PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A MATHEMATICAL, PHYSICAL & ENGINEERING SCIENCES

The Consumer and Electronics from a British Viewpoint [and Discussion]

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The consumer and electronics from a British viewpoint

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History shows that the U.K. has been exceptionally receptive to the introduction of new consumer electronic products and that each has followed a nearly identical cost–volume curve. There are thus clear messages for any vendor seeking to introduce a new service or product in the future.

1. Introduction

This paper presents a non-engineering overview of the British consumer electronics market. I read history at university but until recently I was Managing Director of Mullard, the British component subsidiary of Philips and was thus intimately concerned in the way that the consumer used the technology. This paper addresses the way that British consumers have accepted electronic technology and the lessons that can be drawn from that acceptance about the introduction of new technology in the future.

Although it is obvious, it is worth making the point that technology is only an enabler to allow information or entertainment to be received by the user. It seems to be pure serendipity when new forms of technology coincide with new market demands to create new products or services. It does not always happen like this. For many years the laser was discussed as a solution awaiting a problem, but, as we know, the waiting is now over. The existence of technology is not enough. There has to be a proper need. In addition the proliferation of technologies available today means that needs can now be satisfied in more than one way. A good example is to be found in optical electronics. A highly innovative technology such as the videodisc was unfortunate enough to appear on the scene just as video cassette recorders (VCRs) were becoming available. As a result, it has not made the immediate impact that otherwise might have been expected. The prospect of similar lack of immediate success in a number of other areas must be accepted as the inevitable result of the proliferation of technologies.

2. History of new consumer products in the U.K.

Having said this, let us examine how the consumer in the U.K. has accepted new technology since the end of World War II. There has been a faster acceptance in the U.K. than elsewhere in Europe. The record shows that if the British consumer can perceive a satisfaction for himself in new technology, he is very willing to take it up. Looking at specific cases, we find that the technology that interests him is one where he is offered entertainment and/or information that he can receive in the sequence he choses and at the time of his choice. Good examples of this include Teletext and the VCR.

The first three figures show the rate of take-up of new technology in the U.K. Figure 1 shows it for colour televisions in the U.K. contrasted against France and West Germany, while figure 2 shows VCR take-up around the world. Notice that the U.K. was ahead of Japan until 1985.

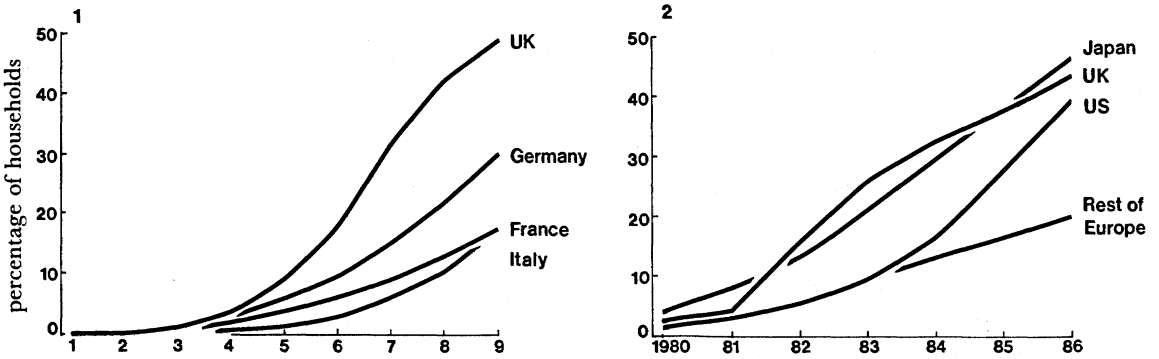

FIGURE 1. Colour TV penetration in years from introduction (U.K. is 1967).
FIGURE 2. Household penetration of VCRs (source: Philips Eindhoven).

Figure 3 shows similar data but for home computer development. In each case the U.K. is the fastest-growing market. Also it is clear that the saturation curve for new successful products reaches 50% in eight years as is shown in figure 4. Even in cable TV, which has been slow to develop in Britain, take-up by homes passed is on the same curve. In part, these curves result from the form of retail distribution in the U.K., which is characterized by the marketing strength of its rental companies and large retailing groups coupled with their combination of offering different pricing methods and affordable prices. It has also been helped by technological price fall.

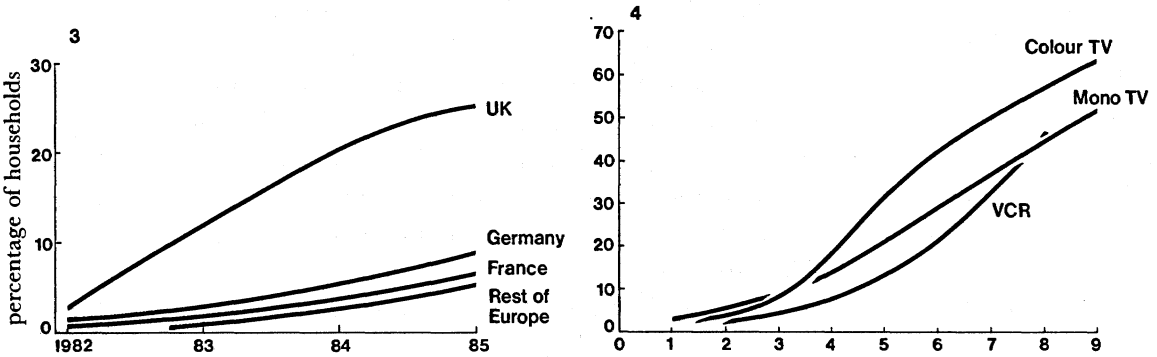

FIGURE 3. Home computer penetration (source: CPMS).
FIGURE 4. Percentage penetration in the U.K. in years from introduction.

Figure 5 shows the relative price fall in real terms of TV sets in the U.K. compared with small cars. A 22 inch (56 cm) TV set was half the price of an Austin Mini in 1970; it is now 10% of the price! Thus people expect electronics to be relatively cheap and to come down in price over the years. This is not a new situation. Figure 6 shows the impact in real terms of electronic products and the consequent growth of demand. To derive this, the price of the item has been normalized by dividing it by the average weekly wage of a man who is over 21 to establish the time it would take him to pay for the product. This approach removes the effects of both inflation and growth in real income. In 1946 it would take the average man 15 weeks to buy

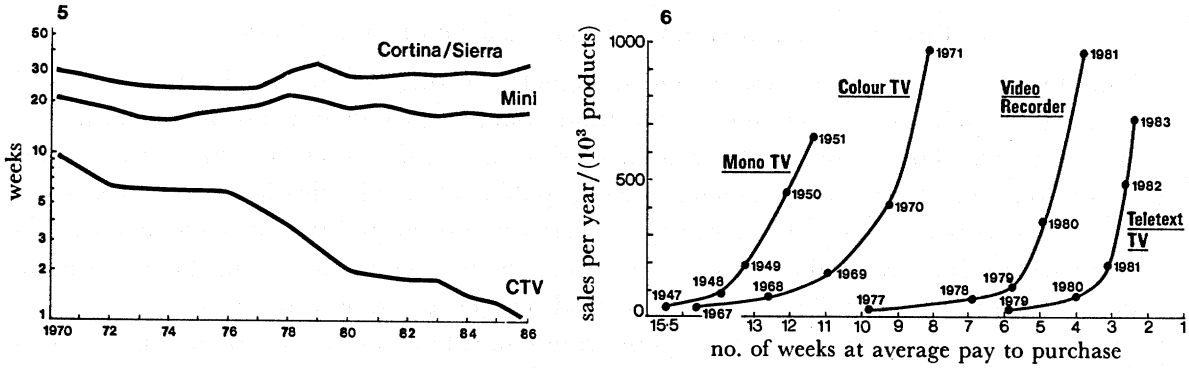

FIGURE 5. Relative time to earn a car or a colour TV.

FIGURE 6. The initial sales growth of consumer electronic products during the first five years from launch (prices expressed in no. of weeks average pay).

a monochrome TV dropping to 11 weeks in 1951. Colour TVs started only a little cheaper in 1967 and dropped to 9 weeks by 1971 (and now corresponds to about two days earnings for a 14 inch set!). Even lower figures apply for the VCR and Teletext receiver. The growth patterns are similar in each case.

The next new product will be satellite TV and the likely starting cost for a dish and decoder will be under two weeks wages! Hence, the determining factor will not be the cost of the equipment, but the quality of the programmes. It is the perceived satisfaction that will determine whether or not a purchase is made. A good example of the negative aspects of this effect was the failure of the concerted Japanese push to establish MSX as a home computer standard operating system. It failed because the home buyer bought programs, not an operating system, and was able to buy better programs – games, word processing, etc. – to run on other systems. No one buys technology for its own sake unless he is an enthusiast. It is what technology offers or enables him to do that counts.

It is intriguing to note, particularly in view of the comments later in this paper, that the growth of most of the above markets was achieved without government subsidy. Indeed, it should be noted that Government taxation policy until the end of the 1970s was positively harmful to the industry, so that the markets grew despite government policy.

It is salutary to see what an increase in choice will do to a market. In the 1970s, the viewer could only receive three TV programmes in the U.K. and the consumers bought about 3 million monochrome and colour sets per year. During the 1980s we have added Channel 4, VCR and home computing and sales of TV sets have grown to 4.3 million per year. With the addition of more material by means of satellite, new terrestrial channels and cable, the market can grow to over 5 million sets per year, implying that nearly 25% of households will acquire a new set each year. Hence it may reasonably be expected that the average household will eventually have at least one set per inhabitant (plus one!). There are many people who will view this with horror, but it is none the less likely to be true. The implications of this growth of viewing on advertising or programming design have not yet been fully recognized.

All the foregoing supports the thesis that the U.K. is a market that will accept new ideas in technology and see them effectively exploited provided that the consumers can see value to them in the entertainment or information that technology brings.

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3. The role of optical fibre and competing systems

This brings us to fibre optics, which are revolutionizing telecommunications and will continue to do so by extension of their application from trunk routes down to offices, businesses and institutions. For example, the existence of a cable infrastructure with large surplus transmission capacity will make it much easier for public telecommunication authorities (PTTs) to react to increased demand for new lines and services and the ability to provide new services quickly greatly encourages their further use. However, the main prize lies in the extension of fibre optics into the home. There are many good reasons for doing this. For example, in the longer term, the demand for point-to-point communications between mobile customers in telephony will be such that there will be great pressure for the finite bands of radio frequencies currently used for entertainment to be allocated for cellular and cordless telephony. As we move further into an information-based world, more people will demand direct access to information to each other so as to participate in the full range of services and opportunities made available by two-way communication. In the longer term this will require a frequency bandwidth greater than that available from existing systems. However, so far as the private consumer is concerned and like the laser, fibre-optic systems are a solution looking for a problem, and the author, along with many others, has been shown to have over-estimated in the past the speed in which the consumer would wish to have such a facility. That there will come a time when fibre-optic connection will be needed is not doubted, the problem is when will that time be? If we examine the situation in the U.K., where the present government is clearly unwilling to invest in the electronic infrastucture itself, then we must look to market forces to drive further developments. The problem is, of course, that cabling represents a very considerable front-end cost and recent experience has shown that not many investors are prepared to take the risk. At the moment, there is some improvement as transatlantic investors, encouraged by the recent success of cable in the U.S.A., are anxious to invest in cable in Britain, but they are not likely to be enthusiastic about interactive systems because there are too many uncertainties. Indeed, one has still to persuade the consumer that the services he will get are worth the price. So far not enough consumers have seen such services as being sufficiently attractive to make them viable. There are some examples of banks using viewdata for home banking, but not enough companies have found it worth much effort to encourage the consumer to support such interactivity.

There is a considerable demand for one-way communication. In the past the conventional technology for one-way communication was terrestrial broadcasting. We now have the VCR and also, although it has been slow coming in Europe, the videodisc player (the Japanese are selling over 1 million a year in their own market). Conventional cable TV still has a low overall penetration in the U.K. and hence growth is possible here. The explosion in growth of satellite services is nearly upon us. In recent weeks, Rupert Murdoch and Robert Maxwell, both press tycoons, have announced their plans to use medium-power satellites for direct broadcast to homes and the government is to allow two of the terrestrial services (BBC2 and Channel 4) to use the British Satellite Broadcasting (BSB) high-power satellite should they choose to do so. Hence, people wishing to invest in a dish and a decoder will be able to receive at least 10 different services. In addition the government is considering two extra (albeit not national) services on terrestrial frequencies while others are thinking about the possibility of multiplexing existing terrestrial frequencies to provide extra programmes! There is also the microwave video distribution system (MVDS).

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4. Present to future and the role of government

None of the above technologies provide complete solutions to the needs of the 21st century. However, most of them can satisfy most of the needs of the 20th century. We have not yet seen that the consumer is prepared to spend a lot of money to buy electronically provided information and suspect that he will only do so when the capital cost of the network is covered largely by entertainment services. The problem is therefore that, in a growing free market, the very high setting-up cost of fibre-optic networks will limit their development over the next few years by the competition of these other technologies just as the videodisc was preempted by VCR.

Perhaps the only way in which the process can be made viable is by the large-scale funding of the infrastructure. For a long time, I have been a proponent of such funding on the grounds that a fibre-optic network was similar to a rail or road network, i.e. a system funded by government to enable the rest of society to add value to the economy by using it. Although this view appears to be well based from a technical viewpoint, the reality is that in Britain the government does not agree. For some time it has held the view that it should not try to 'pick winners' any more in technology than in other forms of industrial activity, although earlier in its life, when Kenneth Baker was the minister at the Department of Trade and Industry, it did try to do so. In its present view the market must decide. There is some validity in this. The problem with technology is that it keeps changing, often far faster than governments can modify their policies. As a result, a number of the early experiments in some countries to put fibre-optic networks into the home have proved to be expensive, under-used by the consumer, and very quickly technologically obsolescent.

How, then, can government best play a role? It should try to establish technological standards to enable communication media to be transparent to the user, so that, whether direct broadcasting by satellite (DBS), cable, terrestrial or MVDS is used to provide the signal, the receiving apparatus can interact through some suitable black box or interface. Such standards must be at least pan-European if not international. Knowing from personal experience the pathetic inadequacy of recent attempts to achieve pan-European standards, it is difficult to have much optimism that we can achieve what we need, but with 1992 approaching we must hope for success. If we are successful, then – as better technological solutions appear – they can be adopted by the entrepreneurs or, indeed, government authorities, at the right time without putting off the consumers. Thus, we would avoid making all elements of the structure obsolete at the same time and fibre-optic cable could be brought in on a piecemeal process as demand developed. The only way to produce an organized national process would be to give the task to the PTTs with their high cash flows, which is perhaps possible in France, Germany or Japan but unlikely to be politically acceptable in the U.K.

So, the risk emerges that, like the laser, fibre-optic technology for the home may not prove to be the sensible solution for the next ten or so years unless a much more evolutionary approach can be developed in contrast to the 'all or nothing' wideband cabling proposals generally being discussed at present. This may represent a very parochial British point of view. Perhaps in other countries governments will sustain a more positive role. However, there is as much risk in a too interventionist a role by government, however good its intentions, and there is a possibility that in other countries, governments eventually will follow a similar approach to that currently being followed in the U.K. If this is so, then there may be a delay in the use of large-scale fibre-optic networks into homes even if it does lead to networks better matched

to genuine customer need. In the longer term fibre optics will provide the best solution for the consumer, the suppliers of the programmes and services. The question that remains to be answered has to be... when?

Discussion

W. J. Stewart (*Plessey Research & Technology (Caswell) Ltd, Towcester, U.K.*). If Mr Cohen were to consider the data he showed on the real (week's work) cost of cars and various products, the latter show rapid falls, but arguably represent variations on a single product, whose total cost is nearly constant, rather than brand new products. Would he concur with the view that to succeed wideband needs to offer a *new* product (taking this to include service as well as hardware) such as interactive TV that might really 'change the lifestyle' and thus justify a larger real cost?

I. H. Cohen. I do not believe that the examples I give are of variations of a single product. A TV and VCR are quite different machines, their only common element being that they each give a picture to the viewer. I could give other examples of similar cost reduction, such as the personal computer or the compact disc player.

The common elements are (i) technological price fall, and (ii) the consumer's interest in obtaining value from some form of entertainment or information or education at his or her choice and convenience.

Wideband (and DBS) represents something different because the major cost lies with the system provider, who faces high front-end cost with all the economic uncertainties involved. We on the Information Technology Advisory Panel felt that interactivity was an important feature when we issued our Report on Cable. I do not think we were wrong but the timescales will be extended, as experience to date has suggested.

D. B. Payne (*British Telecom Research Labs, Ipswich, U.K.*). Does Mr Cohen think that the threat of competition might spur faster deployment of either fibre technology within the local network or, in particular, fibre penetration to the residential customer as opposed to the large business customer?

I. H. Cohen. Certainly, as fibre-optic prices fall (not just the fibre, but the components) the incentive to use it will increase. However, many of the applications can be achieved by the use of the existing telecommunications network, and certainly by integrated service digital networks.

For the residential consumer, the wideband capabilities are only essential for true high-definition TV or videophone but the business customer (large or small) fibre optics offer flexibility in a very attractive way. Competition for fibre optics can come in other applications from other technologies. The risk is that some of these could delay in the way I have described, although not eliminate, the spread of fibre optics.

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