	.727
Good lighting system	4.06	.598
Good A/C quality of the arena	3.99	.657
Traffic and transportation		
Traffic flows smoothly in this area	3.36	.951
Adequate number of places for parking	3.48	.972
Multiple transport options	3.99	.691
Loyalty		
I will share the arena information with my friends/relatives	4.00	.651
I will recommend this arena to my friends/relatives	3.99	.699
I will join future events at this arena	3.85	.696
I have a sense of belonging in this arena	3.55	.799
I think Kaohsiung Arena is worth supporting	4.00	.669

6.2.1 Summary of the Independent-samples t-test of Customer Satisfaction by Gender

The results of the analysis comparing the Customer Satisfaction factors for males and females are shown in Table 6.5. There is no significant difference in 'physical environment' for males (M=31.85, SD=3.89) and females (M=31.45, SD=3.47), 'staff and service' for males (M=26.61, SD=4.34) and females (M=26.04, SD=4.03), 'quality of equipment' for males (M=16.08, SD=2.29) and females (M=15.51, SD=2.11), or 'traffic and transport' for males (M=11.05, SD=2.10) and females (M=10.67, SD=2.15).

Table 6.5 Abstract of Independent-samples t-test of Customer Satisfaction by Gender

Factors	Gender	Frequency	Mean	S.D	t value	P value
Physical Environment	Male	164	31.85	3.89	1.070	.229
	Female	226	31.45	3.47		
Staff and Service	Male	164	26.61	4.34	1.333	.449
	Female	225	26.04	4.03		
Quality of Equipment	Male	164	16.08	2.29	2.542	.270
	Female	226	15.51	2.11		
Traffic and Transport	Male	164	11.05	2.10	1.740	.625
	Female	226	10.67	2.15		

* P < .05 ** P < .01 ***P < .001

6.2.2 Summary of One-way Between-group ANOVA of Customer Satisfaction by Age

Mean scores and standard deviations are reported by different age groups of customers in Table 6.6. It is presented that the age group 56-65 (M=86.07, SD=10.08) had the highest mean score for the customer satisfaction factors, followed by the 66+ age group (M=85.93, SD=8.70), through 46-55 (M=84.62, SD=10.52), and 16-25 (M=84.40, SD=9.77), 26-35 (M=84.40, SD=10.03), to the lowest group, 36-45 (M=83.12, SD=9.20).

Table 6.6 Descriptive Statistics of Customer Satisfaction by Age

Age	Physical Environment (N=390)		Staff and Service (N=389)		Quality of Equipment (N=390)		Traffic and Transport (N=390)		Total Factors (N=389)	
	M	SD	M	SD	M	SD	M	SD	M	SD
16-25	31.49	3.63	26.48	3.69	15.61	2.33	10.83	2.13	84.40	9.77
26-35	31.83	3.62	26.09	4.27	15.77	2.30	10.71	2.12	84.40	10.03
36-45	30.85	3.85	25.95	3.85	15.49	1.87	10.83	2.17	83.12	9.20
46-55	31.73	3.92	25.95	5.09	16.01	2.24	10.85	2.48	84.62	10.52
56-65	32.17	3.22	26.90	4.74	15.90	1.78	11.10	2.02	86.07	10.08
66+	31.43	3.62	27.00	4.28	16.21	1.67	11.29	1.68	85.93	8.70

A one-way between-groups analysis of variance was undertaken to explore the factors of customer satisfaction by the different age groups, as detailed in Table 6.7.

a) Physical Environment factor: The highest score is group 56-65 (M=32.17, SD= 3.22), and the lowest score is group 36-45 (M=30.85, SD=3.85). There is no significant difference in the 'physical environment' scores for the six age groups.

b) Staff and Service factor: The highest score is the 66+ group (M=27.00, SD= 4.28), and the lowest score is the 36-45 group (M=25.95, SD=5.09). There is no significant difference in the 'staff and service' scores for the six age groups.

c) Quality of Equipment: The highest score is the 66+ group (M=16.21, SD= 1.67), and

the lowest score is the 36-45 group (M=15.49, SD=1.87). There is no significant difference in the 'quality of equipment' scores for the six age groups.

d) Traffic and Transport: The highest score is the 66+ group (M=11.29, SD= 1.68), and the lowest score is the 26-35 group (M=10.71, SD=2.12). There is no significant difference in the 'traffic and transport' scores for the six age groups.

Table 6.7 Abstract of One-way ANOVA of Customer Satisfaction within Age

Factors	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Physical Environment	Between Groups	42.056	5	8.411	.628	.678	
	Within Groups	5140.252	384	13.386			
	Total	5182.308	389				
Staff and Service	Between Groups	37.533	5	7.507	.429	.828	
	Within Groups	6694.924	383	17.480			
	Total	6732.458	388				
Quality of Equipment	Between Groups	13.756	5	2.751	.564	.728	
	Within Groups	1873.618	384	4.879			
	Total	1887.374	389				
Traffic and Transportation	Between Groups	7.021	5	1.404	.305	.910	
	Within Groups	1770.468	384	4.611			
	Total	1777.490	389				

* P < .05 ** P < .01 ***P < .001

6.2.3 Summary of One-way Between-groups ANOVA of Customer Satisfaction by Education

Mean scores and standard deviations are reported by the different education groups of customers in Table 6.8. It is presented that the education group of junior high school (M=87.14, SD=10.70) had the highest mean score for the customer satisfaction factors, followed by university and college (M=84.95, SD=9.80), through master and higher (M=83.88, SD=9.87), to the lowest group, senior high school (M=83.11, SD=9.99).

Table 6.8 Descriptive Statistics of Customer Satisfaction by Education

Education	Physical Environment (N=390)		Staff and Service (N=389)		Quality of Equipment (N=390)		Traffic and Transport (N=390)		Total Factors (N=387)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Junior high school	32.57	3.55	27.00	4.40	16.86	1.57	10.71	2.56	87.14	10.70
Senior high school	31.15	3.76	25.91	4.47	15.74	2.06	10.31	2.08	83.11	9.99
University and college	31.74	3.70	26.60	3.94	15.66	2.30	10.95	2.06	84.95	9.80
Master and higher	31.56	3.45	25.52	4.56	15.93	2.09	10.87	2.36	83.88	9.87

A one-way between-groups analysis of variance was undertaken to explore the factors of customer satisfaction by the different education groups, as detailed in Table 6.9.

a) Physical Environment factor: The highest score is the junior high school group (M=35.57, SD= 3.55), and the lowest score is the senior high school group (M=31.15, SD=3.76). There is no significant difference in the 'physical environment' scores for the four education groups.

b) Staff and Service factor: The highest score is the junior high school group (M=27.00, SD= 4.40), and the lowest score is the master and higher group (M=25.52, SD=4.56). There is no significant difference in the 'staff and service' scores for the four education groups.

c) Quality of Equipment: The highest score is the junior high school group (M=16.86, SD= 1.57), and the lowest score is the master and higher group (M=15.66, SD=2.30). There is no significant difference in the 'quality of equipment' scores for the four education groups.

d) Traffic and Transport: The highest score is the university and college group (M=10.95, SD= 2.06), and the lowest score is the senior high school group (M=10.31, SD=2.08). There is no significant difference in the 'traffic and transport' scores for the four education groups.

Table 6.9 Abstract of One-way ANOVA of Customer Satisfaction within Education

Factors	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Physical Environment	Between Groups	33.186	4	8.297	.620	.648	
	Within Groups	5149.121	385	13.374			
	Total	5182.308	389				
Staff and Service	Between Groups	91.067	4	22.767	1.316	.263	
	Within Groups	6641.391	384	17.295			
	Total	6732.458	388				
Quality of Equipment	Between Groups	13.037	4	3.259	.669	.614	
	Within Groups	1874.337	385	4.868			
	Total	1887.374	389				
Traffic and Transportation	Between Groups	20.807	4	5.202	1.140	.337	
	Within Groups	1756.682	385	4.563			
	Total	1777.490	389				

* P < .05 ** P < .01 ***P < .001

6.2.4 Summary of One-way Between-groups ANOVA of Customer Satisfaction by Income

Mean scores and standard deviations are reported by the different income groups of customers in Table 6.10. It is presented that the income level below 20,000 (M=84.79, SD=10.61) had the highest mean score for the customer satisfaction factors, followed by 20,001-30,000 (M=84.72, SD=9.78) and 30,001-40,000 (M=84.38, SD=9.67), through income level 40,001-50,000 (M=84.09, SD=9.12), to the lowest group, more than 50,000 (M=82.84, SD=11.61).

Table 6.10 Descriptive Statistics of Customer Satisfaction by Income

Income	Physical Environment (N=390)		Staff and Service (N=389)		Quality of Equipment (N=390)		Traffic and Transport (N=390)		Total Factors (N=385)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Below 20,000	31.87	4.05	26.08	4.57	15.70	2.47	11.14	2.16	84.79	10.61
20,001-30,000	31.79	3.40	26.10	4.11	15.87	2.13	10.65	2.21	84.72	9.78
30,001-40,000	31.56	3.63	26.33	3.80	15.67	2.16	10.82	2.11	84.38	9.67
40,001-50,000	31.23	3.50	26.42	3.95	15.66	2.08	10.82	2.21	84.09	9.12
More than 50,000	31.11	4.56	25.47	3.77	15.52	2.20	10.74	1.52	82.84	11.61

A one-way between-groups analysis of variance was undertaken to explore the factors of customer satisfaction by the different education groups, as detailed in Table 6.11.

a) Physical Environment factor: The highest score is the income level below 20,000 (M=31.87, SD=4.05), and the lowest score is more than 50,000 (M=31.11, SD=4.56). There is no significant difference in the 'physical environment' scores for the five income level groups.

b) Staff and Service factor: The highest score is the income level 40,001-50,000 (M=26.42, SD=3.95), and the lowest score is more than 50,000 (M=25.47, SD=3.77). There is no significant difference in the 'staff and service' scores for the five income

level groups.

c) Quality of Equipment: The highest score is the income level 20,001-30,000 (M=15.87, SD=2.13), and the lowest score is more than 50,000 (M=15.52, SD=2.20). There is no significant difference in the 'quality of equipment' scores for the five income level groups.

d) Traffic and Transport: The highest score is the income level below 20,000 (M=11.14, SD=2.16), and the lowest score is 20,001-30,000 (M=10.65, SD=2.21). There is no significant difference in the 'traffic and transport' scores for the five income level groups.

Table 6.11 Abstract of One-way ANOVA of Customer Satisfaction within Income

Factors	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Physical Environment	Between Groups	22.166	4	5.542	.411	.800	
	Within Groups	5131.595	381	13.469			
	Total	5153.762	385				
Staff and Service	Between Groups	19.118	4	4.779	.271	.897	
	Within Groups	6708.586	380	17.654			
	Total	6727.704	384				
Quality of Equipment	Between Groups	4.099	4	1.025	.209	.933	
	Within Groups	1864.948	381	4.895			
	Total	1869.047	385				
Traffic and Transportation	Between Groups	11.875	4	2.969	.642	.633	
	Within Groups	1760.791	381	4.621			
	Total	1772.666	385				

* P < .05 ** P < .01 ***P < .001

6.2.5 Summary of One-way Between-groups ANOVA of Customer Satisfaction by Journey Time

Mean scores and standard deviations are reported by different journey time groups of customers in Table 6.12. It is presented that the journey time of 46-60 minutes (M=86.00, SD=8.80) had the highest mean score for the customer satisfaction factors, followed by 31-45 minutes (M=85.20, SD=9.93) and more than 61 minutes (M=84.64, SD=9.45), through journey time under 15 minutes (M=84.62, SD=10.75), to the lowest group,16-30 minutes (M=83.23, SD=9.89).

Table 6.12 Descriptive Statistics of Customer Satisfaction by Journey Time

Journey Time	Physical Environment (N=390)		Staff and Service (N=389)		Quality of Equipment (N=390)		Traffic and Transport (N=390)		Total Factors (N=385)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Under 15 minutes	31.85	3.70	26.22	4.98	15.69	2.36	10.86	2.55	84.62	10.75
16-30 minutes	30.82	3.50	26.20	3.95	15.52	2.19	10.71	2.06	83.23	9.89
31-45 minutes	32.07	3.66	26.49	4.18	15.68	2.29	10.95	2.07	85.20	9.93
46-60 minutes	32.19	3.54	26.43	4.34	16.38	2.08	11.00	1.78	86.00	8.80
More than 61 minutes	31.86	3.82	26.23	3.53	15.80	2.06	10.74	2.10	84.64	9.45

A one-way between-groups analysis of variance was undertaken to explore the factors of customer satisfaction by the different education groups, as detailed in Table 6.13.

a) Physical Environment factor: The highest score is journey time of 46-60 minutes (M=32.19, SD=3.54), and the lowest score is 16-30 minutes (M=30.82, SD=3.50). There is no significant difference in the 'physical environment' scores for the five journey time groups.

b) Staff and Service factor: The highest score is the journey time of 31-45 minutes (M=26.49, SD=4.18), and the lowest score is 16-30 minutes (M=26.20, SD=3.95). There is no significant difference in the 'staff and service' scores for the five journey

time groups.

c) Quality of Equipment: The highest score is the journey time of 46-60 minutes (M=11.38, SD=2.08), and the lowest score is 16-30 minutes (M=15.52, SD=2.19). There is no significant difference in the 'quality of equipment' scores for the five journey time groups.

d) Traffic and Transport: The highest score is the journey time of 46-60 minutes (M=11.00, SD=2.78), and the lowest score is 16-30 minutes (M=10.71, SD=2.06). There is no significant difference in the 'traffic and transport' scores for the five journey time groups.

Table 6.13 Abstract of One-way ANOVA of Customer Satisfaction within Journey Time

Factors	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Physical Environment	Between Groups	114.577	4	28.644	2.165	.072	
	Within Groups	5067.433	383	13.231			
	Total	5182.010	387				
Staff and Service	Between Groups	4.929	4	1.232	.070	.991	
	Within Groups	6706.234	382	17.556			
	Total	6711.163	386				
Quality of Equipment	Between Groups	25.445	4	6.361	1.309	.266	
	Within Groups	1861.802	383	4.861			
	Total	1887.247	387				
Traffic and Transportation	Between Groups	4.839	4	1.210	.262	.902	
	Within Groups	1769.890	383	4.621			
	Total	1774.729	387				

* P < .05 ** P < .01 ***P < .001

6.2.6 Summary of One-way Between-groups ANOVA of Customer Satisfaction by Transport

Mean scores and standard deviations are reported by different transport groups of customers in Table 6.14. It is presented that the transport type bicycle (M=89.50, SD=9.19) had the highest mean score for the customer satisfaction factors, followed by train (M=88.25, SD=12.35) and bus (M=86.87, SD=9.44), through the transport types walk (M=85.67, SD=14.72) and multiple (M=85.15, SD=7.27), to the lowest types, car (M=84.67, SD=9.67), underground (M=84.14, SD=9.579) and motorcycle (M=82.75, SD=9.56) .

Table 6.14 Descriptive Statistics of Customer Satisfaction by Transport

Transport	Physical Environment (N=390)		Staff and Service (N=389)		Quality of Equipment (N=390)		Traffic and Transport (N=390)		Total Factors (N=385)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Walk	33.06	5.03	25.50	7.18	15.61	3.13	11.50	3.26	85.67	14.72
Bicycle	30.50	2.12	31.00	5.66	15.50	2.12	12.50	0.70	89.50	9.19
Motorcycle	30.84	3.27	25.61	4.05	15.57	2.24	10.74	2.16	82.75	9.56
Car	31.87	3.67	26.40	3.84	15.90	2.02	10.50	1.94	84.67	9.67
Bus	32.33	3.50	26.47	4.26	16.40	1.92	11.67	1.72	86.87	9.44
Underground	31.26	3.32	26.50	4.37	15.50	2.21	10.91	2.20	84.14	9.57
Train	32.50	3.92	27.94	4.15	16.31	2.60	11.50	2.58	88.25	12.35
Multiple	32.03	4.20	26.29	2.70	15.79	2.21	11.03	1.75	85.15	7.27

A one-way between-groups analysis of variance was undertaken to explore different education groups into factors of customer satisfaction, detailed in Table 6.15.

a) Physical Environment factor: The highest score is the transport type walk (M=33.06, SD=5.03), and the lowest is bicycle (M=30.50, SD=2.12). There is no significant difference in the 'physical environment' scores for the eight transport type groups.

b) Staff and Service factor: The highest score is the transport type bicycle (M=31.00, SD=5.66), and the lowest score is walk (M=25.50, SD=7.18). There is no significant difference in the 'staff and service' scores for the eight transport type groups.

c) Quality of Equipment: The highest score is the transport type bus (M=12.50, SD=1.29), and the lowest score is underground (M=15.50, SD=2.21). There is no significant difference in the 'quality of equipment' scores for the eight transport type groups.

d) Traffic and Transport: The highest score is transport type bicycle (M=12.50, SD=0.70), and the lowest score is car (M=10.50, SD=1.94). There is no significant difference in the 'traffic and transport' scores for the eight transport type groups.

Table 6.15 Abstract of One-way ANOVA of Customer Satisfaction within Transport

Factors	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Physical Environment	Between Groups	138.305	7	19.758	1.496	.167	
	Within Groups	5044.002	382	13.204			
	Total	5182.308	389				
Staff and Service	Between Groups	144.717	7	20.674	1.196	.304	
	Within Groups	6587.740	381	17.291			
	Total	6732.458	388				
Quality of Equipment	Between Groups	23.236	7	3.319	.680	.689	
	Within Groups	1864.138	382	4.880			
	Total	1887.374	389				
Traffic and Transportation	Between Groups	49.047	7	7.007	1.549	.150	
	Within Groups	1728.443	382	4.525			
	Total	1777.490	389				

* P < .05 ** P < .01 ***P < .001

Table 6.16 shows a summary of the hypothesis test results of customer satisfaction.

Table 6.16 The Results of the Hypothesis Test of Customer Satisfaction

Hypothesis	Test result
H1-1: Customer satisfaction is significantly different by gender.	Reject
H1-2: Customer satisfaction is significantly different by age.	Reject
H1-3: Customer satisfaction is significantly different by education.	Reject
H1-4: Customer satisfaction is significantly different by income.	Reject
H1-5: Customer satisfaction is significantly different by travel time.	Reject
H1-6: Customer satisfaction is significantly different by transport.	Reject

6.2.7 Summary of the Independent-samples t-test of Customer Loyalty by Gender

The results of the analysis comparing the Customer Loyalty scale items for males and females are shown in Table 6.17. There is no significant difference in 'share the arena information' for males (M=4.03, SD=.62) and females (M=3.97, SD=.67), 'recommend this arena' for males (M=4.05, SD=.71) and females (M=3.96, SD=.69),

'join future events' for males (M=3.93, SD=.68) and females (M=3.80, SD=.70), 'have a sense of belonging' for males (M=3.69, SD=.83) and females (M=3.45, SD=.77), or 'the arena is worth supporting' for males (M=4.03, SD=.72) and females (M=3.98, SD=.64).

Table 6.17 Abstract of Independent-samples t-test of Customer Loyalty by Gender

Items	Gender	Frequency	Mean	S.D	t value	P value
Share the arena information	Male Female	164 226	4.03 3.97	.62 .67	.853	.804
Recommend this arena	Male Female	164 225	4.05 3.96	.71 .69	1.299	.537
Join future events	Male Female	164 226	3.93 3.80	.68 .70	1.197	.199
Have a sense of belonging	Male Female	164 226	3.69 3.45	.83 .77	2.850	.317
Arena is worth supporting	Male Female	164 226	4.03 3.98	.72 .64	.766	.205

* P < .05 ** P < .01 ***P < .001

6.2.8 Summary of one-way between-groups ANOVA of customer loyalty test by Age

A one-way between-groups analysis of variance was undertaken to explore the items of Customer Loyalty by the different age groups, as detailed in Table 6.18 and Table 6.19.

a) Share the arena information with friends/relatives: The highest score is the age group 36-45 (M=4.12, SD=.60), and the lowest score is 56-65 (M=3.93, SD=.80). There is no significant difference in the 'share the arena information with friends/relatives ' scores for the six age groups.

b) Recommend this arena to friends/relatives: The highest score is the age group 36-45 (M=4.10, SD=.66), and the lowest score is 56-65 (M=3.93, SD=.80). There is no significant difference in the 'recommend this arena to friends/relatives' scores for the six age groups.

c) Likelihood of joining future events: The highest score is the age group 65+ (M=4.00, SD=.55), and the lowest score is 56-65 (M=3.76, SD=.79). There is no significant difference in the 'likelihood of joining future events' scores for the six age groups.

d) Have a sense of belonging in this arena: The highest score is the age group 65+ (M=3.86, SD=.66), and the lowest score is 16-25 (M=3.44, SD=.76). There is no significant difference in the 'have a sense of belonging in this arena' scores for the six age groups.

e) The arena is worth supporting: The highest score is the age group 56-65 (M=4.10, SD=.72), and the lowest score is 46-55 (M=3.90, SD=.63). There is no significant difference in 'the arena is worth supporting' scores for the six age groups.

Table 6.18 Descriptive Statistics of Customer Loyalty by Age

Age	Share the arena information (N=390)		Recommend this arena (N=389)		Join future events (N=390)		Have a sense of belonging (N=390)		Worth supporting (N=390)	
	M	SD	M	SD	M	SD	M	SD	M	SD
16-25	4.00	.69	4.01	.66	3.83	.71	3.44	.76	3.96	.69
26-35	3.96	.65	3.95	.74	3.88	.69	3.50	.86	4.04	.70
36-45	4.12	.60	4.10	.66	3.85	.69	3.71	.72	4.00	.55
46-55	4.08	.53	4.03	.70	3.85	.70	3.70	.69	3.90	.63
56-65	3.93	.80	3.93	.80	3.76	.79	3.69	.89	4.10	.72
65+	3.93	.47	4.07	.62	4.00	.55	3.86	.66	4.07	.47

Table 6.19 Abstract of One-way ANOVA on Customer Loyalty within Age

Items	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Share the arena information	Between Groups	1.301	5	.260	.610	.692	
	Within Groups	163.697	384	.426			
	Total	164.997	389				
Recommend this arena	Between Groups	.975	5	.195	.396	.852	
	Within Groups	189.015	384	.492			
	Total	189.990	389				
Join future events	Between Groups	.689	5	.138	.281	.923	
	Within Groups	187.981	384	.490			
	Total	188.669	389				
Have a sense of belonging	Between Groups	5.710	5	1.142	1.806	.111	
	Within Groups	242.864	384	.632			
	Total	248.574	389				
Worth Supporting	Between Groups	1.158	5	.232	.515	.765	
	Within Groups	172.842	384	.450			
	Total	174.000	389				

* P < .05 ** P < .01 ***P < .001

6.2.9 Summary of One-way Between-groups ANOVA Test by Education

A one-way between-groups analysis of variance was undertaken to explore the items of Customer Loyalty by the different education groups, as detailed in Table 6.20 and Table 6.21.

a) Share the arena information with friends/relatives: The highest score group is junior high school (M=4.50, SD=.71), and the lowest is university and college (M=3.87,

SD=.74). There is no significant difference in the 'share the arena information with friends/relatives ' scores for the five education groups.

b) Recommend this arena to friends/relatives: The highest score group is junior high school (M=4.50, SD=.71), and the lowest is senior high school (M=3.86, SD=.69). There is no significant difference in the 'recommend this arena to friends/relatives' scores for the five education groups.

c) Likelihood of join future events: The highest score group is junior high school (M=4.50, SD=.71), and the lowest is senior high school (M=3.57, SD=.79). There is no significant difference in the 'likelihood of join future events' scores for the five education groups.

d) Have a sense of belonging in this arena: The highest score group is junior high school (M=4.00, SD=1.41), and the lowest is university and college (M=3.43, SD=.82). There is no significant difference in the 'have a sense of belonging in this arena' scores for the five education groups.

e) The arena is worth supporting: The highest score group is master and higher (M=4.04, SD=.64), and the lowest is senior high school (M=3.86, SD=.38). There is no significant difference in 'the arena is worth supporting' scores for the five education groups.

Table 6.20 Descriptive Statistics of Customer Loyalty by Education

Education	Share the arena information (N=390)		Recommend this arena (N=390)		Join future events (N=390)		Have a sense of belonging (N=390)		Worth supporting (N=390)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Junior high school	4.50	.71	4.50	.71	4.50	.71	4.00	1.41	4.00	1.41
Senior high school	4.00	.58	3.86	.69	3.57	.79	3.71	.49	3.86	.38
University and college	3.87	.74	3.90	.72	3.74	.77	3.43	.82	3.92	.71
Master and higher	3.98	.67	4.01	.71	3.89	.69	3.58	.79	4.04	.64
Junior high school	4.13	.50	4.03	.66	3.83	.64	3.51	.83	3.96	.74

Table 6.21 Abstract of One-way ANOVA on Customer Loyalty within Education

Items	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Share the arena information	Between Groups	2.929	4	.732	1.739	.141	
	Within Groups	162.069	385	.421			
	Total	164.997	389				
Recommend this arena	Between Groups	1.283	4	.321	.654	.624	
	Within Groups	188.707	385	.490			
	Total	189.990	389				
Join future events	Between Groups	2.608	4	.652	1.349	.251	
	Within Groups	186.061	385	.483			
	Total	188.669	389				
Have a sense of belonging	Between Groups	1.797	4	.449	.701	.592	
	Within Groups	246.778	385	.641			
	Total	248.574	389				
Worth Supporting	Between Groups	.998	4	.250	.555	.695	
	Within Groups	173.002	385	.449			
	Total	174.000	389				

* P < .05 ** P < .01 ***P < .001

6.2.10 Summary of One-way Between-groups ANOVA Test by Income

A one-way between-groups analysis of variance was undertaken to explore the items of Customer Loyalty by the different income levels, as detailed in Table 6.22 and Table 6.23.

a) Share the arena information with friends/relatives: The highest score is the income level below 20,000 (M=4.79, SD=.69), and the lowest is more than 50,000 (M=3.79,

SD=.71). There is no significant difference in the 'share the arena information with friends/relatives' scores for the five income level groups.

b) Recommend this arena to friends/relatives: The highest score is the income level below 20,000 (M=4.07, SD=.75), and the lowest is more than 50,000 (M=3.68, SD=.75). There is no significant difference in the 'recommend this arena to friends/relatives' scores for the five income level groups.

c) Likelihood of join future events: The highest score is the income level below 20,000 (M=3.91, SD=.75), and the lowest is more than 50,000 (M=3.63, SD=.68). There is no significant difference in the 'likelihood of join future events' scores for the five income level groups.

d) Have a sense of belonging in this arena: The highest score is the income level 20,001-30,000 (M=3.61, SD=.76), and the lowest is more than 50,000 (M=3.47, SD=.61). There is no significant difference in the 'have a sense of belonging in this arena' scores for the five income level groups.

e) The arena is worth supporting: The highest score is the income level 40,001-50,000 (M=4.07, SD=.78), and the lowest is more than 50,000 (M=3.84, SD=.60). There is no significant difference in 'the arena is worth supporting' scores for the five income level groups.

Table 6.22 Descriptive Statistics of Customer Loyalty by Income

Income	Share the arena information (N=386)		Recommend this arena (N=386)		Join future events (N=386)		Have a sense of belonging (N=386)		Worth supporting (N=386)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Below 20,000	4.79	.69	4.07	.75	3.91	.75	3.49	.93	4.04	.68
20,001-30,000	3.98	.66	4.01	.71	3.89	.71	3.61	.76	4.02	.61
30,001-40,000	3.96	.64	3.94	.62	3.78	.66	3.54	.74	3.93	.69
40,001-50,000	4.05	.59	4.07	.66	3.90	.68	3.50	.87	4.07	.78
More than 50,000	3.79	.71	3.68	.75	3.63	.68	3.47	.61	3.84	.60

Table 6.23 Abstract of One-way ANOVA on Customer Loyalty within Income

Items	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Share the arena information	Between Groups	1.694	4	.423	.994	.411	
	Within Groups	162.296	381	.426			
	Total	163.990	385				
Recommend this arena	Between Groups	2.870	4	.718	1.461	.213	
	Within Groups	187.120	381	.491			
	Total	189.990	385				
Join future events	Between Groups	1.993	4	.498	1.017	.398	
	Within Groups	186.590	381	.490			
	Total	188.583	385				
Have a sense of belonging	Between Groups	1.178	4	.294	.455	.768	
	Within Groups	246.387	381	.647			
	Total	247.565	385				
Worth Supporting	Between Groups	1.439	4	.360	.794	.529	
	Within Groups	172.561	381	.453			
	Total	174.000	385				

* P < .05 ** P < .01 ***P < .001

6.2.11 Summary of One-way Between-groups ANOVA with Post-hoc Test by Journey Time

A one-way between-groups analysis of variance was undertaken to explore the items of Customer Loyalty by the different journey times, as detailed in Table 6.24 and Table 6.25.

a) Share the arena information with friends/relatives: The highest score is journey time 31-45 minutes (M=4.09, SD=.57), and the lowest score is journey time more than 60 minutes (M=3.90, SD=.70). There is no significant difference in the 'share the arena information with friends/relatives' scores for the five journey time groups.

b) Recommend this arena to friends/relatives: The highest score is for the journey time of 31-45 minutes (M=4.14, SD=.55), and the lowest score is for more than 60 minutes (M=3.65, SD=.70). There is no significant difference in the 'recommend this arena to friends/relatives' scores for the five journey time groups.

c) Likelihood of join future events: There is a significant difference, $p<.05$, in the 'likelihood of join future events' scores for the five journey time groups [$F(4,383)=3.672$, $p=.006$]. Post-hoc comparisons use Scheffe's method, which shows that the mean score for the journey time group of 31-45 minutes (M=4.05, SD=.57) is significantly different from that of the more than 60 minutes group (M=3.65, SD=.70).

d) Have a sense of belonging in this arena: The highest score is for the journey time of under 15 minutes (M=3.67, SD=.78), and the lowest score is for more than 60 minutes (M=3.45, SD=.68). There is no significant difference in the 'have a sense of belonging in this arena' scores for the five journey time groups.

e) The arena is worth supporting: The highest score is for the journey time of 31-45 minutes (M=4.11, SD=.66), and the lowest score is for more than 60 minutes (M=3.87, SD=.65). There is no significant difference in 'the arena is worth supporting' scores for the five journey time groups.

Table 6.24 Descriptive Statistics of Customer Loyalty by Journey Time

Journey Time	Share the arena information (N=388)		Recommend this arena (N=388)		Join future events (N=388)		Have a sense of belonging (N=388)		Worth supporting (N=388)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Under 15 minutes	4.09	.63	4.03	.72	3.97	.64	3.67	.78	3.99	.71
16-30-minutes	3.98	.62	3.98	.75	3.83	.73	3.57	.88	4.09	.68
31-45 minutes	4.09	.57	4.14	.55	4.05	.57	3.53	.79	4.11	.66
46-60 minutes	3.91	.78	3.96	.75	3.79	.78	3.47	.83	3.89	.60
More than 60 minutes	3.90	.70	3.90	.68	3.65	.70	3.45	.68	3.87	.65

Table 6.25 Abstract of One-way ANOVA on Customer Loyalty within Journey Time

Items	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Share the arena information	Between Groups	2.366	4	.591	1.393	.236	
	Within Groups	162.632	383	.425			
	Total	164.997	387				
Recommend this arena	Between Groups	2.215	4	.554	1.136	.339	
	Within Groups	186.782	383	.488			
	Total	188.997	387				
Join future events	Between Groups	6.940	4	1.735	3.672	.006*	31-45 minutes*, More than 60 minutes*, and 31-45 minutes> More than 60 minutes
	Within Groups	180.977	383	.473			
	Total	187.918	387				
Have a sense of belonging	Between Groups	2.252	4	.563	.877	.478	
	Within Groups	245.913	383	.642			
	Total	248.165	387				
Worth Supporting	Between Groups	4.150	4	1.038	2.340	.055	
	Within Groups	169.850	383	.443			
	Total	174.000	387				

* P < .05 ** P < .01 ***P < .001

6.2.12 Summary of One-way Between-groups ANOVA Test by Transport

A one-way between-groups analysis of variance was undertaken to explore the items of Customer Loyalty by the different transport type, as detailed in Table 6.26 and Table 6.27.

a) Share the arena information with friends/relatives: The highest score is walk (M=4.28, SD=.75), and the lowest score is car (M=3.94, SD=.66). There is no significant difference in the 'share the arena information with friends/relatives' scores for the seven transport types.

b) Recommend this arena to friends/relatives: The highest score is walk (M=4.22, SD=1.00), and the lowest score is car (M=3.93, SD=.64). There is no significant difference in the 'recommend this arena to friends/relatives' scores for the seven transport types.

c) Likelihood of join future events: The highest score is walk (M=4.11, SD=.76), and the lowest score is multiple (M=3.71, SD=.58). There is no significant difference in the 'likelihood of join future events' scores for the seven transport types.

d) Have a sense of belonging in this arena: The highest score is walk (M=3.89, SD=.90), and the lowest score is bus (M=3.40, SD=.99). There is no significant difference in the 'have a sense of belonging in this arena' scores for the seven transport types.

e) The arena is worth supporting: The highest score is underground (M=4.06, SD=.64), and the lowest score is bus (M=3.67, SD=1.05). There is no significant difference in 'the arena is worth supporting' scores for the seven transport types.

Table 6.26 Descriptive Statistics of Customer Loyalty by Transport

Transport	Share the arena information (N=390)		Recommend this arena (N=390)		Join future events (N=390)		Have a sense of belonging (N=390)		Worth supporting (N=390)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Walk	4.28	.75	4.22	1.00	4.11	.76	3.89	.90	4.06	.94
Motorcycle	4.02	.57	3.97	.69	3.91	.69	3.50	.91	4.06	.65
Car	3.94	.66	3.93	.64	3.77	.66	3.53	.69	3.93	.60
Bus	4.20	.56	4.13	.64	3.93	.88	3.40	.99	3.67	1.05
Underground	3.98	.65	4.02	.74	3.89	.70	3.54	.83	4.06	.64
Train	4.00	.82	4.00	.82	3.94	.85	3.75	.86	4.00	.82
Multiple	3.94	.69	4.03	.63	3.71	.58	3.50	.56	4.03	.58

Table 6.27 Abstract of One-way ANOVA on Customer Loyalty within Transport

Items	Sources of SS	Sum of Squares(SS)	DF	MS	F Value	P Value	Multiple Comparisons
Share the arena information	Between Groups	3.172	7	.453	1.070	.382	
	Within Groups	161.825	382	.424			
	Total	164.997	389				
Recommend this arena	Between Groups	4.067	7	.581	1.194	.305	
	Within Groups	185.923	382	.487			
	Total	189.990	389				
Join future events	Between Groups	6.262	7	.895	1.873	.073	
	Within Groups	182.407	382	.478			
	Total	188.669	389				
Have a sense of belonging	Between Groups	7.647	7	1.092	1.732	.100	
	Within Groups	240.927	382	.631			
	Total	248.574	389				
Worth Supporting	Between Groups	4.941	7	.706	1.595	.135	
	Within Groups	169.059	382	.443			
	Total	174.000	389				

* P < .05 ** P < .01 ***P < .001

Table 6.28 shows a summary of the hypothesis test results for customer loyalty.

Table 6.28 The Results of the Hypothesis Test for Customer Loyalty

Hypothesis	Test result
H1-1: Customer loyalty is significantly different by gender.	Reject
H1-2: Customer loyalty is significantly different by age.	Reject
H1-3: Customer loyalty is significantly different by education.	Reject
H1-4: Customer loyalty is significantly different by income.	Reject
H1-5: Customer loyalty is significantly different by travel time.	The likelihood of join future events was fail to reject
H1-6: Customer loyalty is significantly different by transport.	Reject

6.3 Section Three: The Correlation between Customer Satisfaction and Loyalty

Correlation analysis was used to describe the strength of the relationship between customer satisfaction and loyalty in this section. The relationship between customer satisfaction factors and the loyalty factor was investigated using Pearson product moment correlation coefficient. Table 28 shows that there was a strong correlation between the two variables, $r = .67$, $n = 389$, $p < 0.0005$, with high levels of customer satisfaction associated with high levels of customer loyalty.

Table 6.29 Pearson Product-moment Correlation coefficient between Customer Satisfaction and Customer Loyalty

		Customer Satisfaction	Customer Loyalty
Customer Satisfaction	Pearson Correlation	1	.673**
	Sig. (2-tailed)		.000
	N	389	389
Customer Loyalty	Pearson Correlation	.673**	1
	Sig. (2-tailed)	.000	
	N	389	390

**. Correlation is significant at the 0.01 level (2-tailed).

6.4 Section Four: Summary of Key Results

- The result shows that 42.1% of respondents are male, and 57.9% female.
- The majority of respondents are between the ages of 15 and 35 at 67.2%.
- 82.1% of respondents were university graduates and above.
- 80.5% of respondents earned a monthly income of below NT$40,000.
- 57.2% of the respondents used cars or motorcycles/scooters as the transport to the Kaohsiung Arena; 21.6% took the underground.
- 79.9% of respondents spent under 60 minutes travelling to the Kaohsiung Arena.
- The mean of overall customer satisfaction is 4.02, and the mean of customer loyalty is 3.88.
- The customers are most satisfied with the 'Physical environment' factor of Kaohsiung Arena, and least satisfied with the 'Traffic and Transport' factor.
- There is no significant difference in terms of customer satisfaction by age, gender, education, monthly income, type of transport or travelling time.
- There is no significant difference in terms of customer loyalty by age, gender, education, monthly income or type of transport.
- A significant difference was found for the customer loyalty item of 'likelihood of joining future events'. The scores for the five journey time groups show that the mean score for the journey group of 31-45 minutes (M=4.05, SD=.57) is significantly different from that of the journey time of more than 60 minutes (M=3.65, SD=.70). Although the other three groups have no significant difference, the means are all higher than 60 minutes, at between 3.79 and 3.97 (Table 6.24).
- There is a strong correlation between customer satisfaction and customer loyalty, $r = .67$, $n = 389$, $p < 0.0005$, with high levels of association between customer satisfaction and loyalty.

6.5 Discussion

The operation of Kaohsiung Arena is a positive case for other sports arenas to refer to.

The customer satisfaction in the previous studies of indoor sports related facilities in Taiwan show that significant differences are most common in education level (Lin, 2009; Huang, 2006; Lin, 2005, Li, 2004; Chung, 2003) and age (Hu, 2013; Lin, 2009; Lee, 2004, Chung, 2003), followed by other significant difference groups such as gender (Hu, 2013; Lin, 2005; Wu, 2005), income (Huang, 2006; Lin, 2005) and commute time (Wu, 2005). In this study, none of these groups analysed above showed any significant differences. This means that the Kaohsiung Arena is suitable for all kinds of people. Besides, the overall customer satisfaction is 4.02, which is fairly high. Hill and Alexander (2006) stated that these two factors are used in the public sector to measure operational success. The results show that the operation of the Kaohsiung Arena is worth demonstrating as a positive case for other sports arenas. This finding matches with the interview result. Customers, government and private companies have positive attitudes toward Kaohsiung Arena. It demonstrates that to date, this BOT project is successful.

Improving the 'Traffic and Transport' issue is the first job to increase customer satisfaction with the Kaohsiung Arena:

The scores of customer satisfaction show that the 'physical environment' and 'quality of equipment' are the two most significant factors for customers. Besides, 'staff and service' rate third, and 'traffic and transport' have the lowest score of the customer satisfaction factors. The Kaohsiung Arena operation team has to improve the factor of 'traffic and transport'. To analyse it more specifically, the customers were least satisfied with the two items, 'Traffic flows smoothly in this area' (Mean = 3.36) and 'Adequate number of places for parking' (Mean = 3.48). The means of these two items are

obviously lower than those of other items (see Table 6.3). This matches with the results of the participant observation, which found that there were many cars blocking the front of the exit/entrance - and the exit/entrance had heavy traffic (see Photograph 3.9). Moreover, there are 1,465 spaces for cars and 4,174 spaces for scooters in the parking area. The underground parking lot can be used for the people who go to Kaohsiung Arena or the shopping centre. When there are no activities in Kaohsiung Arena, the parking lot will still be occupied (see Photograph 3.8). To sum up, Kaohsiung Arena has to figure out a solution immediately to solve the traffic congestion in the underground parking lots. Secondly, the results show that there are not enough parking spaces. The parking lots to seats ratio is about 1:10.2. This offers a reference for future similar sports BOT projects in urban areas to increase the ratio. The survey results do not match the interview results. According to on-site observation, the Kaohsiung Arena parking lot routes tend to be jammed. It is inferred that the managers neglect the problem or they expect the consumers to stay longer in the shopping malls when there are traffic jams at rush hour.

The customers are willing to recommend Kaohsiung Arena to friends/relatives and to join future events.

The scores of customer loyalty show that 'I will recommend this arena to my friends/relatives' and 'I will join future events at this arena' have the highest scores, while 'I have a sense of belonging in this arena' got the lowest score. The results show that the customers are willing to recommend Kaohsiung Arena to friends/relatives and to join future events. However, the Kaohsiung Arena can still improve customer loyalty by communicating with local residents, for example, by hosting more activities for public welfare. Thus, the local residents can have a greater sense of belonging in Kaohsiung Arena in the future.

Kaohsiung Arena can try to explore potential customers from the suburbs and other cities in the future

The customers who spent over 60 minutes travelling to the Kaohsiung Arena have lower loyalty than other groups, especially the 31 - 45 minutes group. They have less pleasure from joining future events in Kaohsiung Arena. It can be inferred that those customers mostly live in the suburbs around Kaohsiung City or even further away. It is reasonable when customers come from longer distances that they may have other choices to replace Kaohsiung Arena or they do not like to spend a lot of time traveling when there are events in the arena. The result is the same as that of a study of customer satisfaction and loyalty in Taipei sports centres (Lin, 2005). In the future, Kaohsiung Arena can try to explore the potential customers from suburbs and other cities.

Customer satisfaction and customer loyalty have a strong positive association.

The results show that there is a strong correlation between customer satisfaction and customer loyalty. This matches the results of other papers which show that there is a high coefficient between customer satisfaction and loyalty (Oliva *et al.,* 1992; Anderson and Sullivan, 1993; Heskett *et al.,* 1994; Reichheld and Sasser, 1995), and is also supported by other studies which found that consumer satisfaction is reflected in consumer loyalty (Engel, 1986; Fornell *et al.*, 1996; Ruyter *et al.*, 1997). Moreover, the results also fit with other studies of indoor sports facilities in Taiwan (Lin, 2005; Lin, 2009; Hu, 2013). There is no doubt that customer satisfaction and loyalty are two very important elements which have a strong effect upon each other in Kaohsiung Arena. To sum up, the operation team has to maintain customer satisfaction which is the best strategy to keep old customers.

According to the investigation of customers' satisfaction and loyalty, there are

different interpretations by different perspectives of observation. It shows that in BOT projects, not only the views of government or private companies, but also the users' opinions should be listened to. BOT cases might satisfy the needs of government and private companies. However, it does not mean users' needs are satisfied.

Chapter Six has presented the results of the customer and loyalty survey of Kaohsiung Arena. It also answers the research questions posed in Chapter One. The next chapter will offer a cross-comparison of the Chapter Five and Chapter Six results, followed by the research conclusions and research suggestions.

Chapter Seven Conclusions and Implications

7.1 Introduction

Investigations were conducted using face-to-face interviews and a questionnaire during the early operational stage of the Kaohsiung Arena BOT project. The results and findings are extremely important for the future procurement and development of BOT sports projects in Taiwan because they provide suggestions for the Taiwanese Government and private companies on how to avoid potential problems in future projects. It also provides an opportunity for government and the private sector to review the process of decision making in a BOT project. Furthermore, the findings may help policy makers worldwide to examine possible PPP projects or sports facilities in the future.

7.2 Research Findings

The overall research aim was to explore the BOT approach to infrastructure development, using a case study of Kaohsiung Arena. Chapter Two reviewed the literature of BOT projects. Chapter Five examined the interview results of the respondents regarding the issues raised from the exploratory interviews in Chapter Three. These issues include the cooperation between government and the private sector, the advantages gained from the Kaohsiung Arena project, and other additional issues raised by the interviewees. Chapter Six then detailed the approaches to the quantitative data analysis. The results are now summarised in sequence to answer the research aim and objectives. Additionally, the findings of the quantitative results are also offered to support the interview results. The following sections details the accomplished findings and achieved research objectives.

Research Objective 1: To critically review the literature related to BOT procurement routes and the development of BOT sports infrastructure.

In Taiwan, BOT development is the opposite from to that in Europe and the US. The BOT project was developed first, and then expanded to the broader PPPs. The approach was enacted in 1999 when the European countries were making great efforts in the implementation of BOT. Thus, at the beginning, the development of the BOT model was more rapid. Based upon the BOT model, different types of public-private partnerships were developed. Based on the literature review, there are 4 conclusions which are listed below:

The BOT has two main risks – general risks and project risks:

This study divides BOT risk into general risk and project risk. At the early stage of planning a BOT project, government and private firms should assess the risk carefully and confirm the problem-solving capability for the potential risk. It is important to balance the risks and responsibilities for both government and private firms.

Although BOT projects are not the same, they have the same structure and principles:

All BOT projects are not completely the same, but they all share similar principles and develop from the same framework. Thus, each project should be based on precise contract regulations. The development and integration of related legal documents and related articles and conditions are associated with the success of BOT projects. It is suggested that the host government hire professional legal consultants and carefully examine the content of the contracts at the early stage of a project.

It is important to study BOT past cases:

With the limited scale of the capital market, the minimum cost and maximum benefit are expected in a BOT project. It is important to study past cases especially from three aspects: year limit of the franchise term, limit of budgets and related measures

such as governmental subsidies and favourable taxes.

Government should carefully evaluate a BOT arena case from different aspects:

Generally speaking, in terms of a BOT arena project, the government should carefully evaluate the population, the average income of residents, the location, the public transportation systems, the amount of total investment and the total duration of the contract. Thus, a BOT arena should not benefit only the government but also the residents.

It is important to understand the performance of PPP projects from customers or users perspectives:

Customer satisfaction and loyalty are very important to discover and to improve the service quality of the sports and leisure industry. It is also a responsibility for the government to know the performance of PPP projects (including BOT projects). The government can easily understand how a project is carried out and improve the industry competitiveness from customers' perspectives.

Research Objective 2: To examine the issues and challenges that arise between the government and private enterprises during BOT sports projects, through the Kaohsiung Arena.

There are four problems and three operational issues which have been identified through the case study of Kaohsiung Arena. The following sections details these problems and operational issues.

The Main and Potential Problems of the Kaohsiung Arena

To begin with, the city government has problems because of a lack of experience. In the Kaohsiung Arena BOT project, the government did not forbid the private company to outsource the project to a third party, so the owner of the Arena outsourced the arena operation part to a third company, Kegel. The city government found that it is

difficult to monitor Kaohsiung Arena sometimes because they do not know which company to contact when problems occur and need to be discussed. This has been used as an excuse to shirk responsibilities when the government has tried to supervise Kaohsiung Arena. Since a large-scale sports BOT project involves many professional aspects, which are sometimes beyond the knowledge of the professional investment team, it is hence reasonable that the concessionaire should consider entrusting a professional operation team to manage the operation, hoping to improve the operational efficiency. However, when the government supervising authority holds meetings with the concessionaire or when a problem occurs, it discovers that it is unable to directly guide the management team. How this situation could be dealt with should be more carefully and strictly stipulated in the BOT contract before the implementation of projects in the future.

Then, the Kaohsiung Arena is primarily designed as a sports utility for hosting sporting events including those for basketball and volleyball. The operational team has to host sports events at least 60 days per year. This is for improving sports activities in Kaohsiung City, but the number of major sports events is still well under the set requirement. The operational team of Kaohsiung Arena found that the goal was very difficult to reach. As detailed in the Kaohsiung Arena government report (2011), the number of sports events hosted in the Arena in 2009 and 2010 was below the minimum as specified in the contract, with 17 and 37 days respectively. However, the city government has no clear laws for penalizing the private company in this situation. In fact, the issue has been reported in the newspaper that a city government officer has been interrogated on the lack of sports events held in Kaohsiung Arena (Wang, 2011). This is another oversight that the government failed to stipulate in the BOT contract. Fortunately, there is currently a good opportunity for the Kaohsiung Arena, as the government is intending to resume professional basketball games from the current

Super Basketball League (SBL, 2012). The Kaohsiung Arena will therefore have more chances to host sports events. Furthermore, it is possible to increase another source of revenue by selling box use rights as is done in the U.S. For example, the Staples Centre (2013) statistical data demonstrate that there are 160 suite boxes which could be leased for $197,500 to $307,500 per year.

Next, the Taiwanese government is yet to release the naming rights for sports BOT facilities. The owner of Kaohsiung Arena, the Hanshin Company, cannot change the name of Kaohsiung Arena to the Hanshin Arena. This is a big disadvantage for the private company. If they secure the naming rights, the company's reputation could be enhanced, which would provide a greater impetus for revenue raising. According to the statistics of ESPN (2013) shown in Table 4.8, every year the system of naming rights brings in several hundred thousand to several million USD to arenas in the U.S. Geraint *et al.* (2007) also support that the naming rights revenue is one of the most important funds of major sports facilities.

Last, there is one sports arena in Taipei of comparable scope to Kaohsiung Arena. Taipei is the capital of Taiwan. Its population and average salary are significantly greater than those of Kaohsiung City. The average salary of Kaohsiung residents was NT 616,487, while it was NT 884,546 in Taipei in the year 2010, and the population of Taipei was 6,516,139 versus 2,773,483 in Kaohsiung in 2010 (see section 5.2.2). This is reflected in the city's more extensive and profitable business sector. Many companies are more willing to host sports, entertainment and exhibition events in Taipei Arena. This demonstrates the advantages of hosting similar events in the Taipei Arena, where a larger attendance would be expected than at the Kaohsiung Arena, even though the running costs of these two arenas are exactly the same. This is a disadvantage to the Kaohsiung Arena.

The Operational Issues of the Kaohsiung BOT Arena

To start with, the Kaohsiung City government lacked experience with sports BOT projects. Prior to signing the project, the city government did not have complete project agreement rules such as the percentage of shareholders and the details of fundraising projects. As a result, this project was postponed by one year because of insufficient funding.

Secondly, in a BOT project in Taiwan, the government always plays the important role of leading the project. The main job for the government is to monitor the concessionaire. To be concrete, it all follows the contract. For example, the concessionaire of Kaohsiung Arena has to report to the city government at the beginning and the end of each year. The reports must include the details of events held, a six-month financial statement, the maintenance and condition of the facilities of the Arena, and details of the current marketing strategy. In fact, the public and private sectors are co-operating in a constructive partnership, and the contract has been sufficiently well-defined to prevent the occurrence of potential operational problems so far. Admittedly, in a BOT project, if the private sector company achieves the estimated profit, it is more likely to co-operate with the public sector. There is one current issue of the Kaohsiung Arena. Overall, the government did not forbid the private company from outsourcing this project to a third party. The city government found that it is difficult to monitor the Kaohsiung Arena sometimes. Hence, when the government supervising authority holds meetings with the concessionaire or when a problem occurs, it discovers that it is unable to directly guide the management team in order to prevent cooperation problems. In the future, the contents specific to the aforementioned questions need to be more carefully and strictly stipulated in the BOT contract before the implementation of the project.

Thirdly, all of the major BOT sports facilities were 100% funded by the

government in the past, with many sports events hosted at low charge. Hence, many people still expect that they can host sports events in Kaohsiung Arena for free, but circumstances have changed. It now costs a lot more to operate an arena of this scale because of utility costs such as water and electricity. The costs of staff maintenance and facility depreciation also need to be taken into account. The function of the arena is distinct from that of small-scale gymnasiums. This is a challenge for Kaohsiung Arena to promote sports events.

Research Objective 3: To undertake an analysis of the advantages and disadvantages of BOT from the perspectives of the host government and the private operating company, through the Kaohsiung Arena.

The findings of BOT benefits and advantages were separated into two parts. One is to the government; another is to the private sector.

The Benefits or Advantages of the Kaohsiung BOT Arena to the City Government

The results below provide an analysis of the benefits gained by the government. Many research works have listed the BOT advantages. In this study, the results show that the Kaohsiung City Government has also benefited from the Kaohsiung Arena project.

First, the Kaohsiung City Government previously did not have the major indoor sports facilities required to host various events, so it lost the chances to apply for international sports events three times over the past ten years. This BOT project has enhanced the city government's reputation from 2009. As a matter of fact, the Kaohsiung City Government invested in 8.6485 acres of land and £40 million to build an arena in the city development scheme, including a £20 million subsidy from the central government because the government was promoting the development of local sports facilities using the BOT approach. The surrounding area now has high-level

residential areas, a large park, a new underground route and a wide pedestrian precinct (Figure 4.1; Figure 4.2; Photograph 3.6). The total cost of Kaohsiung Arena was approximately £158 million. In consequence, this BOT project saved the government around £118 million, thus helping relieve the city government's financial burden. Moreover, this project has successfully accelerated the improvement of a new commercial area. According to section 5.5.1, the population increased 6.3% in this area in the last 6 years followed by land price increases from 30% to 60%.

Second, the Kaohsiung Arena paid approximately £5 million in income tax in the year 2010 (KCG,2011) and successfully created 4,000 job opportunities (KCG Information Bureau, 2013). The arena, shopping centre and surrounding business activities not only bring in a great deal of tax revenue but also create many job opportunities for local residents. Besides, the Taiwanese Government has limited the total number of civil servants. Whenever a new public infrastructure facility is built, the local government cannot increase the civil servant input to manage the facility. The BOT project can effectively solve this problem by ensuring that an adequate number of civil servants are involved. In addition, the major sports facilities in Taiwan were designed by government organisations in the past. The operational team always took over these sports facilities after the construction was completed. The operational teams never had the chance to coordinate with the architecture teams. Although BOT projects can prevent similar situations from happening again, the Kaohsiung Arena concessionaire still made some mistakes, such as the lack of indoor hanging systems, lighting systems and storage space. However, the BOT still offers the opportunity to let the concessionaire join the arena design. The design and function is still better than traditional government funded sports facilities. This can be supported by the overall customer satisfaction of Kaohsiung Arena reported in Chapter Six.

Prior to the construction of the Kaohsiung BOT Arena, the biggest hall in Kaohsiung

City only offered a seating capacity of 1,700 (although there is now another new high quality hall which can offer 1,820 seats) for the hosting of indoor concerts, along with other cultural and artistic events. The Kaohsiung Arena offers 15,000 seats which brings many other events to Kaohsiung City, and the city is no longer described as a 'cultural desert'.

The Benefits of the Kaohsiung BOT Arena to the Private Sector

Basically, the key point for the private sector is to achieve or to surpass the estimated profits. The Kaohsiung Arena BOT project that combines a sports arena with commercial areas has made a breakthrough in sports-related projects in Taiwan. Many customers who join Kaohsiung Arena events also spend money on the combined commercial areas. This can be proved by Kaohsiung Arena paying £5 million in income tax in the year 2010. Besides that, based on the manager's point of view, the Kaohsiung Arena concessionaire is not only developing a good reputation but also enhancing its company's image. In addition, the total land value of the Kaohsiung Arena is NT 16,286,760,000 (approximately £325.6 million). It is impossible for the private company to buy this area to build a shopping centre.

Research Objective 4: To analyse the operational success of the Kaohsiung Arena by investigating customer satisfaction and loyalty.

Customer Satisfaction and Loyalty to Kaohsiung Arena

This section analyses the results from the customer satisfaction and loyalty survey of Kaohsiung Arena. To begin with, there is no significant difference in terms of the customer satisfaction by age, gender, education, monthly income, type of transport or travelling time. This means that the Kaohsiung Arena is suitable for all kinds of people. Besides, the overall customer satisfaction is 4.02, which is fairly high. The results show that the operation of Kaohsiung Arena is worth demonstrating as a positive case for

other sports arenas.

Then, the scores show that the first job for the Kaohsiung Arena operation team is to improve the factor of 'traffic and transport', especially traffic flows and parking lots. Although there are 1,465 spaces for cars and 4,174 spaces for scooters in the parking area, the parking lots can be used for the people who go to Kaohsiung Arena and to the shopping centre. The results show that there are not enough parking spaces. The parking lots to seats ratio is about 1:10.2. This offers a reference for future similar sports BOT projects in urban areas to increase the ratio. Also, Kaohsiung Arena has to figure out a solution immediately to solve the traffic congestion in the underground parking lot.

Next, the survey results point out that Kaohsiung Arena can still improve customer loyalty by communicating with local residents, for example, by hosting more activities for public welfare; thus, the local residents can have a greater sense of belonging in Kaohsiung Arena. In addition, the customers who spent more than 60 minutes travelling to the Kaohsiung Arena have lower loyalty than other groups. These people who live in the suburbs and other cities have less pleasure in joining future events in Kaohsiung Arena. The arena can try to explore these potential customers from the suburbs and other cities in the future.

Last, there is a strong correlation between customer satisfaction and customer loyalty. It once again proves that customer satisfaction and loyalty are two very important elements which have a great effect upon each other in Kaohsiung Arena. To sum up, the operation team has to maintain customer satisfaction, which is the best strategy to keep old customers.

A Cross-Comparison of the Interview and Survey Results

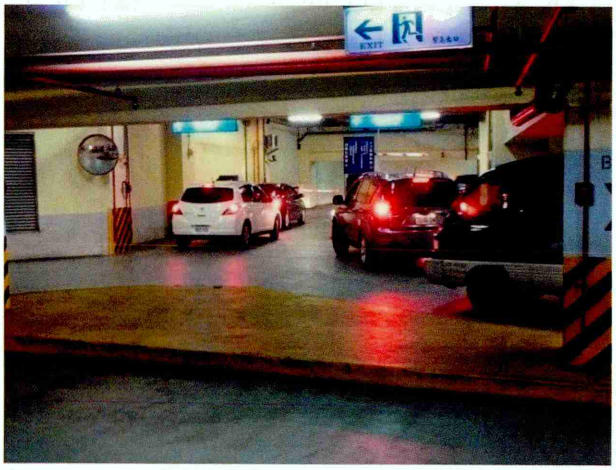
a) The overall customer satisfaction with the Kaohsiung Arena was 4.02, which is fairly high, and the results also show that the operation in Kaohsiung Arena is worth

demonstrating as a positive case for other sports arenas. This matches the interview results; the interviewees think that the facilities of the arena meet customers' expectations. One BOT contract can last for decades, so the government must have a comprehensive plan that includes the functions and the purposes of the target sports facilities, along with the strong cooperation of the government and the private sector. This is one way of ensuring the long-term visibility and smooth operation of the BOT project.

b) The customers were least satisfied with the traffic flow and the number of parking spaces in Kaohsiung Arena; the amount of dissatisfaction fluctuated depending on the interviewees' point of view. This differed from the interview results; the interviewees think the traffic situation was very good, both before an event started and after it finished. According to the participant observation, Photograph 7.1 shows that there are many entrances in Kaohsiung Arena, and none of them were jammed. However, the cars are mostly blocked in front of the exit, especially when an event has just finished. Photograph 7.2 shows cars were blocked after an event was finished. It can be inferred that the interviewees ignored those cars stuck in the underground parking space instead of traffic congestion around Kaohsiung Arena. Although there are 1,465 parking spaces, the original plan of this BOT project ignored the fact that this sports arena is connected to many nearby stores and restaurants. Hence, the Kaohsiung Arena has to figure out a solution immediately to solve the traffic congestion in the underground parking lots. Moreover, for future similar sports BOT projects in urban areas, planners will have to consider carefully how many parking lots are enough to satisfy the need, especially in a developing area such as Kaohsiung Arena.

Photograph 7.1 Kaohsiung Arena Has Many Entrances to the Parking Area

Photograph 7.2 Cars Were Blocked After An Event Was Finished



Research Objective 5: To make recommendations to government and private companies to maximise the beneficial effects of future major sports venues utilising BOT procurement routes.

Based on the literature review, the results and analysis of the major sports arena, in the following, a few recommendations are offered to the government and private sector.

Recommendations to the Government

Through analysis of this study, it is suggested that when governments or

metropolises of different countries intend to construct large-scale sports facilities by BOT, they should assess and study the following items.

1. Will square measure of base or environment attract private investment? Environment includes population in the cities, citizens' consumption capacity and citizens' preference for sport and art activities.
2. Regarding future BOT buildings, what are the operational periods offered by the government? What is the subsidy amount? During the period of operation, what are the premium and feedback required by the government?
3. What are governmental measures to meet the BOT projects, such as road system, mass transit system, reduction in tax and the consistency of the policy?
4. Since the period of a large-scale BOT project is long, there are likely to be disputes between the government and investors. Therefore, the violation of the contract of BOT projects, governmental supervision, arbitration and punishment should be regulated. We should avoid lawsuits as they would not only influence the rights of the public, but would also violate the aims of the BOT project.
5. In order to make sure that BOT projects can be finished as soon as possible and provide service, the construction period and operational years are combined and calculated. For instance, the limit of the construction and operation period of Kaohsiung Arena is 50 years. When investors' construction is delayed, it will influence the following operational years.
6. When the government implements BOT, it should invite related experts or construct a planning committee to plan and regulate the facilities; otherwise, after the BOT construction, there will be inconvenience. For instance, at the beginning of the construction of Kaohsiung Arena, the quantity of the hanging facilities for activities was not regulated. Hence, the application became insufficient and inconvenient.

Besides, at first, the city government required the construction of a fitness center. However, for the space which can make a profit, it might not be appropriate to establish a fitness center, and it might even reduce the profits.

7. Although there are some operational problems with Kaohsiung Arena, generally speaking, with various conditions, the operation is successful and the profits are better than expected. It has successfully enhanced the prosperity of the surrounding area and as such the case can be a reference for future large-scale BOT sports projects.
8. A successful BOT project should not only satisfy the demands of government and private enterprises, but should also consider the feedback of the public who experience the service. After all, the public buildings aim to provide public service. If the government successfully saves on expenditure, private enterprises obtain the profits and the total service level is not reinforced, the BOT project will not be successful.
9. The Taiwanese Government can consider the possibility of releasing the naming rights to a private company. The naming rights can be included in the BOT contract in the future, not only to increase government revenue but also to attract more investment from the private sector.
10. The main purpose of the Kaohsiung Arena BOT project is to accelerate the development of sports events. Basically, the Kaohsiung City Government should build small-scale gymnasiums to stage small-scale sports events instead of only relying on one major arena. Most organisers of local sports events cannot afford the rent to host events in Kaohsiung Arena. The Kaohsiung Arena should host international sports events to increase its profits by, for example, inviting NBA teams to play exhibition games.

Recommendations to the Private Sector

When assessing BOT projects, private investment teams should be careful about the following items and authorize professional personnel for the evaluation to avoid the chance of failure:

1. Are the conditions provided by the government worthy of investment? During the operational period, does the government have strict measures on premium or return? Does the government promise that it will not introduce similar BOT projects in the same location in a certain period of time?
2. Since the capital required for a BOT project is enormous, does the government have a limit for the loan? Does it negotiate with public banks for a favourable return and interest exemption?
3. In the early construction stage of the BOT project, a future professional operation and management team should be included to carefully review the requirements. At this stage, the demands of future operation should be reviewed.
4. Does the government provide favourable land tax, house tax and business tax in the period of operation?
5. Does the government require complicated facilities? Is there difficulty in actual operation? For instance, in Kaohsiung Arena, due to the shortage of storerooms, large-scale facilities cannot be stored, which increases the difficulty of operation.
6. When setting up the operational strategy, the operational team should not only be concerned about the public's consumption model, salary and consumption preference, but should also pay attention to cultural differences. For instance, the AEG group mentioned in this study obtained a satisfactory outcome when operating Sydney Superdome, a BOT project. However, when it managed the Beijing WuKe Song Culture & Sports Centre, it was unfamiliar with eastern culture and it

withdrew from the operation due to ineffective results.

7.3 Summative Conclusions

The Kaohsiung Arena BOT project is operating smoothly at this point in time, with the Kaohsiung City Government and the private sector co-operating quite well. Both the city government and the owner of Kaohsiung Arena are pleased with the benefits that have been gained from this project. The customers are satisfied with the physical environment and facilities of the Kaohsiung Arena, although there are still a few minor problems which need to be solved. Overall, this project can be highlighted conclusively as a really positive example for future major sports BOT projects. Beyond that, it is not easy to successfully operate a BOT project. In addition to comprehensive plans, it is necessary to have an experienced private partner with sufficient funds. Given how the Kaohsiung Arena BOT project will be undertaken over fifty consecutive years, changes to the political, economic and business environment become difficult to predict. Both the government and the private sector have to evaluate the feasibility very carefully before deciding to commit to a project. The more detailed the contract, the less likelihood there will be of problems occurring during the operational stage.

The configuration of BOT projects varies considerably from country to country, especially in relation to BOT laws, the degree of government help, the amount of financing allowance and the political environment. A successful BOT project in one country could fail in another. Therefore, besides the BOT experiences, the establishment of BOT laws and regulations is also very important to a government. For example, in China, all land belongs to the government, so the early BOT projects mostly solicited investments from foreign-funded enterprises. However, every BOT project has different laws and standards. Cheng (2009) pointed out that the BOT laws in China still have no system. The Chinese Government must make greater efforts to systematise the laws so

that they can more effectively regulate BOT projects.

7.4 Lessons Learned From Kaohsiung Arena

a) Other than the amount of financing, problems that are more difficult to solve and evaluate include supervisory and legal issues that require careful assessment when a large sports arena is built through a build–operate–transfer (BOT) scheme. It might even be necessary to form professional teams in an initial phase of the BOT infrastructure project. Given the importance of financial viability and operational feasibility analysis, both investment companies and the government examination department shall involve very experienced professional teams in the process of feasibility evaluation. The Kaohsiung Arena project serves as an example of the insufficient experience of the Kaohsiung City Government in the initial phase of construction, and imprecise financial evaluation, therefore resulting in a project that fell behind schedule. In addition, the Kaohsiung City Government failed to stipulate a clear extent of authority for the BOT tender, which resulted in the BOT tender subcontracting parts of the project to other parties during the course of the infrastructure project and in turn made follow-up supervision and management troublesome for the Kaohsiung City Government.

b) In spite of the convenient transport in the vicinity of the Kaohsiung Arena and its capacity of approximately 1,400 parking spaces, the design and planning of the Kaohsiung Arena neglected the future development of the community as a whole. As the area where the Kaohsiung Arena is situated has been zoned as an emerging urban planning and development precinct by the Kaohsiung City Government, burgeoning commercial activities in the peripheral areas of the Kaohsiung Arena have caused the problem of undersupplied parking spaces for spectators who drive there to watch sports. Moreover, inadequately-designed road networks for the movement of traffic in parking lots of the Kaohsiung Arena have resulted in vehicles frequently lining up in a queue

next to exits of the parking lots and serious traffic jams. Therefore, planning of parking lots in the future can consider including decentralized parking areas in parking lots and shuttle bus services in addition to the carefully calculated number of parking lots and design of road networks in the parking lots.

c) As a major sports facility without professional teams to use it, the Kaohsiung Arena has been compensating for its deficits from the arena with surplus from the shopping center. Besides the land on which Kaohsiung Arena is built, the land provided by the Kaohsiung City Government is big enough to build commercial buildings. Being committed to zoning this area as an emerging urban planning and development precinct, the Kaohsiung City Government anticipates an increase in overall revenues through an increased influx of people and subsequent encouragement of investments from private enterprises. Therefore, regardless of some existing problems, the BOT project is a success from a macro perspective and brings benefits to the three parties – the government, private enterprises, and the public. It is recommended that cities with circumstances similar to those of Kaohsiung follow this path for development in the future.

d) Despite the popularity of the concept of "naming rights" in American and European countries, the concept has not found extensive application in Europe and many other countries in other continents. Large stadiums in Japan and Taiwan are still named after the cities or districts where they are located. After the Beijing Wu Ke Song Arena recent change in financial position from deficit to surplus as a result of changing its name to the MasterCard Center, the Chinese government has begun to ponder whether to apply the same formula to other big sport facilities to increase revenues. On top of that, the application of naming rights has also prompted potential enterprises' willingness to invest.

As a result of the Kaohsiung Arena operating team's lack of involvement in the

planning and design of the arena, the arena subsequently experienced some inconvenience in its practical operation. For example, there were not enough hanger rods on beams inside the Kaohsiung Arena, which has caused significant inconvenience for the arrangement of several events. In addition, as the storage area was not spacious enough, more time was spent moving items or changing venues when different events were held. Therefore, it is recommended that planning and design squads in the future include the operating team in the initial phase of planning and design.

7.5 Key Contributions to Knowledge

According to the BOT case of Kaohsiung Arena, it can reinforce construction of public sports facilities of local governments and solve the problems of operation and management. However, the conditions in cities of different countries are different. In the cities with more than a million people and higher national incomes, they have the resources to enhance large-scale sports facilities; nevertheless, there can be the following difference. The findings and conclusions from the case study of Kaohsiung Arena are extremely important for future PPP projects (especially BOT projects) in Taiwan and elsewhere in Asia. The main research contributions are as follows:

1. In countries with popular indoor professional sport, such as the U.S. (professional basketball, ice hockey and American football), operation of the games can constitute more than half of the annual revenue (including box, food, advertising and name taking). Therefore, in a city with few facilities of a similar scale, it is easier to construct large-scale facilities by BOT, such as in the centre of the city, suburbs or those areas with convenient transportation or large bases.
2. In the countries with developing national incomes and without indoor professional sports, operation of the accomplished facilities should rely on non-sport activities, such as concerts, art activities and exhibitions. Selection of the locations should be

precise. They should not be in remote areas without convenient transportation. When designing the facilities, there should be proper concern and design regarding art, meetings and exhibitions.

3. When a city has the previous condition and no companies have the intention to invest in sports facilities by BOT, city governments can consider overall development in a large base, particularly the permission of construction of commercial space. The size of the commercial space is an important factor for investors. When the incentives are insufficient, the government can try to increase the investment intention of private enterprises by subsidy of capital and tax.
4. Regarding BOT investment cases, since the developers invest a great amount of money and the operational year limit is longer, the conditions include the space of the base, commercial space, investment amount, financing amount, operational year limit, return, tax rebates, political stability, policy consistency and potential competitors which are the factors of government's assessment to implement BOT cases. Thus, it is not easy to practice large-scale BOT projects, and the experience of Kaohsiung Arena can serve as a positive reference, especially in Taiwan and in other countries in Asia with a similar socio-political and economic context.

This research contributes greatly to bridging the gaps within sports BOT studies. The novelty and key contributions to knowledge are summarised in Table 7.1 below.

Table 7.1 Highlights and the Significance of the Work

Current situations of BOT project studies	Contributions of this study
1. Most sports BOT studies have concentrated on exploring BOT principles and key successful issues.	This research stresses the issues and difficulties in the operation stage of a sports BOT project.
2. Researchers prefer either a qualitative or quantitative research approach.	A mixed-methods approach is used to receive feedback not only from city government and the private sector, but also from customers. The research reveals that a successful BOT project should have positive feedback from all stakeholders including government, the private sector and customers.
3. Gaps in comparing different PPP principles in different areas.	This research identifies the different principles of PPP in EU countries, the UK, the USA and Taiwan. It divides the most popular PPP projects into three categories.
4. Gaps in BOT Studies of major sports venues.	Major sports facilities are crucial to modern societies. This research gives government an idea of how to continue developing sports venues, what issues have to be noticed and the potential problems which need to be minimised.
5. Most research neglects the comparison of regional diversity such as cultural and political differences.	This research identifies the cultural differences in the operation of major sports arenas in Taiwan and Asia.
6. Gaps in knowledge and understanding of BOT based strategies of sports facilities.	This research makes recommendations to government and the private sector when they intend to construct large-scale sports facilities using the BOT approach in counties with a similar socio-political and economic context.

7.6 Research Limitations:

Limitations of Data Collection

The formal interviews were related to the in-depth development of BOT in Taiwan and understanding of Kaohsiung Arena. Therefore, the interviewees could only be selected from limited sources. The results would possibly be extended if the interviewee sources had come from a wider range of areas. It is suggested that in the future, researchers can interview more and different people to offer a wider view of sport BOT projects from other perspectives such as architects, professional sports managers and athletes.

Limitation of the results

Although BOT projects differ from country to country, the findings of this research can still offer ideas to assist other countries in completing the development of such projects. A sports arena combined with commercial areas cannot only be used in BOT projects but also in other PPP projects. The advantages and disadvantages of Kaohsiung Arena provide an indispensable benchmark that can be applied to other similar cases in the future. However, the results are still limited with regard to every sport BOT arena in the world. The results should be considered with caution, especially in terms of culture, politics and government policies. This study represents a case study and while lessons can be learnt, the results cannot be widely generalised.

7.7 Future Recommendations:

Future research should consider investigating the following to further the knowledge in this area:

- **Other aspects of the BOT projects that need further analysis**: Future studies of sports BOT projects could concentrate on other specific areas such as financial development, laws and regulations, economic impact or project implementation.

- **Multiple case studies:** The use of Kaohsiung Arena as a case study has been developed into a number of criteria for use with future major BOT sports projects, and thus can aid the government in drafting related development strategies. For future research, a comparison of multiple cases which have similarities or differences is suggested.
- **Further investigation of Kaohsiung Arena in several years:** Kaohsiung Arena is so far a positive BOT sport case, and several suggestions have been made in this study. In the future, it would be worth investigating other possible issues which can affect Kaohsiung Arena in the long term.

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Appendices

Appendix A

Customer satisfaction and loyalty survey - Kaohsiung Arena (English version)

Hi !

This is a survey aimed at the customer satisfaction and loyalty of Kaohsiung Arena, to analyze the operational issue of a BOT arena. This survey is only for research purpose, thanks again for your assistance.

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Part I : General Questions

This part is general questions, please tick the suitable answers below

1. Gender : ☐ Male ☐ Female
2. Age : ☐ under 15 ☐ 15-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ 66 or more
3. Level of education : ☐Primary school ☐Junior high school ☐Senior high school ☐University(college) ☐Master(or above)
4. Month income: ☐ Below 20,000 ☐ 20,001-30,000 ☐ 30,001-40,000 ☐40,001-50,000 ☐ More than 50,001
5. Transportation to Kaohsiung Arena : ☐ Walk ☐ Bicycle ☐ Motorbike ☐ Car ☐ Bus ☐ MRT ☐ Train ☐ Multiple
6. Journey time to Kaohsiung Arena : ☐ under 15 minutes ☐ 16-30 minutes ☐ 31- 45 minutes ☐ 46-60 minutes ☐ 61 minutes or more

※Please turn the page※

Part II(A)：Satisfaction—Physical environment

This part aims to understand your satisfaction of this arena, please rate on a scale from strongly agree to strongly disagree.

	Please indicate your level of satisfaction	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Physical environment	1. I am very satisfied with the whole design of this arena	☐	☐	☐	☐	☐
	2. I am very satisfied with the facility maintenance of this arena	☐	☐	☐	☐	☐
	3. I am very satisfied with the overall cleanliness of the arena	☐	☐	☐	☐	☐
	4. I am very satisfied with the ease of access to/from seats	☐	☐	☐	☐	☐
	5. The signs are easy to understand	☐	☐	☐	☐	☐
	6. Well circulation of inside arena	☐	☐	☐	☐	☐
	7. Toilets are well maintained	☐	☐	☐	☐	☐
	8. Well function of the screen	☐	☐	☐	☐	☐
	9. Well Broadcasting system	☐	☐	☐	☐	☐
	10. Well Lighting system	☐	☐	☐	☐	☐
	11. Good A/C quality of the arena	☐	☐	☐	☐	☐
	12. I am very satisfied with the overall satisfaction of this arena	☐	☐	☐	☐	☐
	13. Toilets are very dirty	☐	☐	☐	☐	☐

Part II(B)：Satisfaction—Staff and service

	Please indicate your level of satisfaction	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Staff and service	1. Staffs are politeness	☐	☐	☐	☐	☐
	2. Staff knowledge of venue are good	☐	☐	☐	☐	☐
	3. Staff ability of saving problems are good	☐	☐	☐	☐	☐
	4. Staff crown management are good	☐	☐	☐	☐	☐
	5. The information given of the activities are plentifully	☐	☐	☐	☐	☐
	6. Ease of access to tickets	☐	☐	☐	☐	☐
	7. Ease of navigation the events in the official website	☐	☐	☐	☐	☐

※Please turn the page※

Part II(C)：Satisfaction—Traffic and transportation

	Please indicate your level of satisfaction	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Transportation	1. Traffic flows smoothly in this area	☐	☐	☐	☐	☐
	2. Adequate number of places for parking	☐	☐	☐	☐	☐
	3. Multiple transport options	☐	☐	☐	☐	☐

Part III：Loyalty

This part aims to understand your loyalty of this arena, please rate on a scale from strongly agree to strongly disagree.

	Please indicate your level of loyalty	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
	1. I will share the arena information with my friends/relatives	☐	☐	☐	☐	☐
	2. I will recommend this arena to my friends/relatives	☐	☐	☐	☐	☐
	3. I will join future events at this arena	☐	☐	☐	☐	☐
	4. I have a sense of belonging in this arena	☐	☐	☐	☐	☐
	5. I will not share information with my friends	☐	☐	☐	☐	☐
	6. I think Kaohsiung Arena is worthy to support	☐	☐	☐	☐	☐

Thank you again for completing the questionnaire!

Appendix B Exploratory Interview

The details of the exploratory interview cases

1. The BOT project of Dapeng Bay National Scenic Area

- Characteristics in scale: The largest and most unique recreation center features a combination of water activities, compassing a dimension of 532 hectare of bay area and 650 hectares of land.
- Characteristics in theme: The one national park among others in Taiwan that focusing its theme on multi water activities.
- Characteristics in historic importance: retaining relics of Japanese military activities during the colonial period.
- Characteristics in ecology: the unique ecological features of lagoon and mangrove swamp.

Facilities

- 2-3 theme parks (subjects on cultures, ecology, or sports)
- 1 golf course and peripheral facilities
- 3~4 stars hotels and holiday villages and accommodation facilities
- Harbor of yachts and fisherman's wharf.
- Other smaller scale of theme attractions

Providing interconnecting facilities and amenities for visitors, including travel package and services.

Exploratory Interview Questions

Base on the research questions, six issues were developed and categorized into two main interview questions from literature review which are as follows:

Q1: What are the likely types of problems with BOT projects in leisure industries in

Taiwan?

i) To understand the degree of monitoring the enterprise by government.

ii) To understand the related legislation made for the BOT project case.

iii) To understand the real problems occurred in this project.

ix) To understand the management difficulties.

Q2: What are the benefits and advantages gained by government and private enterprise?

x) To understand what kind of benefits and advantages gained by the government.

xi) To understand what kind of benefits and advantages gained by the enterprise.

Exploratory Interview Data Analysis

Case 1: Dapeng Bay National Scenic Area BOT project

Case 2: National Kangshan Agricultural & Industrial Vocational College Pool

The connection between government and enterprise plays an important role in a BOT project. Government has to supervise the construction process of the enterprise. In Dapeng Bay BOT Project, the manager thinks the monitoring from government is a little bit too much. It differs from case 2, the manager of the swimming pool think government didn't monitor them too much.

Interview case 1:

Of course... yes. There are two monitoring system. One is monitoring the BOT contract regularly; another is to hold coordinate meetings once a month, in order to control our progress of the project. This kind of control we can accept. Government also hired project consultants to monitor us. After all, government doesn't have so many specialists. We can accept this as well. But we feel pressure that government want us follow their steps. Besides contract...there are a few none contract monitoring. That really disturbed us.....

Interview case 2:

Basically...government is not intervening too much.....

The legislation issue in a BOT project which is very complicated. The manager hope the government could do more help in the legislation issue, such as aquatic motorcycle, the loans from banks. This is quite similar to the BOT aquatic center. They all asked for more help from government in the legislation issue.

Interview case 1:

For us, we have already faced this kind of situation. For example, let's talk about aquatic motorcycle. In a part of our BOT project, we have a very big lagoon area for the aquatic activities. We can split it up into many parts. It is just only one small part that we can develop the aquatic motorcycle area, but official authorities said "NO"...

...because of the banks didn't loan us so fast. They're afraid of they can't get money back. In the contract of our BOT project, we have to raise money from banks. The government should help us to make deals with bank...

The Dapeng Bay BOT project manager listed three real problems that happened to them. First, the global economic depressed. As a project manager of leisure activities, he thinks this is the common situation that every leisure industry has faced. Second, this is a very big project, it contains a wide range of the specialized filed, and the professional staffs are not easy to search. Third, government didn't follow the fundamental construction schedules that should be done on time. The chairman of the aquatic center listed two problems they face. First, the global economic depressed, it is quite similar to the case 1. Second, he hopes the government can ban the illegal aquatic centers in Taiwan.

Interview case 1:

...of course is the global economic depressed. As to leisure industry, we have to deal with labor intensive, fund intensive and clearly of slack or busy season...

To be honest, there is a special situation we faced, which is...human resource...This

is a very big BOT project, which needs a lot of specialists from different areas, such as...financial evaluation, land development, lows, construction and different kind of licenses.

I think they really did well. But they faced many contractors went bankrupt. A few bids of contract were failed or broke the contract

Interview case 2:
The second problem we have which is global economic depression, but this is the situation that every enterprise has, nobody can avoid this...

The real situation is, many aquatic centres they don't have operating licenses. The schools still go to these illegal aquatic centres. This is shame. I think this could only happen in Taiwan.

There are three management difficulties in case 1, which are communicate with government, the legal aspect and the pressure from local residents.

First is the expectancies for BOT progress are different; this is a quite big issue. The government wanted our company to follow their schedule, but for us, we have faced the real operation issue to think about...it is very difficult to communicate with the government.

The opinions from local residents, sometimes it comes through the government, sometimes it comes to us directly. This is a difficulty in operation of this BOT project.

There are two management difficulties in case 2, which are the fund issue and the legislation issue.

Interview case2:
For example, we know the government properties don't have to pay the building tax, but we have to pay. Of course this is a right thing for paying building tax. But I think

the enterprise should get the discount. That's move to the finance issue, this is also a part of capitalized cost. I think the government can have an economics incentive.

...we have a problem that ministry of education has a new regulation of the pool size and the amount of lifeguards. I think this kind of regulation is not suitable for the BOT project enterprise.

In operating the Dapeng Bay National leisure zone, the manager believes this is a unique BOT leisure project in Taiwan, he has to investigate other cases abroad. But still, BOT projects vary from country to country, case to case.

Interview case 1:

...this is the biggest leisure BOT project in Taiwan. We have no successful cases to follow. We are doing the "only one" thing in Taiwan. So.....we are trying to learn several cases happened in other countries. We call it benchmark learning. But still, it's not so useful all the time...

In case 1, from the company's aspect, the government gained lots of advantages than they did, the government doesn't have to manage this project. They only have to monitoring it. And it saves a lot of human resources and "Know-how". Moreover, this project decreased the unemployed rate for local government. As to the company, this project is still in the initial stage, the contract was signed for the next fifty years. The only benefit that the manager said was enterprise image. This project increased the better image for this company.

I think the answer is yes. For government, first, they don't have to do this project themselves, they just only monitoring it. It saves a lot of human resources and 'know-how'. Second, the spirit of this BOT project, government asked us to employ the staffs from local area, so we decreased the unemployed rate for local government.

For us, so far, I think our enterprise image has increased. Most of our cases were in

the China, our president of this company always invested in the golf industry. But we are a Taiwan company, a lot of people didn't know that before this BOT project. I think if we can successful in this case, it is an advantage for the future investment.

In case 2, from the chairman's aspect, the school gained two advantages than before. The school has indoor pools now and the enterprise has to pay the rent to the school regularly.

... these swimming pools are in the open air – outdoor. Besides, the school didn't have any lifeguard. The school janitor has to clean and check the pools. The school didn't even have enough money to buy sodium hypochlorite. Also, the school didn't have enough funds to maintain clean of pools. After signed the BOT project, we offered a very good indoor swimming environment for the students. They don't have to worry about if it is rain or not. Moreover, we have to pay the rent to school regularly.

Appendix C Formal Interview Questions

From the exploratory interview results, site visit for the observations and consultations with the supervisory team, and the face-to-face open-ended interview questions developed into four main questions and resulting in issues below.

Q1: With the cooperation between government and private sector, please elaborate the following issues and supplement your opinion if not listed below.

i) The degree of monitoring the enterprise by government.

ii) The related legislation made for this BOT project case.

iii) The potential operation problems in this project.

ix) The operation difficulties in this project.

x) Other additional cooperation issues without listed above.

Q2: In operating and management Kaohsiung Arena, please elaborate the following issues and supplement your opinion if not listed below.

i) The management system of Kaohsiung Arena.

ii) The specialization of operation team.

iii) The specialization of stuffs.

ix) The service quality.

x) The operation risks.

xi) Environment and traffic.

xii) The potential management difficulties.

xiii) Difficulties occurred in operation and management Kaohsiung Arena.

xix) Other issues without listed above.

Q3: In government side, please elaborate the following issues and supplement your opinion if not listed below.

i) The pressure from public opinion.

ii) The interaction with the private sector.

iii) Does the private sector follows the rules?

ix) Other issues without listed above.

Q4: Please elaborate the benefits or advantages gained by government and private enterprise from the BOT project of Kaohsiung Arena?

i) What kind of benefits and advantages gained by the government.

ii) What kind of benefits and advantages gained by the private sector.

iii) Other issues without listed above.