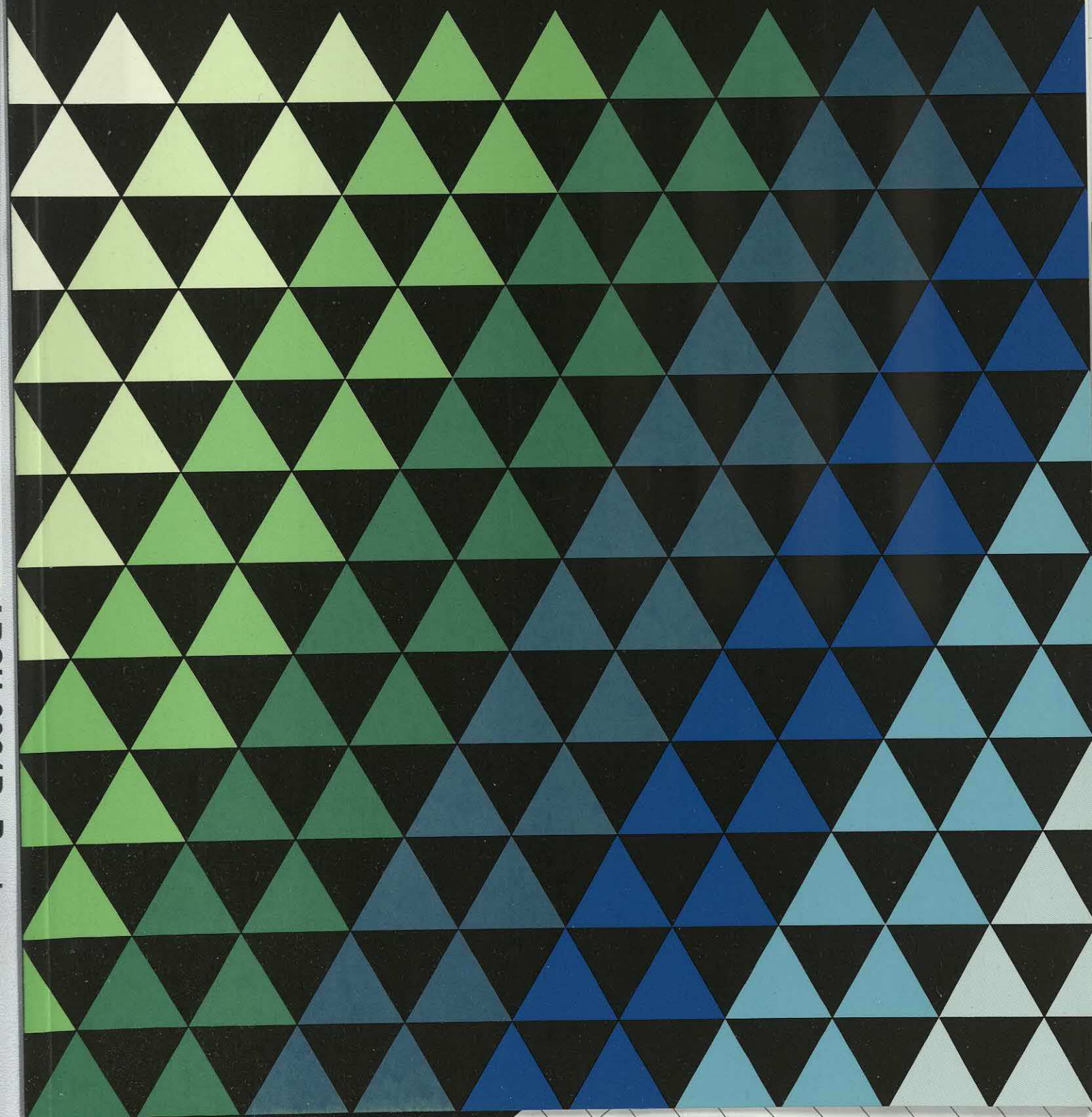


Getting Value from
Information Technology

BUTLER COX
FOUNDATION

Research Report 75, June 1990



Getting Value from Information Technology

Research Report 75, June 1990

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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.

Report synopsis

Getting value from information technology is probably one of the greatest concerns of business managers. There is, unfortunately, no single measure that can be used to prove conclusively the business value of IT expenditure. However, by relating the expenditure to a range of business-performance measures, the value of IT investments can be assessed at least as well as that of other investments. Getting value from IT is critically dependent on how IT investment decisions are made, and this means recognising that different evaluation criteria are applicable to different types of IT investments. For some types of investment, cost/benefit analysis is insufficient; management judgement must be applied as well. IT investment proposals must also take account of the prevailing corporate climate, which means that systems directors must be sensitive to the realities of corporate politics.

Chapter 1

Assessing the value from investment in IT is a growing management concern

*"The Chairman of our worldwide operations paid us a visit this morning. He seemed very impressed with what we are doing. But if he had asked me **how** our activities contribute to his business, I would not have known how to answer."*

— Systems director of a large European food manufacturer

These words, spoken by a Foundation member during the research for this report, summarise a concern that many systems directors have: how can they demonstrate that their organisations are getting value from the substantial investments made in information technology (IT). Top business managers are also very concerned about whether their organisation is getting value from its investment in IT, as Figure 1.1 illustrates. They see IT accounting for a large and increasing proportion

of corporate operating costs and wish to be reassured that this investment is making an appropriate contribution to the performance of the business.

For the systems director, there is an added dimension to this concern. Many systems directors are now responsible for one of the largest cost items in the corporate budget and for providing facilities and services that are crucial to the organisation's commercial performance in areas like sales and marketing, product design and development, and flexible manufacturing. Indeed, most businesses today could not hope to survive without information systems. Information systems have come out of the back office and become part of the competitive toolkit of the enterprise. Ensuring that investment in IT contributes to the organisation, and is seen to provide value, is therefore becoming an increasingly pressing concern for the systems director.

Proof that the money spent on IT improves the financial performance of the business is notoriously difficult to provide, however. In particular, traditional investment-appraisal measures are inappropriate for evaluating many IT investment proposals because they focus on the capital costs of the technology, not on the value of the information processed by the technology. A new perspective is needed to define the business value of IT, based on managing both the technology and the business information that it supports.

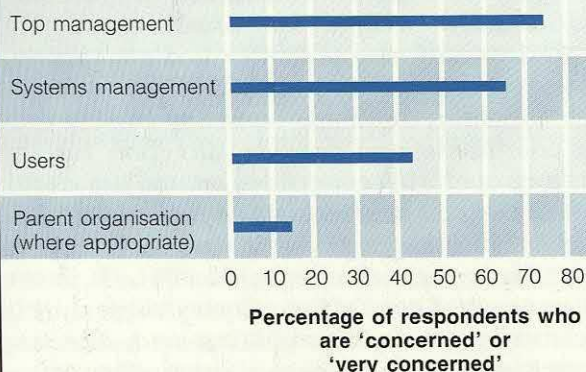
There is no proof that IT investments lead to better business performance

The amounts spent on IT are larger in some industry sectors than in others, and rates of increase in expenditure vary considerably, too.

Figure 1.1 Top managers and IT managers are most concerned about getting value from IT

Respondents were asked to rate their degree of concern on a scale of 0 to 5, where 0 = not concerned, and 5 = very concerned.

Type of respondent



(Source: Butler Cox survey of Foundation members)

Industry sectors for which information is a key asset, often referred to as 'information-intensive' industries, rely heavily on IT to support their business operations, and their expenditure is relatively high. In the banking sector, for example, IT budgets can easily account for 30 per cent or more of operating expenses. In the less information-intensive industries, expenditure on IT will be much lower. For this reason, comparisons of IT expenditure between industry sectors can be very misleading. (Note that, for the purpose of this report, investment in IT includes not only the costs of purchasing equipment and software, but also the costs of developing and running application systems.)

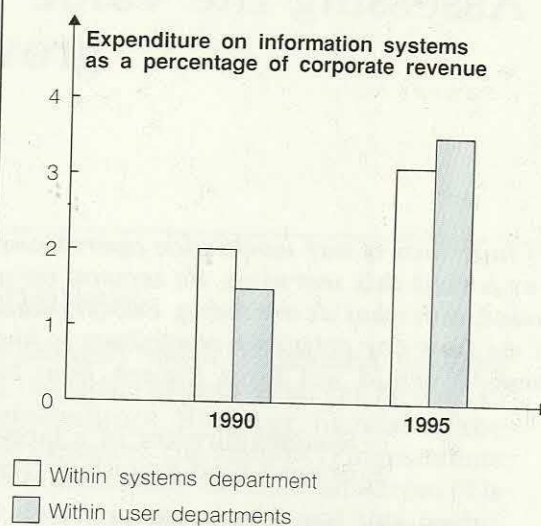
Even within the same sector, comparisons should be treated with caution, because different organisations often include different cost areas in the IT budget. The level of IT expenditure will also vary according to the current level of development activity, and the maturity of the installed base of applications.

Nevertheless, there is a general trend in most Western countries for expenditure on IT to increase as a proportion of corporate budgets. A feature of this increasing corporate expenditure on IT is that a growing part of it is now under the direct control of business managers, rather than of the systems department. According to a Computerworld survey of Fortune 500 companies in the United States, IT expenditure incurred directly by users in 1989 was estimated to be about 40 per cent of total IT expenditure, and this proportion is expected to increase to more than 50 per cent by 1995, as Figure 1.2 illustrates.

In some sectors and in some countries, the rates of increase in expenditure on IT are now beginning to slow down. In the retailing and petrochemicals sectors, for example, and among larger companies everywhere, spectacular annual rates of increase in IT budgets are no longer the norm. Nevertheless, during much of the 1980s, very large annual increases in IT expenditure did occur. It is this rapid rate of increase that has made the issue of getting value from IT investments so pressing and so widespread.

Many studies have been carried out with a view to establishing whether money spent on IT leads

Figure 1.2 By the middle of the 1990s, users will be spending more on information systems than systems departments themselves will be spending

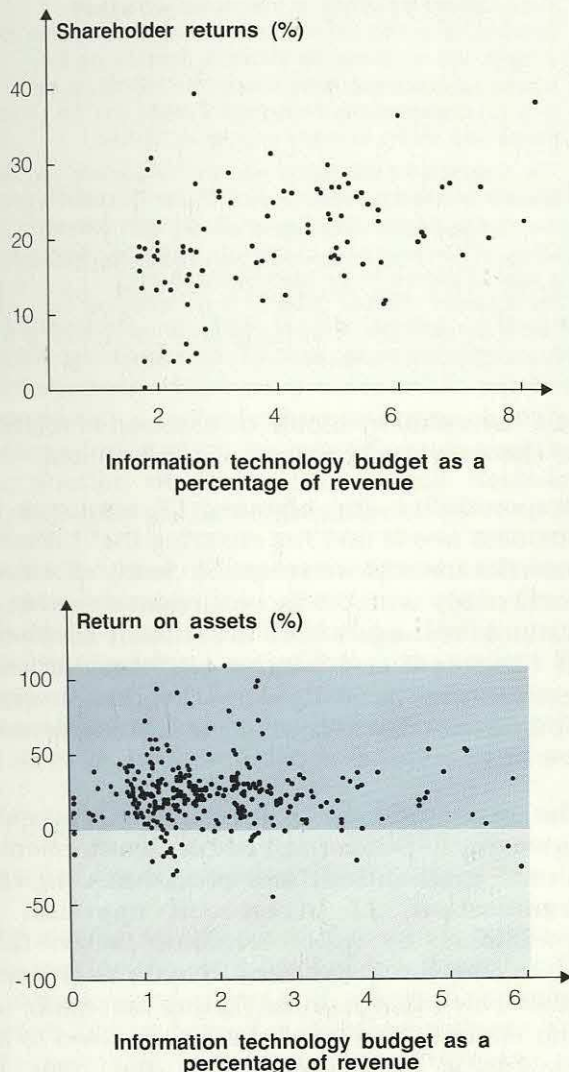


(Source: Computerworld, October 9, 1989.)

to improved business performance. None, however, provides conclusive proof that this is so. Figure 1.3 shows the results of some of the correlational studies undertaken by Paul Strassmann, the well known researcher and writer in the IT productivity field, which are fairly typical of the kinds of studies that have been carried out. They show no correlation between the proportion of corporate revenue spent on IT and either returns on assets or shareholders' investments.

The difficulty of correlating expenditure on IT and returns from that investment is compounded by the fact that the IT budget itself is only a small proportion of the total cost of processing information within the organisation. The experience of one of Butler Cox's consulting clients illustrates the point. The head office of this large multinational company existed only to coordinate and provide direction for the various operating companies around the world. It was becoming increasingly concerned with IT costs, which had risen to around \$6.4 million a year. Investigations revealed that, at most, 20 per cent of head office effort could genuinely be attributed to coordinating and directing activities. Eighty per cent of head office effort (and, hence, costs) had therefore properly to be attributed to information collection, handling,

Figure 1.3 There is no correlation between the amount of money invested in IT and the return from that investment



(Source: Strassmann, P. New approaches to investment appraisal, in *Measuring the Value of IT Investments* (Conference). London, October 1989.)

and distribution, and to services provided to the staff involved in this. This equated to \$96 million a year. The IT budget therefore accounted for only a small proportion of total information processing costs. This example suggests that getting value from money spent on information processing is an even bigger concern than getting value from IT.

The business value of IT depends on how the technology is used to support the business's information needs

Traditional methods for justifying investment rely heavily on the concept that value originates exclusively from capital. However, return on investment and return on assets are often inappropriate measures in the case of IT.

The domain of IT now includes systems as diverse as telecommunications, office systems, factory automation, and point-of-sale systems. All of these are, in one way or another, designed to improve the way in which an organisation processes, transmits, and uses the information necessary to undertake its business. When organisations seek to define the return on an investment in IT, they tend to concentrate on the cost of the technology and to ignore the value of the information. Few ask what return they get from information, yet it is the information that is critical. The technology that supports the information is of value only insofar as it allows better use to be made of information. The search for proof that investment in IT provides business value will continue to be futile unless management — both business and systems — recognises that divorcing the cost of the technology from the value of the information it supports is not only meaningless, but counter-productive.

Thus, the value that an organisation gets from IT depends on how well it manages its investment in *technology* so as to maximise the return it gets from *information*. The ability of the organisation to manage the technology in relation to the business and its information needs is critical to successful investment in IT. Investing in IT to maximise the business benefits is a business issue first, and a technology issue second.

Purpose and structure of the report

This report provides principles and pragmatic advice about the business issues associated with investments in IT. The report interprets the best practice we found during the research, to provide guidance to Foundation members on those issues that are of greatest concern to them.

Much has been written on the subject of establishing the value of investments in IT. At the beginning of the research, our aim was to review this material and identify the most appropriate set of measures that could be used by Foundation members to demonstrate the business value achieved from investments in IT. Despite an exhaustive search of the material, we found none of the many methods, approaches, and 'magic formulae' that abound in the industry to be suitable for this purpose. (We do, however, refer to these where appropriate, and a bibliography is included at the end of this report.) The scope of the research and the research team are described in Figure 1.4.

We commented earlier that the methods commonly used for measuring the value of IT investments are of limited validity for establishing its contribution to the business. In Chapter 2, we discuss a selection of these performance measures and identify their weaknesses. A good set of performance measures is, however, an important element of effective management, because it provides a yardstick against which the contribution of IT investment to the business can be judged and is evidence of good management. In the latter part of Chapter 2, we propose a framework that can be used by each organisation to relate IT expenditure to a set of business-performance measures.

IT investment decisions must be taken in relation to the objectives of the business. While this may seem obvious, the way in which IT investment proposals are evaluated does not always reflect the realities of the business in practice. Inappropriate criteria are often used to evaluate investment proposals, and as a result, decisions are sometimes taken that are potentially damaging for the organisation. In Chapter 3, we examine how the different kinds

Figure 1.4 Scope of the research and research team

Our research effort for this report has been even greater than is usual for a Foundation Report. We sent a questionnaire to all Foundation members and received over 120 replies. Many of the replies were quite detailed, reflecting the interest that members have in the subject. We reviewed the available literature on the subject, and subsequently conducted interviews with over 40 organisations throughout Europe and the United States and spoke to many experts in the field.

The research for this report was led by Cornelia Varney, director of vendor consultancy at Butler Cox. She was assisted by Martin Ray, Declan Good, and Graham Otter, all consultants in Butler Cox's London office, with a special interest in the business aspects of IT management. Further research was carried out by Lothar Schmidt (Munich), Michel Lederman (Paris), and Bruno Coppola (Italy).

of IT investment should be assessed in relation to the overall objectives of the business.

Responsibility for aligning IT resources to business needs and for ensuring that business benefits are achieved must be clearly allocated, particularly with the increasing involvement of business managers in IT investment decisions. In Chapter 4, we suggest the organisational mechanisms that will ensure that these responsibilities are discharged in the best interests of the business.

The evaluation of IT investment proposals, however, depends not just on measurements, formal mechanisms, and procedures. In any organisation, IT investment appraisal is conditioned by wider corporate factors that determine the investment climate at any one time. The organisational factors that make up that climate, and what changes it, need to be recognised and respected if the right IT investment decisions for the business are to be made. In Chapter 5, we examine the organisational and political factors that influence the IT investment-appraisal process.

Chapter 2

Monitoring the business contribution of IT requires business-oriented measures

Many different schemes of measuring the overall contribution of IT to the business have been devised. Some of these measure the contribution of IT by making comparisons with other organisations — that is, by using external performance criteria. Others measure aspects of performance that are internal to the organisation — notably the performance of the systems department, user satisfaction, and the contribution of IT to the overall business performance of the organisation.

We analyse some of these measurement schemes in this chapter and examine both their advantages and their limitations. Building on this, we describe a set of ratios that relate IT expenditure to key business-performance measures, and that each organisation can adapt to meet its own circumstances and objectives.

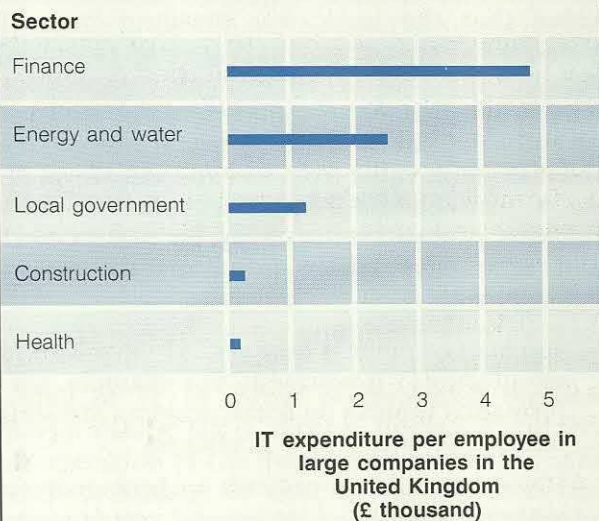
External performance measures can be easily misinterpreted

One way for an organisation to assess whether it is making the right level of investment in IT is to make comparisons with others in the same sector. Typical bases for such comparisons are IT expenditure as a percentage of turnover, or expenditure on IT per employee. Figure 2.1 shows such a comparison for large companies in various sectors in the United Kingdom.

The limitations of such comparisons are, however, well recognised: one organisation's accounting method usually differs from that of others; definitions of what it includes under IT expenditure usually vary; it may have unusually high or low expenditure for particular reasons. For example:

- Aer Lingus, the Irish airline, aware of the limitations of published industry comparisons of IT expenditure, teamed up with other

Figure 2.1 One way for an organisation to assess the appropriateness of its level of investment in IT is to make comparisons with others in the same sector



(Source: Pedder Associates/Computer Users Yearbook)

airlines to generate more reliable figures. IT expenditures as a percentage of total expenditures were found to cover a wide range — between 1.5 and 5 per cent. Aer Lingus attributes some of the differences to different accounting criteria, different operating conditions, and difficulties in defining what expenditures to include under IT.

- Northumbrian Water Group plc is one of the 10 newly privatised Water Holding Companies in England and Wales. Prior to privatisation, the predecessors of the new companies used to compare their business performance with each other. One of the comparisons was IT expenditure measured in terms of expenditure per employee. During the period from 1978, when a new

mainframe was installed, to 1989, Northumbrian Water's IT expenditure was concentrated on cost-justified microcomputing developments. Even with its low manpower levels, this resulted in low IT expenditure per employee compared with the other water businesses. As a consequence, Northumbrian Water places no real reliance on this particular comparison because the measures can fluctuate according to different policies and to organisational and cultural factors.

Used constructively, such sectoral comparisons can, however, lead to useful debate and analysis, as they did at Amro Bank in the Netherlands. There had been growing concern about the value that the bank was deriving from IT because its expenditure on IT seemed to exceed significantly that of some of its competitors. Amro's management responded, not by insisting on cutbacks, but by ensuring that it was getting the maximum value from its expenditure on IT. As a consequence, Amro introduced more rigorous procedures to improve cost control and now pays closer attention to project management:

- Top management is now actively involved in monitoring IT investment. For example, performance reports on some projects are sent directly to the bank's president.
- Major development projects are broken down wherever possible into several components so that the initial system includes only the core functions required — the remaining features are added when the initial system is running satisfactorily.
- Amro has introduced the concept of information managers, who work on behalf of and within the business units. Their role is to reinforce the units' responsibilities for ensuring that the right level of IT is included in their products and services.
- More user-oriented attitudes are promoted in the systems department. Unit systems managers have been appointed, with the responsibility of managing the relationship with the business units.

Although the case of Amro illustrates how information on IT expenditure by competitors can be used constructively, we advise that such comparisons be treated with extreme care. If the level of spending by an organisation is atypical

of others in its sector, it does not necessarily mean that too little or too much is being spent, and it may even lead to unhelpful recriminations. If the level of spending is in line with that of others in the sector, management can be lulled into a false sense of security, believing that spending the 'average' amount is the same as spending the 'right' amount.

Internal systems-performance measures do not indicate the business contribution of IT

Measures of how well systems departments are performing, in terms of delivering and operating systems for the business, are used to varying degrees in most organisations. A comprehensive example is the measurement programme developed by IBM in the United States that compiles information on systems resources and internal performance from various IBM sites, as shown in Figure 2.2. Individual sites can judge their own performance against the average performance for all the sites.

The IBM programme also collects information designed to test the future health of the systems department — for example, the number of days that systems staff spend on training, the nature of the management procedures in place, and the number of audits performed. It also requires documented cases of gross benefits achieved from the systems that have been installed, and results of user-satisfaction surveys. IBM is still working on the most difficult task of developing measures to assess the strategic business impact of systems.

The IBM performance-measurement programme is a systematic attempt to bring together different indicators of systems performance. Most systems managers develop similar indicators for their functions, although the exact measures and their comprehensiveness vary. Such measures establish benchmarks against which the performance of the systems department can be tracked, and they are an important element of good systems management. Good performance judged by these measures, however, does not necessarily mean that the systems department's customers are satisfied with the services and systems they are getting, nor that the systems are contributing to the performance of the business.

Figure 2.2 A programme developed by IBM in the United States compiles information on systems resources and internal performance

Resources

Gross and net annual information-processing expense: The gross figure is the sum of information-processing expenses within the site. The net figure excludes charges made to support other business units within IBM and is meant to represent expenses to support only a site's own business unit. The expenses are reported for five major business functions, and ongoing operating expenses are differentiated from expenses incurred in introducing changes.

The distribution of information-processing people: The average number of people assigned to consulting, application delivery, strategy and planning, installed application support, system support, and computer operations.

Systems performance measures

Service quality: The number of service-level agreements set and met.

Application-delivery quality: The total number of man-months for all projects committed and met — within cost, on schedule, and performing the agreed functions.

Quality of installed applications and operations: The total number of man-months to correct installed applications defects, and the total number of man-months to correct ongoing operations problems.

Operations productivity: The total number of support people required per central processing unit installed, per mips installed, and per gigabyte of direct-access storage installed.

Application-support productivity: An estimate of the total inventory of installed function points at year end and the total number of man-months that support this installed application base.

Application-delivery productivity: The total number of function points delivered during the year and the total number of man-months to develop or deliver those function points.

User-satisfaction surveys provide important feedback but must be used with care

User-satisfaction surveys are designed to measure the extent to which the systems department's customers are satisfied with both the systems and the services provided to them, and they help to identify areas where systems are either under-delivered or over-delivered. They are becoming common practice in the United States, where nearly 40 per cent of the systems departments of large companies survey their users on a regular basis. They are a valuable source of information on how well the department serves users' needs and should become standard practice in most large organisations, with the results being fed back to users and corporate management. We

described a method for undertaking such surveys in Report 66, *Marketing the Systems Department*.

Some organisations treat user-satisfaction surveys primarily as advisory and marketing tools. Others use them as a measure of the performance of the systems department, and bonuses and salaries may be linked to them. However, while high user satisfaction is a mark of success for the systems department and a prerequisite for the effective use of IT in the organisation, it is not necessarily proof that the organisation is getting business value from IT. Measuring user satisfaction is very important, but if poorly managed, user surveys can fuel unreasonable customer demands and expectations. They should not be used as performance measures in isolation, but should be regarded as part of a wider effort to improve the business benefits of IT investment.

Methods designed to calculate the value of IT to the business can be unrealistic

Several consultancies and other organisations have developed methods for calculating the value of IT in terms of improved business performance. Many of these single out one area of operation of the business (for example, sales and marketing) or concentrate on particular types of IT investment (for example, executive information systems), rather than attempting to provide a global measure of the value of IT to the business as a whole. The following, however, are two examples of very different types of method, each of which provides a more comprehensive view of the value being gained from IT investment:

- *Paul Strassmann's 'return-on-management':* Paul Strassmann, to whose work in the IT productivity field we referred in Chapter 1, has developed a measure of performance that is based on the added-value to an organisation provided by management. To calculate management added-value, he uses the financial results of the business and excludes those items that are outside the control of management. The total value-added of a firm is computed as the difference between net revenues and the payments made to suppliers of raw materials, energy, contract labour,

leases, and so on (revenue by itself is not regarded as a reliable measure, since it includes the costs of resources employed by others). The contribution of capital is then separated from the contribution of labour. This leaves labour value-added. Taking out the direct operating costs leaves management value-added. When divided by the costs of management, this gives an indicator of the total performance of management — return on management (ROM). The extent to which ROM is improved as a result of investment in IT provides a measure of its business contribution.

- *IBM UK's SESAME method*: The method is based on comparing the costs and benefits of an IT system with the costs and benefits of an equivalent system based on manual procedures. It is therefore essentially a method based on calculating the cost of clerical substitution, although the method incorporates a range of sophisticated corrections — for example, to compensate for increasing business complexity.

Methods such as these can be useful, especially for one-off reviews, or for very particular circumstances, but they do have limitations. Using them on a continuing basis to monitor performance may be cumbersome, or simply unrealistic for many of today's IT systems. (For example, it would be impossible to undertake manually what many of today's IT systems undertake.) Perhaps most important, some of the organisations we have spoken to about such methods are very sceptical about using measures based on concepts and approaches that seem artificial or that are alien to the organisation's business culture and language.

The business contribution of IT should be related to key business-performance measures

Although the types of measurement schemes described so far in this chapter can provide useful insights, our research has convinced us that there is no single 'magic formula' for proving the contribution of IT to business performance. Nor can there be. Because the value of IT is inextricably linked with the business's ability to exploit its information asset

by using technology, putting a precise value on the contribution of the technology alone would be misleading. As in other parts of the business, it can be difficult to isolate the precise business contribution of individual investments.

This does not mean, however, that no measurements should be made. Top management looks for evidence that IT is as well managed as any other aspect of the business. Monitoring performance in line with appropriate measures is one aspect of good management. The set of business performance measures to which IT investment can be related and which we describe below is designed to meet this purpose.

We propose a set of ratios that can be used to monitor the relationship between IT expenditure and overall business performance. The ratios relate IT expenditure to the four main measures of business performance with which managers are already familiar:

- *Size*: For commercial organisations, size can be measured in terms of revenue (or its equivalent, such as premium income for insurance companies) or number of employees. Thus, two of the ratios will be IT expenditure as a proportion of revenue, and IT expenditure per employee.
- *Business volume*: This is the volume of business carried out, measured in terms other than money. It applies to both commercial and public-sector organisations. Examples include the population served by a local authority, the total number of passengers carried by an airline, or the total generating capacity of an electricity company. Thus, in a local authority, one of the ratios would be IT expenditure per head of population served, and in an airline, IT expenditure per passenger carried.
- *Operating expenses* (including IT costs). Another ratio would be IT expenditure as a proportion of operating expenses.
- *Key business indicators*: These measure business performance in non-financial terms. The common basis for such indicators is to measure business activity or volume in terms of resources employed (man-hours to assemble a car, for example, or seat-loading factors for an airline). We provide a selection of typical business indicators for a range of industries in Figure 2.3.

Figure 2.3 Key business indicators are those that are important to how a business in a particular sector performs in other than financial terms

Airlines	Ratio of seats occupied to seats available.
Police	Ratio of crimes solved to crimes reported.
Health care	Ratio of patients discharged to total patients.
Fire service	Mean time to reach fires.
Process manufacturing	Plant utilisation.
Retailing	Sales per square metre.
Car manufacturing	Man-hours to assemble a car.

Using the framework of the four types of business-performance measures listed above, each organisation needs to establish its own unique set of ratios that relate IT expenditure to its key business measures and indicators. Figure 2.4, overleaf, illustrates how this would work in the case of a hypothetical airline. As in the example, it can be helpful to relate IT expenditure to more than one measure for each category of business performance to reflect the different activities and objectives of the business. However, it is important to avoid too many.

Each of the ratios can be tracked over time to build up a composite picture of the contribution of IT to overall business performance, and to smooth out fluctuations in business performance and any unusually high or low IT costs, or high or low use, in a particular period. Three years is probably the minimum length of time needed by most organisations to get a reliable picture of the main trends.

The primary purpose of the ratios is to establish whether the general picture is a healthy one. They are therefore intended to be an aid to management judgement — a diagnostic tool, not a ‘proof’ of the value of IT. If the trends indicate cause for concern, a more detailed analysis can be carried out when it is appropriate.

The advantage of using a set of ratios that relate IT expenditure to business-performance measures is that it allows the contribution of IT to be assessed in a holistic manner. Even though

the trend in one of the ratios may be indicating that IT expenditure is rising faster than the business warrants, others may be indicating that increased expenditure is helping to improve business performance. For example:

- IT expenditure as a proportion of revenue may be increasing. This may not be a cause for concern if expenditure as a proportion of operating costs is falling.
- IT expenditure as a proportion both of revenue and operating costs may be increasing. This is not necessarily an indication that IT costs are out of control, however. The revenues of an organisation can fluctuate wildly, especially in some industry sectors, and relating IT expenditure to such revenues would not always be helpful. In a European oil company that we interviewed during our research, for example, IT expenditure had grown consistently by about 12 per cent a year. Revenues were not a reliable basis on which to assess the contribution of IT to the business because they had been quite unpredictable. However, ‘tonnes delivered’ is a common alternative size indicator in the oil business, and IT costs per tonne delivered had decreased by 11 per cent.

The use of such indicators can be particularly helpful in the public sector, as they provide a measure of the contribution of IT in relation to the volume of business and not just in terms of operating costs. In commercial organisations, the non-monetary measures provide an indication of the growth of the business, which is particularly useful where revenues are subject to rapid fluctuations.

- IT expenditure per passenger kilometre flown (for an airline) or per patient discharged from a hospital may be decreasing, even though some of the other measures indicate that there could be cause for concern.

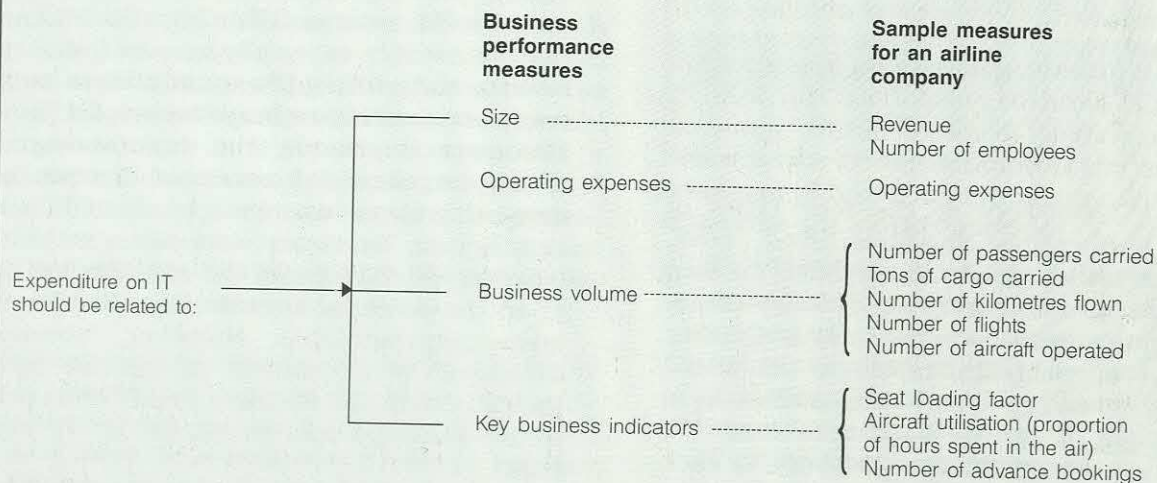
The key to using the set of ratios lies in interpreting them in accordance with business priorities and realities at any one time. For example, an organisation may decide to forego short-term profits in order to increase its market share significantly, and the trends in the ratios should be interpreted in the light of this business aim.

Figure 2.4 A composite picture of value for money can be built up by relating IT expenditure to a set of business-oriented measures

The figure illustrates possible performance measures for a hypothetical airline company. In the example, the IT performance ratios might be:

- IT expenditure as a percentage of revenue.
- IT expenditure per employee.
- IT expenditure as a percentage of operating costs.
- IT expenditure per passenger carried.
- IT expenditure per ton of cargo carried.
- The relationship between IT expenditure and seat-loading factors.*
- The relationship between IT expenditure and aircraft utilisation.*

Each of these would be tracked over time as trend lines, with IT expenditure plotted on the y-axis and the business performance measure (revenue, costs, passengers carried, and so on) on the x-axis. By reviewing *the complete set of* trend lines, it will be possible to build up a composite picture of the contribution of IT to business performance.



* For these two, the expenditure on systems designed to improve a business indicator would be related to that indicator.

If the business is highly decentralised or engages in a wide range of diverse operations, the framework of business-performance measures that we have described can be used to establish a set of ratios for each business unit, as well as for the organisation as a whole. This approach has been adopted by Wavin, a Dutch manufacturer of plastics (although Wavin does not fully follow our proposed approach). Wavin relates the IT expenditure of each business unit, including units based outside the Netherlands, to a comprehensive range of business-performance measures. The information is kept centrally in the Netherlands, tracked, and used

as an overall planning and control aid, together with the usual management accounts.

The ratios described above are designed to monitor the overall business contribution of IT and are intended to be used with other measures, such as measures of the performance of the systems department and user-satisfaction surveys. However, for the organisation to maximise the benefits of IT investment, it is important that it should evaluate investment proposals correctly in the first place. We describe how to approach the investment-appraisal process in Chapter 3.

Chapter 3

Evaluation of the benefits of IT investment proposals must reflect their business purpose

Like any other investment decisions, IT investment decisions must reflect the needs of the organisation. As we emphasised in Chapter 1, IT is a business tool that can significantly improve the way in which an organisation exploits its information resources. The benefits of a proposed investment in IT must therefore be evaluated in relation to the business purpose of the investment. The criteria that are appropriate for justifying different types of IT investment differ according to the purpose of the investment, and in particular, to the kind of benefits that are to be achieved by the proposed system. It is important to distinguish between the different types of IT investment if appropriate evaluation criteria are to be used when justifying systems.

While formal cost-justification procedures and methods have a role to play in evaluating IT investment proposals, they are not sufficient for all types of IT investment. Sometimes, management judgement is needed as well to assess the justification of a proposed investment.

There are different types of IT investment

There are many ways of classifying information systems. A technology-oriented classification would be data processing systems, office systems, and telecommunications systems. An application-oriented classification would be sales and marketing systems, financial and accounting systems, management information systems, and so on. The most appropriate classification for investment-appraisal purposes, however, is the *business purpose* of the proposed investment. As Figure 3.1 shows, we have identified five main business purposes for investing in IT, which lead to five types of IT investment:

- *Mandatory investments.* These are the investments that the organisation must make because of commercial or statutory pressures.
- *Investments to improve business performance.* These are investments that are aimed at improving the organisation's business performance by reducing costs, or increasing revenues.
- *Investments to gain competitive advantage.* These are aimed at improving the organisation's share of, or position in, its market.
- *Infrastructure investments.* These are investments in the technical facilities needed to support business applications. They do not offer direct benefits, but enable the benefits of other IT investments to be realised.
- *Investments in research projects.* These are made with the aim of ensuring that the organisation is prepared for the future so that it can continue to sustain or improve its competitive position.

Figure 3.1 The business purpose defines the category of IT investment

Purpose of the investment	Type of IT investment
Surviving and functioning as a business	→ Mandatory investments
Improving business performance by reducing costs or increasing sales revenue	→ Investments to improve performance
Achieving a competitive leap	→ Competitive-edge investments
Enabling the benefits of other IT investments to be realised	→ Infrastructure investments
Being prepared to compete effectively in the future	→ Research investments

Mandatory investments

Most organisations recognise that they have no choice but to invest in some kinds of systems in order to survive and to operate legally and effectively. Our research indicates that in some organisations, as much as 80 or 90 per cent of IT expenditure may be mandatory. Investment in mandatory systems is sometimes called 'the threshold investment in IT', and represents the amount of money that an organisation must invest in IT if it is simply to survive. Because the organisation has no choice but to invest in mandatory systems, the main investment consideration is how the total costs of the system can be minimised and which available design option will be most cost-effective. Mandatory investments in IT may arise as a result of three different types of requirements:

Regulatory requirements

Most organisations will need to invest in some systems to comply with regulatory or other formally enforced requirements. These generate a need for systems that are designed, for example, to comply with computer database privacy laws, tax laws, or airline security.

Organisational requirements

Every organisation needs systems to enable it to function in pursuit of its main commercial or other objectives, such as systems to provide financial reporting to head offices, accounting systems, or systems to improve the security of operations.

Competitive requirements

Where an organisation's competitors introduce systems that become an integral part of the business, the organisation has little choice but to follow suit. For example, in many countries, it is not possible to operate as a retail bank without offering automatic cash-dispensing services.

The subject of using IT to gain competitive advantage has received considerable attention during much of the second half of the 1980s. A few organisations have gained spectacular successes from applying the concepts. Baxter Healthcare in the United States, for example, introduced a highly successful online ordering system for its customers. Its chief executive is quoted as saying: "It will cost anyone at least \$100 million to compete with us in terms of our systems capabilities, and by the time they catch

up, we'll be on our next iteration. Information systems are a major part of our strategy." However, unless the organisation is the best, or among the first to introduce a novel system to get the better of its competitors, the point of investing in competitive systems is not to gain competitive advantage, but to avoid competitive disadvantage.

Situations where the organisation must invest because of competitive pressures require very careful business judgement and knowledge of the market in which the organisation operates. In some instances, it may even be better not to aim to emulate the competition. A UK financial institution, Abbey National, for example, decided in 1989 not to move into the highly competitive credit-card business. It concluded that, if all the players in its industry acted to overheat the market and increase customer expectations, the ultimate effect may well be an overstimulated market with a rising investment profile and declining profit margins for all the players. Considerations such as these are not a matter for the systems director alone. They need the active participation and judgement of his business colleagues, and positive decisions from, and the commitment of, the board.

Investments to improve business performance

Most commercial organisations aim to achieve growth in revenue and profitability. Greater profitability can be achieved by either reducing costs or increasing revenues, and information systems may contribute to either in various ways, as shown in Figure 3.2.

The role of systems in reducing costs is well established, and cost-reduction continues to be an important criterion for justifying IT investment proposals. For some organisations, this is still the greatest benefit of IT, but its role in winning new business is growing. A German producer of industrial gases, for example, told us that cost savings continue to be an important criterion for areas such as transportation scheduling and the administration involved in calculating leasing charges for gas containers. Using information systems to improve the performance of the business-generating functions has, however, become at least as important — the sales department recently

justified the introduction of 120 laptop computers for use by its sales force by convincing management that a 1 per cent increase in sales would result.

Cost/benefit analysis is, in principle, the most appropriate method of evaluating investments to improve business performance, and there is a range of methods that can be used for expressing the benefits in monetary terms. We provide a brief description of the principal ones in Figure 3.3, overleaf. The final stage of a cost/benefit analysis is to apply one of the well known financial techniques (payback period, cost/benefit ratio, return on investment, net-present value, internal rate of return, and so on) to determine if the investment is justified. Some organisations use different financial 'hurdle rates' (preset net-present values, for example) for different types of investment proposals. The higher the perceived risk to the organisation, the higher the hurdle rate. As a consequence, high hurdle rates are often applied to many IT investment proposals, which can lead to a very conservative approach to IT investment decisions.

However, it is not always easy to apply conventional cost/benefit analysis to IT investment proposals. For some types of benefit (cost

reductions, projected increases in sales, or reductions in staff, for example), the monetary value of the benefits can be estimated with a high degree of certainty. Other types of benefits, such as better decision-making or improved interpersonal communications, are difficult to quantify. In addition, the link between the investment and the benefit may be indirect, and therefore hard to verify.

The attitude of organisations to quantifying benefits varies considerably. Benefits are always assessed in monetary terms in 22 per cent of the organisations that responded to our questionnaire. In other organisations, monetary value is not always calculated, but efforts are made to quantify the benefits in other terms. For example, a system might be justified because it will enable the number of visits made by sales representatives to be increased, even though no attempt is made to translate the increase into a higher sales value. Sometimes, however, no attempt is made to quantify the benefits either in monetary or non-monetary terms.

In practice, most IT investment decisions involve both an assessment of the cost and benefits (expressed in monetary terms), and management judgement. The more subjective

Figure 3.2 Investment in IT may help to increase revenue or to reduce costs

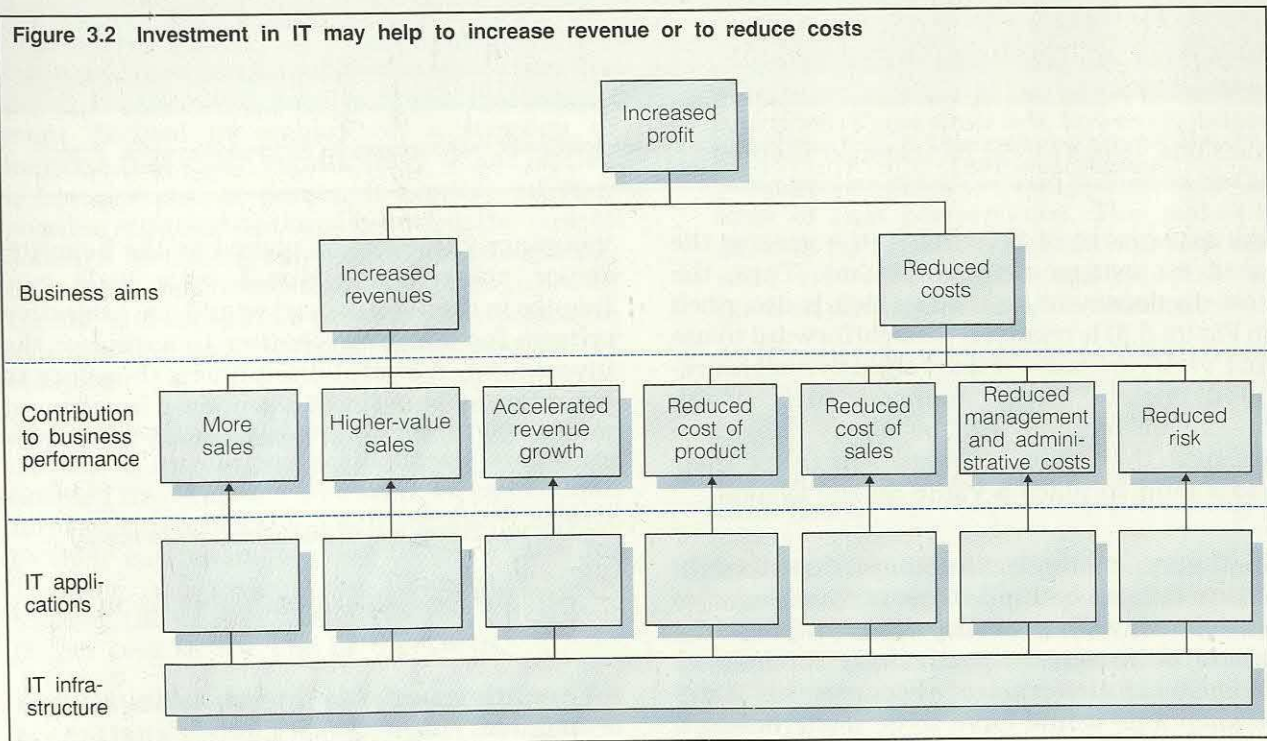


Figure 3.3 Different methods for cost-justifying IT projects are suitable in different circumstances

Cost displacement/avoidance

Perhaps the most common, and most direct, method for cost-justifying information systems is to compare their cost to the total of the current costs that they will displace plus the projected costs that they will avoid. This method is best suited to justifying traditional data processing systems, where clerical labour is replaced by computer systems. It is increasingly inapplicable today, where many new systems do not displace costs, but add value.

Decision analysis

The decision-analysis method is based on the assumption that better information leads to better decisions. If a new system increases the probability of the right decisions being made and these decisions can be shown to lead to greater profits, the system can be shown to offer a positive payoff. This method is useful for evaluating information systems designed to support routine decision-making with known payoffs, such as credit decisions. However, relatively few implementations of information systems fit neatly into the decision-analysis framework.

Structural models

A structural model analyses a line or business function and the impact of an information system on the costs and revenues of that function. The activities of a department are analysed in terms of their impact on the bottom line. For example, the increased time that information systems will allow sales people to spend with prospective customers is translated into more sales. This method is attractive because it links performance improvements to the bottom line; the relationships are very tenuous, however, and the analysis can be time-consuming to prepare.

Breakeven analysis

With the breakeven-analysis method, which is often used for quantifying intangible benefits, the decision-maker is asked to determine subjectively how much the benefits are worth to him. If the value of the estimated benefits is equal to or exceeds the costs, the system is considered cost-justified. The quality of the results of breakeven analysis is highly dependent on the knowledge and judgement of the managers whose views are sought. This method is often used if other more objective methods cannot be used.

Time savings multiplied by salary

With this method, the value of information systems is assessed by estimating the percentage of office workers' time that the system will save and multiplying that by the workers' salaries plus direct employment costs. The method has the merit of being quite easily carried out, but it is based on the assumption that a person's value is equal to his or her cost to the organisation, and it does not take into account whether the time saved will be used productively.

'Hedonic wage model'

This is an extension of the previous method. The model is based on the premise that the values of workers' activities can be inferred from an analysis of the firm's resource-allocation decisions. An analysis is made of an organisation's allocation of its time, by level in the job hierarchy, and by major type of activity. By assuming that the allocation of resources is optimal, and by measuring those allocations and the cost of the resources, the marginal values of the kinds of work performed by managers and professionals can be inferred. These implicit marginal-activity values can be used to estimate the value of restructuring office work patterns.

(Source: Adapted from Sassone, P. G. Cost justification: a survey of cost-benefit methodologies for information systems. *Project Appraisal*, June 1988.)

the assessment of benefits is, the greater the need for management judgement. Thus, the cost-displacement method (which is described in Figure 3.3) is relatively straightforward to use and verify because it uses objective measurement criteria. Other methods, such as the breakeven method, can be highly subjective because they rely on managers using their judgement to place a value on the system.

In theory, methods like those described in Figure 3.3 can be used to quantify all benefits in some way. In practice, the effort required would be excessive, particularly for indirect benefits. Furthermore, because so many assumptions would have to be made before a

monetary value can be placed on the benefits, senior management would have little confidence in the figures, and would use subjective criteria for deciding whether to authorise the investment. A useful discipline is therefore to consider the benefits of a proposed investment under the following headings *in the order shown*:

- Do we have no choice but to invest?
- Are the benefits quantifiable in monetary terms?
- Are the benefits quantifiable in non-monetary terms?

- Are the benefits assessable only by management judgement?

Answering these questions in this order will help to identify the objectives of the system and focus the effort of quantification, where applicable, on where it is really appropriate. If the benefits cannot be satisfactorily quantified and management judges the risk to be high, a pilot project may be a good way of establishing a clearer view of the main benefits of the system.

Investments to achieve competitive advantage

The third type of IT investment is investment in systems that are designed to achieve a major competitive leap for the organisation. Evaluating such proposals, however, is more than simply assessing the extent to which revenues or profitability may be increased. A company that is a market leader in its industry may decide, for example, to forego short-term profits to achieve such a leap. Such a company can exercise significant control over the pricing and cost structure of the industry and its future direction. IT investment proposals should therefore be evaluated in the light of the long-term business advantages that may accrue.

One of the most spectacular success stories in using IT to improve competitive position is that of Thomson Holidays, a UK packaged-holiday company. Thomson Holidays' share of its market in the late 1970s was 8 or 9 per cent. Its management decided to embark on a strategy to increase that share significantly — not just by a few percentage points. It considered four possible strategic options: reducing the cost of holidays, increasing expenditure on advertising, increasing the commission incentives to travel agents, and using IT to provide information on availability and instant confirmation of bookings.

A mixture of the third and fourth strategies was chosen. It introduced a videotex system that enabled travel agents who were equipped with terminals to provide a much improved service to their customers, leading to more sales for Thomson. As a consequence, Thomson Holidays' share of the market had increased to well over 30 per cent by the end of the 1980s.

Cost/benefit analyses are inappropriate for potentially significant and long-term

investments aimed at supporting a major competitive thrust of the business. Such decisions must be based on business vision, knowledge of the market and its dynamics, and a very good understanding of the costs and potential risks of making the investment.

Infrastructure investments

For many organisations, justifying the fourth type of IT investment (infrastructure investments) is a major problem. Investments in IT infrastructure systems enable the benefits of other IT investment to be realised. The usual definition of IT infrastructure is the common hardware, operating systems, database systems, and telecommunications systems that form the basis on which application systems are built, although the definition of an infrastructure investment can be extended to other types of investment — for example, in user support, training, maintenance, and so on.

It will always be particularly difficult to justify investment in the IT infrastructure, just as it is to justify infrastructure investments in other areas of the business (office buildings, warehouses, corporate libraries, and so on). Two main problems tend to arise in justifying IT infrastructure investments:

- The benefits of infrastructure systems accrue to the organisation as a whole and are not always readily visible in the short-term performance of individual business units or functions. These units are, however, judged by their commercial performance and their managers are rewarded and promoted on the basis of that performance. This makes it difficult for them to accept an organisation-wide view of benefits, and reluctant to sponsor the cost of such investments.
- As it may take a long time to develop and implement infrastructure systems, no return may be achieved on the investment until well into the future. Most managers of business units are concerned with achieving short-term goals.

Ultimately, corporate management must form a judgement as to whether the potential benefits of the proposed infrastructure justify the investment. However, the justification process for IT infrastructure investments can be made easier by:

Chapter 3 Evaluation of the benefits of IT investment proposals must reflect their business purpose

- Establishing performance standards for the IT infrastructure.
- Including a share of infrastructure costs when evaluating application systems.

Corporate culture also plays an important role in determining how infrastructure investment proposals are considered.

Establishing performance standards for the IT infrastructure

Often, a large proportion of infrastructure investments can, in fact, be mandatory — the organisation has no choice but to invest in the IT infrastructure. However, because most large organisations already have an infrastructure in place, the problem of cost-justification tends to arise when upgrades, replacements, or new facilities are proposed. Setting standards of performance for infrastructure systems and justifying the investment by reference to those standards can be helpful.

For example, Westland Utrecht, a Dutch mortgage bank, specifies a 98 per cent uptime for all systems, a mean time to respond to problems of 45 minutes, and a two- to three-second response time. Investments in the infrastructure are evaluated by establishing the requirements of business applications and their impact on the infrastructure, and determining the infrastructure upgrades that are necessary to maintain the performance standards.

Performance standards for the infrastructure need to be set according to the requirements of current and future applications. When the demands on the infrastructure exceed the capacity of existing infrastructure systems and threaten to reduce the level of performance provided by the infrastructure, there is a clear case for an upgrade. Major new applications could require substantial upgrades to the infrastructure systems, if the performance standards are to be maintained.

Including a share of infrastructure costs when evaluating application systems

Most new applications will use the IT infrastructure to some extent. It is therefore important to consider the likely impact on infrastructure systems at the time the investment in a proposed application is evaluated. Some organisations do this by including the costs of upgrading the infrastructure systems with the investment case for

the application. In some organisations, this is the only way in which infrastructure investments can be justified. There is a downside to this approach, however, because it may mean that the infrastructure is upgraded in a less than optimum way. In the long term, piecemeal enhancements to the infrastructure to meet specific application requirements are unlikely to be cost-effective.

It may also be possible to justify infrastructure investments, within a predefined systems strategy, in terms of the general benefits expected from a strategic portfolio of applications that will be supported by the infrastructure.

Importance of corporate culture

We found in our research that corporate culture plays an important role in the way in which IT infrastructure investments are considered. The stronger the corporate culture, the more likely it is that a corporate-wide view of such investments will prevail. A strong corporate culture is easy to foster in a homogeneous, highly centralised business, but can also be found in more diversified and decentralised businesses. An example is Wavin, the Dutch plastics manufacturer we referred to on page 10, which has several subsidiaries and has recently made several acquisitions. It places great emphasis on the role of its corporate culture in evaluating investments of corporate-wide benefit (see Figure 3.4).

Investments in research projects

The fifth and last type of IT investment is in research projects. Many organisations devote a proportion of IT expenditure to researching technologies and systems that will help ensure that their information needs can continue to be met adequately in the future.

About half of the organisations that participated in the research for Report 73, *Emerging Technologies*, had research sections for IT. The average budget of these sections was around \$900,000, an amount that we estimate to be between 1.5 and 2 per cent of these organisations' IT expenditure. Some of the research sections are concerned with product and method testing. Others engage in genuine research, even joint ventures with IT suppliers, to develop new products and services.

Figure 3.4 A strong corporate culture plays a crucial role in the evaluation of infrastructure investments at Wavin

Wavin is a pan-European plastics manufacturer with 1989 turnover of Dfl 1.8 billion (\$1 billion) and over 5,000 employees. It has three major operating divisions — pipes, film, and profiles — each of which consists of several operating companies. Decisions about most IT investments are made at the local level, where there are tight controls on project development activity.

The exceptions are large divisional or group-wide projects. Wavin has recently implemented an international network that was not subjected to a cost-justification exercise. Instead, the network was justified in terms of the perceived benefits of electronic mail and intergroup software development and support. The IT director (responsible for both corporate finance and IT) believes that infrastructure investments depend on a culture that consists of:

- A strong belief in IT at top-management level.
- Innovative management.

— An encouraging attitude to risk-taking.

— Staff prepared to take risks.

Multicountry/multibusiness-unit project teams and committees are established to evaluate and recommend corporate standards for infrastructure investments — for example, relational database management systems, and computer-aided software engineering. The objective is to develop corporate standards that operating companies are expected to follow. Although this approach may not always provide the best value for each subsidiary, a strong consensus is created among IT managers and controllers who are involved in the decision-making, and general managers trust this approach. In some recently acquired businesses, however, the corporate culture is weaker and the entrepreneurial spirit stronger. Wavin is now investigating ways of incorporating these subsidiaries into its culture.

Allocating a predefined amount of money for research projects, and setting clear objectives and budgets for the projects, is the common way of funding such work. However, the business benefits of research projects usually take several years to become evident. Hence, how much to spend on researching future applications and products is a question of judging the future needs of the business, and the value of individual research projects in preparing the organisation to meet those needs.

Management judgement is an essential element of the evaluation process

Formal cost-justification procedures can be inappropriate for evaluating certain types of IT investment proposals. However, formal procedures are often carried out simply to satisfy corporate requirements, when the decisions have, in reality, already been taken, or are forced on the organisation by external circumstances.

Even though the limitations of using cost/benefit analyses to evaluate many of today's IT investment proposals are generally well understood, most proposals are still based on such analyses. In our view, cost/benefit analyses are often used and even insisted upon, when they are inappropriate to the purpose of the particular investment situation. If an organisation's competitors offer 24-hour service, for example,

it may well have no choice but to invest in systems that will allow it to provide a similar service, if it is to survive. A few organisations, however, have realised that the application of rigid financial criteria may mean that worthwhile IT investment opportunities are turned down. To be properly assessed, some types of IT investment require intimate knowledge and experience of the business.

Management judgement is therefore an essential element of the evaluation process. Management judgement, often applied in the absence of quantitative measures, is common in the rest of the business, but such an input to systems decisions is often derisively termed 'an act of faith'. IT investment decisions are no different from any other investment, however; they are exercises in predicting how the business should allocate its resources to respond to and manage future changes in the environment in which it operates. Depending on the situation, it may not be appropriate, or even possible, for IT investment decisions to be based just on formal financial-evaluation methods.

Evaluating the five different types of IT investment situations calls for different degrees of management judgement in evaluating each type of proposed investment. We summarise these in Figure 3.5, overleaf. The judgemental aspects of investment evaluation become more important both as the need to understand the demands of the market and as the organisational resources to meet those demands increase.

Chapter 3 Evaluation of the benefits of IT investment proposals must reflect their business purpose

Figure 3.5 Both formal methods and management judgement are necessary for evaluating IT investments

Type of investment	Business benefit	Main formal aids to investment evaluation	Importance of management judgement	Main aspects of management judgement
Mandatory investments as a result of:				
Regulatory requirements	Satisfy minimum legal requirement.	Analysis of costs.	Low	Fitness of the system for the purpose.
Organisational requirements	Facilitate business operations.	Analysis of costs.	Low	Fitness of the system for the purpose. Best option for variable organisational requirements.
Competitive pressure	Keep up with the competition.	Analysis of costs to achieve parity with the competition. Marginal cost to differentiate from the competition, providing the opportunity for competitive advantage.	Crucial	Competitive need to introduce the system at all. Effect of introducing the system into the marketplace. Commercial risk. Ability to sustain competitive advantage.
Investments to improve performance	Reduce costs.	Cost/benefit analyses.	Medium	Validity of the assumptions behind the case.
	Increase revenues.	Cost/benefit analyses. Assessment of hard-to-quantify benefits. Pilots for high-risk investment.	High	Validity of the assumptions behind the case. Real value of hard-to-quantify benefits. Risk involved.
Investments to achieve competitive advantage	Achieve a competitive leap.	Analysis of costs and risks.	Crucial	Competitive aim of the system. Impact on the market and the organisation. Risk involved.
Infrastructure investment	Enable the benefits of other applications to be realised.	Setting of performance standards. Analysis of costs.	Crucial	Corporate need and benefit, both short and long term.
Investment in research	Be prepared for the future.	Setting objectives within cost limits.	High	Long-term corporate benefit. Amount of money to be allocated.

The management responsibility for the investments, however, must be clearly allocated if the right decisions for the business are to be taken and if the benefits are to be realised.

It is crucial to get the right balance of responsibility between business and systems functions. We describe how to achieve this in the next chapter.

Chapter 4

Responsibilities for managing investment in IT must be clear

Ensuring that investment in IT is managed in line with business interests and that the benefits are delivered are concerns for both the business and the IT sides of the organisation. The respective responsibilities of business functions and the systems department for managing IT investments must be clearly established. This is critical at a time when more and more responsibility for IT is being devolved to business managers, which means that the dividing lines for authority and accountability can become blurred.

Matching IT resources to business priorities is becoming more complex

IT is now central to most large organisations' operations and competitive strategies, but to exploit this resource, organisations need effective mechanisms to ensure that investment in IT is directed to those areas that will yield the greatest benefits. Matching IT resources to business requirements is complex and difficult, however. The allocation of resources needs to be reviewed regularly to ensure that it matches the current business priorities. In most organisations, providing the IT resources required to meet *all* of the business's demands would give poor value for money. Hence, there is a need to allocate IT resources in line with a systems strategy that reflects the needs of the business.

The allocation of IT resources must match current business priorities

The annual IT planning and budgeting process is often based on the existing allocation of resources, with the result that particular business functions are frequently allocated resources that may no longer be warranted in view of changed business priorities. The

approach of 'zero-based budgeting' is designed to avoid this tendency. In zero-based budgeting, each project competes on an equal basis for limited resources in each planning and budgeting cycle. Zero-based budgets are not based on last year's budget, but on the assumption that all investment items need to be justified to be allocated funds. A critical examination of the installed base of applications, which in many large organisations can consume three-quarters or more of the annual systems budget, can help to identify redundant, over-engineered, or over-maintained applications. It can also help to highlight areas of the business that have inadequate systems.

Some organisations are taking an even more radical approach to ensuring that the allocation of IT resources reflects business priorities. For example, Dow Chemical, whose European headquarters are in Switzerland, now assesses its systems needs according to business *processes* as well as *functions*. The company carried out a detailed review of all the elements (not just the systems element) of each business process and identified both potential savings and increases in sales. The expected scale of benefits was such that top management was convinced that the proposed approach was worthwhile. As a consequence, top management is actively supporting the concept.

The five processes that were identified as critical to Dow Chemical's business success are ordering and delivering, producing the product, marketing and selling, developing the product, and planning, allocation, and control. The problem that Dow Chemical's systems management faces is that on the one hand, top management has set a ceiling on overall systems expenditure, and on the other, it insists that the new process-based approach is made to work, even though it will probably initially cost more.

Four main projects, which are part of the highest-priority process, have already absorbed all available resources. The systems department's policy is to buy-in wherever possible, building systems only where it is essential. This means that it can use its own staff primarily to add value, and with this in mind, it broadly matches the allocation of staff to the agreed process priorities.

Limited resources need to be allocated so that they provide the best value for money

In many systems departments, the IT resources required to meet all, or even most, business requirements are simply not available. The case of Westland Utrecht, a Dutch mortgage bank, provides an excellent illustration of the dilemma faced by many systems departments: it must respond positively to the demand for business applications by users, but also ensure that IT resources are used in the most cost-effective way. IT is of both strategic and operational significance to the bank. It has recently rebuilt its core applications (accounts payable and receivable, general ledger, customer database, and so on). It has also started developing some new, competitive applications, notably a new customer application.

The aim of this application is to achieve a higher rate of customer acceptances of loan offers, which currently stands at 65 per cent. According to data made available to the bank, even a 5 per cent improvement would pay for the cost of two systems departments. However, the bank's systems department is seriously short of resources, and its main concern now is to provide adequate (80 per cent) solutions, instead of the 100 per cent solutions demanded by users. Educating users to accept that, for most systems, an adequate implementation is more cost-effective for the organisation as a whole has not been easy.

An effective corporate steering group is critical to directing IT investment

Nearly all the organisations that took part in our research, including most of those in the public sector, operate under the constraints discussed above and need to find ways of reconciling the

business's priorities and the systems department's capabilities in the best way for the business. We have reviewed our research to identify what distinguishes those organisations that most successfully manage the IT investment process in the face of these constraints. We have looked for standard procedures and policies, reporting lines, and levels of authority as possible mechanisms. All these have a role to play, but they must come together in a single person or body with high-level executive responsibility for *both* the business and IT sides of the organisation. It will be extremely rare for one person to have both the authority and the attributes needed to do this effectively.

In the organisations we researched, a corporate IT steering group (sometimes called an IT steering committee), on which both business and IT interests are represented, seems to be the most effective mechanism for ensuring that IT investment is directed in the best interests of the organisation. Many Foundation members already have such a group. Usually, various sub-committees report to it, each with responsibility for particular areas of the business, or geographic regions, or projects. Sometimes, it has relationships with other steering groups in the organisation — for example, groups for approving all capital projects in the organisation.

The most effective IT steering groups have many features in common

To be a truly effective management body, an IT steering group must fulfil three main requirements:

Vested authority from the top: Top management needs to be committed to the concept and role of the group, and to work closely with it. Of course, for certain types of investment, approval by the board or even a parent company will be required, but the group must be the recognised executive arm of top management as far as IT matters are concerned.

Board-level representation: At least one of the group members should be a member of the board. Board-level representation helps to ensure that overall business strategy and direction are recognised and considered, and that the agenda for meetings remains high-level and business-oriented. The Colonial Mutual Life

Assurance Society (the UK mutual life branch of an Australian finance-services company), for example, has two board members on its IT steering committee. The systems director may be a board member, but this is not a prerequisite for a successful IT steering group.

Business emphasis: The IT steering group should be concerned with allocating IT resources according to business needs. Any conflict between the requirements of the different business areas should be resolved with reference to the overall objectives of the organisation rather than to the interests of any one business area, or to purely technical considerations.

The IT steering group is responsible for high-level investment decisions

An IT steering group has three main responsibilities:

Approving and monitoring IT strategies and plans

Most organisations now have formal IT strategies aligned to business strategies, but business strategies can change quickly. Formulating an IT strategy is not an event, but a process that needs to be managed. The group should review the strategy regularly to ensure that it is still aligned with current business strategies. It should also review the IT budgets to ensure that they align with the IT strategies and plans.

Setting priorities for IT investment

The IT strategy will provide the ground rules for appraising IT investment proposals. The IT steering group may delegate responsibility for reviewing proposals up to a certain value, but will normally concern itself with proposals above that value or that are likely to have a significant business impact.

Many formal techniques and methods are available for evaluating IT investment proposals to ensure that they match business priorities. They support the decision-making process by helping to assess the relative contribution of proposed projects in a disciplined and systematic way. Methods are typically based on ranking the business contributions (financial and/or other) and risks according to criteria that are relevant to the organisation. The criteria vary according

to the priorities of each business. Barilla, an Italian food manufacturer, for example, aims to be the cost leader in its market, and its investment priorities, listed in Figure 4.1, are consistent with this aim.

A comprehensive method to weight and set priorities for the business contribution of IT projects has been developed by Marilyn Parker of IBM's Los Angeles Scientific Center, and Robert Benson, who runs the Center for the Study of Data Processing at Washington University in Saint Louis. Their method is based on an approach that they call 'information economics'. (The book describing the method is listed in the bibliography.) It involves scoring projects on 10 features, which include, but go beyond, financial considerations. They are of two types. One type is for assessing the business justification of the project; the other is for assessing its technical viability. Weights for the different features must be set by each organisation to reflect its own priorities for IT investment and the features of its technical architecture. Projects are then ranked in terms of their weighted scores. The 10 features are shown in Figure 4.2, overleaf.

Some organisations will find the information economics approach over-mechanistic if applied to all projects. Others will feel uncomfortable with the subjective basis of many of the scores. We do, however, endorse the use of the 10 features as a useful checklist for assessing the wider impact of introducing systems, which goes well beyond the financial impact.

Figure 4.1 Barilla aims to be cost leader in its market, and its investment priorities reflect this ambition

Barilla allocates scores to a systems investment proposal, according to whether the following criteria apply. Proposals with high overall scores are given high priority.

Criteria	Score
System will result in cost reductions	4
System will enable a better service to be provided	4
System will enable better decisions to be made	4
System will result in labour savings	2
System will result in time reductions	2
System will improve the quality of work	2
System will provide better facilities than competitors' systems	2

Figure 4.2 The 'information economics' approach to setting investment priorities is based on 10 features of a system

Weights must be allocated to the different features by each organisation to reflect its own priorities for IT investment and the features of its technical architecture.

Economic impact	The quantified financial return of the project.
Strategic alignment	The match with established corporate strategy.
Competitive advantage	The degree to which the project is expected to give market advantage.
Management-information support	The project's contribution to management's need for information so that it can make informed decisions.
Competitive response	An assessment of the corporate risk of not undertaking the project.
Strategic and organisational risk	The degree to which a project depends on new or untested corporate skills, management capabilities, and/or experience.
Strategic systems architecture	The degree to which the proposed project is consistent with the overall direction of information systems in the business.
Definitional uncertainty	The degree of specificity of the users' objectives.
Technical uncertainty	The extent to which a project depends on new or untried technologies.
Systems infrastructure	The degree to which investment in infrastructure is needed for the project to be viable.

(Source: Parker, M M, and Benson, R J. *Information economics: linking business performance to information technology*. London: Prentice-Hall International, 1988.)

Setting guidelines and policies for day-to-day management

The IT steering group should not concern itself with day-to-day management responsibilities and conflicts, unless there are exceptional circumstances. These matters should be left to management or to appropriate subgroups. However, the group does need to set overall policies and guidelines, or to assign specific responsibilities for establishing these to one or more members of the group. It should also set and review levels of authority for IT investment across the organisation.

Responsibilities for achieving benefits must be clearly allocated

So far, in this chapter, we have been concerned with management responsibility for ensuring that the right investment decisions are taken. As responsibility for IT becomes increasingly decentralised, more and more IT investment decisions are being shared by systems and business managers, or are being entirely devolved to the business units, and it is important that in such a period of transition, responsibility for achieving the projected benefits is clearly allocated. Figure 4.3 shows the levels at which business units and corporate management in large US companies share authority for various IT decisions, for both hardware and software. The results coincide with our own observations of an increasing trend for more user responsibility in IT investment decisions throughout Europe.

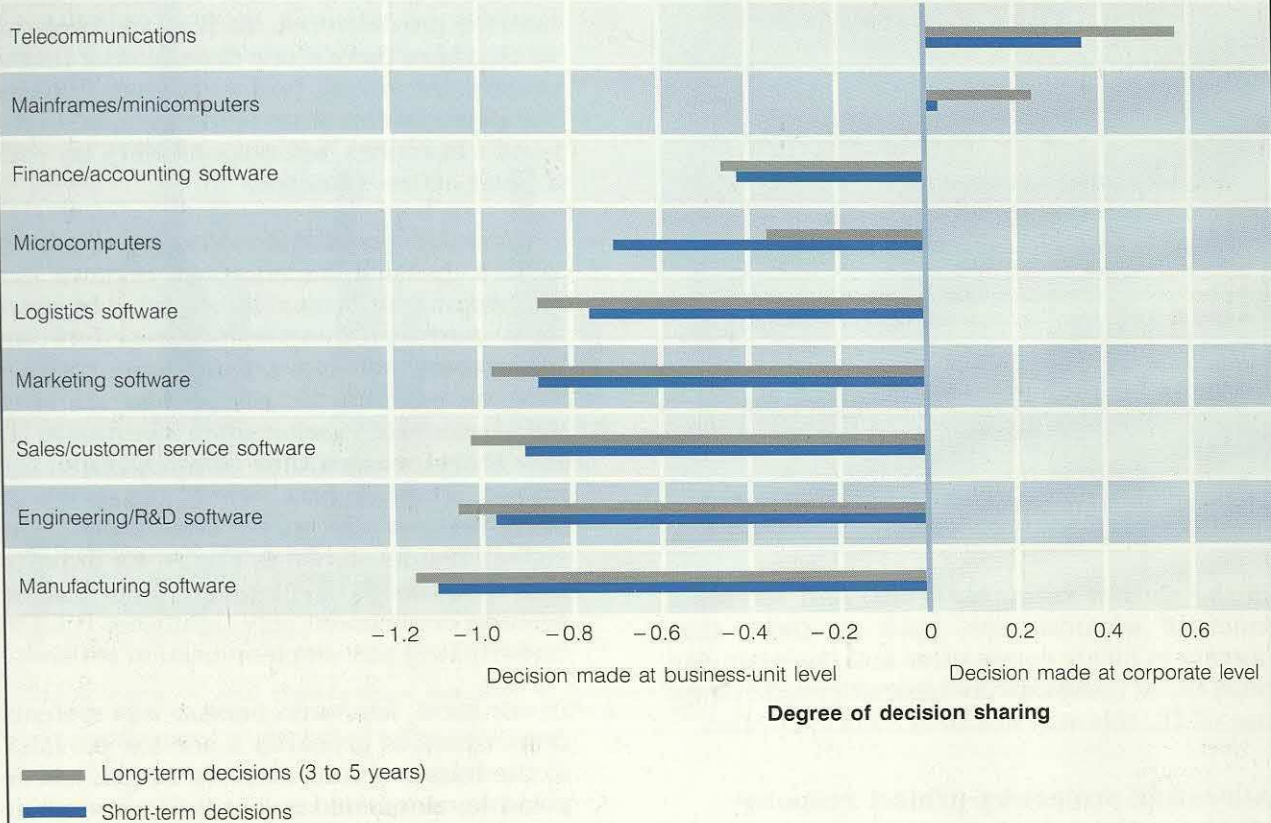
When investment proposals are submitted, the most common practice is for users to take responsibility for the benefits, and for the systems department to take responsibility for the costs. Subsequently, costs are rigorously controlled and monitored, but the achievement of the benefits is rarely monitored. Post-implementation audits are often included in systems development standards, but are not, in general, carried out. During our research, various reasons were put forward for a failure to check, after implementation, whether the benefits are being achieved. Some of the more common are listed in Figure 4.4, on page 24.

Confusion and lack of clarity over responsibility for achieving benefits can lead to frustration, resentment, and poor relations between the systems department and users, and to a lack of control over, and accountabilities for, IT investment for the organisation. Clearer responsibilities can be established either by changing the organisational relationship between the systems department and the business it serves to a strictly commercial one in which users are responsible for both benefits and costs, or by taking project-by-project steps to allocate responsibilities.

Figure 4.3 There is a trend for more IT investment decisions to be taken at the business-unit level

In the figure, zero marks the point at which decisions are equally shared by business units and corporate managers. To the left of that point, decision-making authority rests more with the business unit, and to the right, with corporate management. For example, business units make most decisions about microcomputers but not about other hardware. Most decisions about software are made by the business units, but in the area of financial and accounting software, more of the decision making is shared by the business unit and the corporation.

Expenditure categories



(Source: *Computer Economics Report*, vol. 11, no. 12, December 1989.)

Creating a commercial relationship between the systems department and business units

Many organisations have already instituted a commercial or quasi-commercial relationship between business units and the systems department. Such an arrangement gives business units responsibility and full accountability for both the benefits and the costs of IT projects that they commission; the systems department acts as a provider of services for which the business units pay. It is entirely up to the business units to ensure that benefits are reflected in business results.

The manner in which such an arrangement is set up depends on the extent to which business

units and the systems department may choose to buy or sell IT services outside the organisation. In the extreme case, the systems department may be set up as a separate company, selling its services not just to the business units in its parent organisation, but also to other organisations. Moreover, the business units may buy IT services from whomever they choose.

We expect more organisations to move to a more commercial relationship between business units and the systems department, with users responsible for both costs and benefits. The implication of doing this is that the systems department must be prepared to operate in the same way, and with the same terms and conditions, as any other commercial supplier.

Figure 4.4 A variety of reasons is offered for failing to monitor whether the projected benefits of an investment are being achieved

"It is not necessary": Some organisations adopt the view that if the investment appraisal has been undertaken correctly in the first place and the project implemented according to plan, there is no need to check for benefits. By definition, they must accrue.

"It is too difficult": Benefits can be difficult to assess after the project has been implemented because many IT projects span several business or functional areas. Once a project is completed and the project team has been disbanded, the costs of the project can be assessed fairly accurately, but the benefits that accrue, over the different areas, over a period of time, are often hidden in the general business results of those areas and are not easily identifiable.

"It is against our culture and philosophy": Many systems departments have worked hard at promoting their role with the rest of the business, as a function providing a service. Acting as 'policemen' to check on benefits is appropriate for an internal audit function, but not for a service department.

"It is too costly": Undertaking proper post-implementation reviews can be costly and use resources that may be better deployed on more pressing problems. A balance needs to be struck between the need to monitor the achievement of benefits and the costs of undertaking post-implementation reviews.

In the shorter term, however, and for some kinds of organisations, such as those that operate in highly competitive and fast-changing markets, or those that are inexperienced in their use of IT, this will not be a suitable option.

Allocating project-by-project responsibility for the achievement of benefits

An alternative to a commercial relationship between business units and the systems department is to assign responsibilities for achieving the benefits at the start of individual projects. There are several ways in which this may be done, depending on the organisation and the type of project:

- *Incorporate projected benefits into business-area budgets*: Some organisations insist that business managers incorporate the expected benefits of a project into business-area budgets by altering future budgets according to the benefits to be achieved. For such an approach to work well, the organisation needs to have a strong planning culture; in many organisations, detailed planning and

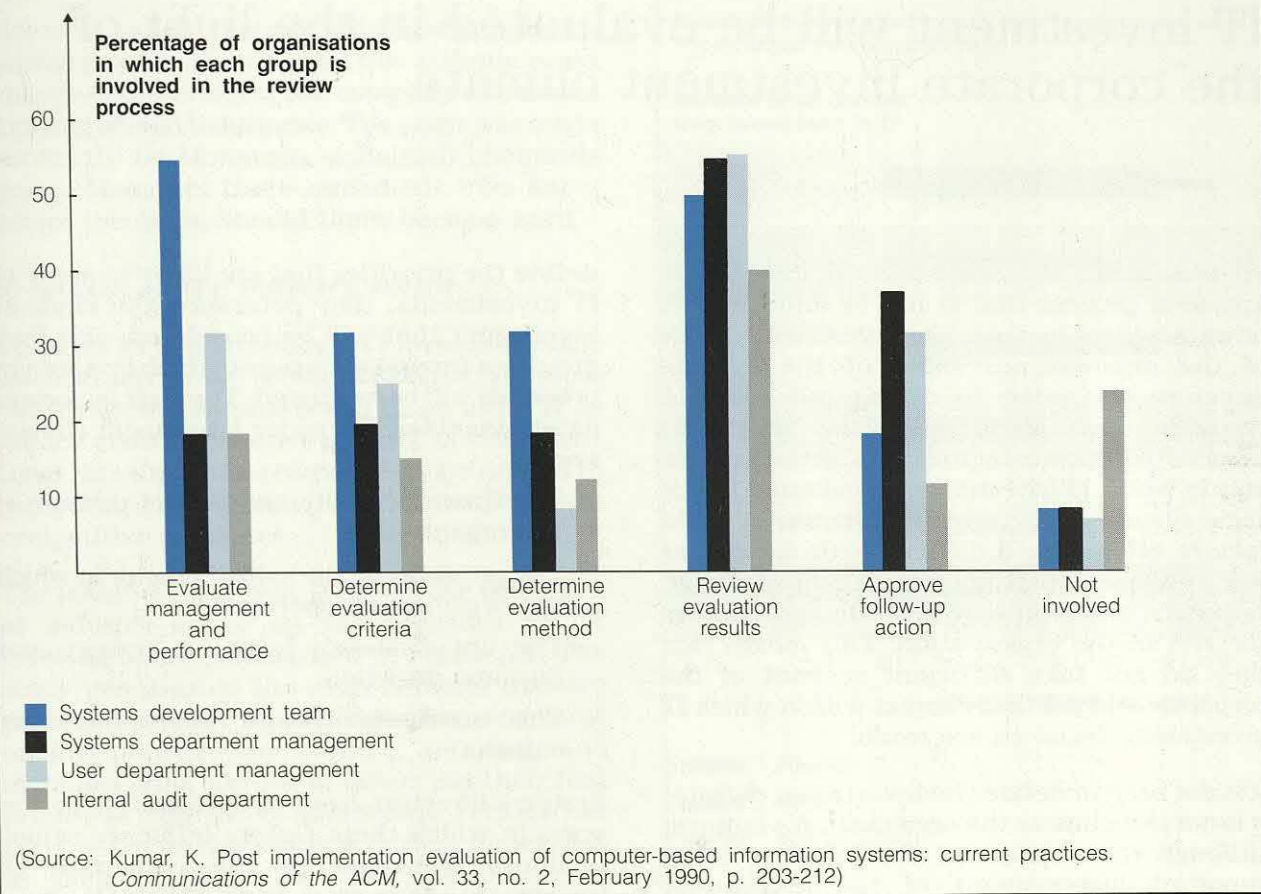
budgeting is not done far enough ahead for such an approach to be realistic or credible.

- *Allocate responsibility to one individual*: Amro Bank in the Netherlands, for example, has been very concerned about how to allocate responsibility for IT investment. Amro now allocates responsibility for results, and it is one person's task to ensure that the benefits are delivered. Such an approach can work where there is one clear sponsor for the project. At Amro, problems arose because the new systems were being installed in the bank's branches, but responsibility lay with a head office manager.
- *Undertake post-implementation reviews*: Where post-implementation reviews are carried out, they must be regarded by users as a normal management procedure for larger or unusual types of investment, rather than as policing, if the organisation is to avoid excessive caution when investing in IT. It is therefore desirable to establish, at the outset, whether, how, when, and by whom such reviews are to be undertaken. The survey results shown in Figure 4.5 indicate that the systems development team and the systems department play significant roles in undertaking post-implementation reviews.

In our view, however, because the systems department is primarily a service provider to the business, such reviews should, where possible, be carried out by an independent party, such as the auditing, finance, or organisation and methods function of the organisation, or by external consultants. The reviews should be regarded not just as a check, but also as a learning exercise for the organisation.

Each of the methods described above for allocating responsibilities for the achievement of benefits will appeal to different organisations and be applicable for different investment situations, even in the same business. There is no single answer to what is a major issue in most businesses today. What is important is that there should be a clear understanding of the respective responsibilities of the systems department and the business units. The policy should be applied at the time the investment proposal is presented and approved; it should not be applied retrospectively.

Figure 4.5 The systems development team and the systems department play significant roles in undertaking post-implementation reviews



Chapter 5

IT investment will be evaluated in the light of the corporate investment climate

There is hardly any aspect of the IT investment-appraisal process that is not in some way or other tempered by the wider investment climate of the organisation. Many of the systems directors we spoke to during our research recognise that there are often overriding broader corporate factors that influence the way in which IT investment is evaluated. While some systems directors take account of these factors, others find it difficult to do so because the systems department is organisationally, culturally, and even geographically remote from the rest of the organisation. This means that they do not take sufficient account of the corporate and political context within which IT investment decisions are made.

It is not easy to define the investment climate. It is not the same as the organisation's culture, although the culture of the business is an important determinant of the investment climate. Culture, commonly defined as the shared beliefs concerning the organisation's history, mission, and values, is much more stable than the investment climate, which can change fundamentally in a very short time, for what sometimes seem to be quite unpredictable reasons. As a consequence, even the best-founded and best-argued case for investment can fail if it is not compatible with the organisation's investment climate at a particular time. Managing IT investments successfully is therefore not just concerned with building and presenting the financial case, but also with the wider corporate political environment within which investment decisions are made.

Complex corporate factors determine the investment climate for IT

Many factors determine the investment climate of an organisation at any particular time. They

define the priorities that are likely to apply to IT investments, they determine the kinds of investment that will be considered, and they provide a framework against which investment proposals will be evaluated. The most important determinants of the wider investment climate are:

- The financial health and market position of the organisation.
- The pressures on the industry sector in which the organisation operates.
- The organisation's business strategy and business direction.
- The management and decision-making culture.

Systems directors need to be sensitive to the ways in which these factors influence senior business managers as they evaluate IT investment proposals. It is the interaction between the factors and the apparent contradictions that can result from that interaction that make the process of managing the IT investment-approval process within the corporate context so complex for some systems directors.

Financial health and market position

Current and predicted financial performance is one of the most important factors determining the way in which senior management evaluates proposed investments. When an organisation is performing well, it will obviously look more favourably on investment proposals than in times of hardship. Schering, a German chemicals group, provides a good example. At the time of our research, this company was in a very strong financial position. It has a board committed to applying IT, and a culture that encourages quick decision-making. In this climate, a very brief statement of the benefits of proposed IT investments is often acceptable, and sometimes

no benefit needs to be demonstrated. The company is prepared to take risks as part of its policy to encourage the use of IT.

However, as Schering and other companies in a similar position pointed out, this attitude could change dramatically if the company's financial fortunes should deteriorate. The point was made succinctly by Monsanto, a Belgian chemicals group. Managers there remarked, "We know where the fat is, should times become hard."

Pressures on the industry sector

Priorities for and attitudes to IT investment vary considerably from sector to sector. In some industries, the emphasis will be on using IT to reduce costs or shorten product development times. In others, the priorities will be related to competitive positioning or fast response to competitive pressures.

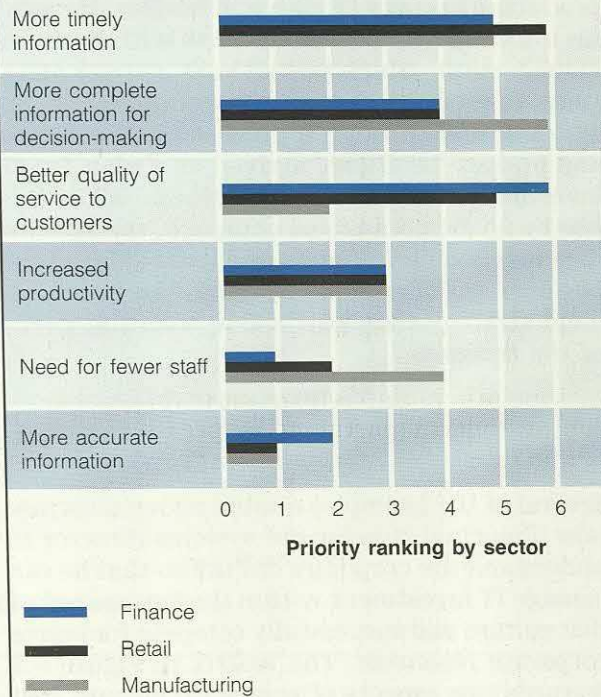
The results of a recent study of the influence of industry sector on the priorities for IT investment are summarised in Figure 5.1. The study investigated the main benefits that are expected from IT by medium-sized and large organisations in the finance, retailing, and manufacturing sectors. Retailers put their first priority as more timely information, because fast turnover of product lines is critical for success in their business. For the finance sector, improving customer service is the highest priority, although this benefit was rated as a very low priority by companies in the manufacturing sector; they put greater emphasis on having more complete information available.

The difference in attitudes to IT investment by organisations in different industry sectors can be profound. In the finance sector, IT is an integral part of the business (indeed, one might say that for a high street bank, IT *is* the business), but in manufacturing and the public sector, the emphasis tends to be on cost control and cost reduction. As one systems director for a large UK manufacturing group said to us ruefully: "Our chief executive sees our marketing manager and discusses the latest sales figures with him. He sees me and says, you are the man who costs me £30 million a year." Systems directors in industries where IT is not an integral part of the business, like manufacturing, tend to have a greater communications barrier to overcome with their top

Figure 5.1 Different industry sectors have different IT investment priorities

Respondents were asked to rank each benefit on a scale of 1 to 6, where 1 = low and 6 = high.

Benefits to be derived from investment in IT



(Source: Datasolve)

management than those in highly information-dependent industries.

The organisation's business strategy and direction

The nature and scope of business strategies are an important influence on the way in which proposed investments in IT are evaluated. The Colonial Mutual Life Assurance Society, for example, has an aggressive strategy to double the size of its business in the four-year period up to 1992. It used to insist on strict cost/benefit analyses for all its IT investments. Its philosophy has now changed: today, all IT investments are judged solely in terms of supporting the commercial strategy and objectives that the Colonial Mutual has set itself.

Business strategies can change rapidly, of course, or not exist at all. In such circumstances,

managing investment in IT can be very difficult. The case of Télémécanique is a good example. This French manufacturer of electronic components was the subject of a much-publicised hostile takeover in 1988. Many management changes resulted, established planning procedures came to a halt, and no business strategy existed. The systems director therefore set about producing his own IT plan and budget. He used his informal network of contacts with business management, which he had built up over many years, to establish the business requirements for systems, and through a process of discussions and budget iterations, arrived at a plan for IT investment that suited the business. While this was by no means an ideal approach, the systems director used his initiative and knowledge of the business and its people to create an IT investment strategy that was in line with the needs of the business.

The management and decision-making culture

Several of the examples quoted above illustrate how important it is for the systems director to understand the corporate culture so that he can manage IT investment within the framework of that culture and successfully compete for scarce corporate resources. The matrix in Figure 5.2 features two aspects of corporate culture that significantly influence attitudes to IT investment: decision-making style and attitude to risk. Investment in large innovative systems that can transform the organisation are more likely in risk-tolerant management cultures with a strong, decision-making style. Innovative investments are likely to be less acceptable in risk-averse, consensus-driven management cultures, and hence, much more difficult to get through the corporate decision-making process. IT directors can use this matrix to determine their organisation's most likely attitude to IT investment.

IT investment appraisal is influenced by political factors

The factors that make up the corporate investment climate can act as a powerful influence on investment decisions. Managing the investment-approval process within the corporate context can therefore be as important as preparing the financial case itself. As well as

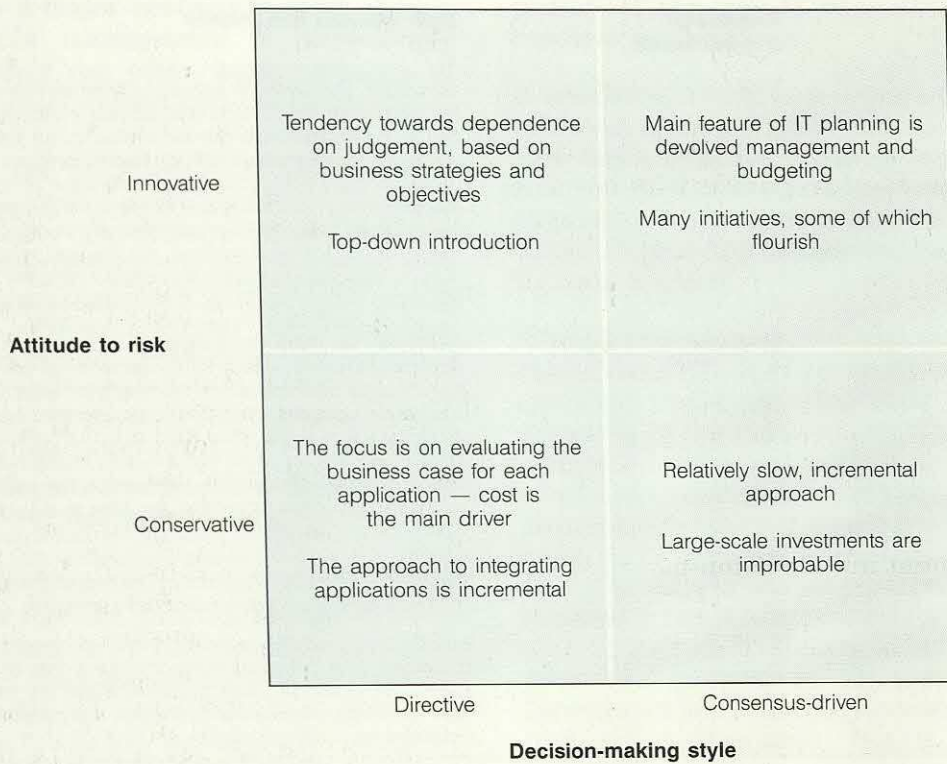
considering the financial merits of an investment proposal, the appraisal process will inevitably be influenced by corporate politics. Indeed, for political reasons, the formal investment procedures and financial analyses are sometimes bypassed or subverted. When this happens, however, it very often arises from genuine attempts to ensure that the right decisions are, in fact, taken.

Research carried out at the London Business School into the way in which strategic investment decisions are made concluded that the whole activity must be seen as part of a wider 'political' context, embracing potential differences of interest between groups and divisions, and the personal stakes of managers. Estimates and forecasts included in an investment proposal cannot be isolated from the individuals or groups that provide them. In the projects studied, the managers involved had a strong emotional bias towards going ahead with the project. The researchers pointed out that people are more sensitive to the priorities revealed by actions (such as which memos are put at the top of the action pile) than those enshrined in formal procedures. The organisational investment climate is heavily influenced by informal actions, such as who talks to whom, and the kinds of debate that take place.

The importance of the human and political aspects of IT investment evaluation is rarely explicitly recognised in research on the topic. However, some research has been undertaken, notably by the Oxford Institute of Information Management at Templeton College in the United Kingdom. This research suggests that the IT investment-evaluation process includes subjective and political aspects as well as objective and rational aspects, as shown in Figure 5.3 on page 30. Evaluation of the case for investment may be based on objective criteria, such as performance improvements resulting from the investment, but may be overridden by more subjective criteria and political considerations, such as the fit of the investment in the wider organisational environment.

By drawing attention to the importance of the political aspects of evaluating IT investment proposals, we do not mean to suggest that formal evaluations are meaningless, as some researchers have done. Value for money is nearly always

Figure 5.2 Management style has a marked influence on attitudes to IT investment



partly a matter of counting and partly a matter of perceptions, and it is so in the IT field, too. Being sensitive to the political aspects of IT investment can be as important as preparing a convincing financial case.

Investment proposals must be sensitive to the corporate environment

To appreciate the influence of the corporate environment on IT investment, it is essential that the culture of the systems department is aligned with that of the business. Some systems directors, however, are perceived as being remote from the business and fail to adopt the higher business profile that would be justified by the size of the corporate investment for which they are responsible. This point was made forcibly by Butler Cox's managing director, George Cox, at the International Foundation Conference in Cannes in October 1989: 'Many systems directors are too preoccupied with

technical rather than commercial achievement, and too oriented to running their departments rather than becoming truly involved in the business. The likely consequences', he said, 'are even greater devolution of systems responsibilities to the business, or contracting out altogether, leading to a gradual erosion of the systems director's responsibilities and status.'

Adopting a business orientation means being part of the organisation's senior business management team, and being seen to be so. Where the systems director is a board member, the task will be easier, but being a member of the board is not, in itself, enough. The systems director must speak the language of the business and encourage his own systems staff to do the same, he must have a genuine interest in, and knowledge of what the business is doing and where it is heading, and he must, where appropriate, stake his career and personal fortune with the business. As one systems director of a large and successful British conglomerate said: 'Thirty per cent of my pay

Figure 5.3 The IT investment-evaluation process includes subjective and political elements as well as objective and rational elements

Spectrum of the evaluation	Purpose of the evaluation	Main features and criteria
Objective/rational	'Doing things right'	<i>Efficiency:</i> Evaluation in terms of efficiency is at one extreme of the objective/rational-subjective/political dimension. The overall aim is to achieve more precise measures for performance, efficiency, or reliability. Methods and techniques are used to measure more accurately the performance of computer systems, the correctness and efficiency of programs, and so on. There is generally little intrinsic difficulty in accepting the validity of such measurements, but the assumption behind them is that the specification is correct, that the systems do in fact meet the purpose they are intended to serve.
	'Doing the right things'	<i>Effectiveness:</i> Here, the concern of the evaluator is that systems should 'do the right things, and not just do things right' based on the well known dictum of Peter Drucker. Evaluation becomes much more problematic, because effectiveness is more difficult to judge than efficiency. Even if initial objectives could be set and later measured, they tend to evolve and change over time. Moreover, the aspects that are measured are often those that are easy to measure rather than those that are important. Although the formal justification for systems designed to increase effectiveness may be made in hard financial terms, the actual planning of the system is often based upon the perceived qualitative benefits.
Subjective/political	Fit with the environment	<i>Understanding of the organisational environment:</i> This kind of evaluation is at the subjective/political extreme of the dimension proposed by the Templeton workers. Here, the concern is with how evaluations are performed within the political-social environment of an organisation.

comes from the increase in earnings per share that my company achieves. I encourage share-option schemes for all my own senior staff. It's all part of giving a message to them — that we are part of the business.'

Very often, the political process for a major investment proposal begins long before the financial case has been compiled. Managing the politics of the organisation to improve the chances of making the right investment decisions means knowing how to present proposals, involving appropriate people in the process, and judging the right time and place for every step in that process.

It also means understanding the many subtleties and idiosyncrasies of corporate life. For example, in one of the large European petrochemical companies we spoke to, it is not acceptable to assume a reduction in oil revenues in any long-

range planning exercise. While such 'rules' may seem ludicrous to outsiders, they are part of the politics of any organisation, and must be reflected in the way in which IT investment proposals are presented.

Managing corporate politics is a fine art. Excessive political manoeuvring, where the game becomes the objective, can be detrimental rather than helpful. The systems director must recognise the importance of political subtleties, take steps to stay close to senior management, and take an active part in corporate life. If senior management turns down IT investment proposals, or questions the value that their organisations get from IT, it may well have nothing to do with the objective merits of the case. It may simply mean that senior management does not have sufficient trust. To build such trust needs political skills as well as effective management skills.

Report conclusion

Ensuring that IT investments provide business value is now a major concern in most organisations. Senior management is increasingly asking whether the often huge amounts of money spent on IT deliver value to the business.

As a result, the emphasis of IT performance measures has moved away from the efficiency and productivity of the systems department to the quality and relevance of the service offered. Increasingly, the concern is with demonstrating that IT investment sustains and improves business performance. This changing emphasis has led to the realisation that the business contribution of IT is intimately linked with *how* the business uses the technology. Getting value from IT is therefore primarily a business concern, not a technology-management concern.

Our research has convinced us that there is no single 'magic formula' that can be used to prove that investment in IT contributes to business performance. Each organisation needs to devise its own range of measures that relate IT expenditure to the key performance measures and indicators already used by the business.

Over time, it is possible to build up a composite picture of the way IT expenditure relates to business performance.

It is also important to recognise that there are different types of IT investment and that each type has a different business purpose. Formal cost-justification methods are inappropriate for evaluating some types of investment proposal. A high degree of management judgement must be used instead.

When business managers ask "Are we getting value from IT?", they are really asking "Are we spending too much? Too little? And are we spending in the right areas?" These questions cannot be answered without considering the overall aims and strategy of the business. If the business is in a poor strategic position, investing more in IT is likely to contribute to an even faster decline in business performance. If the business is in a strong strategic position, greater expenditure on IT is likely to help the business grow and prosper at an even faster rate. Investment in IT cannot compensate for poor business performance, but it can enhance business success.

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