Vapourware and the agency of ideas

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'Vapourware'—computer hardware which is promoted as forthcoming but which is never manufactured—has received little attention in Design History, although it is important. Vapourware often has a direct influence on the future development of computing technology—causing competitors to reconsider, alter or even stop their planned activities. This paper shows that often, product concepts themselves influence market expectations or desires for future technological developments. Proof, in fact, of the agency of ideas.

1. Introduction

This paper discusses the phenomenon of 'vapourware'—prototype designs for computers which reach the final stages of development and are promoted as forthcoming products, but which then fall at the final hurdle before being offered for sale. They are often product concepts that stretch the very boundaries of proven technology or market territories, but which fall from view without trace.

Writers of Design History and the History of Technology have previously discussed different aspects of product failures, by turn taking the perspectives of Technological Determinism or the Social Construction of Technology (Bijker, Hughes, & Pinch 1987) as analytical approaches to discuss the various explanations for the demise of different computer products. The reasons cited are legion, including the lack of a suitable market for a new product; the failure of a product to perform as expected or to 'fit' the needs of its target user group; the lack of a robust infrastructure of peripheral hardware or software; or 'path dependency'—the stranglehold of established products proving too difficult to overthrow.

Vapourware products, by contrast, are not subject to these particular forces, as they are never actually exposed to the acid test of market success. Vapourware 'fails' (if indeed it can be said to fail at all) for different reasons–often, but not always, the inability to make a new technology reliably functional; the lack of available funding required to fully develop or productionize prototypes; or the missing of a particularly narrow window of opportunity for a new product in a rapidly and ever-changing technological market.

The fact that vapourware doesn't get to market, though, does not mean that it is of no importance. The fact these products are announced if not sold is a key aspect, as it means the function and form of an intended product are known to an audience, even if the actual product does not appear. Through numerous case studies, this research has shown that such announcements often have a direct, causal influence on the future development of computing technology—causing competing companies to either rush to market, change direction, or drop their own lines of product development completely. The promotion of non-existent products has even been key in competitors creating completely new markets for products that perhaps otherwise would never have appeared.

2. Early Vapourware

The computing industry has a longer history than many imagine, especially if one traces the origins of calculating devices back to the abacus. Even discounting such simple devices to concentrate only those enabling automatic programmable calculation, the history goes back almost 200 years. Interestingly, so too does the history of vapourware. In fact, wherever there has been a computer of any description successfully marketed, there have been associated examples of machines that did not go into production at all.

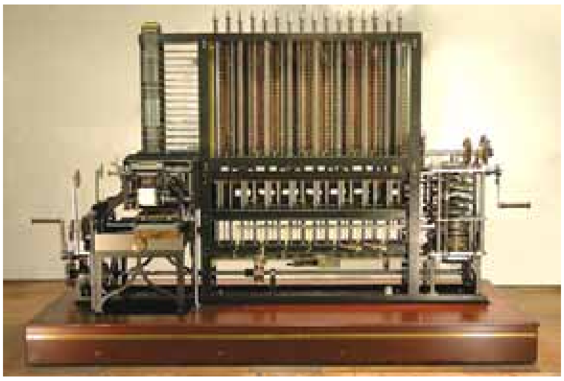

Figure 1. Reconstruction of Babbage's Difference Engine, 1991. The first piece of vapourware? (photo by Doron Swade).

One of the people most commonly labelled by historians of computing as the 'father' of the computer, Charles Babbage, has been described as being 'equally famous for two things: for inventing vast computers, and for failing to build them' (Swade 2004). Starting in 1821, Babbage spent the last 50 years of his life trying to perfect his Difference Engine and his Analytical Engine—huge mechanical contraptions that would produce error-free mathematical calculations. Babbage's ongoing efforts were widely celebrated in late Georgian and Victorian England. His highly ambitious design for the Difference Engine (fig. 1) called for the accurate assembly of 25,000 precision-engineered parts, but after a decade of development and the spending of the then enormous sum of over £17,000 of public money, all he achieved was a prototype mechanism—a small part of one section of the machine. His work, though, inspired many who followed in his footsteps, in-

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cluding the Swedish inventor Pehr Georg Scheutz, to create working difference engines such as the Scheutzian Calculation Engine of 1837, albeit of lesser capability than Babbage's proposal. The government finally withdrew from funding Babbage in 1842, at which point, his prototype section was consigned to a museum. Yet it is a testament to how advanced and influential this design was that, forty years after its conception, it was displayed in London alongside other commercially available calculators at the International Exhibition of 1862. The exhibition showcased the latest advances in technology, and the jurors of the Exhibition stated that Babbage's machine was still of 'a higher order' than those available. (Purbrick 1993). Babbage's inability to complete the machine was thought for many years to have been due to the limitations of Victorian manufacturing technology. However, in order to celebrate 200 years of Babbage's birth, the Science Museum in London recreated his Difference Engine in 1991 using manufacturing processes and tolerances achievable in his time, and it worked perfectly.

3. Personal Vapourware

At every stage of the computer's development into the machines we know today, there have been examples of vapourware that have had influence on the wider computer industry. As computers began to be manufactured by more companies, the opportunities for machines to be developed but not released increased accordingly. Often, this was because smaller companies set up to manufacture computers with little experience and few resources, but occasionally such drawbacks occurred in the largest, most experienced and best resourced companies.

IBM was one such company. The world leaders in business computing had, by the mid 1950s, built 70% of all the computers in the world. Consequently, when one of their own directors, Bill Lowe, told them in the early 1970s that business computers would be replaced by personal computers, the Executive Board would not listen. In the mid 1970s, Lowe had in-house Industrial Designer, Tom Hardy, produce working prototypes of home computers—small, powerful, brightly coloured machines that used a domestic television as a display (a low-cost route eventually adopted by most manufacturers). Despite these being radical proposals that would have established IBM as clear leaders in a new market, the executives were not convinced of the potential for personal computers. In 1977, three competitors launched successful home computers that together, kick started a whole industry. By 1978, the Commodore PET 2001, the Apple II and the Tandy TRS-80 had sold in their thousands, and IBM executives started to take notice. When the spreadsheet package VisiCalc for the Apple II was launched in 1979, Apple became a threat to the office computer market, and they really started to worry. Finally, the Executive Board asked Lowe to produce a personal computer.

It was no secret that IBM was not the fastest in producing new products. In fact, the internal processes were so convoluted that it took three years to go from concept to production. Lowe knew

Figure 2. The IBM PC, 1981. The direct result of a vapourware proposal (courtesy of IBM Archives).

that this was far too long for an industry that was moving more quickly than ever before. The only chance of getting a product to market quickly enough was to bypass the usual processes, but he knew he would never be given permission to do so. To force the issue, Lowe met with a smaller company that had recently launched a home computer used mainly for playing games. Unbeknown to management, he had one of these products upgraded, redesigned by Hardy into a package that followed IBMs design language, and badged it as an IBM product. He then presented it to the board, saying that the only way they could get into the market fast enough was to buy this smaller company and rebadge their products. The board was not amused. The very idea that the largest computer company in the world would be reduced to buying a 'toy' was complete anathema. Lowe then told them that the only alternative was to give him complete freedom to disregard IBMs internal processes to get a product to market within a year. Stunned, the board agreed and Lowe went outside of IBM to use many off-the-shelf components to build the IBM PC (fig. 2). It proved to be one of the most successful computer designs of all time, and became the industry standard. But this was partly due to the fact that, because of its construction from existing parts, others could so easily copy it, which proved to be the thin end of the wedge in the decline of IBMs fortunes.

4. Portable Vapourware

Xerox, the world's largest manufacturers of photocopiers, was another well resourced but risk averse company. Aware that their patents on photocopiers were about to expire, releasing their stranglehold on the industry, Xerox assembled a team of the best computer researchers in their Palo Alto Research Center (PARC) and set them to invent new products. PARC were exceptionally good at this, although almost nothing they created made it successfully to market. One example was the Xerox Notetaker. As soon as he arrived at PARC in 1970, its designer, Alan Kay, inspired many people to try and develop a truly portable computer through his vision of the 'Dynabook'—a computer that looked like a large notepad, that could be drawn on with a pen, and was so simple to operate that even a child could use it (Atkinson 2008).

Figure 3. The Osborne 1, 1981. Closely based on a piece of vapourware (courtesy of oldcomputers.net).

The Dynabook was technologically out of reach at the time, although Kay was convinced he could make it happen if he were given the necessary backing. Xerox management were not supportive, and so in 1975, Kay started building a computer that was a 'stepping stone' towards his grander vision. The result, the Xerox Notetaker (fig. 3), had much of the capability of a larger computer system being developed at PARC, the Alto, which was the first with a Graphical User Interface (GUI) operated by a mouse. When the technology of the Alto was crammed into the Notetaker, it was the size of a small suitcase and had a small touch-sensitive screen, a floppy disk drive, a GUI operating system, 128k of memory (powerful for the time) and network capability. It also boasted a microphone, stereo speakers, and a rechargeable battery. The components alone were worth around ten thousands dollars (Hiltzik 2000). The downside was the weight—over 20kg (45 lbs), meaning there was no way it could be carried by children, and not easily by adults. By June 1978, Kay's team had produced ten fully working prototypes to show Xerox management that it was indeed possible to produce a high-performance portable computer. It was tested in the field, and even used successfully during airplane flights. The team spent the best part of a year presenting the Notetaker to Xerox executives across the country, but despite numerous promises, nothing happened. In despair, Kay left and never returned to PARC. The Notetaker was never put into production, but Adam Osborne, who was well aware of Kay's design, built an almost identical, much cheaper, less capable but just as heavy computer, the Osborne 1, This is often stated as being the first successful mass-produced portable computer and despite its drawbacks was massively influential, spawning numerous clones from competitors and defining the accepted form of portable computing for a number of years until the appearance of cheaper laptops.

5. Pen-based Vapourware

One of the best-documented cases of vapourware was part of a development in the computer industry that promised a whole new world of computing products. Pen Computing, a method of interacting with computers by writing commands onto the screen rather than typing instructions, was hailed as the future for computers with complete certainty by those involved. At one point in the early 1990s, almost every computer manufacturer was developing a pen-based machine (Atkinson 2008). The GO Computer was the product everyone was talking about, and its writing-based operating system, PenPoint, was seen as a more natural, intuitive way to interact with computers (Kaplan, 1994). Computers that were operated with pens had been produced a few years before, but these were half-way houses—machines that used existing mouse and keyboard-operated interfaces and merely replaced the mouse with a pen and the keyboard with an onscreen version. True Pen Computing offered much more—full handwriting recognition and whole commands that could be replaced with gestures made by single strokes of the pen in electronic ink. The computer industry

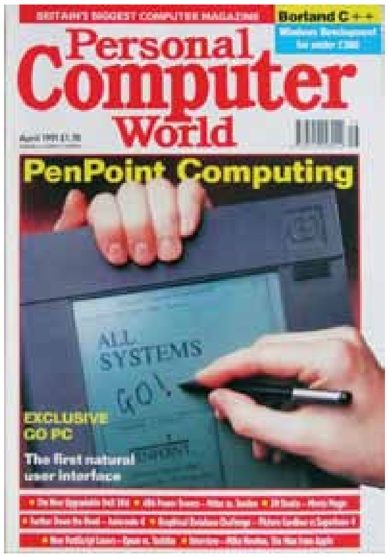

Figure 4. The non-existent GO Computer was even reviewed in magazines (photo of cover by author).

From the word go, GO made no secret about its intentions, and had announced its forthcoming product as soon as it had a working prototype (fig. 4). The problem was that the prototype was nowhere near production quality, and a whole series of technical problems kept emerging, sending the development team back to the drawing board. It proved impossible to write on the LCD screens without damage, the addition of a sheet of glass made the pen appear to 'float' above the 'ink' on screen, the components that tracked the position of the pen wouldn't work properly, and assembled prototypes burst into flames for no apparent reason. The expensive product development process meant that the directors had to constantly search for more financial backing and sign parts of the company over to strategic partners in recompense. The lengthy delays also gave the competition, namely Microsoft, the time to announce their own version of essentially the same device and give mocked-up video presentations of their designs in use, giving the impression they had a finished product almost ready to launch (which they didn't). As a result, all the developers that were writing third-party software for GO switched to work with Microsoft. In the end, GO created a spin-off company, EO, to manufacture the hardware and changed direction to become purely a software company. By this time, the industry was starting to become very disillusioned with the whole Pen Computing project, and the bottom fell out of the market before it had even got going. Manufacturers continued to try and develop and launch products, but with little success. Pen Computing took a different route, and emerged in far more successful but less capable products in the form of hand-held Personal Digital Assistants (PDA's).

6. Conclusions

There are obviously far more cases of vapourware than there is room to discuss here, but even these few examples demonstrate the different and significant impacts that immaterial products can have. Babbage's Difference Engine and the Xerox Notetaker both inspired others to make significant advances and successfully produce real products that had a tangible effect on the direction of computing, even if the machines they produced did not reach the technical heights of the original concepts. The dream of Pen Computing embodied in the GO Computer drove the whole industry to explore a possible alternate path for computers and the creation of myriad products that pushed the boundaries of computer technology, even if those products went on to fail in the marketplace. The widespread public dissemination of the concept raised awareness among potential users and made them consider what computers could be like, arguably clearing the way for the ready acceptance of smaller, simpler pen operated devices in the form of PDAs. The personal computer prototypes produced within IBM had a very specific and localised impact, but nevertheless were directly responsible for the creation of a product that completely altered the course of computer history and opened up the computer industry to a much wider range of manufacturers. Indirectly, this led to the widespread mass production of compatible machines, huge reductions in the cost of computers and supported a change of the perception of the computer from a high-end specialist piece of equipment to a quotidian, status-free product.

These are not the only effects of vapourware, but they at least prove a significant point. While the focus of much of design history focuses on the consumption of mass produced products, and great play is rightly made of the powerful forces of social construction, there remains an area of study of products which never made it into manufacture, never appeared in the retail market, were never subjected to the capricious test of public opinion and yet which still had significant effects of the development of computer history. The mere concepts themselves were enough. These pieces of vapourware are indeed proof, if any was ever needed, of the agency of ideas.

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About the author

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