
“Make or buy”: the potential subversion of corporate strategy – the case of Philips

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Introduction

The point we wish to make is that “make-or-buy” decisions have a direct effect on corporate strategy. A decision to make production equipment “in-house” frequently begins with an assignment given to the research and development department specializing in production technology to solve a particular problem. The results influence corporate strategy, but at the same time corporate strategy also affects the importance attached to, and the policies adopted for, research and development. In response to technological developments large enterprises engage in an ongoing re-evaluation of their core activities. For example, a former producer of heaters is now transformed into a producer of integrated heating systems. In response to changes in market structure in the 1980s large corporations used to choose a strategy of diversification. Nowadays they favour a return to core activities and “make-or-buy” decisions interfere with this.

Market structure and technological development

In the mid-1970s the sellers’ market turned into a buyers’ market. Throughout the era of the sellers’ market whatever products were technically feasible to produce appeared on the market and were sold in large quantities. In this period companies were dominated by technology and its engineers. The engineers were considered the “uncrowned kings of the company”. They worked hard to perfect each product which originated in their research labs, confident that as soon as it reached the market customers would be queuing up to buy it. For a long time this was exactly what was happening. The result was that “the products were often overengineered, overpriced and late on the market” (Lorenz, 1986, p. 104). As a result of the worldwide recession, things were changing in the 1980s. The orientation ceased to be determined by technological feasibility and shifted to the market. Next to this the arrival of the cheap microprocessor and the inexpensive memory chips influenced companies’ orientation. Until then the applications for new inventions were first sought in the domain of systems for industrial use. Only later, after they had matured in this use, was their application in consumer products ventured. The microprocessor and the memory chips upset this order and in some cases even reversed it (Pannenberg, 1987, p. 1046).

Technology and corporate strategy

In the 1980s the important developments in production technology can be listed under three headings: first, computer-aided manufacturing (CAM), flexible manufacturing systems (FMS) and robotics; second, computer-aided design (CAD) and paperless knowledge work; and third, increased understanding of physical phenomena. Their combination provided the basis for computer-integrated manufacturing (CIM). In practice these trends led Philips to “miniaturization” (smaller, cheaper products), narrower definition of tolerances (avoidance of non-conformities) and the integration of functions.

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Globalization

The changes in both technology and market structure caused a revision of market strategy. As Prahalad (1987, p. 24) observed, until the 1980s multinational companies’ main problem was the co-ordination of their national corporate policies. Since then they changed from being companies in many countries into truly global concerns. The new managerial “watchword” became “globalization”.

The four most important general factors encouraging globalization were, and continue to be, the growing capital intensity of manufacture; the accelerating tempo of technologies; the emergence of a growing body of universal users; and the growth of neoprotectionist pressures.

The growing capital intensity of manufacture commends even larger economies of scale than in the past. In spite of the spreading of flexible manufacturing systems (FMS) providing cheap, short production runs, this is, and will probably remain, a major source of globalization. The accelerating tempo in which new technologies are discovered and applied makes the cost of R&D soar, while the diffusion of new technology through the industrialized countries has become so much more rapid than in the past that technological advantage is increasingly hard to attain and to sustain. This forces companies, which are planning to penetrate the “triad” (i.e. Japan, the USA and Europe) with new products, to “invade” the entire zone simultaneously rather than gradually on the old country-by-country pattern. The emergence of a growing body of universal users on a more massive market scale than ever before also pushes companies in this direction. Finally, the revival of neoprotectionist pressures is forcing multinationals to attempt the extraordinarily tricky balancing act of becoming “true insiders” within each country, while at the same time “going global” in product development and production.

Coalition

Coalition forming as a specific type of co-operation accompanied the globalization strategy. It is noteworthy that coalitions are different from mergers and takeovers. They allow participants to retain their relative independence. This was referred to as *the* new way of running an enterprise. The reasons behind this urge to co-operate are fairly obvious. It provides the opportunity to establish a position in strategic markets; it has a synergetic

effect by recruiting partners to fill gaps in one another's operations; it increases the exploitation of economies of scale; it leads to cost and risk spreading; and it also helps to arrive at new standards. Kenichi Ohmae (1985) listed several examples of this type of co-operation. In aero engines, General Electric and Rolls-Royce; Pratt and Whitney-Kawasaki-Rolls-Royce. In motor vehicles, (components and assembly) GM and Toyota; Chrysler and Mitsubishi; Volkswagen and Nissan; Volvo and Renault. In consumer electronics, Matsushita and Kodak; JVC, Telefunken and Thorn, Philips and Sony. In computers, AT&T and Olivetti; Hitachi and Hewlett-Packard; Fujitsu, Amdahl, Siemens and ICL; IBM and Matsushita (Lorenz, 1986, p. 138).

To obtain these ends Philips co-operated with Sony in the field of compact disc players and with Matsushita and Yamaha in efforts to establish a standard for interactive CD and CD-video.

A detailed study of technological alliances into which Philips had entered, and of the multiplicity of relationships with companies that are working in tandem with Philips (with five or more co-operation agreements), was published in 1989 (Hagedoorn and Schakenraad, 1989). The list is headed by 27 agreements with Siemens, and is followed by 11 agreements with Thomson, ten with Matsushita, eight with Bull, Olivetti and Sony, seven with AT&T and Bosch, six with DEC and Nixdorf, five with Alcatel (CGE), Hewlett-Packard and STC (+ICL). The co-operation with Siemens was primarily in the sphere of integrated circuits, software and telecommunications. The majority of the joint ventures (28 per cent) were in the field of consumer electronics, while most of the R&D agreements were in micro-electronics (27 per cent). Of the registered inter-company agreements, 43 per cent were finalized between 1986 and 1988.

During the same period the proportion of alliances in professional products and in the systems sector (including production automation) rose from 10 per cent prior to 1986, to more than 13 per cent between 1986 and 1989. But the number of alliances in micro-electronics fell considerably at this time. The earlier mentioned type of alliances and coalitions, which in the opinion of Kreiken (1986) may be seen as a kind of inter-organizational growth strategy, were internationally popular. The strategy was especially favoured by capital-intensive industries with high R&D costs and a broad technological base. The aircraft and electronics industries, and increasingly the motor vehicle industry, serve as good examples. Even the largest enterprises felt that they could no longer afford the independence which they had previously been guarding jealously. In view of this change in the multinationals' industrial concept, Kreiken predicted that interest in this strategy of coalition rather than independence will continue spreading. The strategy not only improves the coalition members' competitive position but also can influence countries' national industrial structures in a manner conducive to the maintenance or strengthening of the competitive advantage of the coalition as a whole.

Core activities

The choice of coalition partners has been derived from the companies' core activities (the third element in recent corporate strategy). However, concentration on core activities is subject to certain constraints. These come to light when questions are raised about how broad the basis for high-tech development should be within a company. Core activity strategies, like globalization and coalition forming, are consistent with the dominant pattern of strategic planning. To maintain international standards large enterprises need to specialize. Stopfort and Dunning (1983) explain that the tendency to concentrate on core activities springs from firms' desire to improve competitiveness and to reduce the cost associated with the increasing complexity of their operations. Dosi *et al.*(1987) pointed to the risk of competence destroying diversification when firms prematurely or inadvertently step outside the technological and market paradigms with which they are familiar. Such moves lead to a failure in both the new and the old.

Philips' new long-term strategy was to divest itself of the diversification which had sprouted in the course of its history and to concentrate resources on its core activities. In the words of Philips' top German manager the strategy in 1987 was to concentrate resources on core activities and on key technologies and growth markets (*Industriemagazin*, 1987). In line with this policy the company terminated its involvement in the white-goods sector (dishwashers, etc.) and in January 1989 transferred them, together with its interests in other large household appliances, to Whirlpool International. The latter concern is a joint venture with 53 per cent participation by the Whirlpool Corporation (USA) and 47 per cent by Philips. Other activities of which Philips divested itself in the course of 1986 were NKF cable manufacturing; a cabinet factory in Roermond; Baker, Knapp & Tubbs, the American furniture manufacturers; the German concern Felten & Guillaume; and the Irish Unidare. Philips' cardboard manufacturing had already been discontinued earlier (Boswal and Oppewal, 1987, p. 5). By December 1987 the company had clearly determined that lighting, components, consumer electronics, information technology and communications were the concern's core activities. In line with this Philips is one of the producers participating in the tender for the "electronic highway" in the USA. In spite of this Philips did not ignore the opportunity when it arose to take up some "extra" core activities in public sector telecommunication and medical systems. The same is true for production equipment.

The opportunity to produce production equipment in-house arose as a result of the rise in electronic machining. A very important consequence of this new FMS technology, as Ramchadran pointed out, is that size, formerly a *conditio sine qua non* to obtain economies of scale, is no longer a barrier to whichever market one desires to enter (Ramchadran, 1986, p. 69). So many electronic companies have been confronted with the decision whether or not to incorporate the production of production equipment which contains a major electronic input in their core activities. A description of how this process fared with Philips will follow.

Make or buy

As already said, most large multinational corporations are faced continually with the “make-or-buy” dilemma, especially in the field of manufacturing technology. The advice offered in the early 1980s by Robert Hayes and the late William Abernathy was that “companies can make products more profitable by investing in the development of their own process technology” (Hayes and Abernathy, 1980, p. 74).

The generally accepted belief is that to maintain a prominent position in the market of the core products of a firm it is necessary to maintain a leading position in manufacturing technology (Pot and Verwoerd, 1986, p. 236). Moreover, an important trend in manufacturing is that while in general the number of components of a product is diminishing their complexity increases. The know-how that goes into the manufacture of, say, a television set is more and more in the sub-assemblies (in welding and adhesive technologies) than in the main configuration. This explains the increasing strategic importance of the chip industry and of production equipment for the entire electronics sector. In line with this, as we elaborated elsewhere, labour costs in the final assembly of many products are no longer a major factor. At Philips already in 1987 material costs (inclusive of energy costs) were 70 per cent and added value 30 per cent, where the latter figure not only includes labour costs (which make up half of these costs at most) but also depreciation and overheads (Manders, 1990).

Philips was, and still is, an important supplier of electrical components and integrated circuits. In the days of wired electrical components the production of equipment for mounting wired components had always been entrusted to well-established producers (notably Universal). The technological change from wired components to chips was of vital importance. The decision to develop chip-mounting equipment in-house heralded the introduction into the company of a new technology which has since become the contemporary SMD (surface-mounting devices) technology. The chip producer’s ability to supply flexible component-placing equipment, suitable for small batches, guarantees him a lucrative share in the chip market by virtue of effectively creating “captive consumers”. Toshiba was supplying components in conjunction with a placing machine. Moreover, if Philips did not act quickly, the standard method of packing the chips would be determined by competitors. At that stage there were three modes in use alongside one another, namely: bulk packaging, in (push-out) strips, and in stacks, but it was clear that customers wanted to see standardization to become less dependent on a single component supplier.

The workgroup at Philips which was concerned with modular chip-mounting (MCM) development soon reached the conclusion that an interesting market in component-placing machines existed and they were confident that Philips had sufficient know-how about production technology equipment at its disposal to enable it to enter this field. The only elements which were lacking were marketing and after-sales service organizations.

A further significant factor was the fact that an in-house customer, the Consumer Electronics Division, had brought a sense of urgency to the project by announcing that it would require seven machines within a couple of years.

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Besides chip-mounting equipment, Philips decided in the early 1980s to develop in-house a more flexible transport system for the production of TV sets. At that time the company was not engaged in competition with the existing transport system suppliers and had no wish to be so. On the other hand, it was already obvious at that juncture that the requirements set for the transport of products were going to be entirely different in the near future. In both technological and commercial terms the transport system and the component-mounting machine proved to be a success. This confronted top management with a choice: they could simply sell the production rights to established equipment suppliers, or set up a new product division “Production Equipment” and become fully-fledged production equipment manufacturers in direct competition with their former suppliers. Since it was already apparent that production equipment would be making more and more use of micro-electronics, in which the concern was specialized, the choice was a pressing one. Company policy on this point turned out to choose the first alternative: to produce and market the equipment themselves as a sideline. At present, the flexible assembly and transport systems are in demand in the automobile, electronic and light mechanics industries. They are the logistical backbone of these industries. For example, in 1993 Ford Canada awarded Philips electronic manufacturing technology contracts for three assembly lines in the Toronto plant because of its reliability. Moreover, Philips’ Industrial Electronics Division has become the biggest supplier of surface-mounting devices systems for the American automobile industry (for example, Delco Electronics).

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The role of research and development

A major element in the make-or-buy process under consideration has been related to the results of R&D. In several electronic corporations the strategic option of remaining at the forefront of manufacturing technology found a concrete expression in the creation of R&D departments directed towards the development of production equipment, and in the strengthening of large plant-mechanization departments to serve the automation needs of companies. In 1968 Philips established its Centre for Manufacturing Technology (CFT); in 1970 Toshiba set up a Manufacturing Engineering Laboratory (MEL), and in the following year Hitachi founded its Production Engineering Research Laboratory (PERL).

In general, an important fact informing R&D strategy is that the expenditure involved in research and development has soared in a relatively short time. The growing use of information technology has increased the capital intensity of the laboratories and institutes and the manning of the laboratories has changed in the sense that there are more highly qualified personnel and fewer assistants. In view of this, and because the profitability of R&D is usually unpredictable, large enterprises often apply only simple rules of thumb to determine their

R&D budgets. Dosi explains that as a result of this “firms tend to work with relatively general and event-independent routines with rules of the kind ... spend x per cent of sales on R&D ... distribute your research activity between basic research, risky projects, incremental innovations according to some routine shares ... and sometimes metarules of the kind ... with high interest rates and low profits, cut the basic research, etc.” (Dosi, 1988, p. 1134).

The earlier mentioned strategy of coalition becomes particularly visible in the approach to R&D. It involves the establishment of joint research enterprises – research consortia. The American SEMATECH (Semiconductor Manufacturing Technology Institute) consortium, set up in November 1986, can serve as an example. The new consortium was sponsored by the five largest chip producers in the USA: Texas Instruments, Motorola, National Semiconductor, Advanced Micro Devices and Intel, as well as by IBM, Digital Equipment and Hewlett-Packard (Roobeek and van Tulder, 1987, p. 35).

Another phenomenon concerning R&D which is important (at least in industries involved in micro-electronics and in information technology) for the analysis of the make-or-buy choices is the change in the former tendency for new developments to find their first applications in systems for industrial use (i.e. in capital goods), and only later in application in consumer goods. The advent of the cheap micro-processor has disturbed, if not reversed, this sequence. This change has led to increases in expenditure on research, to a closer integration of R&D in corporate policy, and to an increased emphasis on the promptness with which R&D findings are translated into commercial success, i.e. to shorter lead times. Co-operation, subcontracting and the acquisition of licences have become important elements of R&D strategies.

Conclusion

The analysis of various sub-strategies and the empirical data gathered at Philips (and to a lesser extent at other relevant large enterprises) confirms that make-or-buy decisions can more often than not subvert multinational corporations' core activities. It shows that decisions, particularly in the sphere of production technology, can signal the beginning of a process which will eventually result in changes in the character of the MNC. They can effect a shift in its core activities and range of production. The R&D activities which inextricably accompany a “make” decision may substantially influence the corporate strategy of MNCs even in enterprises whose core activities are essentially far removed from producing production equipment. It also confirms that the transformation in the mid-1970s of the sellers' market into a buyers' market had far-reaching consequences for changing multinational enterprises into global concerns which concentrate on their core activities. It was the combination of both the technological revolution and the reversed market situation which gave R&D its strong influence on managerial strategic planning, and it was this strategic planning which determined the general course of events.

References

- Boswal, M. and Oppewal, J. (1987), *Intermediair*, 19 June, p. 5.
- Dosi, G. (1988), "Sources, procedures and micro-economic effects of innovation", *Journal of Economic Literature*, Vol. 26, pp. 1120-71.
- Dosi, G., Teece, D. and Winter, S. (1987), "Towards a theory of corporate coherence", conference paper, Terni, Italy.
- Hagedoorn, J. and Schakenraad, J. (1989), "Philips en haar technologische allianties", *Merit Publikatie* No. 89-001, Maastricht.
- Hayes, R.H. and Abernathy, W.J. (1980), "Managing our way to economic decline", *Harvard Business Review*, July-August.
- Industriemagazin*, March 1987, p. 42.
- Kreiken, E.J. (1986), "De coalitiestrategie: creatieve cooperative competitie", in Bilderbeek, J., Jansen, J. and Vijge, G. (Eds), *Ondernemingsstrategie*, Stenfert Kroese, Leiden.
- Lorenz, C. (1986), *The Design Dimension, the New Competitive Weapon for Business*, Basil Blackwell, New York and Oxford.
- Manders, A.J.C. (1990), *Sturing van Productie Technologie* (Decision making about Production-Technology), Kerckebosch, Zeist, The Netherlands.
- Ohmae, K. (1985), "Triad", *De Opkomst van Mondiale Konkurrentie*, Van Veen, Utrecht and Antwerpen.
- Pannenburg, A. (1987), *Economisch Statistische Berichten*, 4 November.
- Pot, H. and Verwoerd, W. (1986), *Elseviers Magazine*, 20 December.
- Prahalad, C.K. (1987), *Financieel Economisch Magazine*, March.
- Ramchadran, J. (1986), "Postindustrial manufacturing", *Harvard Business Review*, March.
- Roobeek, A. and van Tulder, R. (1987), *Intermediair*, 31 July.
- Stopfort, J. and Dunning, J. (1983), *Multinationals, Company Performance and Global Trends*, Macmillan, London.