Competitive-Edge Applications: Myths and Reality

BUTLER COX FOUNDATION

Research Report 61, December 1987



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Butler Cox & Partners Limited

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Management Summary

A Management Summary of this report has been published separately and distributed to all Foundation members. Additional copies of the Management Summary are available from Butler Cox

Chapter 1

The reality of competitive edge and information systems

There is a view that 'competitive-edge applications' may be no more than the latest computer-industry attempt to assert its importance to business. Senior managers still remember the unfulfilled promise of management information systems in the late 1970s and the office of the future in the early 1980s. Cynics comment on the way in which competitive advantage has provided academics with a lucrative global platform. The media has also got into the act, with, for example, the Financial Times averaging this year more than one mention per day of the subject. Consultancy practices have not been slow to see the new business opportunities that competitive-edge strategies can provide, whilst computer vendors see the opportunity to change both the basis on which IT investment decisions are made and the level at which those decisions are made.

During the course of the research for this report many Foundation members expressed views and concerns of the kind outlined above.

At the same time, there is general acceptance that information technology (IT) is moving from being a support function that addresses issues of internal efficiency and effectiveness to being a significant front-line business asset. As such, it has an increasingly important role to play in shaping market forces, in supporting products and services, and in providing new market and product opportunities.

In fact, the research for this report revealed a surprisingly large number of competitive-edge applications. It also revealed that, as yet, there is little relationship between the practical examples of systems being used for competitive advantage and the strategic-planning and opportunity-identification techniques propounded by the gurus. (The bibliography at the end of the report lists the publications in which the best-known techniques are described.) There is considerable evidence, both from our research and from that of others, that in most cases competitive-edge applications 'evolve' through the incremental extension of in-house systems; and that they are identified and pursued by line management without (in many cases) much help from the systems department.

There is more than a suspicion that many of the successful competitive-edge applications would, if left to the planning and prioritising procedures of the systems department, become part of the applications backlog. (Indeed, we believe that this backlog could be fertile ground in which to look for immediate competitive-edge opportunities.)

Against this background, we set out to investigate the realities and — otherwise — of using information systems to gain a competitive advantage.

The definition of 'competitive-edge applications' is not easy. Most of the published material avoids a definition, either because it is primarily concerned with strategic-planning issues or because it focuses on specific application types. However, among Foundation members and other practitioners and academics, we found considerable agreement on the types of systems that together form competitive-edge applications. These include applications that:

- Assist in product and market planning and in product design.
- Are products or services in their own right.
- Help to influence the relationship with customers, intermediaries, suppliers, and/or regulatory bodies.
- Help to frustrate or pre-empt moves by existing competitors or by new entrants into a marketplace.

Figure 1.1 overleaf summarises the six main ways in which IT can provide competitive-edge opportunities.

Although competitive-edge applications differ from each other in many respects, a unifying characteristic is the basis on which they are justified. Whilst 'conventional' applications are typically justified on the basis of cost/benefit and return-on-investment analyses, this is not the case with competitive-edge applications. Competitiveedge applications inevitably require the consideration of intangibles such as opportunities and risk, and commercial judgement is essential. This is a new dimension in the 'justification' of information systems — and 'risk' is a new dimension for most systems directors and departments.

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Figure 1.1 The six main ways in which IT can provide competitive-edge opportunities

Information technology can assist in the creation of new products and services that compete with existing offerings. Online databases are an example of this.

Information technology can change the scope and size of the market. For example, telecommunications-based systems can enable an organisation to operate in geographic markets where it has little (if any) presence and to overcome time differences.

Information technology can reduce the life-cycle cost of products. Examples include the reduced development time and cost for cars and pharmaceutical goods, and the use of components for a wider range of products.

Information technology can enable more complex products to be produced — with the prospect that a competitive advantage can be sustained for longer. Uses of computer systems in financial services provide examples of this.

Information technology can permit a rapid response to competitive moves by allowing new products to be brought to the market quickly or by allowing new supporting services that increase the attractiveness of existing products.

Information technology can lead to the redistribution of added-value within an industry. This is particularly the case with electronic links between manufacturers, suppliers, and retailers.

The current interest in competitive edge and information technology has its origins in two phenomena:

- Well-publicised case histories of leading-edge organisations that have made innovative use of information technology. The successful applications have resulted from the availability both of increasingly powerful and costeffective technology and of greater skills and experience — throughout the organisation in exploiting systems.
- Important conceptual developments in strategic business planning that have focused in particular on competitive-advantage factors.

Many organisations now have, or are close to, a mature and stable information systems infrastructure. They have a portfolio of base applications that are second- or third-generation systems; they have experience in using interestablishment telecommunications that, over the past decade. have become more reliable and standardised; and they make widespread use of low-cost terminals. Such a platform has enabled innovative organisations - often at no great cost - to expand the use of their systems to encompass customers, intermediaries, and suppliers. For the most part, the innovation has been in the application idea rather than in the technology used. Indeed, the use of well-proven or simple technology is a feature of many competitive-advantage case histories.

Following Michael Porter's work on competitive business strategy, other academics specialising in information technology have developed theories and conceptual frameworks for linking IT with competitive edge. This work has focused on linking business strategy with IT strategy, and has sought to explain the early case histories from this perspective. The explanations (not surprisingly) tend to emphasise the role of strategic planning in identifying and exploiting IT in organisations such as American Airlines, American Hospital Supply, and so on. The importance of strategic planning has been reinforced by consultants, the media, and major vendors - each of whom has reason to support this viewpoint. Vendors in particular quite rightly see competitive edge as a means of changing the basis on which organisations make decisions about information systems investment.

A problem for information systems practitioners and the underlying reason for this report — is that the observable facts about today's competitiveedge applications are difficult to reconcile with the strategy-based theories. For example, the applications seem to be evolutionary, rather than the result of major new initiatives; and the emphasis in large businesses is on building long-term trading relationships (for example to obtain the benefits of 'just-in-time' logistics) rather than on reducing the cost of changing from one supplier to another.

Like the novel use of any technology, much of what has happened so far has its origins in business vision, intuition, determination, and the ability to take advantage of opportunities as they arise. The main question that we are addressing in this report is concerned with the future, however. It is: "What should Foundation members be doing to ensure that their organisations are best placed, from a systems viewpoint, to exploit competitive-edge opportunities?"

We also examine whether competitive-edge applications can be regarded as a separate class of systems; we determine whether there are significant patterns in competitive-edge applications across industry sectors and business functions; and we consider whether there are relevant and practical formal methods for identifying and evaluating competitive-edge opportunities.

At first sight, these issues may seem to be of more relevance to organisations in the private sector than they are to most government and other publicsector organisations. However, the public sector has an interest in this subject on at least three counts:

 The government is a major (or the major) customer in all countries and must ensure that the systems it uses for trading do not result in undue advantages for particular suppliers.

Chapter 1 The reality of competitive edge and information systems

- Government organisations compete with the private sector for scarce staff and other resources and need to ensure that they are equipped to do this effectively.
- Private sector organisations are increasingly offering alternative services to those provided by the public sector, and the effective use of IT is one of the ways in which these services are being differentiated.

Our findings are reported in the following chapters. In Chapter 2 we review the results of our survey of competitive-edge applications in Foundation member organisations. The survey covered application types, management attitudes to the value of information systems in achieving competitive advantage, and the use of formal methods.

As part of the research for this report we conducted in-depth reviews of several European case histories, most of which have not been reported before. Some of these cases focused on applications and some on methods and attitudes. Our findings are reported in Chapter 3.

In the final chapter of the report we advise members on the action they should take - in the light of our research - to put themselves in the best position to achieve the emerging competitive uses of information technology.

The research was carried out during the middle of 1987 and was led by Martin Ray, Butler Cox's director of development. He was assisted by Cathal Conaty, a consultant with Butler Cox in London and by Onno Schroder, the Foundation's manager for Belgium and the Netherlands. Most of the published material on the subject of using IT for competitive advantage originates from the United States. Although we took account of this material in preparing the report, we deliberately set out to gather new case-history material from Europe, particularly from France, Italy, the Netherlands, and the United Kingdom. The bibliography at the end of the report lists those publications that we found most useful in helping us to form our views.

Chapter 2

The views and experiences of Foundation members

As part of the research for this report we conducted a survey amongst Foundation member organisations. The aims of the survey were to determine attitudes towards information technology and competitive-edge applications; to determine the extent to which member organisations have identified and exploited competitive-edge opportunities; to assess the importance placed by senior management on information technology as a strategic resource; and to find out whether Foundation members have adapted their systems-planning methods to include consideration of competitive factors. In all, 60 responses were received from organisations in eight industry sectors (see Figure 2.1).

COMPETITIVE-EDGE APPLICATIONS ARE REGARDED AS A SEPARATE CLASS OF SYSTEM

In Chapter 1, we referred to the difficulty of classifying competitive-edge applications. In our survey we were interested to know the extent to which members regarded them as a separate class of system. We therefore asked: "Do you regard competitive-edge applications as significantly different from other IT applications?"

Of the respondents, 68 per cent indicated that they do regard competitive-edge applications as different. Several respondents provided reasons for their view, and these can be summarised as just two basic differences:

- An important difference is the basis on which the decision to proceed is made. The emphasis is on comparing opportunities and risks rather than on comparing costs and benefits. As a result, intangible factors (and even intuition) play a significant part in the decision process. For this reason, line management must necessarily lead the evaluation (as well as identify most of the opportunities) and take prime responsibility for the outcome.
- Different attitudes and approaches to systems development are needed. Speed of implementation, reliability, and the quality of the user interface rank more highly than efficiency and technical elegance.



However, those who do regard competitive-edge applications as a separate class of system emphasised that, from a technical viewpoint, they are similar or identical to traditional applications. Indeed, for the most part they are extensions of internal systems that enable systems and data to be used by suppliers or customers. (We return to this subject later in the report.)

Thirty-two per cent of respondents indicated that, in their view, competitive-edge applications do not constitute a separate class of system. In general, they held this view because, in their organisations, all factors — competitiveness, efficiency, and effectiveness — were taken into account during systems planning. Also, management was aware of the potential role of information systems in enabling or supporting the organisation's drive for competitive edge and insisted that this be taken into account in planning the priorities for the development of applications. A case history of an organisation that expressed this view is described in Figure 2.2. Figure 2.2 Some organisations regard competitiveness as an essential element of all systems

J SAINSBURY PLC

Sainsbury's main business activity is grocery retailing through supermarkets. The company has been extremely successful over the past eight years, doubling its market share whilst increasing its profits by more than 20 per cent a year.

The business has become a complex one, with the number of individual lines rising from 500 to around 10,000 over the past 25 years, and selling space doubling since 1980. At the same time, customers' expectations have risen substantially, which has required the company to focus more on service levels and price.

The underlying objectives of the business are to provide a high level of service, competitive prices, and to build a loyal relationship with its customers. All business developments, including systems, are focused on these objectives. Sainsbury does not therefore recognise a separate class of 'competitive-advantage' applications because management views all systems' investments from this standpoint.

In discussing competitive edge and Sainsbury's approach to business, two interesting comments were made about suppliers and about the installation of ATMs (automatic bank-teller machines) in supermarkets.

Suppliers

The aim is to build long-term relationships with suppliers to ensure high-quality products, minimum stockholding, and minimum administrative cost. Whilst EDI (electronic data interchange) is useful, particularly in reducing administrative costs, competitive-advantage concepts such as minimising Sainsbury's costs of switching from one supplier to another play little part in the company's thinking.

ATMs

Other supermarkets have gone on record as saying that the installation of ATMs in their stores provides them with a competitive advantage (the Publix supermarket chain in the United States being an example). Sainsbury's attitude is of interest. It provides ATMs in some supermarkets because they offer a service to customers. However, Sainsbury does not view the installation of ATMs in terms of making a specific impact on its market share or profitability. Rather, Sainsbury regards the provision of ATMs as a natural outcome of its overall policy of developing the business to provide the best possible service for its customers.

TAKE-UP OF COMPETITIVE-EDGE APPLICATIONS IS GREATER THAN EXPECTED

Previous Butler Cox research had revealed many more competitive-edge applications than just the well-known examples. However, we were not aware at the start of our research of the great extent to which the (mainly) European organisations that form the Foundation had identified and taken up information-technology-based competitive-edge opportunities.

Our survey asked: "Have you identified competitive-edge applications?", and followed with a supplementary question intended to identify those

aspects of the business operation in which most applications were being implemented. Of the respondents, some 90 per cent indicated that they had already implemented an application intended to provide a competitive edge, and more were in the process of doing so.

Most of the opportunities had been identified by users and involved incremental improvements of existing systems. The systems had 'become' strategic rather than being identified as such in the first place by a strategic systems-planning process.

In answer to our supplementary question regarding the nature of the opportunities that have been found, the respondents provided information about 51 separate applications. (Only one respondent was not prepared to discuss his organisation's competitive-edge application for reasons of commercial confidence.) Figure 2.3 shows the types and proportions of applications reported, together with some of the results of a similar survey conducted in 1986 at the London School of Economics by R D Galliers.

On close inspection, the results of the two surveys are very similar. (When sales and marketing are combined — to take account of different definitions — the percentages are very close.) In addition to asking questions about the application types identified by our survey, Galliers' survey also looked at the impact of systems infrastructure and administrative applications on competitive edge, and these formed the largest single category in his survey. The inclusion of these applications in an



Chapter 2 The views and experiences of Foundation members

analysis of the impact of IT on competitive advantage presumably relates to their impact on costs (cost-leadership being a competitive strategy) and adds weight to the views of those Foundation members that are unwilling to identify competitiveedge applications as a separate class of system.

MOST SENIOR MANAGERS PERCEIVE INFORMATION TECHNOLOGY AS AN IMPORTANT COMPETITIVE FACTOR

The next questions in the Foundation survey asked: "Does senior management in your organisation perceive information technology as an important competitive factor? Do they think its importance will increase over the next five years?" The responses to these questions are summarised in Figure 2.4. Clearly, in the majority of responding Foundation member organisations, the use of information systems as a competitive resource is becoming an accepted fact. This finding is corroborated by the answers to the later question about the ways in which the importance of IT as a competitive-edge factor has been manifested (see page 7).

However, the finding is in sharp contrast to that of another study that covered the same issue. The study was conducted by A T Kearney for the Institute of Administrative Management and the UK Department of Trade and Industry in 1985. Kearney found that, in 235 companies surveyed,



the senior management of only 30 per cent of them perceived IT as increasing the organisation's market share. Indeed, in as many as 45 per cent of the organisations studied, senior management did not believe that IT had made a contribution to reducing costs. This survey also found that senior managers do not believe that IT can be used to achieve competitive advantage. As many as 70 per cent of those surveyed were unaware of the competitive activities of their rivals in relation to the use of IT.

Within the overall results of our survey there were some interesting differences between industry sectors. These are illustrated in Figure 2.5, which shows that the majority view varied from all senior managers in transportation and leisure organisations perceiving IT as being a very important factor for competitive advantage, to two-thirds of senior managers in government agencies believing that IT was of little importance to competitive advantage.

These results are, for the most part, not surprising, reflecting the different 'information intensity' and inherent competitiveness of the various sectors. (Information intensity is a measure both of the importance of information in the value chain and of the information content of the product or service.)

We are concerned (but not altogether surprised) at the perceptions of government and government agencies. We have already commented in chapter 1 (on page 3) about the increasing need for publicsector organisations to demonstrate that they are competitive compared with equivalent organisations in the private sector. These comments, together with the potential importance of infor-



mation as a government asset, lead us to believe that government and government agencies need to seriously consider the ways in which IT can make them more 'competitive'.

THE GROWING IMPORTANCE OF INFORMATION TECHNOLOGY IS MANIFESTED IN SEVERAL WAYS

In order to substantiate senior managers' perceptions about using IT for competitive advantage, we asked Foundation members a further question: "What are the principal ways in which the importance of IT as a competitive-edge factor has been manifested?" The responses to this question are summarised in Figure 2.6. These responses were explored in more detail during the interviews with selected members and confirmed that a significant change in senior management's view of the role of information technology is now taking place — IT increasingly is being recognised as an important asset rather than as a cost to be controlled.

MOST APPLICATIONS HAVE NOT RESULTED FROM FORMAL COMPETITIVE-ADVANTAGE STUDIES

Our preliminary desk research indicated a possible gap between the conceptual work of (mainly East Coast) US academics and the practical needs of systems directors wishing to identify and evaluate competitive-edge opportunities. To check whether this was the case, we asked the question: "Have you conducted any formal studies of IT and competitive advantage?" Thirty-six per cent of respon-



dents indicated that they had done so. Approximately two-thirds of these studies had been initiated by top management. The remainder had been initiated by the systems director — sometimes in conjunction with a line executive such as the marketing director. In five of the cases where top management had initiated such studies, the systems department was not involved in the investigation, and from their responses seemed to be unaware of the outcome. From our interviews it appears that the studies initiated by top management were mainly one-off or ad hoc studies, unrelated to the (annual) systems-planning activity.

We were also interested in the extent to which competitive-edge factors were being taken into account in regular information systems planning. Earlier in this chapter we referred to R D Galliers' survey. That survey also included questions on this subject and, again, a comparison of findings is useful.

Galliers surveyed 73 UK companies and also 17 consulting firms. In the case of the consulting firms, only one indicated that its information systems planning methodology included any consideration of the client organisation's position regarding the use of IT in relation to its competitors. The main findings of Galliers' survey relating to the 73 companies are shown in Figure 2.7. The majority of approaches to information systems planning focus attention on matters of efficiency and/or effective-ness *per se*. Although improved competitiveness is often a by-product of such endeavours, it is clearly not the focus of current information systems planning.



Chapter 2 The views and experiences of Foundation members

Comparing our own findings from the research for this report with findings elsewhere (including other Butler Cox studies), a curious pattern emerges. There is no doubt that competitive-edge applications are being found and exploited, and that senior management is becoming aware of the importance of information technology to the future of most enterprises and is becoming more involved in systems planning and associated activities. At the same time, few organisations appear to take account of competitive factors in systems planning and few of the application ideas are the result of a systematic planning activity.

One explanation of this finding - which we return

to later on — is that there has been a 'first-wave' of competitive-edge applications that have been identified and pursued by business managers who understand the potential of information technology and who have the support of an effective information systems infrastructure. Opportunities of this type will continue to be identified as more managers understand the opportunities.

However, there may be other — perhaps more radical and far-reaching — applications that will emerge from a systematic approach that involves the innovators in the organisation. Such 'planned' competitive-edge applications would constitute a 'second wave'.

Chapter 3

Lessons from European case histories

Most of the published material on information systems and competitive advantage has resulted from US-based research. Understandably, the case histories have been almost entirely American.

In planning the research for this report, we believed that it was important to collect fresh source material - of European origin - and asked Foundation members to volunteer both their application experiences and their organisations' attitudes to competitive edge and information systems. We supplemented the 13 Foundation experiences with two other European examples that have been widely publicised. An important aim in examining the experiences was — using the close relationship that exists between Butler Cox and Foundation members - to get a first-hand understanding of the history of the applications. We believed this to be important because of a concern on our part that the presentation of some of the well-known US-based case histories has masked their real origins. Many American authors have used the examples to illustrate an aspect of strategic theory and this may have had the effect of overemphasising the role of strategic planning and competitive analysis in the origins of the case histories.

The 15 case histories came from a variety of industry sectors and covered a wide range of applications, as shown in Figure 3.1. They had several common features, however. These features were sufficiently consistent across industry sectors, and (where appropriate) across application types, that there is reason to believe they are generally relevant.

COMPETITIVE-EDGE APPLICATIONS ARE EVOLUTIONARY

In almost all of the cases where it is claimed that a competitive advantage has been achieved, the application is an incremental evolution of an internal system. The case history described in Figure 3.2 overleaf illustrates this aspect of competitive-edge applications, and several other case histories elsewhere in the report support the same point.

However, we also encountered companies that had tried, or are trying, to achieve a competitive

Figure 3.1 Fifteen European case histories were examined from a variety of industry sectors, covering a range of applications				
Industry sector	Competitive-edge application (or thrust)			
Auctioneering	Payment and distribution			
Banking	Overall cost leadership			
Building society	New products			
Capital goods manufacturing	Manufacturing and service			
Clothes manufacturing	Production and channel management			
Consumer travel	Holiday sales			
Credit financing	Sales			
Food manufacturing	Sales			
Food retailing	Outlet management and logistics			
Health insurance	Customer service			
High-street retail	Sales			
Life assurance	New products			
Life assurance	Sales			
Pharmaceutical	Product research and development			
Wholesaling	Retailer support			

advantage through a major systems initiative that requires the construction of a new system. Based upon our assessment of the prospects of these cases, and on the histories we examined, we believe that the odds are very much against such initiatives reaching their objectives, and suspect that this is likely to be the case generally.

There are two powerful reasons for the evolutionary approach being more successful:

- Senior managers are primarily concerned with short-term improvements in business or with fast response to competitive threats. They are much more likely to get this from the extension of an existing facility than they are from a new one.
- Management is very concerned with customerservice levels and with the organisation's image. In many organisations the information systems department does not have a particularly good track record of implementing new

systems that are immediately fault-free and reliable. Management is right to be wary of new systems that may fall short of expectations and that may give competitors an unearned advantage.

One other consequence of the evolving nature of most competitive-edge applications is that the costs involved in developing them are not particularly

Figure 3.2 Most competitive-edge applications are incremental evolutions of internal systems

W H SMITH AND SON PLC

W H Smith is a high street retailer and has interests in newstrade wholesaling, and do-it-yourself and speciality stores.

Retailing

The company has 370 retail outlets that carry a range of periodicals, books, stationery, and seasonal goods. Large outlets stock 60,000 product lines and the group turns over £100 million of stock every six weeks. The emphasis is on holding a wide range of goods at the expense of 'depth'. This is particularly true of books. Approximately 60,000 new books are published each year, and these are added to a backlist of around 350,000 books. Obviously, any individual store can only hold in stock a tiny fraction of the books available, and the management of the retail division has been keen to improve the book service provided to customers.

The group has a private network that links all its retail outlets and it has a central mainframe equipped with ICL's CAFS (content addressable file store) system. By storing Whittaker's Directory of Books in the system, and combining this information with stock information available from the relevant application, W H Smith has been able to introduce a new facility at very low cost. The application enables customers both to order books (by subject, author, or title) and to search the database using a variety of keys via a videotex terminal. The company believes that this application will provide it with a competitive advantage in its book-selling business.

The application had been identified some years ago but could not be pursued because at that time the incremental cost was too high.

Wholesaling

W H Smith's wholesaling division is the UK market leader in the distribution of newspapers and periodicals to newsagents and other retail outlets. Divisional management was concerned about the prospects for the business in a rapidly changing marketplace. New newspapers, targeted periodicals, changing economics, and potential new distributors seemed likely to affect the company's market position.

The division has therefore embarked upon a programme that is aimed at providing trade merchandisers and newspaper publishers with information services. It has created a system that provides national daily newspapers with much earlier feedback about the actual level of sales. By building a database that contains demographic data about the catchment area of each outlet and by taking into account actual sales for each newspaper and periodical, the division is able to provide outlets with advice about product mix and shelf-space optimisation.

The underlying purpose of this application is to reinforce W H Smith's position as the market leader by increasing the whole industry's reliance on information that it, as market leader, is best placed to provide.

great. Several of the systems directors we interviewed stressed this point, arguing that line management is more interested in the immediate commercial exploitation of available systems assets than it is in the medium-to-long-term development of completely new facilities.

MANY APPLICATIONS ARE INTERORGANISATIONAL

A substantial number of competitive-edge applications involve customers or suppliers accessing the organisation's information systems via computer terminals. In each of these cases, there has been (or is likely to be) a three-step progression:

- A second- or third-generation system is installed to meet internal needs — to provide regional offices or retail outlets with access to centrally held product and inventory databases, for example.
- These systems are then used (often at the instigation of front-line management) as the basis for information systems for customers and agents. The second step is therefore to provide systems that link the customer or intermediary with the supplying organisation. Examples include access to stock availability, to quotation services, and to product information. At this stage which today is the most common customers have access to information and probably absorb some of the costs that were previously incurred by the supplier in providing the information.
- The third step is to move beyond the provision of simple links to customers, and for the supplier to use the facilities provided by the system to 'lock-in' customers. Lock-in is a comparative term because market dynamics work to reduce (the often unwilling) dependency of a customer on a particular supplier. With this caveat, we would argue that Thomson Holidays has achieved a high level of lock-in, as we describe in Figure 3.3. This lock-in was achieved as a result of providing a better interface than that provided by competitors and by encouraging customers to invest in the system through participating in the design and through compulsory training.

There is some evidence that customer loyalty (or lock-in) is best sustained by providing a customer with 'management' or administrative services that can be effective only if most or all of the relevant business is placed with one supplier. There are some cases (European as well as American) where customers have changed substantially their own procedures to take account of such facilities. Notable cases include travel and insurance services.

Figure 3.3 Competitive advantage is often gained by locking-in customers

THOMSON HOLIDAYS LIMITED

Thomson Holidays is the UK's leading holiday company with approximately 30 per cent of the overseas air holiday market, which is dominated by three major operators, followed by a large number of 'niche' operators. Thomson's continued leadership in this market has much to do with the success of TOP, its videotex-based holiday reservation system (although this alone would not account for market leadership).

The TOP reservation system

The history of TOP illustrates several of the points made earlier in this report. (Only the relevant parts of the project history are included in the interest of brevity.)

1976:

Thomson installed a new online reservation system for use by *its own staff* in 10 regional offices. At that time, the possible provision of electronic links to travel agents was considered "because that was the way things would go sooner or later", but was not thought to be a top priority.

1979:

Videotex emerged as the preferred technology in the travel industry, with two major companies (a ferry operator and a television rental company) jointly sponsoring the installation of 3,000 Prestel sets in travel agents' premises. Thomson and Thomas Cook were the leaders in defining possible standards and agreeing them with the industry. In spite of this, there was concern within Thomson about basing future developments on videotex:

- The technical staff were sceptical about videotex, regarding it as an inferior technology.
- Top management was worried about the implications of agents "playing with the inventory".

1980/81:

Thomson conducted a substantial pilot scheme in 10 towns, involving 66 agents. Interestingly, this pilot only proceeded because a hardware supplier seeking market entry provided equipment at a very low cost. Thomson's view was that "there was no real financial risk" and the system could be thrown away if necessary. The main findings of the pilot were that:

- Forty per cent of Thomson's business immediately transferred to the system and the travel agents liked it.
- The overall level of business in the towns used for the pilot scheme increased by between 10 and 20 per cent above the average.

1981:

Following a decision to implement the system nationwide, the application was redesigned under the *leadership* of the

INTERNAL APPLICATIONS CAN ALSO PROVIDE A COMPETITIVE EDGE

Whilst much of the search for competitive-edge applications has focused on the perimeter of the organisation with systems that link to customers or suppliers, some Foundation members reported internal applications that have considerably improved their competitive position. Typically, these organisations are ones with substantial research and development and manufacturing functions that are an important part of their organisation's value chain. Figure 3.4 overleaf provides an illustration of one such case.

commercial management. The application was planned thoroughly with the active involvement of users.

1982:

The system was *launched as a product* with promotion and marketing, accompanied by mass training of travel-agency staff. Nine thousand agency staff were trained in six weeks, enabling the system to be fully implemented in that time (rather than in the nine-to-twelve months that the industry expected). Formal training was mandatory.

1985:

Thomson's telephone sales service was reduced as a costreduction measure — with the *inadvertent effect* of transferring even more transactions to TOP.

1986:

Thomson was sufficiently confident of TOP to announce the withdrawal of alternative forms of holiday reservation. The system enabled Thomson to process 205,000 passenger bookings on the first day of the new season's sales campaign — a throughput that could not have been achieved without the system.

Response by Thomson's competitors

Thomson was not the first to launch a holiday reservation system. However, the TOP system became the *de facto* industry standard partly because of Thomson's market leadership but also because travel agents preferred to use it. (The data was reliable and up to date, and there was less chance of making an embarrassing error in front of a customer.)

Thomson's competitors took some time to respond to TOP partly because they failed to recognise the importance of its user-friendly interface and of the need to *copy the interface* rather than compete with it. Also, at least one was caught out by investing heavily in an (obsolete) telephone sales system just as TOP was introduced.

Competitors are now providing comparable systems, but with some improvements (for example, additional information services and sophisticated searching algorithms). In conjunction with a VAN operator (ISTEL), they are combining to provide holiday information via a single network.

In the view of Thomson's management, the factors that have allowed TOP to continue to provide a competitive edge have been:

- A user-friendly interface.
- Thorough and mandatory user training.
- Sufficient market share to ensure regular use of the system by all travel agents.
 - The withdrawal of the alternative telephone booking service.
- Commercial management of the information systems function.

MOST OPPORTUNITIES ARE IDENTIFIED BY THE BUSINESS

In almost every case, the idea for the competitiveedge application came from the business, not from the information systems department. And, usually, line management was responsible for leading and funding the development project. Perhaps the best example of this in Europe is the Benetton group, whose growth has only been possible because information technology is used to link a comparatively small company with a vast array of subcontractors and franchised outlets. (The Benetton case history is described in Figure 3.7 on page 13.) Figure 3.4 Internal applications can also provide a competitive edge

AKZO PHARMA

Akzo Pharma is a major pharmaceutical research and production company with its headquarters in the Netherlands, but with its products distributed worldwide. A major requirement in the drugs industry is the need to meet international standards (such as those set by the US Federal Drug Administration) as well as the differing rules and standards set by each of the 50 countries in which Akzo's products are marketed.

Product research is a major activity, involving more than 800 professionals, and with very long product-development cycles. The total time for the development and testing of a drug can exceed 10 years and is increasing. About half of the development time is under Akzo's direct control and the company has made substantial use of computers to shorten the development cycle. Many computer systems are used to control, register, and monitor laboratory tests. These systems have enabled product-testing to be much more cost-effective, reliable, and accurate, leading to the commercial justification of products that would not have been developed a few years ago.

The overall systems architecture is determined centrally by the systems department. Within the agreed architecture, user management is free to select packages providing they meet the prescribed data-interchange requirements.

The company monitors its competitors' commercial activities, but does not specifically monitor their IT activities. This is a deliberately policy — the aim is to focus on the purpose of the activities rather than the methods. However, Akzo has found that responding to competitive actions now often involves the use of information technology.

The responsibility for proposing and funding IT projects lies entirely with line management, with the information systems function playing an active supporting role. Since new applications have been focused on critical, competitive factors, the investment by user departments has increased sharply.

There is some evidence from our research, although not as much as is reported elsewhere, that application ideas are pursued — at least to the point of a successful pilot — outside the normal information systems development function. In many organisations, the formal process of evaluating and prioritising application ideas seems to work against competitive-edge applications.

In four of our case histories, the systems department played a much more active role. In two instances the origins of the opportunity were in the use of relatively novel technology, and the systems department was able to convince a 'product champion' of the merits of the idea. In this context, we define a product champion not merely as an individual with the vision or foresight to support the idea, but as someone with sufficient standing in the organisation to provide initial funding and 'protection' for the project, and with the right contacts to ensure that the idea can be 'marketed' within the organisation in order to overcome resistance. Rowntree Mackintosh's experience provides a good illustration of this (see Figure 3.5). In another case (see Figure 3.6, which describes the experience of a life assurance company) the main board contains three members who were previously systems analysts. As a consequence, there is a very close understanding between top management and the systems department.

INFORMATION TECHNOLOGY CAN BE USED TO HELP CHANGE MARKET STRUCTURES

Figure 3.7 describes the experiences of Benetton, one of the European leaders in the 'youth' fashionclothing market. This case history illustrates how a comparatively small company can exploit IT to control a network of suppliers and outlets that enables rapid international expansion. This type of IT exploitation has only been possible since reliable and standardised communication systems and lowcost terminal devices became available.

In *The Age of Discontinuity*, Peter Drucker asserts that industrial and commercial discontinuities occur much more frequently than is appreciated,

Figure 3.5 A product champion is essential

ROWNTREE MACKINTOSH PLC

Rowntree Mackintosh is an international food group manufacturing and retailing confectionery, snack foods, and grocery products.

In the late 1970s, its order-process and distribution system had several major drawbacks. The system was based on collecting orders at headquarters where they were read by OCR equipment to create work files for the distribution depots. These files were transmitted from the central mainframe to local minicomputers each night. Because the system relied on the orders arriving by post (with the biggest delays during the peak sales period) and because of misreading of the orders, Rowntree was concerned that it might gain a reputation for late and incomplete delivery, and that cash flow would suffer as a consequence.

A senior member of the management services department spotted the possibility of providing sales staff with a portable terminal that would communicate with the central computer each evening. Line managers and systems staff were sceptical, however.

One main board director enthused about the idea and provided the funding to allow a prototype terminal to be built. Subsequently, he supported the project through the development process, which lasted several years.

Today, all sales staff have these terminals, and as a consequence:

- Error rates have fallen from 20 per cent to two per cent.
- Information is now available earlier at the depots, so that distribution can start more quickly.
- Administration costs have been reduced, and cash flow has been improved.
- Sales staff can now concentrate on selling rather than on apologising.
- The company's image has been improved.

Figure 3.6 Successful applications require the systems function to be involved in the business

ALLIED DUNBAR ASSURANCE PLC

Allied Dunbar is a financial-services company specialising in life assurance, pensions, unit trusts, and loans. The various markets are fragmented with no one company having a dominant position. Allied Dunbar is one of a number of the larger companies. Three main board directors were previously systems analysts.

The company sells most of its products through its own sales force, with independent intermediaries accounting for around 10 per cent of sales.

The two main thrusts of Allied Dunbar are to:

- Develop a competitive product range in which information systems play a major part.
- Attract and retain top-class sales staff. They need to be supplied with competitive products and properly supported in the sales process. Information systems also play a part here.

The use of IT in products

Allied Dunbar uses information systems to create and administer very complex financial schemes. Traditionally, insurers have taken a conservative view of risks. However, by developing an approach called Total Linking, Allied Dunbar has been able to reduce its premium rates substantially. Total Linking is a concept whereby the need for huge reserves has been avoided by sharing the risks, and the benefits, with the policyholders. This has only been possible through the development of large, complex computer systems to "keep the score". These systems have needed the resources of a large company in order to implement them successfully, together with a systems function that is heavily involved in the business itself.

The use of IT to support the sales force

Allied Dunbar has developed a financial-planning service that enables its sales staff to provide total personal financial guidance at the point of sale. The service, which is in effect an expert system, manipulates data concerning a potential client and enables sales staff to provide the right advice in the light of the client's overall financial position.

and that they are becoming more frequent. Arguably, Benetton was quick to see how information technology had created the potential for a new approach to international fashion-goods supply, and seized the opportunity to change the market structure in its sector.

One lesson for Foundation members (many of whom are large, established market leaders) is that information technology has reduced some of the barriers that previously prevented relatively small organisations from competing on an international scale and from gaining the consequential economies of scale.

COMPETITIVE-EDGE APPLICATIONS REQUIRE DIFFERENT SYSTEM DEVELOPMENT PROCEDURES

Several systems directors reported that the rules for development projects were modified for com-

Figure 3.7 IT can help to change market structures

BENETTON S.p.A.

The Benetton group has a turnover in excess of \$1.5 billion, with a profit margin of around 10 per cent. Based in Italy, it is one of the leaders of 'youth' fashion clothing in Europe, even though it is a comparatively small company with only 1,300 employees. The growth of the company has been possible because it uses 450 subcontractors for cutting, dyeing, and manufacturing activities (in all, these subcontractors employ approximately 25,000 staff on Benetton work), and relies on about 4,500 franchised retail outlets for distributing its goods in over 60 countries.

Apart from undoubted marketing flair, investment in technology has been a key to Benetton's successful growth. The company has been innovative in using information technology for the design, cutting, and dyeing processes. (For example, computer-driven cutting systems have substantially reduced wastage, and dyeing completed garments in response to demand for particular colours has both reduced inventories and matched product availability to market requirements.)

Another factor in Benetton's sustained growth has been its ability to exploit not only its own abilities and entrepreneurial spirit, but also that of its suppliers and retail outlets. Information systems have an important role to play in managing and developing this network of organisations.

Key applications are the collection of sales information from throughout Europe and the provision of computerbased financial services to franchisees — the latter are aimed at helping to attract, and then make successful, highquality business partners.

Top management has a good grasp of the possibilities of information systems and is active in supporting systemsbased initiatives. The Benetton systems development budget has been increasing at a rate of 30 per cent a year for each of the last three years.

There are no formal methods for identifying and evaluating opportunities — the decision to proceed with a development is taken by a sponsoring line manager. Over the past two or three years, the emphasis has focused on developing systems that support the successful growth of Benetton — in particular on communications with subcontractors and retail outlets.

Benetton's top management views information technology as a key element in building with its trading partners a powerful international trading capability.

petitive-edge applications. In some cases, the rules were ignored, in others calculated risks were taken (one application was being system tested before a final go ahead was given by the board). Others had recognised that different rules and attitudes must apply. Several interviewees reported that system developers were uncomfortable with an approach that required commercial priorities to have priority over technical considerations.

In several cases, systems directors admitted that, had a competitive-edge idea gone through the formal channels of approval, it would have been stillborn. The difficulty was that the idea was not in the agreed application development plan and therefore joined the 'waiting list'.

SUCCESSFUL APPLICATIONS OFTEN INVOLVE CUSTOMERS IN DEVELOPMENT

Another common theme running through the evidently successful applications was the involvement of customers in the development of the system usually through such means as pilot trials and joint working parties. Pilot trials provide the opportunity both to test the chosen systems approach and, much more importantly, to test the competitive-application idea. In one case, a comprehensive pilot project was run in one region, and the resulting sales were compared with those in a control region. The consequences of this pilot were that management had confirmed the potential of the idea, and the systems function was able to redevelop parts of the system (particularly the user interface) prior to its launch.

Other customer-oriented factors that were found in successful application histories were focused marketing of the application to the target users and a considerable investment in user training. Other research by M J Earl (whose work is referenced in the bibliography) has confirmed this. In a survey of 24 applications he found a high correlation between customer involvement in development and the rate of acceptance of the system. His findings are illustrated in Figure 3.8.

Another spin-off from early customer involvement in the project is that necessary modifications will be identified sooner — with several important consequences. Unlike conventional systems, where deficiencies may cause additional cost (either in coping with them or in modifying the system), deficiencies in customer-oriented systems provide competitors with an advantage. Customers may become dissatisfied and change trading partners as a consequence, or competitors may have the opportunity to replicate the idea and improve it before there is the possibility of properly capitalising on it.

FORMAL METHODS FOR IDENTIFYING COMPETITIVE-EDGE APPLICATIONS HAVE NOT BEEN USED

Although most of the organisations whose experiences are reported in the case histories conduct strategic-systems planning, only one had any experience of using a formal method for identifying and evaluating competitive-edge applications. This organisation — which has an enviable track record for systems innovation — reported that no new ideas had emerged as a result of using a formal method. Its view was that such approaches had little prospect of identifying opportunities that alert entrepreneurial businessmen would not find for themselves — provided they have a sound appreciation of the technology and its possible applications.



(Source: M J Earl, Formulation of Information Systems Strategy. A Practical Approach. Published in Information Management State of the Art Report 14:7, Pergamon Infotech Limited, 1986)

Chapter 4

Achieving competitive advantage from using information technology

We have already reported that many large organisations have competitive-edge applications in place. In reviewing these applications and their origins we have concluded that they do have distinct characteristics — but that their differences lie more in factors related to the business environment than in technical ones. Indeed there is no clear relationship between the use of leading-edge technology and success in this field.

We have also reported that, both from our research and from that of others, there is evidence that competitive-edge applications have emerged and blossomed in spite of, rather than because of, the efforts of the systems department. In particular:

- Few competitive-edge application ideas have emerged from formal information systems planning exercises.
- For the most part, successful ideas have been unable to achieve priority by conventional means and have had to be pursued — at least to a pilot stage — outside the normal systems development framework.
- Systems development staff have priorities and attitudes that can be unhelpful, and are themselves often restricted by development procedures that were designed for different purposes.

Although line managers charged with running the business must be responsible for market-related initiatives, clearly the systems department should take the responsibility for providing appropriate guidance and assistance to the organisation. Our strongest message to systems directors is therefore that they should urgently take steps to make sure that they are able to assist users in exploiting the potential for using information systems for competitive advantage. To achieve this the following actions are necessary:

- Understand the current and potential importance of information technology in the organisation's business sector.
- Revise the systems policies and the systemsplanning process to involve top management

and to focus both on customers' needs and on competitive issues and opportunities.

 Ensure that the systems infrastructure is adequate to meet the organisation's likely future demands.

UNDERSTAND THE IMPORTANCE OF INFORMATION TECHNOLOGY IN THE SECTOR

During the course of the research for this report we visited organisations that had very different views on the importance of information technology to their businesses. We believe that some overrate the potential value of competitive-edge applications whilst others underrate their value and in particular the threat that they may pose in the hands of an innovative competitor.

In our view, the best starting point is a joint programme by management and the information systems function. The aims of the programme are to understand the competitive factors within their own industry and organisation, particularly those related to customer-service needs. Such an understanding is a prerequisite to assessing - again jointly - the potential importance of information technology to the organisation. We believe this is best achieved by a series of linked actions that bring together key management and information systems staff and that use the emerging tools and techniques for assessing the competitive use of IT (details about some of these tools and techniques can be found in the publications listed in the bibliography).

Figure 4.1 overleaf provides an illustrative agenda for a workshop designed to develop an appreciation of the potential role of IT and to identify key application opportunities. This approach, called 'the decision workshop', was developed by Butler Cox as part of a wider information systems planning methodology. Backed by the necessary preparatory work, it has been used with considerable success by Butler Cox consultants.

Few organisations claim to have any systematic approach to monitoring the use of IT in their sector.

Chapter 4 Achieving competitive advantage from using information technology

Figure 4.1 A typical agenda for a edge workshop	a competitive-
Day 1	
Review of current market position Assessment of market dynamics — Value chains — Political, economic, social, and technical factors	Presentation and discussion led by the marketing function
Review of information technology applications: — Technology evaluation — Application case histories	Presentation and discussion led by the information systems function
Explanation of competitive-edge evaluation methods	
Development of business scenarios	Syndicate work
Day 2	
Development of application ideas	Syndicate work
Matching of technology/application opportunities	
Analysis of business systems implications	Group activity
Identification of the next steps	

Indeed, research shows that very few executives know how their competitors use IT. Relatively few have identified the key activities in their own (and their customers') value chain, and few look out for relevant applications in other sectors that could be copied.

This is in stark contrast to management's awareness of other business functions — marketing for example, where management is always aware of the advertising spend by competitive brands, of competitors' product promotions, and so on. The workshop provides the opportunity for combining the marketing department's understanding of the competition and of customers' needs with the systems department's understanding of the potential of IT.

There are several reasons for collecting information about the sector's use of IT and using it in workshops of the type described above, and then making it more widely available:

 The information systems department will understand more about the applications and technologies used by competitors and about competitors' business strategies, and will be able to form a better view of its own relative capability.

- Distributing the information will make top and line management aware of the sector's use of IT for competitive purposes and will help them to realise the extent of the potential threats and opportunities.
- The perception of the importance of the information systems department in the organisation will be increased because it will be seen to be relating more closely to business issues.

Some Foundation members have set up research groups charged with spotting and evaluating new technologies and new IT-based facilities that may help to provide a competitive edge. We believe that this approach can be used to advantage by most organisations. Typically, the aims of such groups are:

- To identify customer-service needs and threats.
- To identify new technologies that may be relevant to the organisation and to assess when they will be usable — both technically and economically.
- To acquire sufficient knowledge about the technologies so that the organisation can understand their potential application, seize opportunities with limited risk of technical failure, and respond swiftly to innovative uses of IT by competitors.

However, members should note that, to date, most of the successful competitive-edge applications are concerned more with novel applications than with the use of new (leading-edge) technology.

REVISE THE SYSTEMS POLICIES AND THE SYSTEMS-PLANNING PROCESS

Systems policies and the systems-planning process need to be refocused so they involve top management and include competitive factors (as well as those of efficiency and effectiveness). To achieve this, three actions are required:

- The prime responsibility for investing in competitive-edge applications should be placed on the management responsible for the relevant business function(s).
- Top management needs to be involved in the systems-planning process.
- Planning methods need to be modified to provide for competitive factors.

PLACE THE INVESTMENT DECISION WITH LINE MANAGEMENT

At the beginning of this report we reported that most Foundation members have implemented, or are implementing, competitive-edge applications. Our research has found that much of the initiative in finding and implementing these applications has come from line management, rather than the systems department.

Many of the successful competitive-edge applications have bypassed the formal applicationsapproval process. In many cases, they have not been identified by the formal systems-planning process because they are enhancements of existing systems. And, if many of the successful ideas had been pursued according to the 'procedures', they would more than likely have joined the applications backlog, in which case the opportunity for gaining a competitive advantage may have disappeared by the time the system was developed. Determined commercial managers have therefore found alternative ways of pursuing competitive-edge ideas - often involving external computing services - and have succeeded in spite of the systems department.

The decision to proceed with a competitive-edge application must, to a very large extent, lie with the line manager who will be accountable for its commercial success or failure. Furthermore, the decision will most likely take into account several factors that have previously not been considered when systems priorities are determined. This means that, in the many organisations that have not given total responsibility for the funding of systems initiatives to line management, scarce development resources will have to be allocated without the benefit of a common basis for setting priorities. The difficulty can be overcome by placing with user management the ultimate responsibility for determining priorities and for setting the absolute level of expenditure. After all, if information systems are to be used as a competitive weapon, then they should be considered alongside all other related investment opportunities (rather than merely amongst other systems opportunities). Decisions about systems investments will then be made in the same way as any other business investments, with senior management agreeing priorities by debating the issues and reaching a consensus. It is the management process that is important, not the absolute level of expenditure.

INVOLVE TOP MANAGEMENT IN SYSTEMS PLANNING

Although top management was involved in systems-planning and investment decisions in the early days of data processing, much of the responsibility was delegated as the topic became more routine. The top-management involvement in the late 1960s and early 1970s (which was often reluctant) was necessary because of the scale of

investment required for what was then a completely new area of expenditure. There are signs that, once again, top management is now increasing its involvement in systems planning (as we reported in Chapter 2). This renewed involvement has its origins in three factors:

- The increasingly strategic nature of systems and their potential impact on the organisation's competitive position.
- The close interrelationship between systems and both the internal organisation structure and the way in which distribution and supply channels are organised.
- The substantial penalties for mistakes in the information systems area. Indeed, it is arguable that a wrong direction in information systems is more difficult and more time-consuming to reverse than is the case for most other aspects of business operations. This point can be illustrated by reference to one of our case histories Thomson Holidays. One of Thomson's major competitors was unable to respond quickly to the TOP systems initiative because it had made a recent and heavy investment in a new telephone sales system, which made its top management reluctant to invest immediately in a replacement for it.

Systems directors need to bear in mind that top management, by and large, is more interested in strategies and plans that take the business forward in an evolutionary, rather than revolutionary, way. Top management also tends to be more enthusiastic about applications that will yield relatively quick gains, and is therefore more likely to be positive about developments that build on the existing applications portfolio.

FOCUS SYSTEMS PLANNING ON COMPETITIVENESS

In a recent Foundation report – Developing and Implementing a Systems Strategy - we argued that traditional approaches to systems planning are often inadequate. One reason for this is that, although they have been modified to take account of changes in the scope and potential use of information technology, their origins lie in the support of internal management and operational-control requirements. All of the three best-known methodologies - Nolan's Stages, Rockart's Critical Success Factors, and IBM's BSP - were originally based on the three-level hierarchy of strategic planning, management control, and operational control. Nolan's original methodology was designed to set out an ideal applications portfolio that excludes many of the areas that are today the focus of competitive opportunity. And in IBM's

Chapter 4 Achieving competitive advantage from using information technology

BSP, participants used to be cautioned against considering environmental factors such as regulation, competition, and industry trends, and to treat these as external to the scope of the study.

Although the methodologies themselves have successively been updated to take account of changing circumstances, one of the consequences of their widespread use is that systems planners are familiar and comfortable with internally oriented systems. However, the success factors — and risks — associated with in-house systems can be quite different from those associated with competitiveedge applications — particularly those involving links with customers or suppliers.

Moreover, in conventional systems planning, there is a case for proceeding with a project once sufficient internal benefits have been identified. In the case of competitive-edge applications, the decision to proceed is more complex and more judgemental. For example, factors such as customers' or suppliers' reactions and competitors' likely responses need to be taken into account. Activities such as market research and product promotion may be vital ingredients of the planning process and may change both the structure and the total cost of project budgets. Activities such as these are foreign to many systems departments.

A main objective of systems planning is to revise the 'target' applications portfolio. M J Earl has identified seven types of application that need to be considered during planning. (The bibliography contains a reference to the paper in which he sets out his ideas.) These applications cover data processing, telecommunications, and office systems. The seven application types are:

- Mandatory applications.
- Strategic applications.
- Infrastructure developments.
- System renewals or conversions.
- Research and development and experiments.
- Maintenance and enhancement.
- Niche developments.

Most of these types are likely to contain developments that have potential competitive significance and, as a consequence, we believe that consideration of competitive factors needs to pervade the systems-planning process and not be an 'add-on' to existing practices. The planning process needs to focus on addressing three questions related to competitiveness:

 What are our business needs, given both our goals and those of our current and potential competitors?

- What is our current systems position and capability and how does it compare with that of our competitors?
- What are our IT-related business development opportunities, should we pursue them, and, if so, how and when?

A high-level planning model that can be used to answer these three key questions, and thence to identify an applications portfolio, is illustrated in Figure 4.2. This model has been devised by Butler Cox and has now been used successfully in several strategic systems-planning assignments. The focal point of the decision-making is a decision workshop, structured as per Figure 4.1 on page 16.

In practice, organisations will place different emphasis on each of the three 'legs' of the model.

For example, an organisation that is in a sector where information technology is the main means of delivering services is likely to place greater emphasis on a 'bottom-up' assessment of its current systems infrastructure and applications. If information technology is becoming increasingly important in achieving strategic goals, then a 'top-down' approach is likely to dominate.

ENSURE THAT THE SYSTEMS INFRASTRUCTURE IS ADEQUATE

The ability to exploit opportunities swiftly and effectively (or to respond to competitive threats) requires an adequate and flexible systems infrastructure. In the context of this report, the infrastructure has three important components:

- Telecommunications systems. These need to be adequate to meet the foreseeable needs of applications that extend out to customers, agents, or suppliers. They must also provide a sufficiently reliable service so that commercial managers have the confidence to use them for linking with the organisation's trading partners.
- Databases and their associated access systems. These need to be organised so that relevant data can be accessed effectively and so that this can be done without compromising confidentiality or other security issues (particularly when access is by third parties such as customers).
- Systems development capability. The objectives and priorities of conventional and of competitiveedge application developments are often quite different. For example, in the latter case the emphasis is frequently on speed of implementation rather than on operational efficiency or development productivity. Researchers in the United States have noted that organisations there have been much more responsive to users'

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application ideas when a separate team or teams (perhaps located in a business unit) has the responsibility for development. This organisational approach to systems development requires different working and control methods.

Given that, in most organisations, system development resources are scarce, it could make sense to concentrate the use of these resources on applications that add value and increase competitiveness, whilst meeting other legitimate systems requirements with packaged software.

Also, as we reported earlier, there is a high correlation between successful competitive-edge applications and a high-level of customer involvement in the development process. In several particularly successful applications, the design process was led by an experienced business manager and involved customers in pilot schemes and market research.

REPORT CONCLUSION

The research for this report has revealed that many organisations have successfully identified and exploited competitive-edge opportunities that are enabled or strongly supported by information technology. Most of the opportunities reported to us have been concerned with the relationships between the organisation and its marketplace and have covered such functions as sales, marketing, and distribution.

There is evidence — both from our research and from that of others — that the systems department has not always been helpful in identifying, resourcing, and exploiting such opportunities. In many instances, the opportunity has been pursued outside the normal framework of system development projects. We believe that systems directors should act immediately to make a much greater contribution to their organisation's competitive position - and to be seen to be doing so. In this last chapter, we have set out specific steps that can be taken to achieve this. However, to be successful each of these steps requires that systems staff change their attitudes to take more account of business factors. rather than concentrating just on technical matters. Perhaps for the first time information technologies and application opportunities are available that can very significantly improve both the short-term and longer-term prospects for the organisation - in terms of growth, profitability, and so forth. The task for the systems director is to ensure that this potential is harnessed swiftly and effectively.

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BUTLER COX FOUNDATION

Butler Cox

Butler Cox is an independent management consultancy and research organisation, specialising in the application of information technology within commerce, government, and industry. The company offers a wide range of services both to suppliers and users of this technology. The Butler Cox Foundation is a service operated by Butler Cox on behalf of subscribing members.

Objectives of the Foundation

The Butler Cox Foundation sets out to study on behalf of subscribing members the opportunities and possible threats arising from developments in the field of information systems.

The Foundation not only provides access to an extensive and coherent programme of continuous research, it also provides an opportunity for widespread exchange of experience and views between its members.

Membership of the Foundation

The majority of organisations participating in the Butler Cox Foundation are large organisations seeking to exploit to the full the most recent developments in information systems technology. An important minority of the membership is formed by suppliers of the technology. The membership is international, with participants from Australia, Belgium, France, Germany, Italy, the Netherlands, Sweden, Switzerland, the United Kingdom, and elsewhere.

The Foundation research programme

The research programme is planned jointly by Butler Cox and by the member organisations. Half of the research topics are selected by Butler Cox and half by preferences expressed by the membership. Each year a shortlist of topics is circulated for consideration by the members. Member organisations rank the topics according to their own requirements and as a result of this process, members' preferences are determined.

Before each research project starts there is a further opportunity for members to influence the direction of the research. A detailed description of the project defining its scope and the issues to be addressed is sent to all members for comment.

The report series

The Foundation publishes six reports each year. The reports are intended to be read primarily by senior and middle managers who are concerned with the planning of information systems. They are, however, written in a style that makes them suitable to be read both by line managers and functional managers. The reports concentrate on defining key management issues and on offering advice and guidance on how and when to address those issues.

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- 8 Project Management
- 20 The Interface Between People and Equipment
- 21 Corporate Communications Networks
- 22 Applications Packages
- 23 Communicating Terminals
- 24 Investment in Systems
- 25 System Development Methods
- 26 Trends in Voice Communication Systems
- 27 Developments in Videotex
- 28 User Experience with Data Networks
- 29 Implementing Office Systems
- 30 End-User Computing
- 31 A Director's Guide to Information Technology
- 32 Data Management
- 33 Managing Operational Computer Services
- 34 Strategic Systems Planning
- 35 Multifunction Equipment
- 36 Cost-effective Systems Development and Maintenance
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- 38 Selecting Local Network Facilities
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- 49 Developing and Implementing a Systems Strategy
- 50 Unlocking the Corporate Data Resource
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- 53 Using Information Technology to Improve Decision Making
- 54 Integrated Networks
- 55 Planning the Corporate Data Centre
- 56 The Impact of Information Technology on Corporate Organisation Structure
- 57 Using System Development Methods
- 58 Senior Management IT Education
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