Old Structures versus New Logic in the Electronics Industry

Electronics is a branch of industry in which the competitive position of European firms is relatively weak, compared to the chemical, motor vehicle and mechanical engineering industries. This fact appears to some observers – in view of the electronic industry’s high rates of growth and its technologically “strategic” importance – to represent a threat to Europe’s future industrial development. This has led to intensive political discussions in recent years and to a multitude of initiatives for the revitalisation of the European electronics industry. This paper analyses the extent to which the discussions and initiatives have in fact dealt with the problems in hand.

Electronics is an industry in which production locations are distributed worldwide, with globally oriented firms and both public and private international research operations. But above all – and this is the difference between electronics and most other branches – it is an industry which sells homogeneous products throughout the world. Whereas, for example, the “universal car” strategy was less successful, PCs and Walkmans, televisions and mobile telephones look the same the world over. The basis for this is the separation of hardware and software: identical hardware can be adapted by means of specific software to fit specific local culture and demand. This is true of computers and consumer electronics, the largest market segments with 41.5% and 13.5% respectively, but it also applies to communications equipment (13%) and industrial electronics (8%).

Firms have to be present on all major markets – the ability to launch new products on all the large markets simultaneously is a precondition, in view of today’s increasingly shorter product cycles and strong product differentiation, for amortising R&D investments and realising the advantages of mass production.

The actors in the electronics industry and the logic which they follow began in the 1980s to go through a fundamental change – particularly, but not exclusively, in the computer industry. This is true both for relationships between the producers of final products and their customers, the users, and for relationships between component producers and the producers of final products.

The interaction between producer and user until recently corresponded to the usual structure in the marketing of capital goods. It was dominated by the close collusion between information technology (IT) experts in the user firms and the IT producers’ salespeople, which contrasted strongly with the communication problems and conflicts between IT experts and IT users within a given firm. For a long time, the organisation of IT in the user firms was highly centralised because the organisational structures established in the early phase of “batch processing” and centralised data input had survived; and many IT producers (especially the largest, IBM) had organised their firm’s structure accordingly.

This structure has long since been breached by “wild PCs”, i.e. the non-managed, non-controlled introduction of computers by employees; and today, with the almost unlimited possibilities of interoperability among widely differing computers with different operating systems, the technical necessity for centralised procurement decisions regarding hardware is disappearing; (nota bene: this does not apply to software!) IT procurement decisions have been decentralised and the logic is often one of costs: who can supply the computer capacity I need at the lowest price? A logic between producers and users is thus gaining prevalence which does not exist even on the market for consumer durables (where there is generally such a thing as brand loyalty): if the products are largely interchangeable because there are hardly any differences in quality and performance, the price alone is decisive.

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1 Microelectronics account for 10%, other components 13%; calculated according to the figures published in the specialist magazine “Electronics”, January 1990. This magazine has not published any detailed figures on the structure of the market since then, and such data are not available anywhere else (except from market research organisations at corresponding prices).
This phenomenon is further strengthened in the IT industry by two tendencies. Firstly, universal architectures are supplanting individually tailored solutions – dedicated word processing systems and CAD hardware have been replaced by normal PCs and workstations. Secondly, low end systems are supplanting high end systems. At the end of the 1980s the prognosis that PC networks would one day be capable of competing with mainframes caused far more amusement than headaches. That prognosis is today’s reality, and IBM – regarded a few years ago as having the most secure future among the large enterprises – finds itself in a deep crisis, to which it is reacting with radical structural adjustments.

The upheaval in the electronics industry is – in Freeman’s terminology – a case of radical technical change as a result of radical innovations which are changing the direction of development of the entire branch; it is not easy – in view of the fact that the branch as a whole is relatively young – for the participants to accept this.

There are two possible ways for firms to adapt to the new logic: either by submitting to it, or by evading it via product differentiation.

Submission
Submission to the new logic means: venturing into the race with regard to the innovation and prices of standardised goods, making production leaner via the reduction of vertical integration of manufacture and the improvement of response time via debureaucratisation and de-hierarchisation. Submission, however, not infrequently ends in a downward spiral: in order to meet the requirements of lean production, downsizing programmes are designed. These demoralise employees; the best skilled workers often leave the company. Commitment and thus productivity and innovativeness decline; competitive strength is reduced. At the end of the spiral is a firm with fewer workers, less turnover, a lower profit margin and fewer (particularly non-material) assets. In this way a major enterprise can turn into a marginal supplier in the space of a few years.

Submission to the new logic is particularly fatal if it is not combined with a clear improvement in communication with the firm’s customers. The Japanese example (especially in consumer electronics) is very instructive here: when time-based competition became the paradigm of the 1980s, virtually every firm implemented optimising strategies in this direction – and in doing so lost sight of the customer and his/her needs. The result was shorter and shorter innovation cycles for products which were increasingly difficult to operate. The firms increased their efforts continuously and appeared at first glance to be adapting optimally to the new pattern of competition, but their products became more and more difficult to sell.

Evasion via Differentiation
The alternative of evading the new logic by means of product differentiation appears to hold more promise of success, although it is more difficult. It is a precondition for this alternative that trends must be recognised early and that the producer must always have an ear close to the user.

Many IT producers – and especially brand-name suppliers – are, however, very weak in this regard. IBM’s attempts to sell underdimensioned, feeble PCs to private households when the latter were already stocking up on high-performance computers from cheap chain outlets were only the tip of the iceberg. The current activities of a number of brand-name companies are very instructive: in a phase in which ergonomics (e.g. flickerfree screens) are becoming financeable, these firms are still operating in their advertisements with the argument of a low radiation factor. The brand-name producer who, in the present situation, put a quiet PC, with a monitor which did not flicker even if the user did not have intimate VGA programming knowledge, at a good price onto the market, could score a brilliant success. Instead, these firms apparently suspect that now only the price is decisive, and they run after the cheap chains without any great hope of overtaking. It is a typical case of the hare and the tortoise.

It is doubtful whether two other approaches offer a way out:

- Leading-edge products, which are developed and produced specifically for particular applications. One example are those products which are presently being