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The Challenge of IS/IT Investments

Managers considering the current role and value of IT within their organizations can be forgiven for feeling they are at a crossroads and being given very little help with which direction they should go, either from their colleagues or from outside commentators and experts.

The demand from colleagues within the organization for new systems, improvements to existing systems and increased support seems to grow continuously. Such demands will be supported by descriptions of the expected improvements, either claiming cost savings from improved efficiencies or increased revenue generation from the creation of new services or capabilities. Many of these arguments will be well founded. However, these demands must be set against the reality that IT budgets are finite and in many cases these budgets are being reduced. Although for many organizations budgets are linked to the prevailing trading climate, this also suggests that senior managers are not as convinced of the positive outcomes from IT spending as those further down the organization. This may also be a reaction to the overblown expectations that accompanied the dot.com boom of the late 1990s, when many claims were made for how internet-based initiatives would change organizations and even create a 'new economy'.

Equally, commentators appear to have conflicting advice on the subject. Articles in the press and respected management journals constantly describe how organizations have improved their operations, generated new business opportunities and outperformed their competitors by means of well-selected and deployed IT. In their discussion of IT investment approaches, Ross and Beath (2002) describe how United Parcel Service (UPS) invested $11 billion over a 10-year

period to create a centralized data repository, built a global network, implemented enterprise-wide applications and shared databases and implemented disaster recovery operations. This has resulted in UPS being able to exchange 88% of all transactions and package information electronically, significantly improving the efficiency and hence the cost base of its operations, while also being able to pursue new business opportunities. This, they state, has allowed UPS to reassert its leadership in its industry, with *Fortune* magazine naming it the most admired mail, package and freight company in 2000.

In contrast, the provocatively titled article, 'IT doesn't matter' (Carr, 2003), suggested that the considerable investments organizations continue to make in IT are wrong headed. The author argued that the decreasing costs of IT, be that processing power, data storage or data transport, coupled with the significant sums that organizations have spent on these capabilities, have resulted in ubiquitous powerful IT – something that every organization can own. He therefore reasoned that, since all organizations can tap into this capability, it cannot provide competitive advantage to any one firm. Carr developed his argument by likening IT to earlier broadly adopted technologies that have shaped modern-day industry, from steam engines and railways to the electricity grid and telephone networks. These technologies he referred to as 'infrastructural' and observed that, unlike the results of most company proprietary R&D work, these developments are more valuable when shared with other companies rather than kept private.

He continued that such infrastructural developments initially result in standard technology becoming available to all firms, but after time, even the way that technology is used becomes standardized, with best practices being well understood and even built into the technology. This reduces the possibility for competitive advantage for any one firm even further. In the case of software, because many business processes and activities have become embedded in software, those processes are replicated as standard across organizations. As any IT manager is well aware, customization of packages is expensive and often results in reduced interoperability, but without which there is little distinction between organizations. The ability to deliver software over the Internet, as standardized web services, Carr argued, will exacerbate the standardization and commoditization even further. The growing use of the term 'utility computing', where the leading vendors will rent their applications rather than sell them, further underlies this move to commoditization.

A study by a group of US academics (Mata et al., 1995) explored the issue of sustained competitive advantage from IT. They concluded that many issues related to IT, such as technology, access to capital and technical IT skills could not provide sustained competitive advantage. The only factor that could provide this was IT management skills, described as '*the ability to conceive of, develop and exploit IT applications to support or enhance other business functions*'. Skills required to achieve this include the ability of IT managers to understand the business needs of other functional managers and to work with these managers to develop and exploit appropriate systems. The authors concluded that these IT management skills were often tacit, composed of many hundreds of small decisions and had a strong social element to them. They were therefore difficult for competitors to imitate and hence could, if developed, provide a source of sustained competitive advantage.

The Development of IS/IT within Organizations

As the competitive pressures on organizations have changed over the last four decades, so the expectations from IT in helping to meet those challenges have changed. As shown in Table 1.1 (Farbey et al., 1993; Renkema, 2000), the early days of IT adoption within organizations were characterized by the automation of routine activities to improve efficiency. As IT adoption became more widespread, the emphasis began to shift from using IT solely to reduce costs to also using it to improve the quality of firms' operations and products.

Table 1.1 *The development of IT support for business (after Farbey et al., 1993; Renkema, 2000)*

Decade	Market demands	Ideal firm	IT performance criteria	Technology base	IT applications
1960s	Price	The efficient firm	Efficiency	Mainframe – batch processing	Data processing/ automation of routine tasks
1970s	Price, quality	The quality firm	Efficiency + quality	Mainframe – batch processing	Functional efficiency
1980s	Price, quality, choice/delivery time	The flexible firm	Efficiency + quality + flexibility	Personal computing	Personal productivity
1990s and beyond	Price, quality, choice/delivery time, uniqueness	The innovating firm	Efficiency + quality + flexibility + innovative ability	Networks	Organizational transformation

In many industries, the 1980s saw a movement away from production being determined by raw materials and production capacity, to production being set by customer demand. Fluctuations in this demand caused firms to focus on the flexibility of their operations. The advent of the PC in this era, allowed a more distributed application of IT, for example at individual workstations within factories, within warehouses and in smaller regional offices. This application closer to the point of need, both enabled and further encouraged the increasing demand for flexibility.

The New Economy

The 1990s, and the dawn of the new century, has seen the dramatic growth in the networking of PCs, supporting increased communication between individuals, thus spawning the whole domain of IT-enabled knowledge management. In addition to human-to-human interaction, increased networking, through the increased adoption of standards, has improved the integration between applications addressing the issue of localized adoption of IT that often resulted in unconnected 'islands of automation'.

The 1990s saw the commercial adoption of the most notable of these networks, often described as a 'network of networks', the Internet. This spawned the whole domain of e-business and its associated emphasis on innovation, both in the products and services supplied to business customers and consumers, and also in the business processes supporting this product and service delivery.

Despite the downturn in sentiment towards the dot.com companies in April 2000, e-business continues to be a strategic imperative for many businesses. Firms recognize that e-business can assist with numerous objectives, such as enriching the dialogue with customers, streamlining internal business processes and developing deeper relationships with key suppliers. However, this domain also poses many challenges such as the entrance of new competitors, the blurring of market boundaries and the emergence of new business models.

A number of researchers have suggested that in such environments competitive advantage is transient, rather than sustainable and hence the emphasis for today's firms is on innovation. Managers must therefore concentrate on renewing rather than protecting their sources of competitive advantage. No longer can they rely on the

assets, staff, products, IT and other resources that they have assembled to provide their present competitive position. The dynamic nature of the current business environment requires them to be able to combine these resources in new ways and to develop new resources, and to do this repeatedly, if they are to compete successfully.

Productivity Gains from IS/IT

Farrell (2003) explored the link between productivity, at both industry and organizational level, and the expenditure on IT. Her study focused particularly on the 1990s and sought to see if the considerable expenditures on IT that were witnessed during that decade resulted in corresponding increases in productivity. She found that the latter half of the 1990s saw an increase in labour productivity, particularly in the USA, which coincided with a dramatic increase in the spending on IT. However, she also found that those gains in productivity were not evenly spread across industries, despite all industries increasing their IT spending. Indeed in the US, just six sectors accounted for 76% of the country's net productivity gain. From this she concluded that '*IT is of great, but not primary, importance to the fate of industries and individual companies*'.

From her study, Farrell concluded that the prime cause of the increased productivity witnessed is intensifying competition within an industry and hence on the individual firms. This increase in competition, she stated, causes managers to increase innovation, which in turn increases productivity. IS/IT is just one way, although if used well, a very powerful way, in which such managers can innovate in order to either meet or exceed the increased competition. In considering where and how IS/IT has been used most effectively to improve productivity, she observed certain patterns. These include the application of IS/IT to those areas or levers in the business that matter most (see Box 1.1). These will vary from industry to industry, for example in consumer retailing, systems that improve distribution and logistics, merchandising and store management will have the greatest effect, whereas in banking it is systems that can automate lending and process large-scale back office transactions. This suggests that it is more specialized applications, tailored to particular sectors that will have the greatest impact on productivity. Indeed, she found that general-purpose applications, such as CRM systems, have to date tended to yield poor results. Interestingly, and consistent

with the approach suggested in this book, she also found that IS/IT adoption had most impact on productivity within organizations when it was accompanied by managerial and organizational changes.

Box 1.1 IT and organizational value

Does IT provide value to organizations and, if so, how is that value generated are perennial questions, both for the managers within organizations who must invest ever greater sums in IT and seek to harness value from such investments, and for academics wanting to shed light on these challenging activities. Melville et al. (2004) propose a single, overarching model that brings together or integrates previous studies looking at this topic.

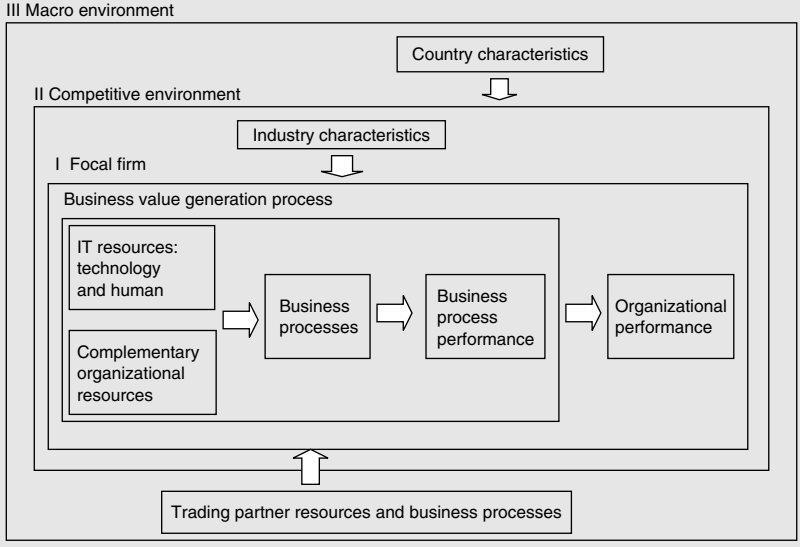

Figure 1.1 *The business value model (after Melville et al., 2004, p. 293) Copyright © 2004 by the Regents of the University of Minnesota. Used with permission*

Their derivation of the proposed model is based on the resource-based view (RBV) of the firm. This strand of strategic thinking proposes that rather than a focus on the external market in which an organization operates, strategy should be based on

a consideration of the resources they have at their disposal or can easily acquire. Such resources include not only physical and financial assets, but also the skills and experience of the staff within the organization. The RBV suggests that if a resource is rare, then it can provide a source of temporary advantage or value to an organization that possesses it. However, in order to provide sustained value, a resource should be both rare and difficult to imitate or substitute.

The model of how IT acts to provide business value within an organization is shown in Figure 1.1. IT resources, which are recognized to consist of both technology and human resources, together with other complementary resources, such as appropriate working practices or culture, are combined and applied to the processes that make up the activities of the organization. Improvement of these processes may be expected to lead to improved organizational performance, although it is noted by the authors that this is not always the case.

The model also shows that the derivation of value by an individual organization will be affected by its trading partners, the industry in which the organization operates and the macro-environment. In particular, the authors observe that partners with whom the firm is trading electronically may try to appropriate some of the value generated by any inter-organizational systems. Additionally, in highly competitive markets the value generated by the use of IT may be appropriated by customers.

The Generic Benefits of IT

In their book exploring evaluation methods for IT, Farbey et al. (1993) present a generic list of benefits that may be expected from IT investments. Their book, which is based on an empirical study of project evaluation in 16 organizations spanning a range of industry sectors, presents a list of benefits drawn from those projects and is augmented by benefits identified in the then existing literature. While the authors stress that the nature and scope of benefits is obviously dependent on what the project is trying to achieve and will vary by particular organizational or market context, they note that such a generic list of benefits would be welcomed.

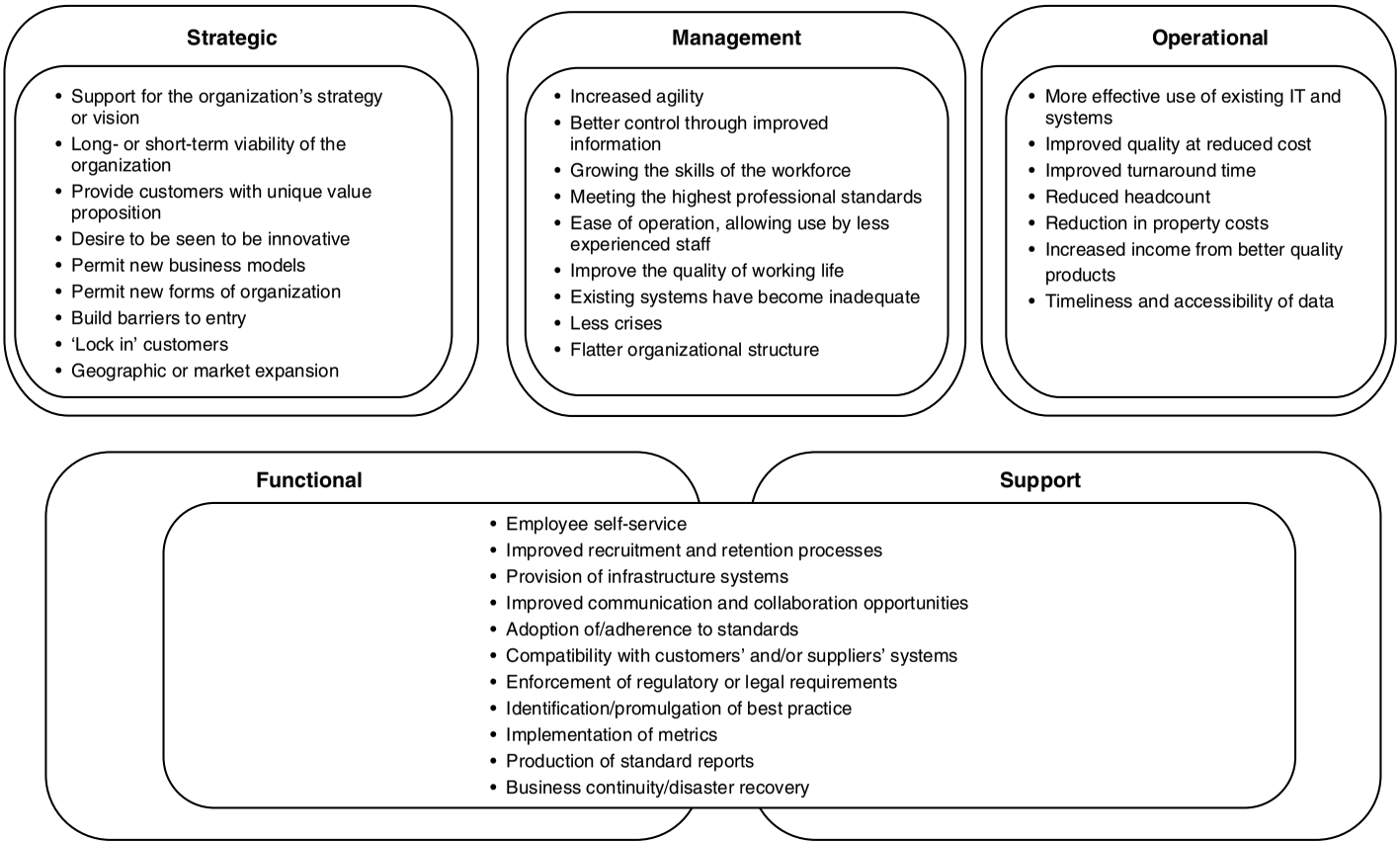

Figure 1.2 *Generic form of benefits arising from IS/IT (after Farbey et al., 1993)*

The resulting list of benefits is categorized according to Mintzberg's view of the structure of an organization described in *Structure in Fives* (1983). In this view of an organization, Mintzberg's intention was to differentiate the elements of a firm according to the *people* contained in each and the activities they undertook. This people-centric view of the organization is a valuable starting point for considering the benefits that arise from the use of IS/IT, since an assumption that underlies the whole benefit-centred approach described in this book is that IS/IT delivers benefits when it allows individuals or groups to improve the performance of their roles or tasks within the organization. Use of the Mintzberg framework underlines that the benefits arising from the adoption of IS/IT cannot be considered in isolation from those individuals who are making use of the new systems.

A version of the Farbey et al. framework, updated to reflect current developments in IS/IT is shown in Figure 1.2.

The meaning of each of the five elements of the organizational structure is shown in Table 1.2. The first three organizational elements shown in this table are relatively easy to understand, even if there may be a discussion about where the boundary should be drawn between them, and remain current today. However, it would seem to be difficult to distinguish between the last two categories. Mintzberg, from whom the underlying model is taken, described the functional component of the organization as containing staff whose role is to influence the *way* in which people work. Such individuals would originally include operations researchers and work-study teams and more recently systems and business process analysts, change managers and, in some firms, internal audit staff. As shown in Table 1.2,

Table 1.2 *The five elements of an organization (after Farbey et al., 1993)*

Organizational structure element	Description
Strategic	Includes people charged with overall responsibility for the organization's direction
Management	Includes middle managers who operate in order to transform the strategic vision into operational reality
Operational	Refers to people who perform work related directly to the production of products and services
Functional	Includes people who serve the organization by affecting others' work
Support	Includes people who provide support for the organization outside the basic production of goods or services. These are often specialists in certain disciplines

he describes the support element of the organization as those staff whose work lies outside the direct production of the products or services of the firm. While a distinction can be drawn between IS/IT support for this activity and that for the functional area of a firm, in practice the distinction is slight. Increasingly the provision of new and improved infrastructure within an organization is intended to improve the *way* in which staff work. For example, the provision of email within an organization is to allow richer, faster and lower cost communication among staff, which will impact how they work with their colleagues. For this reason the benefits arising from application of IS/IT in the functional and support activities will be discussed together.

While a detailed examination of any of the individual benefits would require a consideration of the context of the project, the organization and even the industry in which it operates, Figure 1.2 illustrates a number of generic benefits that can be realized from IS and IT. The figure, and the structure chosen by the authors, clearly shows that IS/IT can generate benefits in all areas of the organization. Many of the benefits continue to be operational gains, such as the reduction in the time taken or costs incurred to complete a task or process or an improvement in the accuracy of an activity. These benefits are consistent with the early uses of IT within firms in the 1960s and 70s, and are often where firms commencing their use of IS/IT focus their efforts. However, Figure 1.2 shows there are also a significant number of benefits that can be linked to the management and strategic development of an organization.

Strategic Benefits

The opportunity for organizations to realize strategic benefit from IS and IT has been possible ever since its early use for business applications, back in the 1960s. However, the advent of e-business in the 1990s caused a particular focus on the use of IS and IT to define or redefine strategy. Many organizations developed new business models, often where IS or IT was not simply a support to the existing organization, but *was* the organization (Amit and Zott, 2001). Well-known examples where IS effectively defines the strategy of the organization include organizations born during the dot.com era, such as Amazon and Lastminute.com. However, a number of firms that preexisted that era have made such significant use of IT to run their internal operations and to work with suppliers and customers, that IT is now key to their existence (see Box 1.2).

Box 1.2 Using IS/IT to define organizational strategy

An example of an organization that makes such extensive use of IS and IT in its operations that it now defines the organization is Dell Computers. The use of information systems starts with customers being encouraged to use the organization's website (www.dell.com) to place their orders. The easy-to-use site guides users through the configuration of a PC that meets their needs, screening out combinations of components that are not optimal. Once the order has been confirmed, purchase orders for the necessary components are automatically generated by Dell and sent to their suppliers. This rapid transmission of orders back to suppliers allows Dell to hold little stock and results in a stockturn of around 60 times per year, a figure that is six times higher than their competitors.

The close communication with suppliers and low stock holding, enabled by IT, allow Dell to define itself as 'building PCs to order'. The benefits of such an approach are significant. Customers get exactly what they want, rather than what a manufacturer has chosen to make many months before, as occurs in the automotive industry. Dell also removes the risk of being left with slow to move finished goods, a particular risk in the high-tech sector, where falling cost and increasing performance of many components mean that such stock can depreciate in value very quickly. Indeed, the electronic customer ordering and payment operated by Dell is so efficient that the company has a positive working capital for such orders.

In other organizations, where IS/IT has not been adopted to such a significant level, it can still offer significant strategic benefits. For example, it may allow the organization to provide a unique service to its customers, differentiating them from the competition and, ideally, 'locking their customers in'. Many e-business developments sought to generate such unique customer value propositions, often by opening internal systems up to customers to provide them with an improved service.

The efficiency savings offered by IS/IT may be so significant that they allow an organization that otherwise would be in severe difficulties to remain viable and even be able to compete effectively with others in their industry. Small and medium sized businesses in

particular are often encourage to explore the use of IS/IT to allow them to '*level the playing field*' with their larger competitors, who benefit from economies of scale. One of the benefits predicted for the electronic procurement marketplaces that flourished during the late 1990s, was that they would reduce the buying costs smaller businesses often face. By combining orders with other small businesses and also reducing the transaction costs associated with purchasing, it was expected that such marketplaces would allow smaller businesses to achieve a cost of goods similar to that of larger organizations. To date, there is no evidence that smaller businesses have brought their purchasing together in order to negotiate bulk discounts. However, such marketplaces have clearly demonstrated the ability to reduce the administrative costs associated with purchasing.

Another strategic reason for adopting IS/IT is a desire to be seen to be innovative. A study undertaken by Daniel and Storey (1997) into the rationale for the then new online banking services being offered by the retail banks found that this was one of the benefits being sought from such systems. A number of other potential strategic benefits were also identified by banks, such as the ability to provide a better service to existing customers and an ability to attract new customers and to target new customer segments. However, interestingly, the ability of the service to protect or enhance their existing reputation for innovation was cited by the banks interviewed as one of the key benefits sought from such systems. This may have been because, at the time, it was clear that uptake would be very slow and, although in the future such systems may allow reduction in the costly branch networks operated by these banks, in the short to medium term, internet banking would only add to the cost and complexity of the organization's operations. Justifying the development on cost savings would not therefore be possible. Developing a reputation for successful innovation is key to many consumer markets, since growing revenues increasingly depend on such innovations. Maintaining such a reputation is important, since studies have shown that consumers are more ready to accept new services from proven innovators.

Management Benefits

Farbey et al. (1993) use the term management in Figure 1.2 to describe the activities of middle managers within the organization. These individuals operate at a business unit level and are often tasked with the collection and sharing of information, together with decision making based on that information, often about the most appropriate use of resources and are also responsible for the development of their staff.

Agility has become an increasingly popular term in all areas of business. As many markets are seen to be becoming more dynamic, and are changing in unexpected ways, organizations must learn how to change frequently and rapidly. The ability of an organization to change in order to accommodate market dynamism is being termed organizational agility. In theory, agility is not dependent on IS/IT, but in reality this is the only practical means of creating the speed and accuracy required (see Box 1.3). While agility can be developed at the organizational level, and be considered as an organizational benefit, it is often more feasible to address agility at the business unit level and hence here it is considered as a management benefit.

Box 1.3 Agility in action: the case of Barclays and the Woolwich

In a further exploration of workforce agility, Breu and Hemingway (2001) undertook a number of case studies. In one of these they report how the development of a B2E portal by Barclays Bank played a key part in making their merger with the Woolwich, which took place in July 2000, effective more quickly.

The portal allowed information presented to staff within the organization to be personalized according to an individual's role, physical location, personal preferences or the subsidiary in which they worked. The Woolwich remained as a distinct brand with its own branches, but the staff in those branches were rapidly assimilated within the Barclays Group by presenting them with both the group-wide and Woolwich-specific information they needed to function in the newly merged organization.

Now, whenever a new member of staff joins the organization or someone within it changes their roles or locations, they can simply reconfigure the selection of information they will see.

The B2E portal is also being used to disseminate management information (MIS) to senior managers within the group. When combined with mobile technologies such as phone, laptops and PDAs, access to the MIS via the enterprise portal ensures that all managers have access to the most up-to-date and consistent view of the state of the organization, which they can use to make effective business decisions.

A study by Breu et al. (2002) considered the concept of agility in the particular case of a knowledge-based workforce. Their study, which is based on a large-scale postal survey, found that highly agile organizations demonstrated 10 aspects of competence, which can be grouped into five areas, as shown in Table 1.3.

Interestingly, their study found that workforce agility was not strongly correlated with the adoption and use of new technology *per se*. Rather, it was the new working models that such technologies allowed that showed the greatest relationship with agility. The ability to develop virtual teams within the organization and with other organizations and the development of communities of practice were all related to increased agility. As noted by the authors, hot-desking, mobile working and home working, which are all aimed at improving the working of individuals, were not as strongly related to agility as those models that involved the collaborative working between groups and teams. In addition to collaborative working models, the study found that access to consistent and accurate organizational and customer information is a key prerequisite for organizational agility.

Other benefits from the use of IS/IT that may be expected to accrue to the middle management layer of the organization include better decision making and control at the business unit level, largely through the access to improved information. While the obvious limitations of the information that organizations currently hold include

Table 1.3 *Capabilities required for workforce agility (after Breu et al., 2002)*

Capabilities for workforce agility	
Intelligence	Responsiveness to changing customer needs Responsiveness to changing market conditions
Competences	Speed of developing new skills and competencies Speed of acquiring the skills necessary for business process change Speed of acquiring new IT and software skills Speed of developing innovative management skills
Collaboration	Effectiveness of cooperating across functional boundaries Ease of moving between projects
Culture	Employee empowerment for independent decision making
IS	Support of the IT infrastructure for the rapid introduction of new IS

it being out of date, inaccurate or incomplete, a less obvious, but commonly encountered problem is that of duplicated information. Many organizations report spending considerable time debating which of a number of information sources should be used as a basis of decision making or trying to reconcile differing information. The considerable expenditures witnessed by organizations on data warehouses is frequently driven by the wish to resolve this limitation and provide '*a single version of the truth*' to everyone in the organization.

Benefits also sought by this level of the organization are often related to the skills of the workforce. This may include the development of systems that allow employees to develop their skills or knowledge, for example the use of computer-based training (CBT) systems. A report on the use of IT in the workplace by the iSociety (2003) describes the use of such a system by a leading firm of accountants to train their staff on the important regulatory issue of money laundering. As the report describes '*training consists of watching a video, reading the policy statement and completing the full computer based training*'.

Information systems may also be deployed with the intention of allowing staff with limited experience or skills to carry out a given activity to a required standard. Many telephone call centres suffer from high levels of staff turnover, with levels of 100% per annum not being unknown. In such cases, the provision of information systems that provide script information to a screen in front of the call handler, including prompts to ask the customer questions and answers for frequently asked questions (FAQs), allows such organizations to provide a consistent level of service regardless of such high turnover in staff.

Despite the economic slowdown of the early 2000s, and the redundancies announced by many businesses, the importance of retaining and attracting the best staff is a key concern. IS and IT are often viewed as opportunities to improve the '*work–life balance*' that can be offered to staff. For example, many firms are exploring the opportunities for mobile working so that staff can work at locations that suit them and even at times to suit themselves. This may include the opportunity to work from home or, for organizations located on multiple sites, may allow a reduction in travel between those sites, with colleagues collaborating via IT-based systems. As well as improving the working life of staff, such systems and technology

can reduce the travel costs incurred by organizations and may even allow them to reduce their property costs. Interestingly, while the opportunities for such flexible working sound attractive, research is beginning to suggest that it is not always appreciated by staff, and can have associated disadvantages or 'disbenefits'. These disbenefits are discussed in the following section.

Operational Benefits

Benefits are classified as operational in the model of Farbey et al. (1993) when they are associated with the production of the goods and services the firm provides. This production is frequently comprised of a number of interrelated processes. Each of these processes can be considered as a number of inputs to the process, actions or activities that comprise the process and a range of outputs that either become inputs to the next process, or are the finished goods or services produced by the organization and are passed to customers or users.

When taking such a generic, process view of an organization's core activities, it can be seen that IS or IT can only act in a limited and structured number of ways. First, it can act on the inputs to the process, the process itself or its outputs, and for each of these, it can act in three basic ways: to increase efficiency, that is to improve the use of resources, usually cost; to improve the quality, which is often associated with accuracy; or to reduce the time taken for the process, that is, increase its speed. Any system may impact all three stages of the process and in all three ways, or more usually, a number of stages and in just one or two of the three basic ways described.

The use of such logic to identify the possible benefits arising from an information system that will allow patients, whose doctor has referred them to their local hospital for an X-ray examination, to choose a date and time for that appointment that is convenient to them is shown in Figure 1.3. This project, called 'Choose and Book', forms part of the Connecting for Health programme (formerly the National Programme for IT) being pursued in the UK National Health Service. Currently when a patient requires an X-ray, their GP sends a letter of request to the local hospital, which will send the patient an appointment. Many hospitals are left with wasted appointment slots,

Business process	*'Choose and Book'* *Allowing patients to book X-ray appointments at a hospital*		
Areas of possible benefit / Basic attributes of IT	Inbound – booking appointment	Business process – performing X-ray	Outbound – reporting X-ray results
Efficiency (lower cost)	Cost associated with paper requests for X-rays and paper records (e.g. storage) removed both at GP's surgery and hospital	Reduced cost per X-ray due to reduction in unused slots DNAs – did not attend	Reports of X-ray can be sent electronically to requesting GP removing costs associated with paper reports
Accuracy (quality)	Complete and accurate record of patient received by X-ray department e.g. name, address, date of birth, hospital number	Complete electronic record of X-rays undertaken on each patient ensures radiological guidelines on exposure are not exceeded	Missing or delayed reports can cause electronic alert on GPs' systems, ensuring all requested X-rays are carried out and all results are received and acted on
Speed	Electronic or telephone request for X-ray received from patient or GP removes delays associated with traditional postal requests	Reduced need to complete or correct inaccurate patient information prior to examination reduces time taken for each appointment – allowing more appointment slots per day	Electronic reports of X-ray remove delays associated with traditional postal reporting – and allow treatment or follow-on tests to be commenced sooner

Figure 1.3 *IT's improvement of operational business procedures*

since when patients find their date or time inconvenient they fail either to attend or to inform the hospital in time for the appointment to be given to another patient. With the system that is being developed, either the doctor will book an appointment during the patient consultation or the patient will book the appointment themselves by telephone or online. It is expected that by allowing the patient to select the date and time of the appointment the number of wasted slots, called 'DNAs' (did not attends), will be significantly reduced. The system will also offer other benefits, such as the reduction in costs and delays associated with traditional postal booking arrangements. The reduction in these delays will allow the results of the X-ray to be known by the requesting doctor sooner and hence allow treatment or follow-up tests to be instigated as soon as possible. Also, by recording all of the X-rays given to a certain patient to be built up, the system will ensure that radiological guidelines on exposure are not exceeded, improving the quality of the service offered by the X-ray department.

Such consideration often shows that the efficiency gains associated with IS/IT can result in staff productivity improvements. If this is the case, then firms must consider how they wish to realize that productivity improvement. This could involve reducing the headcount within the business or redeploying staff on other, higher value adding tasks. IS/IT may alternatively, or additionally, offer other forms of efficiency gains, such as improvement in the use of plant, land or other assets including intellectual property. Once again, firms must consider how they wish to realize this gain. Can they sell the asset or lease it to another organization or, if not, can they put it to another value-adding use?

Functional and Support Benefits

In his model of the internal value chain (see Chapter 2), Porter (1985) identifies certain activities that are intended to support the core activities associated with the production of the goods and services made by the firm. These support activities include human resources, legal, finance and IT. Both Figure 1.2 and the case described in Box 1.4 show how the introduction of IS/IT within these specialist support areas can provide benefits, both within the specialism and for the wider business.

Many organizations are developing a self-service approach to support functions. This involves providing staff with online access to information and tools that allow them to carry out tasks such as

selecting and tracking employee benefits, claiming expenses and arranging travel themselves. Such services can take away repetitive enquiries from specialist staff within support functions such as HR and allow them to apply themselves to more value-adding work. It can also improve the service offered to the staff within the organization, allowing them to get rapid responses to their enquiries and complete reservations on the spot. Research in a wide range of organizations (Breu and Hemingway, 2001) has shown that there is a strong correlation between the use of self-service for support activities and highly performing companies. It would seem there is a two-way mechanism in operation. By allowing both operational and functional support staff to become more productive, self-service can lead to an improvement in the performance of an organization. Equally, high performing organizations have a proven track record in being able to spot and develop effective systems and have identified employee self-service to be such systems.

Box 1.4 Winning the 'war for talent'

One of the world's major software vendors uses IS to improve both the quality and the efficiency of its recruitment process. The organization receives many hundreds of applications from potential recruits every day, most of these by email, but a few via traditional post. The paper applications are scanned to produce an electronic version then all applications are parsed to produce information that can be fed into a database of applicants. All applications receive an acknowledgement within 48 hours of being received.

The information in the applicant database is then matched against open job positions. The database is also scanned by HR staff to ensure that good candidates are not missed. Once candidates who the organization might like to interest have been identified, HR staff liaise with the relevant managers to arrange a suitable time for the interview to take place. All the information known about the candidate is sent electronically to the manager before the interview to ensure that he or she is fully briefed and so the interview can be most effective for both parties. Following the interview, feedback on the candidate is sent back to HR and entered into the applicant database. If additional interviews are deemed appropriate, follow-up questions suggested by the first interviewer can be stored and will be passed to subsequent interviewers. This ensures that the interviews

Box 1.4 (Continued)

build on each other and particular areas of the candidate's skills or experience can be fully explored.

The whole process not only ensures that the organization finds the people who best match their needs, but also gives the candidates a good impression of the organization. Even when unemployment rates are high, recruitment has been described as a '*war for talent*', and such systems can improve the ability to match individuals to open positions and present the organization in a better light than other employers.

The provision of improved IT infrastructure within the organization, and some of the consequent benefits that this can give rise to are shown within the functional/support components of the Farbey et al. model shown in Figure 1.2. Such IT infrastructures would include voice and data networks, both wired and wireless, servers and PCs and mass data storage facilities. The benefits are shown in the functional/support area due to the fact that the implementation and operation of those infrastructures are undertaken by the IT function, which in most organizations is viewed as a support activity to the core business. However, while some benefits of such infrastructure deployments accrue directly to the IT function, such as lower maintenance costs or reduced data storage costs, the majority of benefits are realized by wider areas, if not the entire business. This is similar for other support functions, for example, the deployment of an improved recruitment system, as described in Box 1.4, benefits the HR department, in that it makes them more efficient, but it also improves the suitability of the candidates recruited to all areas of the business.

Tangible and Intangible Benefits

Benefits arising from IS/IT are often described as either tangible or intangible. *Tangible* benefits are those that can be measured by an objective, quantitative and often financial measure. Examples of such benefits would be the revenue generated by the launch of a new e-commerce website or the cost savings caused by discontinuing the licences to certain software packages. These benefits can easily be

measured and in both of these cases the unit of measurement could be financial. Such benefits are often termed 'hard', as opposed to the 'soft' benefits discussed later and many organizations concentrate their consideration of new IS/IT investments solely on such hard benefits.

In some cases it may be that a benefit has a quantitative measure, but it is not financial. For example, provision of training courses to staff within an organization can be accomplished by providing those courses through online resources. The benefit of this system could be expressed as the number of courses that are offered online, to show the breadth or diversity of the service. However, it is usually difficult to associate the access to these online courses directly to any financial benefit.

Intangible benefits are those that can only be judged subjectively and tend to employ qualitative measures. Examples of intangible benefits include improvements in satisfaction, either of customers or of employees, or an improved ability to make decisions. Some organizations that recognize the importance of such qualitative issues to their organization, work hard to develop suitable measures. The importance of customer satisfaction to the major supermarkets, in the UK and elsewhere in the world, has led them to develop very sophisticated customer satisfaction indices. Past data and modelling shows them how changes to the index directly impact the amounts spent by shoppers. Any initiative is therefore carefully considered in terms of how it will impact this customer satisfaction index. Other organizations recognize the importance of such intangible benefits, but understand that they cannot derive a financial value for them. However, they are recorded in the business case for new investments, where they are viewed as important as more tangible benefits.

Different types of benefits and how they may be measured are discussed in more detail in Chapter 5.

Emergent Benefits

In their study, Farbey et al. (1993) identified that many of the IS/IT projects studied, in addition to the anticipated benefits, gave rise to unplanned or emergent benefits. Many of these unplanned benefits appear to be 'second order' benefits, that is they arose from achieving an initial or planned benefit. For example, they describe how a firm offering professional services had deployed a network within their

offices and between their regional offices, to improve the communication between staff. It was only once this network was in use, it was realized that it could be used to switch work between offices, to the point where they could take advantage of cheaper labour and property costs outside London.

Interestingly they found that unplanned benefits tended to be more intangible than the planned benefits. This is likely to be largely a function of the emphasis many firms place on a financially justified business case or ROI, as discussed later. However, such qualitative or intangible benefits are often associated with how individuals perceive the system and how satisfied they are with it. Such benefits are therefore important in contributing to considerations such as employee satisfaction.

The Disbenefits of IS/IT

While the adoption of IS/IT by an organization is driven by the desire to realize benefits, such adoption may also be accompanied by some form of disadvantage or downside, either to the organization as a whole, or to groups or individuals within it. These adverse effects we term '*disbenefits*'.

The dominant focus for much adoption of IS/IT tends to be the realization of benefits by the organization. Such a focus tends to either ignore the benefits at the level of individuals or groups within the organization or only explore these benefits if they are consistent with the organizational benefits sought. In the worst cases organizational benefits are often achieved at the expense of an individual's ability to improve their working conditions or way of working. Box 1.5 describes how the use of knowledge management systems, particularly when used in conjunction with dispersed teams, can provide considerable organizational benefit, but significant disbenefit to the individuals on whom the success of the systems relies.

Box 1.5 IT as a jealous mistress

Many organizations are interested in knowledge management and collaboration and have developed or are in the process of developing systems to support these activities. A study by

Griffith et al. (2003) investigates how such systems, particularly when used by remote or dispersed staff, may provide benefits to the organization but at the expense of the individuals on whom they rely to be successful.

Any discussion of knowledge management should commence with a discussion of the important concepts of explicit and tacit knowledge. Explicit knowledge is that knowledge that can be expressed and hence codified. This is often called objective or fact-based knowledge. In contrast, tacit knowledge is the knowledge that cannot be easily expressed. It is the knowledge held in the 'heads' of individuals that has been acquired over time, usually from many interactions with others, and which is often also termed experience or skills.

The intention of most knowledge management initiatives within organizations is to ensure that as much explicit knowledge as possible, or at least that most valuable to the organization, is expressly captured. Such initiatives also aim to ensure such knowledge is fully and correctly identified and stored such that it can be retrieved and reused by others. These initiatives also aim to find ways and means to transform tacit knowledge into explicit knowledge, so that this might be stored and shared with others. Indeed, while explicit knowledge may easily leak away or be copied by others, firms recognize that their key asset is often the tacit knowledge of their employees and are keen to try and capture as much of this as possible just in case it walks out of the door!

The paper by Griffith et al. asserts that IT can play the role of a jealous mistress between an organization and its employees. They suggest that IT used to support collaboration in virtual or dispersed teams increases the transformation of tacit knowledge to explicit knowledge, since individuals are encouraged to express their knowledge in order to collaborate with other team members. However this dispersed way of working reduces the ability to produce new, individually held tacit knowledge, due to the removal of the rich interactions from co-located peers that the generation and acquisition of such knowledge is reliant on.

They suggest that such IT support for virtual collaboration therefore benefits the organization but not the individual. The

Box 1.5 (Continued)

organization may therefore gain from this in the first instance, but this will be short lived as without certain safeguards to mitigate the effects described, individuals will not be keen to work in such environments. In order to address this, the authors state that organizations must allow individuals the opportunity to replace their personal tacit knowledge. This, they suggest, can be achieved by the use of systems that support rich interactions such as the personal experimentation and learning-by-doing that are necessary to transfer tacit knowledge among individuals.

The most extreme disbenefit that may arise for individuals from the adoption of IS/IT is the loss of their job. As shown in Figure 1.2, many of the benefits sought are associated with the improvements in operational efficiency, which are linked to increased productivity and frequently to a consequential reduction in headcount. Many organizations seek to redeploy such individuals in other areas of their business, often in more value creating, and hence more satisfying roles. However, other organizations are keen to realize a reduction in their cost base or may find that the staff released are not suitable for other roles in the organization.

Other disbenefits that may be associated with the adoption of new IS are standardization of tasks and the associated deskilling of roles and loss of autonomy. Many organizations keen to reap the rewards of the control and standardization of processes have adopted workflow systems to control and monitor the stages in their key processes. Computer systems control the flow of activity between individuals, who are given a certain time to complete their allocated tasks. The completion of tasks is monitored by the system and failure to complete such tasks on time is flagged to a manager. While such systems offer many benefits to organizations, often including improved cycle times and consistency of approach, they tend to reduce the creativity and autonomy of the individuals involved. While the reduction in these aspects may be appropriate in areas such as the approval of bank loans or the processing of an insurance claim, workflow systems are increasingly being applied to areas that are considered highly creative or non-routine, such as developing marketing campaigns, new product development and the handling of legal cases.

The use of expert systems that codify the expert or professional knowledge in a certain subject area is also being adopted by more organizations. These include businesses and public sector organizations, such as healthcare providers. Again, while these systems provide the organization with a means of ensuring a consistent approach, they often reduce the autonomy of individuals.

New information technologies may also represent a mixed blessing to those who must use them. An example is that of remote or mobile working. Many organizations are interested in exploring the use of new technologies to achieve this way of working for their staff. The organizational benefits that may be sought from this approach include less 'dead' time when staff are unable to work because they are travelling, resulting in increased productivity and the ability to reduce property costs, by encouraging activities such as hot-desking. While the ability to work anywhere, anytime, often appeals to staff at first, including the ability to work from home, before long they find that they are expected to work all the time and everywhere. Working hours, it is found are not reduced due to improved productivity, rather they are increased with staff being expected to be contactable at all times. Studies have also shown that many staff do not like hot-desking, since the lack of a fixed location to return to reduces their ability to have regular contact with colleagues. Perversely, the provision of improved communication networks, allowing mobile and home working, results in many staff feeling increasingly 'disconnected' from the organization.

Net Benefits: The Measure of IS Success

In 1992 DeLone and McLean proposed perhaps the most widely used framework for measuring the success of information systems (DeLone and McLean, 1992). Since its publication almost 300 studies of IS success have made use of or cited this framework. Ten years later, these authors considered both the studies that had been based on their original framework and the developments that had occurred in this time in IS/IT use in organizations. This led to their proposing a refined version of this framework, which is shown in Figure 1.4 (DeLone and McLean, 2003).

In their initial model, DeLone and McLean identified six factors which contribute to the success of an information system: systems

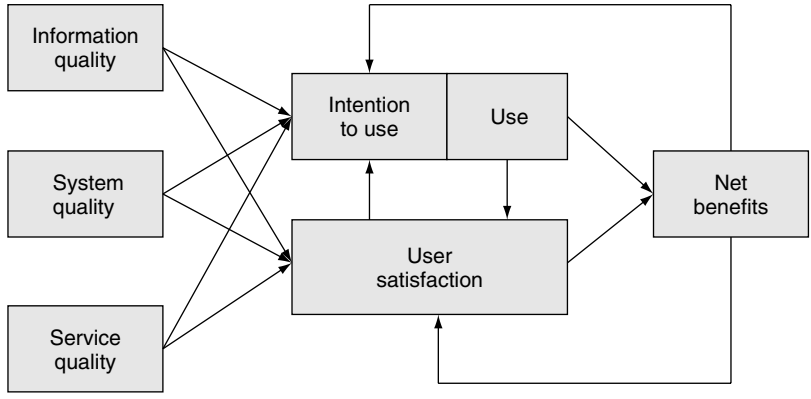

Figure 1.4 *DeLone and McLean IS success model (after DeLone and McLean, 2003)*

quality, information quality, systems use, user satisfaction, individual impact and organizational impact. In their revised model, they suggest, in addition to the measures of information and system quality, the inclusion of service quality. This reflects that many IS organizations within firms undertake the dual role of information provider and service provider (supporting end users). Most interestingly for this consideration of benefits, the authors also reframed their description of the outcomes of the use of the system. Rather than consider only the impact on the individual and the organization, they note that the effects of many current information systems now extend beyond the organization, with impacts on customers, suppliers, the industry and even on society. Instead of including measures at all of these levels, the authors group all of the impact measures into a single category called 'net benefits'. This term, they state, is in their opinion the most accurate descriptor of information system success.

The use of 'net benefits', the authors concede, raises the issues that will be dealt with in detail throughout this book, that is: what qualifies as a benefit?, for whom?, and at what level should this be considered (individual, manager, senior management)? They suggest that the answers to these questions will depend on the particular system, its context and whose perspective of success is being considered. Finally, inclusion of the word 'net' is stressed as important, since in agreement with our earlier discussion of disbenefits, few system developments are wholly positive, without some negative consequences for some individuals or groups.

Current Investment Appraisal Approaches

The most frequently observed approach to the appraisal of IS/IT investments is the preparation and assessment of a financial business case (Ross and Beath, 2002). Such a case is frequently built around a calculation of the return on investment (ROI) expected from the project. Indeed, the ROI approach is so popular, particularly in the USA, that the term is often used synonymously with the term business case.

A fuller discussion of investment appraisal methods will be given in Chapter 5. However, an outline of the key approaches is given here, since an understanding of the underlying concepts and assumptions that comprise these approaches sheds light on their limitations, which affect not only investment appraisal, but also project implementation. Understanding these limitations highlights the need for a new approach and also begins to suggest the issues that it should address.

Return on investment calculations require the financial outcomes expected from the project, in the form of additional revenues or reductions in costs, to be forecast and compared with the costs that will be incurred in undertaking the project. The time over which it is acceptable to count those additional revenues or cost savings will often be specified in an organization's policies or derived from the useful life of the system under consideration. More sophisticated financial approaches to project appraisal recognize the '*time value of money*'. That is, money has an opportunity cost and money earned or saved today has a greater value than money earned or saved in the future. Discounted cash flow (DCF) and net present value (NPV) methods require projects to be described as streams of cash flows, which are then reduced by a discount rate the further in the future they occur.

Such quantitative financial approaches have the benefit that the results are easily compared to those from other projects, either within the IT function, or with capital expenditure projects in other areas of the business. Senior managers are happy with financial descriptions of projects; it is how they are used to expressing activities within the organization. This perceived comfort and the comparability of projects expressed as an ROI or DCF-based case allows managers to use these cases to prioritise projects within the organization, either to allocate scarce resources or to decide in which order projects

should be carried out. However, such approaches either require a financial value to be placed on the more qualitative benefits arising from the investment or, as commonly occurs, such benefits are given no value and are omitted. Furthermore, as will be discussed in later chapters, these traditional approaches to IT investment are likely to encourage the funding of piecemeal applications, rather than true enterprise-wide capabilities firms need to compete in today's increasingly dynamic environment. Such approaches also encourage the funding of safer, incremental projects, rather than more strategic investments.

While determining the additional revenues or savings associated with a project is often far from simple, it has also to be recognized that the cost side to these calculations is difficult, as demonstrated by the massive overspending reported on many projects. While this may often be due to projects that run late, a significant proportion of such cost variances are due to a lack of understanding of the different sources of cost that a project will incur. As we will discuss throughout this book, many IS/IT investments require a significant degree of associated working practice and process change in order to deliver benefits. This change management is often omitted or severely underestimated when determining the costs of an investment.

Although Ross and Beath (2002) note the continued dominance of financial methods on the appraisal of IT projects, their study of the methods major companies had used to undertake this activity found that there were some alternative approaches. Of the companies interviewed, they found that the majority had funded at least one e-business initiative, which was the focus of the study, simply on the basis that it was perceived to be 'strategic'. No formal business case was required for such projects. Allied to this, a significant number of companies interviewed reported setting aside a separate budget for e-business 'experiments'.

Such approaches undoubtedly have a number of advantages compared to the solely financially based approaches, not least in that they allow the inclusion of less tangible benefits, but they also have limitations. In particular, they do not facilitate prioritization between projects, which is often the biggest challenge facing organizations. Also these less rational, more instinctive approaches are more susceptible to being dominated by persuasive or charismatic project champions. While these approaches seem visionary to those at the top of the organization, to those lower down, they often suggest that

the usual financial justification procedures do not apply to the 'pet projects' of senior managers.

Limitations of Current Appraisal Methods

A survey of over 100 companies by Cranfield School of Management (Lambert and Edwards, 2003) explored the implications of current approaches to IS/IT investment appraisal. The key findings from their survey are shown Table 1.4.

Ineffective Appraisal Processes

The survey found that while IT investment appraisal was seen as important, the majority of organizations felt that their investment appraisal processes were ineffective.

Many companies are now finding the traditional financially based approaches limiting. The strategic importance of IT has caused them to consider balancing the return on individual projects, as expressed in ROI calculations, with the need to create organisation-wide capabilities. They must also be able to leverage or improve existing systems while at the same time being able to experiment with new ways of doing business, the returns of which may be very uncertain.

While there is a recognition that information system investments are made to yield benefits to the organization, traditionally business cases have not been explicitly stated in these terms. In many organizations the business case that is required from project teams is a highly financial document. This emphasis is likely to make projects where the benefits are difficult, if not impossible to financially quantify, hard to justify. However, it is such projects that may be contributing to those

Table 1.4 *Survey of IS investment appraisal*

	Yes	**No**
Is IT investment appraisal seen as important by business managers?	55%	45%
Do you have an effective investment appraisal process?	22%	78%
Are business managers adequately involved in IT investment appraisal?	30%	70%
Does the appraisal process consider the implications of business changes?	10%	90%
Do people making decisions understand the business cases?	25%	75%
What % of projects deliver the benefits that justified the investment?	27%	73%

areas of the business that are most important to the organization, for example customer care or employee satisfaction. The dominance of a financial mindset within the investment appraisal process will tend to favour cost cutting or efficiency projects, which although worthwhile, should not be allowed to exclude projects that will improve effectiveness or innovation within the organization.

The money available for new projects is finite within any organization and, in difficult trading conditions, that funding can become very limited. This results in severe competition among projects, which leads to the inevitable consequence that project teams will endeavour to present their business case in the best possible light, often overstating the financial benefits or return from the project in order to secure funding. Research has shown that many organizations fail to conduct post-implementation reviews. Lack of resources and other commitments mean that the time is not found to carry these out and those that are undertaken often focus solely on the technology implementation, rather than determine if the organization achieved what it intended from the project. Without such reviews being performed, the tendency to overstate the return or benefits expected from a project will continue, since those involved will not be called to account later.

It should be noted, that while finite financial resources may be a severe limitation to the undertaking of information systems projects, the lack of other types of resource can be equally limiting, if not, in some cases, even more so. A frequent limitation is that of skilled or experienced staff. Lack of access to IT staff with specialized skills, or experienced IS project managers or of business managers with sufficient time to devote to the project are common examples. While, it may be argued that additional financial resources could address such constraints, this is not always true. In the case of IT or business managers, as discussed before, Mata et al. (1995) note that the effective management of IT is a capability that is not easily transferred between organizations, since it relies on a good understanding of the particular context of the organization and good relationships between staff in different areas, all of which will take some time to establish.

The observation that managerial resources may be more of a scarce resource than capital was made by Strassmann (1999) in his discussion of IT productivity. He notes that capital has become a commodity, which is readily available for a price that is commensurate with the risk involved. The importance of skilled management, rather than

the availability of capital was clearly demonstrated in the dot.com boom of the late 1990s. At that time many venture capital organizations were happy to pour significant sums of money into start-up organizations with highly inexperienced managers. The money invested could not make up for the lack of experience of the managers and many of the organizations failed. While it may be argued that this was due in large part to the lack of uptake of services by customers, managers with greater experience or ability should have been able to address their slower than expected growth in revenues and develop their strategy accordingly. Those dot.com firms that did survive this era, such as Amazon and Lastminute.com, did not have greater funding than many of those that did not survive, demonstrating the enduring need for effective management.

Lack of Involvement of Business Staff

That business managers believe IT is essential to improving the performance of their organizations is underlined by the finding that a majority of managers view IT investments as important. However, the rapid advances in technology make it difficult for business managers to keep abreast of developments and the technical-language of many IT staff further excludes them.

A study by the iSociety (2003), exploring the role and use of IT in workplaces in the UK, identified a separation between the IT staff within an organization and the rest of the business. They found that there were three types of separation: spatial, cultural and structural, one or more of which may be present in an organization. Spatial separation arose from IT staff often being in locations distinct from users, either in the bowels of the building or on another site. This spatial separation tends to result in each group being 'out of sight and out of mind' of the other, resulting in a lack of knowledge or appreciation of the work and working practices of each other.

However, even without physical separation, the report describes a cultural divide between IT staff and others within the organization, summed up by the common feeling of 'them and us'. They quote a survey (Harding, 2003) that found half the office staff surveyed believed that IT staff 'spoke another language'. While it may be tempting to address the divide between IS and the business by means of the formal structures within the organization, a study by Chan (2002) found that a critical success factor for the effective use of IS was the existence of strong informal relationships. Multidisciplinary teams, flexible divisions of work and the exchange of knowledge

between different types of staff were found to be critical to developing an innovative and effective IS capability.

Finally, the lack of understanding at senior levels within the organization can result in the institutionalization of structural barriers between IT and the rest of the business, at its most extreme when such senior managers choose to outsource IT activities to another organization. A tale, perhaps more apocryphal than strictly accurate about the lack of senior participation in the adoption of IT, is given in Box 1.6.

Box 1.6 The president's emails

The archives of the Bill Clinton presidential library contain 40 million emails – mostly memos and notes exchanged between aides and cabinet members.

Careful examination of these emails showed that just two were sent by Bill Clinton himself – and one of them may not even count as it was sent as a test to see if the commander-in-chief understood how to send emails.

And what of the other email? Allegedly, it was an email to astronaut and senator John Glenn on his return to outer space after a 40-year hiatus. According to Reuters, the former president sent the email to the space shuttle while in orbit around the earth (that's the shuttle, not Bill) with the help of Clinton staffers!

While this does not prove the president was a techno-phobe, for a government that was promoting the benefits of e-government, this cannot be considered as leading by example.

Source: *The Weekly Round Up*, Silicon.com, 30 January 2004

Need for Business Change

Table 1.4 also shows that the survey respondents did not believe their appraisal of new IT projects considered the implications of business change. Listening to the promises made by the vendors of information technology, it could be believed that all an organization needs to do to improve its performance is to implement a

given application or set of hardware, often termed the 'silver bullet' approach to IT deployment (Markus and Benjamin, 1997). However, considerable research has shown that such implementations should not simply be exercises in technological deployment, but to be successful, should also be accompanied by complementary changes in processes, the working practices of individuals and groups, the roles of individuals and even the culture of the organization. The report by the iSociety (2003), states this need accordingly: '*New technology is not transformational on its own . . . appropriate use requires considerable complementary investment in people, processes, culture and support . . . some or all of these things are usually missing*'.

The traditional business case fails to identify the changes in these social aspects of information technology adoption, either due to an ignorance of their importance from those preparing the business case or the realization that their inclusion will increase not only the cost of the project, but also the time required and risk involved.

A helpful theoretical model that explains the steps involved in creating value from IS/IT, and highlights the importance of business change in this process, has been proposed by Soh and Markus (1995). As shown in Figure 1.5, this model identifies three distinct processes that must be successfully undertaken. The first is the conversion of purchased IS/IT into assets that can be used by the firm. The second is the effective use of those assets by the firm, which captures the need to undertake business change in order to achieve effective use. Finally, this effective use must be transformed into meaningful improvements in organizational performance. These three stages relate to the ends, ways, means view of strategy development, which

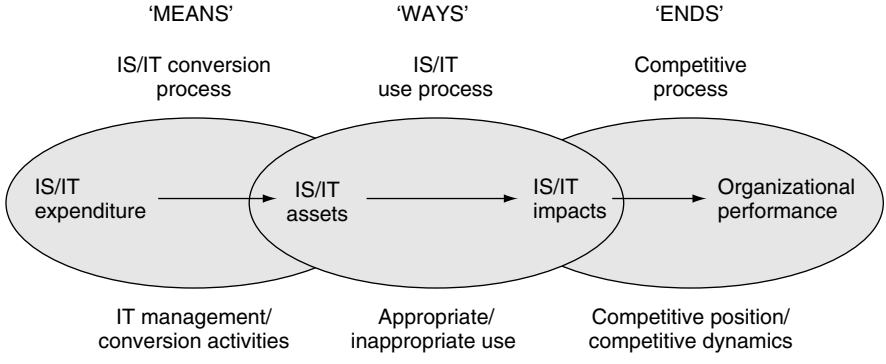

Figure 1.5 *How IT creates business value (after Soh and Markus, 1995)*

will be discussed more fully in Chapter 2. However, it should be observed here that, to date, most emphasis on strategy development has focused on the two end processes identified in this model, that is the means and the ends, with little attention to the vital process that connects these two, that is the new ways of doing things that will allow the new IS/IT assets to deliver improved impacts to the organization.

The recognition that IS projects have a strong social, as well as technical aspect, highlights the need to consider the project from the perspective of those groups or individuals that will be impacted. These groups or individuals, often termed stakeholders, can be expected to react differently to the system depending on what they perceive is '*in it for them*'. If stakeholders are required to make use of the system, or are needed to change their working practices in some way, then their view must be considered if the system is to be effectively implemented.

Need for Prioritization

The limited availability of financial and other resources results in the need for organizations to be able to prioritize the many projects and activities they are undertaking in the information systems and technology domain. When working with organizations, prioritization is often cited as one of the areas they view as most critical, but which they feel least able to do. It is recognized that if an organization can identify what is really important to its future prosperity, it can stop those activities that are not. By doing less, it will be able to deploy additional resources on the important activities and hence be able to do them faster and, more often than not, better.

The current approach to the majority of businesses cases means the only way to prioritize projects is by identifying those with the greatest, or fastest, financial return. However, as also discussed earlier, this is likely to result in a tendency to favour cost reduction projects over more innovative ones. Chapter 2 presents a portfolio, the applications portfolio that can be used to classify different types of project according to their overall business contribution and the ability to produce an appropriately justified business case for each of these types. By recognizing that different types of project will give rise to different types of organizational benefit, and hence business case, this portfolio can be used to prioritize projects more effectively within an organization.

Lack of Guidance for Implementation

The emphasis of the early stages of information systems project planning on the need to produce a business case that will secure funding for the project often results in little thought regarding implementation of the project, if the case for funding is successful. Any consideration of implementation will usually be driven by those responsible for the deployment of the underlying information technology, with detailed project planning carried out around the selection, development, deployment and testing of this aspect of the project. As discussed earlier, most business cases fail to include consideration of the business changes associated with successful implementation of the project. Without this complete picture of what implementation of the project entails, it is no wonder that sufficient thought cannot be given to how the full set of changes will be managed.

Failure to Deliver Benefits

The statistic that over 70% of IT projects are seen to fail to deliver the intended benefits is well known, both among members of the business community and the IT community itself. The promulgation of this statistic results in increased scepticism from the business users and defensive behaviour from the IT staff, resulting in a greater divide between the two sides and a further reduction in constructive communication, the very activity that is needed to address this poor track record. Interestingly, this high failure rate does not only apply to IS/IT projects, but applies to a wide variety of project types, suggesting that it is not something inherent in IT but reflects how complex projects of all types are managed within organizations.

Historically many IT projects did fail. Both the press and academic sources are littered with examples of IT projects that overran their estimated timescales by years and spent their allocated budgets many times over and such stories can still be found. Today, the improved reliability of both software and hardware, the use of standard packages and the increased experience among both internal IT staff and supporting external staff mean there are fewer overruns in cost and timescales. However, this improvement in deployment has not stopped the perception of the majority of IS projects as failures, despite the IT being implemented on time and on budget, because of the failure to deliver benefits to the organization. This may be due to a number of reasons. Perhaps the project was never capable of delivering the intended benefits, in which case, this should have been identified early in the project planning phase and the project cancelled. However, in most cases the project does have the potential

to deliver worthwhile benefits to the organization, but the organizational and social aspects of change associated with delivering the benefits are not identified or addressed and hence those benefits are not realized.

The Need for a Fresh Approach: Benefits Management

The foregoing discussion of current investment appraisal approaches and their limitations suggests the need for a better way to approach the management of information systems projects. As with any project, it is important to get things right from the outset or considerable time and cost can be wasted in reworking activities already undertaken. A new approach should therefore commence with improved project identification and planning. It should also address the other limitations already described, such as the overreliance on financial business cases, a lack of inclusion of the social aspects of information system projects and the lack of review mechanisms at the end of projects.

In the mid-1990s an extended research programme was undertaken by the Information Systems Research Centre (ISRC) at Cranfield School of Management to address the limitations of existing approaches. The research programme, which originally lasted three years but has since been the focus of further research and development activity, was undertaken in conjunction with a number of major private and public sector organizations. The process and tools resulting from this work have been extended and refined from experience gained from the many organizations that have adopted the approach in the last seven to 10 years. Key elements of the approach are now in regular use by over 100 organizations based in the UK, Europe, USA and even in locations as remote as China.

The overall approach developed, termed *benefits management*, can be described as shown in the definition box.

Definition: Benefits management

The process of organizing and managing such that the potential benefits arising from the use of IS/IT are actually realized.

As emphasized in this definition, the approach developed was based on a process that is a set of steps to guide the planning and implementation of IS projects, such that the potential benefits from that project are realized. The key steps of the process are formulated as interrelated tools or frameworks that can be used to guide and structure the planning and actions needed to implement a project successfully.

The subsequent chapters in this book explain and illustrate, with practical examples, the benefits management process and its underlying tools and frameworks. Before addressing the detailed stages of the process, it is worthwhile considering how the benefits management approach compares with traditional approaches to IS projects and the improvements that it has been shown to yield. This comparison and the improvements resulting from the benefits management approach are shown in Figure 1.6. While we would not claim the activities on the left-hand side of this diagram are wrong or unnecessary, experience from the use of the benefits management approach shows that these activities on their own are insufficient to deliver benefits to the organization. Use of the benefits management approach can enable organizations currently on the left-hand side to move to the right-hand side of this figure.

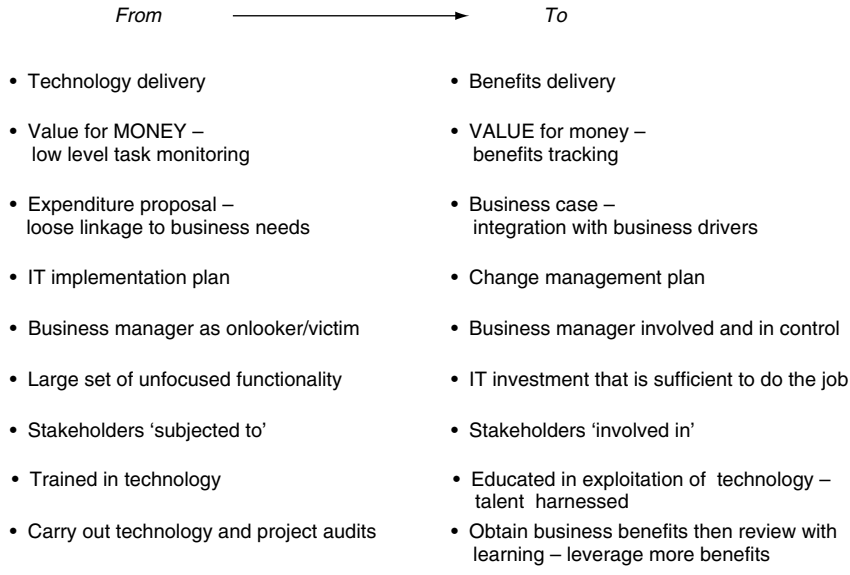

Figure 1.6 *Comparison of benefits management with traditional IS project approaches*

Benefits Delivery

Central to the benefits management approach is the identification of and focus on the potential benefits that can arise from the investment. This focus is continuous throughout the project, from the initial planning stage, through appraisal and implementation, to the final review of the project. Technology delivery remains a key part of the project and, as described later, robust project and systems methodologies should be adopted to ensure that this part of the project is successful. However, too often technology delivery becomes the *raison d'être* of the project at the expense of the benefits the system will deliver to the users and the organization. Many of the implementations of customer relationship management (CRM), enterprise resource planning (ERP) and e-business systems have been driven as much by the promise of vendors and a fear of being left behind by competitors, as by a clear statement of the benefits they will yield the organization. Too often project managers find themselves in the situation that their organization '*has bought Siebel*' or '*is going wall-to-wall SAP*' and they are then left to implement the chosen application without a clear understanding of the expected benefits and the organizational changes that will be required.

A Focus on Value

Money is the language of business and translating all projects, not just IT projects, to a financial case allows senior business managers to believe that they understand the value of the project. While it is not necessary for senior managers to have a detailed understanding of IT or the workings of IS, the continued reduction of business cases to financial numbers and ratios reduces those managers understanding of the role IS or IT can play in their organization. Given also that the financial approach is unlikely to give a full picture, since more qualitative or intangible benefits are likely to be excluded from the case, this lack of understanding is likely to be exacerbated.

It has also been mentioned that it is often easier to identify the costs associated with a project than the benefits or value that it will yield. This leads to the statements commonly used to describe projects that focus on their cost, rather than their value to the organization:

'we are investing £2m in an e-procurement system'

'our £36m global ERP rollout'

'the development budget for 2005 is £4m'.

The emphasis on financial measures to justify projects also results in their use to monitor the progress of projects. This has obvious appeal since it is relatively easy to monitor the expenditure incurred on a project as it progresses, but it gives no information on the progress towards achieving the benefits required from the project, the real reason for the investment.

This use of financial measures to track progress also extends to measuring the success of projects, which are often judged as successful if they were delivered on time or on budget, regardless of the impact of the system on the operation of the organization. While overruns in either of these would not be encouraged, a project that takes longer or costs more, but delivers the intended improvements to the organization should not necessarily be judged as a failure.

A Business Case Linked to Organizational Strategy or Objectives

This focus on the financial case for IS investments, and the relative ease of assessing the cost of a project compared to the value of the benefits it will generate, results in the investment cases often being effectively an expenditure proposal, rather than a true business case. To be comprehensive, the business case should state clearly how the intended project will contribute to the strategy and performance of the organization. In the benefits management approach, described in this book, the planning for a project and the subsequent development of the business case commences with an understanding of the current and expected *drivers* acting on the organization. As introduced in Chapter 3 and discussed more fully in Chapter 4, drivers are the strategic forces acting on an organization that require the organization to make changes to what it does or how it conducts its business activities. In generating this list of drivers, the perspective of the senior management of the organization is taken, to ensure that the identified drivers are actually strategic to the future of the whole enterprise, rather than merely affecting the interests of certain departments or functions. All projects should be considered in the light of how they can contribute to the drivers and hence what is most important to the organization. The result is a project and business case that is tightly coupled to what the organization wishes to achieve.

The Importance of Change Management

The lack of recognition of the importance of the social element to IS and IT deployment often results in the need for the degree of change

to working practices to be overlooked. In particular, the tendency for such projects to be led by IS staff, rather than business staff, exacerbates this lack of recognition of the impact that the system will have on individuals and groups. This may well not be intentional, but is often driven by inadequate understanding of how the business operates by those in the IT department. Many organizations are trying to address this issue by having individuals from within the business participate in IS/IT projects and even lead them. However, they may fail to release those individuals from their day-to-day responsibilities and hence involvement in the project becomes an additional burden for which they have little time. Such instances can result in participation in the early stages of a project, and then leaving it with the IT team until it is ready for delivery. If the project is more than six months in duration, it can be expected that many factors, both within the project and in the wider business context, will change. These are often related to the changes required to how staff within the organization work or their attitudes to the project, rather than to the technology itself. Continued involvement of the business managers is required to identify and address these issues as they emerge.

Commitment from Business Managers

The rapid pace of change of IT, coupled with the technical language of IT staff, frequently causes business managers to feel that they do not understand IT in the same way that they believe they understand marketing or other areas of the business. They therefore feel vulnerable when involved in appraising IS/IT projects, contributing to their preference to have such projects expressed in hard financial terms. This feeling of vulnerability was expressed by business staff in those organizations which took part in the original research project as a feeling of being '*an onlooker or victim where IT is concerned*'. The benefits management process seeks to address this issue by proposing tools and frameworks that both the business staff and IT staff use together, in order to ensure both communities contribute their knowledge and that the combined knowledge produces something neither group could have developed alone. The tools and frameworks are all intended to be used in workshop settings, to encourage participation from multiple individuals from both the business and IT groups. It has been found through the extensive experience of using the process that this approach encourages collaboration, more than the sequential passing of documents between individuals and that those involved often actively enjoy the experience, something many of them say has not happened in previous IS/IT projects.

IS/IT Sufficient to do the Job

IS and IT vendors are keen to promote the many features of their products and, all too often, organizations believe that the list of features equates to a list of benefits that the systems will provide to their organizations. However, it is seldom the case but can result in organizations buying and installing systems that either do not meet their needs or are overcomplex. As a result those systems tend to be underutilized and hence fail to deliver the expected benefits. The benefits management approach looks at this issue from the other direction. Rather than start with the features and functions of the technology or system, benefits management elicits what is causing the organization to consider the investment and what the project is expected to deliver. It is only when this and the required change management actions have been identified that the IS and IT required should be assessed, leading to a technology specification that is '*sufficient to do the job*'.

A focus on the IT that is sufficient to do the job does not imply that organizations should purchase under-specified hardware or software that would soon be insufficient to meet their needs, rather it is to counter the emphasis of many vendors on the long list of features and functionality that they can provide. It is often the case that vendors sell their products in packages or suites. It may therefore be the case that it will cost little more to buy some additional functionality than the cost of the minimum requirements. The additional functionality should be evaluated to see if it contributes benefits that would address the strategy or objectives of the organization. However, if it does not, it should not be purchased or, if bundled in, should not be implemented. Implementing features that are not required is likely to slow the project down, cause additional need for changes to working practices and may result in an overcomplex system that is under-utilized. Theory on the adoption of new information systems states that there are two main factors that determine if a new system will be used (Venkatesh et al., 2003). These are how much the system helps the user in their job and how easy it is to use. If this latter factor is reduced due to unnecessary functionality, it will result in a reduction in use of the system.

Involvement of Stakeholders

Just as business managers may feel they are a 'victim' in IS/IT projects, others who will be impacted by the system often believe that they are '*subjected to IS/IT*', rather than feeling that they are

contributing to and shaping the project. This can at best result in a system that meets their needs but has induced a feeling of resentment that must be overcome if the system is to be used to full effect and, at worst, result in a system that does not meet their needs and therefore is not used.

The lack of involvement of stakeholders may be due in part to their fear or lack of understanding and interest in IS/IT. However, it is also often due to the attitude and activities of the IT staff within the organization. The report by the iSociety (2003) quotes Rose's (2002) work on this subject. He describes IT staff as less concerned with maintaining the quality of contact with others and gaining an understanding of how the organization works than other groups of staff. He also found that they spent less of their time advising, persuading or counselling others; rather they spent their time analysing and dealing with problems that were technical or system related. As he said in summary: '*The work of [IT professionals] as a whole is systems orientated not people orientated*'.

An important part of the benefits management approach presented in this book is the consideration of the project from the perspective of a wide set of stakeholders. Ideally, as many of those stakeholders, or their representatives if they are large groups, will be involved in planning the project, they will maintain a continuing interest and participation in the tracking and realization of benefits. In addition to encouraging participation in planning and implementation activities from a wide range of stakeholder groups, the benefits management approach includes a particular set of tools that specifically uncovers the views of each stakeholder group and identifies actions that may be needed to encourage their cooperation.

Educated in the Use of Technology

Surveys continue to show that firms invest little time and money in training their staff to use IT and IS. This problem tends to be particularly severe in the UK, with such surveys showing that compared to other European countries, organizations spend less per head of workforce on IT training, leading to reduced effectiveness in these activities. Many projects are started with a defined training budget. However, this is often not sufficient to provide enough training for individuals to become familiar, let alone confident with the new system (see Box 1.7). Even when a project does start with an appropriate training budget, if the system runs late or over-budget, it is

often the training budget that is reduced to make up the shortfall elsewhere.

Box 1.7 The (in)adequacy of training budgets

The limited expenditure on staff training is highlighted by the activities of a major, worldwide professional services firm. The firm has recently been implementing a global financial system at a cost of tens of millions of pounds to improve the accounting, time recording and billing activities of the organization. All 15,000 staff in the organization are required to use the system to record their activities, if the expected benefits are to be realized. A significant budget has been set aside for training staff to use the system. However, when the large number of staff and the average charge-out rate to clients of many of those staff are considered, the training budget equated to just 20 minutes per member of staff!

Rather than provide formal training for staff, the iSociety report (2003) found that much training was left to informal, on-the-job training, undertaken by colleagues. Even with formal training in place, such informal training is beneficial since use of a system will depend on the details of a particular context. However, the existence of such informal mechanisms should not be taken as an opportunity for managers to abrogate their responsibility to provided basic systems, technology and even business skills training.

While training staff in how to use technology and systems is important, this is not sufficient in itself. To ensure projects deliver the full set of potential benefits it is usually necessary, not only to teach individuals which screens to access and which keys to press, but to demonstrate to them how the system can improve the role that they carry out for the organization. This training in the impact or exploitation of the technology should include an appreciation of how use of the system will impact others and other processes in the organization. Even if a user has been trained in how to use a piece of technology or a system, if they do not understand why they are using it, or how it can help them perform their role or improve the performance of the organization, their use of the system will be less than optimal. Equally, undertaking this education in exploitation will allow individuals to consider new ways of using the system or

technology in their particular role, harnessing their experience and creativity.

Many systems today may not offer a net benefit to the individual. Rather the major benefits accrue to the entire organization. This may include knowledge management and CRM systems, where individuals are expected to share their expertise or customer contacts. Without a clear understanding of how their use will benefit the organization, individuals will be reluctant to use them. A lack of appreciation of the wider picture leads to individuals by-passing the new systems and continuing to store information on their local databases and personal devices. This tendency does not only apply to operational staff, but even to senior managers, who should be supporting company-wide initiatives. A survey from BT (2004) among senior managers found that 29% of those interviewed kept essential customer information on their own handheld devices and a further 12% held that information on paper records.

Undertake a Post-Implementation Benefits Review – Capture Learning

While many organizations have been keen to describe themselves as learning organizations, as discussed previously, very few carry out post-implementation reviews, seriously limiting their ability to learn collectively from the experience gained from projects. All too often, competing pressures mean that the project team is disbanded as soon as the project is finished and sometimes even before it is completely finished.

The benefits management process includes a post-implementation benefits review as an important component of the project. This review should not concentrate on the use of technology or on the project management, rather technology and project audits should be carried out separately. Instead, the benefits review should explore which of the planned benefits have been realized, whether there were any unexpected benefits arising and which planned benefits are still expected but may need additional attention to ensure they are realized. Actions should then be put in place to ensure that these benefits are realized. The benefits review should also consider if, given what the project team have learnt and how the organization has changed, there is an opportunity for further benefits to be realized. It is often not possible at the outset of a large project to foresee all the benefits that can be realized when the system is in operation. Many of the current large-scale enterprise system deployments, such as

ERP systems and enterprise portals, are initially intended to remove problems resulting from the existing systems. Once the organization becomes used to operating without these problems, which are often acting to reduce efficiency, they can then consider how the system can be used to improve overall performance and also how it can now be used to do new things and develop innovative ways of working.

The Rewards for Managing Benefits

In a detailed study of 11 strategic IS/IT investments (McGolpin and Ward, 1997), varying in cost between £5m and £100m and carried out across a range of industries, a number of factors differentiating the two projects that were judged highly successful (the benefits exceeded expectations) and the two that were successful (the expected benefits were achieved) from the seven less successful investments were identified (see Figure 1.7). The commitment and involvement of senior management has been identified in many studies as a success factor, but although all the projects were commissioned by senior management, only in the four successful ones was that involvement maintained throughout the projects. In particular, senior management ensured that responsibility for benefit delivery was clearly allocated to individuals and that the investment was seen as an integral component of a strategic change programme. However,

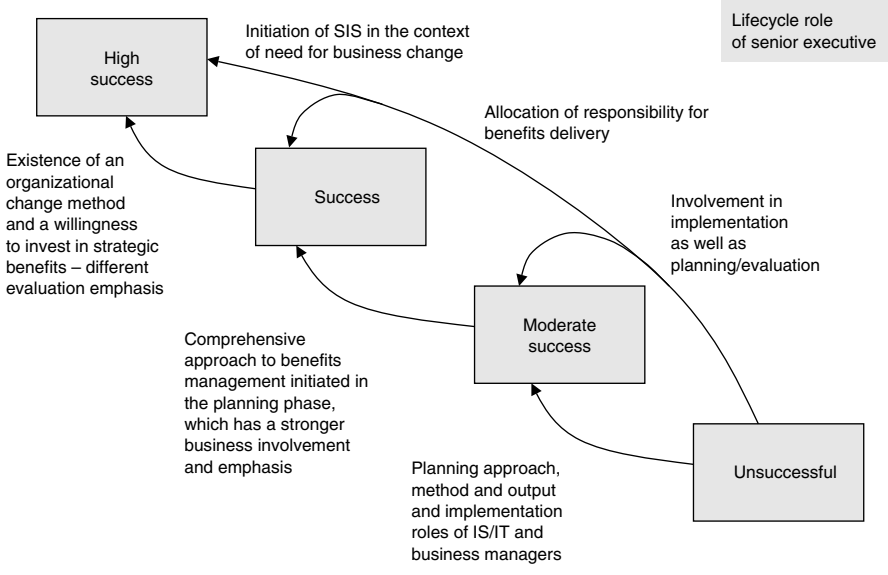

Figure 1.7 *Factors affecting the success of strategic IS investments*

the study also found that the successful projects were characterized by a comprehensive approach to planning and managing the benefits intended from the project. In addition, in the highly successful projects, existing change management processes were used to ensure that the business maximized the value of the IT investment through associated changes to business practices.

In the moderately successful and unsuccessful projects the emphasis was on delivering a working technical solution. The effective deployment of proven systems development and project management methodologies delivered some of the expected benefits in the moderately successful investments, but in the four 'failures' even these best practices were not adequately followed.

The Problems of Not Managing Benefits

The problems associated with following traditional approaches to project planning and evaluation, and the improvements that can arise from adopting a benefits led approach are illustrated in the case described in Figure 1.8. This 'before and after' case concerns the implementation of an ERP system in a Scandinavian optical equipment manufacturer. The case allows a direct comparison within the same firm, since this organization implemented such a system twice. The first implementation, which did not follow a benefits approach, was judged such a failure that the system was re-implemented. In the second implementation, the system went in on budget and ahead

FIRST ATTEMPT – FAILURE	SECOND ATTEMPT – SUCCESS
IS led, with insufficient knowledge of the business function concerned	Business function led, by a newly recruited manager, experienced in the function, supported by IS
Belief that the requirements were simple and already known – just use the package to automate current process	Site visits and reviews of other companies' procedures to establish best practice and system requirements
Belief that this was a low risk and straightforward implementation	Knowledge that this would require some major changes
Lack of business buy-in led to both the new and old (mainly manual) system remaining in place and little move by the business to adopt the new system	New procedures completely replaced the previous system and all staff were required to use them; facilities for the old system withdrawn
Little business change	Organizational and business process changes
Bespoke amendment of package. Longer and more complex system build and difficulty applying upgrades	Minimal changes to the package and innovative use of built-in facilities. Shorter delivery timescale and easy future upgrade paths
Costs, no benefits	Benefits have exceeded expectations

Figure 1.8 *Before and after the use of a benefits management approach (after IMPACT, 1998)*

of schedule, but, most importantly, all the expected benefits were realized.

Figure 1.8 illustrates the key differences in approach for the two implementations. In the first attempt, the project was very much a case of technology push, with IT believing the business would benefit from the deployment of a new information system. However, this technology view, with little understanding of how the business actually worked, resulted in a system that did not meet with the approval of users. These users were then reluctant to give up the existing ways of working, including their paper-based and local systems. Finally, to try and encourage uptake, the project team agreed to undertake a number of significant changes to the software package so that it could conform to the way that many of the users currently did their jobs. The result was a large number of bespoke amendments to the package, which caused serious cost and time overruns and resulted in an ongoing issue about support for the system. Despite the changes made to the package, the users were not satisfied since they felt they had been put through significant upheaval, in order to simply end up with a system that did just what they were already doing.

The second attempt at implementation of the ERP system was approached quite differently. Rather than being viewed as a straightforward implementation of a piece of software, it was recognized to be significant change project, which happened to be enabled by an information system. Viewing the system as a change management issue caused the organization to appoint a business manager to lead the project who could work closely with the IT department. A business manager who had experience of implementing such a system elsewhere was recruited for this lead role. An important part of the project was the identification and implementation of new procedures and best practices to accompany the implementation of the new system. To ensure compliance with the new procedures, the existing ways of doing things were decommissioned. While the introduction of any new procedures is never easy, it was particularly difficult in this case given the scepticism among the staff about this type of system following the first unsuccessful implementation. However, with clear communication of the benefits that were expected from the system and the associated changes, together with actions to aid the changes identified, staff were willing to comply. The result was an achievement of benefits that exceeded expectations, which would have a positive effect on the development and deployment of systems in the future.

The Importance of a Common Language: Information Systems and Information Technology

Before undertaking an exploration of how the benefits from information systems might better be realized, it is worthwhile considering the terms that are used in this field. Some terms are often taken as synonymous, or at least used interchangeably, by business managers, IT specialists and others commentating on these subjects. This lack of clarity in usage can lead to misunderstandings and even barriers, particularly between staff within the business and IT department. The following section discusses major terms in common use and defines how they will be used throughout this book.

Information systems (IS) and *information technology* (IT) are terms that are often used interchangeably. This is discussed by Ward and Peppard (2002) and the definitions and usage adopted in this book are consistent with the approach of these authors. They note that information systems (IS) existed in organizations before the advent of information technology more than 40 years ago. Even today, they stress that many information systems continue to function within organizations with technology nowhere in sight.

Information technology (IT), they state, refers to the technology on which modern information systems operate or run. That is, it refers specifically to the hardware, software and telecommunications networks that underpin modern information systems. Some commentators and organizations, particularly in the government and public sectors use the term *information and communication technologies* (ICT), rather than simply IT, in order to stress the convergence of traditional hardware and software with the networks that characterize communications technologies.

Our definition of information systems is adopted from the UK Academy for Information Systems (UKAIS), a body of both practitioners and academics interested in the study and improvement of information systems usage. They describe information systems as '*the means by which people and organisations, utilising technology, gather, process, store, use and disseminate information*'. Thus, although, as stated earlier, information systems can exist without the use of information technology, our interest in this book will be those information systems that are supported by information technology. This definition of information systems is in agreement with the discussion

of this subject by Checkland and Holwell (1998). They stress that information systems exist to serve, help or support people undertaking their daily tasks and in order to create a useful system, it is first necessary to determine what *is* to be supported, that is the information system, and subsequently to consider *how* this may be achieved, that is the information technology that is required. Too often, rapid advances in the performance or capability of technology and the promises of technology vendors have caused organizations to start their considerations with the capabilities of the technology rather than by clearly identifying what the technology is to serve or support.

The UKAIS also notes that the use and study of these systems includes both the underlying technological and social aspects. Within the business sphere, this social dimension is concerned with how individuals, teams and even whole organizations adopt and use information systems and how this use, in turn, shapes those information systems. Adopting the definitions just given clearly demonstrates that a consideration of information systems must take into account not only the technologies that enable them but also the inherent social implications. It can therefore be seen how the interchangeable use of these terms can lead to misunderstandings between the users of information technology and those providing it. Overreliance on the term information technology at the expense of information systems devalues the importance of the social dimension, which, as has already been stressed, is critical to the realization of benefits.

Another term that is often used when discussing information systems is *applications.* Applications are information systems that are used to accomplish a specific business activity or automate a particular process. Examples of simple applications are the word processing and spreadsheets found on virtually every PC. More sophisticated applications are used to accomplish activities such as general accounting, production scheduling or warehouse management. Such applications are often now sold as *suites*, comprising a number of separate applications. For example, the ubiquitous personal computing suite from Microsoft, Office, contains the word processing and spreadsheet applications just mentioned as well as others such as a graphics application, a database application and software for operating personal diaries and accessing email. Recently there has been a trend to develop very large suites of applications that, when implemented, impact the activities of many processes or functions within

an organization. These are being termed *enterprise systems*, examples including ERP and CRM systems and enterprise portals.

Organizations still face the difficult decision of whether to develop information systems or applications in-house to meet their specific needs, often termed *bespoke* or *customized* applications, or to buy a standard package from a software vendor. Prior to the 1990s, there was a tendency to develop bespoke applications, with the logic that little or no competitive advantage could be gained if a number of organizations in an industry had the same software package. More recently, the pendulum of opinion has swung in the direction of advising organizations to buy standardized packages, in which the vendors could embed best practice gained from their exposure to multiple organizations. As argued by both Carr (2003) and Mata et al. (1995), and discussed earlier in this chapter, it is not the software itself that will confer competitive advantage to any organization, but the skill that the management of the organization has in putting that software to work to address the objectives of their business and create changes to improve performance. The large enterprise suites offer a partial compromise to this dilemma as they allow organizations to configure the standard applications to best suit their circumstances and needs.

A Further Complication: E-Commerce and E-Business

Two other terms now in common usage, which like information systems and information technology are often used synonymously, are the terms electronic commerce (e-commerce) and electronic business (e-business). Kalakota and Whinston (1997) define *e-commerce* as '*the buying and selling of information, products and services via computer networks*', the computer networks primarily being the Internet. Hence e-commerce describes trading activities focused outside the organization itself, for example with customers and suppliers. *E-business*, in contrast, describes the automation of an organization's business processes, both within the organization and with outside trading partners. E-commerce, which was the first of the two terms to be coined with the opening of the Internet to commercial use in the mid-1990s, can therefore be considered as a subset or special case of the broader term, e-business, which grew in popularity when it was realized that the protocols that underpinned the public Internet could be deployed successfully within organizations to improve internal communication and working.

During the late 1990s, almost every business was considering how they might make use of the Internet. Sadly, this interest was more often than not fuelled by the observation that competitors were adopting this way of working or addressing customers, and a belief that it would cause their stock to be more attractive to investors, than a clear understanding of the real value it could add to an organization. This ill-thought-out rush to develop internet sites, often likened to the landgrabs undertaken in settling the west of the USA, contributed to the dot.com bust witnessed by the fall of the NASDAQ in March 2000. Despite the downturn in sentiment to the dot.com companies, many organizations have continued to develop e-commerce and e-business-based activities. However, their investments are now more measured and rather than being seen as something quite distinct, as they often were before 2000, such developments are now viewed as further information systems and technology-enabled changes. Rather than being justified by faith, or by a fear of being left behind, such developments are now required to demonstrate benefits to the organization and hence, like traditional information systems projects, can benefit from the methodology set out in this book to improve the identification and realization of those benefits.

Summary

Given the continued perception of the majority of IS/IT investments as being unsuccessful, there is a need for a fresh approach to how projects are undertaken. We suggest this should be a process approach that encompasses the entire lifecycle of the investment, commencing with the early exploration of the idea and planning the project and continuing throughout implementation and including a review, when it has been completed. The focus throughout the project should be on the realization of benefits, since that, after all, is the reason the organization is undertaking the investment. A major feature of the benefits management process we describe in the following chapters is the recognition of the importance of the need for organizational and business changes to accompany the deployment of technology and how the realization of benefits is dependent on the successful achievement of these changes. Since a wide variety of stakeholders are therefore likely to be affected by these changes, this suggests the need for a range of individuals to be involved in the benefits realization process, something that does not always happen with more traditional project management approaches.

As will be described, the starting point for the development of a benefits plan for a project is an understanding of the strategic drivers acting on the organization and its planned responses to these. An understanding of these drivers can show whether the investment being considered addresses areas that are important to the organization. It can also help in prioritization. As financial and management resources are finite in all organizations, deciding which projects *not* to do is often critical to being able to resource the ones that really matter. A number of tools and frameworks have been developed in the strategic and general management domain to help with the process of identifying and analysing possible strategies and making appropriate choices. The importance of a well-thought-out and clearly stated strategy as the starting point for the realization of benefits from individual projects is underlined by the presentation and discussion of a key set of these tools and frameworks in Chapter 2.

Once the business strategy for the organization has been determined, it is necessary to develop an IS and IT strategy. Ward and Peppard (2002) describe how this essentially has two parts to it: the IS demand, which describes the organisation's demand for information and systems to support the overall strategy of the business; and the IT supply, which describes the provision of IT capabilities and resources required to achieve this. The IS demand element will include an identification and prioritization of the projects that will best meet the stated objectives of the organization and should thus show how individual investments contribute, both on their own and in combination with others, to support the identified business strategy. While the IS strategy should support the business strategy, there is also a recognition that IS can shape the business strategy. This dynamic interrelationship between these two activities is termed *strategic alignment*. The nature and role of IS and IT strategies is discussed further in Chapter 2.