CHAPTER 13

Investing in information technology to grow firm value

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The perennial question of any business is "How does an organization add value?" Value can be defined from many different perspectives and may result from tangible and intangible factors. Principal stakeholders include shareholders (investors), customers, and employees. Shareholders typically measure value in terms of economic return on their investment based on some level of perceived risk. For customers, value is assessed in terms of a price–value relationship; that is, how much they received in terms of product and services for the price they paid. For employees, value is measured by salary and by the intrinsic rewards of the job. Yet, one of the most elusive questions with respect to information technology (IT) is "How can value be measured?" This question is especially important given the growing costs, capital intensity, and competitive requirements to invest heavily in IT and is the subject of this chapter. Hospitality business professionals must be able to successfully answer this question to create compelling business cases, to evaluate and make appropriate strategic and resource allocation decisions, measure and monitor the success of IT projects, and hold IT staff accountable.

IT typically ranks among the top five investments of most organizations, yet one of the least understood areas of the business (Lutchen, 2003). The prevailing attitude shared by many business executives is that IT overpromises and under-delivers (Betz, 2006). In the words of Maizlish and Handler (2005, p. 9):

> IT investments represent a profound hole in companies. There are no other investments within a company that occupy such a large and growing expenditure yet lack disciplined management, processes, and performance measurements.

As a result of assertions such as these and other factors (e.g., the Sarbanes–Oxley Act), corporations recognized the need for increased scrutiny and accountability of their IT function and now experience tremendous pressure to achieve tangible and sustainable results (Weill and Ross, 2004). Adding fuel to the fire is the polemic debate Nicholas Carr created in 2003 regarding the strategic importance of IT in business (Carr, 2003). His controversial article calls into question the value IT plays in firms and its ability to create competitive advantage. While there are merits to some of his arguments, it is difficult to imagine any hospitality business operating in today's complex and competitive environment without the use of IT. IT is an essential ingredient to any hospitality business and an important part of any organization's competitive methods (Piccoli, 2004). Moreover, the IT requirements of today's

marketplace are raising the level of investment and managerial skills required to compete successfully. What is important to note from Carr's article is that IT alone is insufficient in providing strategic value. What matters is how IT is used within organizations and what it enables. The value of IT can only be realized when it is well aligned with business strategy, when business processes are transformed to take advantage of IT, and when people are able to use IT and the information it provides to act in ways that competitors cannot (e.g., to do things faster, better, different and/or cheaper than competitors).

In order for a firm to achieve advantages and value from IT requires complementary relationships among the firm's resources and capabilities. Mata *et al.* (1995) refer to this as the resource-based view of the firm. According to their work, a company achieves competitive advantage through the culmination and convergence of a series of events, resources, experiences, and underlying management processes. In other words, competitive advantage is the result of not only how a firm competes (i.e., the strategies and competitive methods selected) but also the assets it has in which to compete. There is no one contributing factor but rather a series of ingredients or idiosyncratic resources that, when combined, provide a competitive edge in the marketplace. Plimpton (1990) terms this hidden competitive edge as the "X Factor." For many organizations, the integration of software applications and IT with the organizational structure provides the source of competitive advantage (Adcock *et al.*, 1993). Because of its tacit nature, the competitive advantage and its contributing factors are difficult to identify and, therefore, hard to duplicate. The resulting competitive advantage can then be sustained for as long as it remains inimitable and not obsolete, a period that is becoming shorter all the time in today's hypercompetitive marketplace. Because sustainability is difficult, firms should look to creating a sequence of advantages over time (Wiggins and Ruefli, 2005).

The literature is rich in examples of successful IT applications and their contributory role in a firm's success. For example, the work by Hiebeler *et al.* (1998) highlight best practices in 40 well-known and leading firms, including several from the hospitality industry such as Walt Disney, Ritz-Carlton, and Hyatt Hotels. In almost all cases, these authors recognize IT, either explicitly or implicitly, as a critical success factor and contributor to what makes companies stand out among others in their industries. IT is often deployed to help organizations grow revenues, cut costs, improve management decision making and controls, enhance guest services, and facilitate information reporting and communications. What the literature is less clear about, however, are the

direct contributions provided by IT and a formula for success in how executives decide to invest in IT, the methods they employ, and the criteria they use to evaluate and select the appropriate investments, particularly in the hospitality industry. Strategic IT planning and investments have a long history of beleaguering industry professionals (Caldwell, 1998; Post *et al.*, 1995; Applegate *et al.*, 1996; Dreyfuss, 1995; Liao, 1994; Laberis, 1994; Diebold, 1987; Sprague and McNurlin, 1986; Parsons, 1983). It is believed that these problems result largely from the lack of suitable measurement tools, techniques, and criteria, not from any theoretical shortcomings (Saunders and Jones, 1992).

On the surface, IT investment decisions seem straightforward. All projects should be accepted that add value to the firm. In reality, however, the process is much more complex due to the difficulties in defining and measuring value and the expected and actual contributions provided by IT. It does not help that in many firms, spending on IT is viewed as discretionary and, therefore, among the first to be reduced during times of capital rationing (Antonucci and Tucker, 1998). The decision-making process is further complicated by subsequent issues such as build versus buy (or hybrid) decisions for software and lease versus buy decisions–which add to the dimensions of the analysis.

Investment in IT is important to nearly every aspect of an organization since it impacts customer service, transaction processing capabilities, employee performance, and so on. Surprisingly, however, many executives are ill-prepared to make sound decisions regarding IT investment and strategy (Weill and Broadbent, 1998; Weill, 1991). Executives' inability to effectively estimate cash flows, timing, and an IT project's useful life increases the uncertainty—and, hence, the risk—surrounding each investment. Consequently, they tend to shy away from important IT investment decisions, but when they do chose to select an IT project, the results are often mixed despite their best efforts. Commonly published statistics for IT across industries suggest that upwards of three-fourths of all IT projects are late, over budget, or unable to deliver the proposed functionality (O'Brien, 1997) or offer no appreciable business returns (Neelakantan, 1996). The hospitality industry's track record as a whole with respect to IT is, at best, mixed and adds to management's scepticism towards IT.

Practices rooted in traditional capital budgeting methods

The most common approach to IT investment is the capital budgeting process, which relies on traditional financial measures and

the evaluation of cash flows based on the time value of money using discounted cash flow techniques (Bacon, 1992). General limitations to capital budgeting theory as it applies to investments in IT include: (1) a false assumption that all cash flows are known (i.e., that they can be predicted and quantified), (2) an invalid pretence that all contributions from IT (both good and bad) can be quantified, expressed in monetary terms, and measured by financial criteria, and (3) failure to account for organizational and behavioural factors (Bacon, 1992; Hubbard, 1999). The shortcomings of discounted cash flow techniques in particular are as follows: (1) benefits not easily quantifiable tend to be ignored; (2) financial analysis focuses mostly on cost displacement (i.e., labour and material savings) and tends to omit strategic implications such as new products and services or enhancements to existing ones; (3) in situations involving high perceived risk, unjustly high hurdle rates (rates of return) are set to compensate; (4) opportunity costs for forgoing an investment or IT project tend not to be considered, (5) analysis tends to be biased towards short-term returns, and (6) IT investments tend to pervade an organization and rely on interactions among different IT investments and different departments within the organization (Clemons and Weber, 1990; Weill, 1991).

Unfortunately, popular financial models such as net present value (NPV) and discounted cash flow analysis are inadequate for estimating the financial benefits for most of the technology projects under consideration today. While the hospitality industry has disciplined models and sufficient history to determine the financial gains or success of opening a new property in a given city, it lacks the same rigorous models and historical data for technology, especially since each technology project is unique. Although this problem is not specific to the hospitality industry, it is particularly problematic since the industry tends to be technologically conservative and unwilling to adopt new technology applications based on the promises of its long-term merits if it cannot quantify the results and calculate a defined payback period. When uncertainty surrounds the investment, when the timing of the cash flows is unpredictable, and when the investment is perceived as risky, owners and investors will most likely channel their investment capital to projects with more certain returns and minimal risk. Thus, under this thinking, technology will always take a back seat to other organizational priorities and initiatives. Efforts must be made to change this thinking and develop financial models that can accurately predict and capture the financial benefits derived from technology.

Until recently, most technology investment decisions have been considered using a support or utility mentality that stems

from a manufacturing paradigm. Under such thinking, business cases could be built around an application or technology's ability to reduce costs or create labour savings. However, management's attitudes towards technology have been shifting in recent years. The more technologically savvy hospitality companies are looking to IT to build strategic and competitive advantages. These types of investments yield results over time, and seldom in the short run. This is problematic among owners and investors who demand more immediate results. Moreover, it is difficult to quantify and calculate the tangible benefits of technology when it is used for strategic purposes.

Sabherwal and King (1995) identify five decision-making processes: planned, provincial, incremental, fluid, and political. In the hospitality industry, it seems that there are six prevailing philosophies regarding IT investment. All projects tend to fall in one of the following six categories: (1) essentialness to survival, (2) an act of faith (or gut feeling) that an investment will prove beneficial to the firm over the long term, (3) projects with an intuitive appeal and seemingly obvious outcomes, (4) projects that are required or mandated (either by law, by regulation, or by top management), (5) a response to moves by competitors to achieve parity or protect market share, and (6) paralysis by analysis in situations involving high degrees of risk and uncertainty, perceived or actual.

More often than not, decisions related to IT tend to be made on an ad hoc basis because of the difficulties in evaluating IT investment decisions and judging their strategic benefits in advance of implementation (Antonucci and Tucker, 1998; Farbey *et al.*, 1992; Clemons and Weber, 1990; Diebold, 1987). In many firms, formal justification procedures simply do not exist, and where they do exist, they are not always followed or enforced; instead, a project champion is left to determine the approach(es) deemed appropriate and sufficient to gain project approval and funding (Farbey *et al.*, 1992). With respect to overall IT budgeting, firms tend to use simple approaches to establishing IT budgets such as developing guidelines based on existing budgets (some percentage of the current year's budget, which is often determined through a series of negotiations by senior executives and IT management) or benchmarking IT expenditures with those of competitors so as to maintain competitive parity. Needless to say, these approaches demonstrate little rigour and may lead to inappropriate or ineffective investment decisions, especially when resources must be allocated to multiple, contending projects and involve large sums of capital. Betz (2006) calls for a more sophisticated

approach to IT management and oversight with specific focus on the development of effective and efficient IT management processes, discipline measures, and rational decision making. He emphasizes the need for better overall governance and accountability, particularly when it comes to people, priorities, and performance.

Unfortunately, IT is a complex entity to manage, and IT projects are often difficult to substantiate. The benefits of IT are not always obvious or certain, take years to realize, and are sometimes elusive. Because technology pervades a firm's value chain (Porter, 1985), it is difficult—if not impossible—to measure benefits derived from the technology, attribute benefits directly to the technology, or establish causal relationships. Moreover, the study of IT on firm performance is a difficult and complicated task due to the many confounding variables involved (e.g., organizational structure and organizational processes) and the many sources of extraneous variance (Hildebrand, 1997; Loveman, 1991; Bakos, 1987; Chakravarthy, 1986; King, 1983). Since there is a great deal of ambiguity surrounding performance (Anderson, 1984), it is difficult to establish a causal link between IT and firm performance.

In the hospitality industry, absence of this link and concrete evidence makes it more challenging to sell hospitality executives on the merits, capabilities, and benefits of IT—especially when greater emphasis is placed on IT as a support role or utility function rather than as a strategic weapon (Cho, 1996). This lack of clarity begs the question: What factors should executives consider when making IT-related investment decisions? There is often scepticism surrounding IT investment decisions due to the intangible returns and benefits derived from the technology itself, and when competing for resources and capital, IT often loses out to more tangible and visible projects that seemingly offer greater certainty and less risk. For example, one hotel IT executive of a leading, international hotel chain once reported at an industry workshop how he competed for and lost funding for an IT project to a physical facility upgrade. Instead of funding an IT initiative, senior executives favoured marble in guest bathrooms because it was viewed to have an immediate and direct impact on the hotel chain's guests. While one cannot defy this logic, it is representative of the emphasis placed on tangibility and the short-term mentality of industry leaders. It is this short-term thinking that fails to capture the long-term strategic potential of IT applications and plagues the development and advancement of IT throughout the industry.

The traditional approaches to assessing value are derived from accounting and finance practices that focus on physical assets supported by financial capital, but in an information-driven economy, these factors are clearly no longer sufficient; one must also include employees and customer relationships in the equation (Cline and Blatt, 1998) as well as the intangible factors. This holistic view will provide a more complete picture of value derived from IT investments.

Loveman (1991) suggests that because business executives are unable to effectively measure IT costs and benefits, they cannot make informed decisions regarding IT resources and investments—which, in turn, lead to misallocated resources and ineffective or unrealized benefits. Companies must have a clear view of how IT can fit in an organization, allocate resources, and invest according to this view.

Using a multivariate approach

To mitigate the limitations of financial methods when evaluating IT investment decisions, a more comprehensive or holistic approach is needed. The literature suggests that a cluster of metrics reflecting multiple dimensions and disciplines is better than a single measure when evaluating IT to provide a more robust assessment. These metrics can (and probably should) be quantitative as well as qualitative. Parker *et al.* (1988) identify six classes of value derived from IT: return on investment (ROI), strategic match, competitive advantage, management information support, competitive response, and strategic IS architecture. Bacon (1992) uses this framework of value to identify a set of 15 criteria classified in three categories (Table 13.1) and then develops a survey to ascertain what criteria are considered when making IT investment decisions.

Bacon (1992) approaches IT investment decisions from the standpoint of the criteria used, not the processes followed. In a similar vein, Semich (1994), Shein (1998), and Madden (1998) suggests a multiple-criteria approach, building upon the balanced scorecard technique first popularized by Kaplan and Norton (1992, 1996). Using this approach, most of the analysis can be done using a simple spreadsheet to group and rank organizational priorities among each of four categories: financial, internal business processes, customer service, and organizational learning and innovation.

Farbey *et al.* (1992) propose a benefits-oriented perspective to evaluating IT projects and investments. Under this

Table 13.1 IT Project Selection (Investment Decision) Criteria

Category	Measure
Financial criteria	
Discounted cash flow	Net present value
	Internal rate of return
	Profitability index
Other financial	Average/accounting rate of return
	Payback method
	Budgetary constraint
Management criteria	Support explicit business objectives
	Support implicit business objectives
	Response to competitive systems
	Support management decision-making
	Probability of achieving benefits
	Legal/government requirements
Development criteria	Technical/system requirements
	Introduce/learn new technology
	Probability of project completion

Source: Bacon (1992, p. 338).

approach, benefits derived from an IT application are expected to fall within one or more of the following categories (listed by the authors in order of increasing impact):

1. *Efficiency*: Creates savings (or avoidance) of time, manpower, money, or other resources of the firm.
2. *Functionality*: Provides the ability to process or complete new tasks or activities or improves upon the quality in which the existing ones are done.
3. *Communications*: Connects different systems and enables the exchange of information.
4. *Management*: Improves the quality and capabilities of management and enhances decision making.
5. *Strategy*: Supports corporate objectives and creates opportunities for competitive advantage.

In yet another approach, Benjamin *et al.* (1984) provide a simple framework for considering IT investments based on the strategic opportunities they pose. The criteria of this framework

are based on the competitive marketplace and a firm's internal operations. They are:

1. IT's ability to significantly alter the way a firm does business to create competitive advantage.
2. IT's role in providing internal improvements and efficiencies.

Rockart (1979), on the other hand, addresses the process rather than the specific criteria. He introduces the term critical success factors, the defining elements of a firm's competitiveness and organizational performance. He suggests that critical success factors should determine a firm's priorities and needs because these, when done "right," are what make firms flourish. In his work, Rockart presents the process of interviewing top-level executives to identify a firm's critical success factors. Boynton and Zmud (1984), Geller (1984), and Shank *et al.* (1985) later employed this technique.

The critical success factors technique is a strategic approach involving high-level executives of the firm. Davenport *et al.* (1989) propose a somewhat similar methodology called the principles approach, or what Weill and Broadbent (1998) refer to as management by maxim. With this technique, senior executives articulate the firm's basic philosophies regarding the firm's business and its usage of IT through a set of management principles (maxims) that capture how IT should be used to achieve organizational goals and objectives. These principles then guide IT-related decisions and investments. The objective of the methodology is to force strategy to drive technology initiatives and to bridge the communications gap between senior management and technical experts.

Interestingly, despite the rapid change of technology and the newer capabilities afforded by technology, the principal reasons for implementing IT have remained relatively stable over time (Grover *et al.*, 1997). These include such goals as growing revenues, cutting costs, improving management decision making and controls, enhancing guest services, and facilitating information reporting and communications. Despite this stability in objectives, there is no one best solution, process, or set of criteria for evaluating IT investment options because the range of circumstances is so broad (Farbey *et al.*, 1992).

The use of IT throughout a firm should reflect that firm's strategic plan. The methods employed must balance short- and long-term needs with appropriate levels of risk and return using a portfolio approach (Maizlish and Handler, 2005; Applegate *et al.*, 1996; McFarlan, 1981; Thorp and DMR's Center for Strategic Leadership, 1998; Weill and Broadbent,

1998; Weill, 1991; Weill and Olson, 1989). The administration of these portfolios requires the use of fundamental management practices and business concepts, with the overall objective focused on creating value for a firm through supporting current strategies and by enabling new ones (Weill and Broadbent, 1998; Thorp and DMR's Center for Strategic Leadership, 1998). Like any financial investment portfolio, an IT portfolio must be actively managed with continuous monitoring and suitable investment levels to meet a firm's goals and objectives and to create a balanced set of risk-return profiles. Moreover, firms cannot afford to ignore the opportunity costs and strategic implications of failing to accept a given investment opportunity. Complacency is seldom an option since competitors will quickly alter the competitive landscape with their own moves and initiatives and consequently force action by sleeping firms and those attempting to avoid it.

Implicitly, all IT investment decisions are designed to improve strategic value, business performance, and ROI—unless of course, they are made to comply with regulatory, legal, or other government requirements. Realization of the benefits derived from IT applications comes with time, other changes throughout an organization, and complementary resources. IT alone does not generate benefits. However, the tools and methods for evaluation and IT appraisals to capture IT's contribution to these benefits are ill-defined and lacking, making it difficult to apply the necessary rigour and analysis for objective, fact-based decisions and allocations of firm resources.

As the above discussion illustrates, no single metric can adequately measure or capture the contributions of IT. Assessing the impact of IT should not rely on univariate metrics but instead must look at a composite of measures using multiple techniques to provide a more holistic assessment. Multiple measures are almost always preferred to a single measure because of the richness that can be captured. Since a single measure cannot sufficiently assess the impact of IT (e.g., costs, benefits, organizational impact, etc.), King and McAulay (1997) suggest the use of multivariate and multi-method measures to capture the diverse needs of multiple stakeholders, to provide criteria that can be rank ordered, and to offer a source of triangulation. To that end, a composite of quantitative and qualitative measures should be used to create a balanced scorecard approach (Semich, 1994; Kaplan and Norton, 1992, 1996; Shein, 1998; Madden, 1998). In the words of Weill and Broadbent (1998, p. 24):

> Mangers make decisions about information technology investments based on a *cluster of factors* [italics added], including capabilities

required now and in the future, the role of technology in the industry, the level of investment, the clarity with which technology investments are viewed, and the role and history of information technology in the firm.

In the words of Farbey *et al.* (1992, p. 116):

> The organization wishing to sharpen its IT investment decision-making must first recognize that there are evaluation techniques other than ROI. It must then try to find which technique is most suitable for its IT investment.

Why measures matter

IT, when applied appropriately, can have a significant impact on a company's service levels and overall firm performance, but when a project is poorly conceived, the impact to the organization can be catastrophic (Bowen *et al.*, 2007; Maizlish and Handler, 2005). Moreover, selecting too many IT projects at one time or the wrong mix of projects can also lead to disastrous results (Ross and Weill, 2002). Therefore, when contemplating any significant IT investment, it is important to apply rigour and follow a formal and disciplined process to ensure the *right* mix of projects, commitment from the organization, and alignment with the business strategy. These, in turn, will lead to successful outcomes and the creation of business value (Holland and Skarke, 2008; Chan and Reich, 2007; Peak *et al.*, 2005). According to Diebold (1987, p. 590), one should analyze and quantify all IT projects/investments to the fullest extent possible to decrease the level of uncertainty and risk while lessening the leap of faith required by company executives. Bacon (1992) and Farbey *et al.* (1992) postulate that the criteria used in evaluating and making IT investment decisions are important because they determine which projects are accepted and the level of funding and resources they receive. Ultimately, they become instrumental in determining and measuring the overall success and effectiveness of the decisions. The assumption is that the criteria used will ensure that only the *right* projects are accepted, while all others are rejected. These authors suggest the following significant implications regarding the criteria used:

1. The criteria used (or omitted) and the manner in which they are used (or not used) impact which decisions or projects are funded or rejected (thus, defining the mix of projects adopted and the pace at which they are adopted).
2. The criteria provide justification and set expectations within the firm for the application, system, or technology.

3. The criteria provide a basis for comparison of multiple projects competing for a finite set of resources.
4. The criteria impact how a firm attempts to maximize ROI and any ensuing cost-benefit analysis.
5. The criteria used affect how a firm balances multiple stakeholder requirements and needs.
6. The criteria provide a set of measures so a firm can monitor and control project and judge its degree of success.
7. Evaluation and subsequent measurement and comparison with actual achievements or impact provide a basis for learning which can be factored into future evaluation processes.

Common questions related to the IT function in a firm are (1) is the company spending too much money on IT, and (2) is the organization gaining appropriate returns from its investment in IT (Kaplan, 2005; Ross and Weill, 2002). Weill and Ross (2004) argue that the ability to derive value from IT is directly correlated to the effectiveness of a firm's IT governance process. Governance, as defined by Weill and Ross (2004), deals with what decisions should be made, by whom they should be made, the criteria upon which they should be based, and the accountability metrics used to monitor and measure outcomes. Since resources for IT are finite and subject to supply, demand, and costs, firms must have an effective governance process in place (Lutchen, 2003; Weill and Ross, 2004). The extant literature on IT governance reveals two common patterns of decision making: attribute-based (with the focus on characteristics surrounding the IT project and decision-making processes) and stage-based (which emphasizes the various steps through which a decision must move, the actors involved at each stage, and the timing) (Sabherwal and King, 1995).

Given the capital intensity, business impact, and risks associated with IT projects, the decision-making and approval process tends to be complex, multi-faceted, and conducted over a period of time with a number of hoops and hurdles to jump (Xue *et al.*, 2008). Decision making for IT investments typically requires a series of steps that begin with ideation and concludes with a go/no-go decision (Boonstra, 2003). Figure 13.1 provides a typical example of the various process stages IT projects must go through for prioritization and approval. Each stage gate represents a series of hurdles which must be cleared prior to advancing to the next level.

How decisions are analyzed and carried out can vary by firm depending upon IT governance (processes and actors), IT investment characteristics (such as costs, risks, technical complexity, and strategic importance), external forces (e.g., environmental

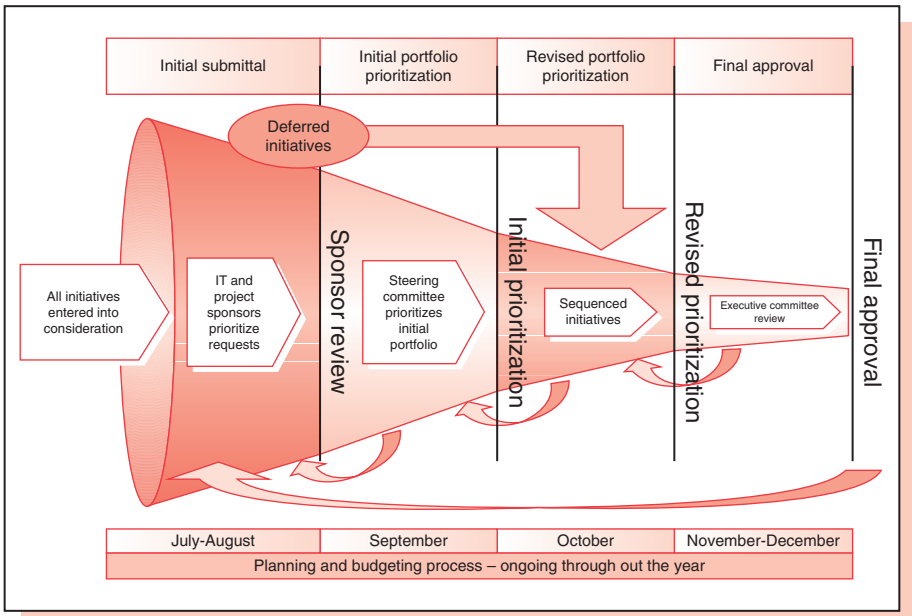

Figure 13.1
An illustrative example of the various stage gates IT projects must pass. (*Source*: Adapted from Tobin, 2007)

threats, regulatory requirements, and competitor moves), organizational structure (including the degree of formalization, centralization, and hierarchical management), and IT function power (which is affected by organizational culture and the clout, reputation, and credibility of the IT organization, among other things) (Xue *et al.*, 2008).

Setting priorities and investment strategies in IT are difficult processes. Since few formal methodologies exist, these processes are as much an art as a science, causing many firms to struggle and fail (Williamson, 1997). The lack of methodologies for determining the value of IT further complicates the process. Financial theory suggests measuring financial returns on a risk and time-adjusted basis (Hamel and Prahalad, 1991), and in most cases, firms rely on financial measures such as ROI, NPV, and internal rate of return (IRR). However, more often than not, the financial rationalization fails to capture the complete picture in terms of customer satisfaction, service, quality, employee satisfaction, productivity, or strategic positioning (Williamson, 1997; Bharadwaj and Konsynski, 1997).

The most popular thinking and prolific theories regarding the use and value of IT come from the Harvard Business

School, which is dominated by the works of Michael Porter (Porter, 1980, 1985; Porter and Millar, 1985). Porter's works are frequently cited in the IT literature as the theoretical underpinnings for studying IT. Applying this school of thought, the frameworks used to measure the strategic significance of IT are value chain analysis, Porter's industry and competitive analysis (ICA) framework or *Five Forces* model (e.g., create economies of scale, barriers to entry, switching costs, links to customers and suppliers, etc.), and Porter's generic strategies (i.e., low-cost producer, product differentiation, or market niche focus).

McFarlan (1984) proposed a strategic grid to evaluate a company's use of IT. Based on the strategic impact of existing systems and those under development, firms could be ranked in one of four categories: support, factory, turnaround, or strategic. Investment decisions can then be made based on consideration of a firm's current standing in the grid with respect to where it wants to be positioned. McFarlan (1984) also suggested five criteria useful when deciding resource allocations with respect to IT applications:

1. System rehabilitation and maintenance
2. Experiments with new technology
3. Competitive advantage
4. Maintenance or regaining of competitive parity
5. ROI

A firm's IT should be treated as any financial investment portfolio; that is, as a collection of assets that, when managed well, will generate suitable returns on investment (Kaplan, 2005; Jeffery and Leliveld, 2004; Weill and Broadbent, 1998; Weill, 1991; Weill and Olson, 1989). Just like with any financial portfolio, one must balance both short- and long-term needs of all stakeholders as well as risk and return while maintaining appropriate levels of investment to achieve a firm's objectives. McFarlan (1981), Applegate *et al.* (1996), and Thorp and DMR's Center for Strategic Leadership (1998) also use a portfolio metaphor, proposing that, as in finance, firms create a technology portfolio to help diffuse risk, particularly with respect to new projects. When embarking on new IT initiatives, firms should consider other projects currently underway and factor in the risks of the new project in terms of three dimensions: project size (in terms of budget, staff, scope, complexity, and development time), experience with technology, and project structure. Clemons and Weber (1990) elaborate on the topic of risk and suggest that there are six types that should be considered with respect to IT: technical risk, project risk, functionality risk, internal political risk, external

environmental risk, and systemic risk. Hence, a sixth category, risk, should be appended to McFarlan's list.

There is growing recognition that intangible benefits and aspects of IT increasingly contribute to the IT's overall value and importance in today's knowledge-based economy. This is why Bharadwaj and Konsynski (1997) suggest that intangible factors such as strategic flexibility, risk avoidance, and growth potential receive greater consideration when evaluating IT investment decisions. Williamson (1997) offers the following as suggested criteria for IT investment decisions:

- Alignment with the business strategy: Consideration for how well the proposed IT project fits with the company's overall business strategy.
- ROI: The anticipated return on the IT investment.
- Risk: The ability to deliver the proposed project, fulfilling the requirements within a timely fashion. Assessments should be made to determine both technical and organizational risks.
- Business readiness: The overall preparedness of the firm to adopt the new technology and make the necessary changes required to implement it.
- Regulatory or mandated changes: Changes that are required due to necessary changes in the business environment.
- Business values: The anticipated changes brought on by the new IT application are consistent with the firm's corporate value system.
- Cost assessment: The best estimate for the project's total cost.
- Sponsorship: The project has support from the user community and an overall product champion.
- Common sense: Intuitively, the project makes sense.

The quest for determining the economic life and payoff from an IT project may very well be an exercise in futility in the minds of some (Hibbard, 1998). Could this be the equivalent of the search for the Holy Grail? Hildebrand (1997) writes of the difficulties in measuring the value of IT because of the many intangible variables. She suggests that IT value is best measured not by hard numbers but by anecdotal evidence based on the following criteria: alignment with business strategy, affordability, flexibility, scalability, cost-effective solutions (i.e., price/performance), dependability, reliability, the ability to accommodate new technologies, service levels, responsiveness to changes in the environment, the ability to deliver projects on time and within budget, support, organizational credibility, innovation and organizational learning, and financial performance (increased revenue, decreased costs, and ROI).

Apostolopoulos and Pramataris (1997), Bharadwaj and Konsynski (1997), Grover *et al.* (1997), Brynjolfsson and Hitt (1996), Semich (1994), Saunders and Jones (1992), Brady *et al.* (1992), and Diebold (1987) among others, also support greater emphasis on the "soft" benefits of IT, including factors such as strategic advantage, service, quality, timeliness, improved decision making, added flexibility, employee satisfaction, and so on in the overall benefits analysis. Indeed, evidence that this shift in focus is surfacing. For example, research by Thyfault *et al.* (1998) suggest that in many companies today, customer loyalty is driving IT investment decisions, not ROI.

Building a business case for IT

Given the high costs and risks typically associated with IT projects, it is necessary for organizations to have a formal, rigorous process for evaluating, approving, and justifying IT projects. This is especially true with the increased scrutiny and level of accountability brought on by the Sarbanes–Oxley Act, which requires strict financial reporting and fiscal responsibility. However, since each IT project tends to be unique in terms of purpose, scope, and objectives, approval processes may vary and decisions may need to be made on a case-by-case basis using some ad hoc criteria or methods.

Based on a series of studies across multiple industries, Weill and Olson (1989), Weill (1991), and Weill and Broadbent (1998) suggest that not all IT investment decisions are alike but rather can be defined by five basic categories: strategic, informational, transactional, infrastructural, and threshold. These authors then suggest that firms apply a contingency theory approach to decision making, where the type of investment and the context of the investment determine the criteria to be used in evaluating that investment (Table 13.2). They posit that there is generally one prevailing measure for each category. However, other authors show that reliance on a single measure can be misleading since it cannot possibly capture all of the complexities of IT.

As Farbey *et al.* (1992) so eloquently state, there are multiple approaches to evaluating IT, and each technique is suitable to a set of circumstances. The challenge for any organization is to select the appropriate methodology and criteria given the situation and desired objectives. A firm must balance rigour with efficacy. To assist firms in achieving this balance, Farbey *et al.* (1992, 1994) present an effectual process that can be followed to determine the contextual setting, capture the relevant characteristics, and match a project with the most appropriate evaluation method. It is important to note that timing can change

Table 13.2 A Simplified Approach to IT Investment Analysis

Investment Category	Description	Examples	Prevailing Measure(s)
Strategic IT	IT decisions designed to alter a firm's products and services or change the way a firm competes in its industry to create competitive advantage and build market share; the overall objective is to drive sales.	Customer relationship management (CRM) Loyalty programme system Central reservation system (CRS) and revenue management system (RMS) integration Web site Mobile (m-) commerce In-room amenities	Revenue and market share growth rates to capture long-term goals related to competitive advantage.
Informational IT	IT geared towards the development of a firm's information and communications infrastructure to provide better information in the hands of a firm's decision makers for managing and controlling the business.	Accounting Business intelligence (BI) Balanced Scorecard Data mining and decision support tools Digital signage	Return on assets to measure medium-term goals for improved decision making and firm performance.
Transactional IT	IT that supports the firm's operations and typically involves repetitive transactions; the primary foci are cost reduction, productivity, efficiencies, and labour savings.	Point-of-sale (POS) Property management system (PMS) Sales and catering Self-service kiosks Energy management Procurement Time and attendance	Indirect labour to capture reductions in labour resulting from the use of IT; productivity and efficiency metrics.

Infrastructural IT	IT that provides the foundation and support infrastructure necessary for shared information technology services and capabilities. The evaluation criteria are typically based on the investment's utilitarian attributes.	Operating system upgrades Hardware upgrades Wired and wireless networks Security	Focus tends to emphasize the IT infrastructure's utility, cost savings, and/or (strategic) enabling capabilities. Traditional accounting measures (e.g., NPV, IRR, and payback) are used and often combined with subjective evaluations.
Threshold IT	IT investment required to compete in a given industry, without which a firm cannot survive; the investment is mandatory or a competitive necessity.	Sarbanes-Oxley compliance Payment Card Industry Data Security Standards (PCI DSS) compliance In-room Internet access	No measure is suggested since the investment is required for a firm to enter, compete, or remain in a marketplace; the investment should be treated as a sunk cost.

Sources: Adapted from Weill and Olson (1989, pp. 13–15), Weill (1991, pp. 4–5), and Weill and Broadbent (1998, pp. 212–220).

perspective and how one views a certain type of technology (in terms of investment category) and the level of risks (perceived or actual) associated with that technology vis-à-vis the maturity lifecycles of both the technology and the organization itself.

Regardless of the type of project, the deliberation should be rigorous, deliberate, and as objective as possible to ensure the firm is appropriately using its resources, aligning its IT initiatives to its business strategy, and mitigating risk. The launch of a new IT initiative often begins with some informal discussions between people within an organization regarding an idea or recognition of an organizational problem or need. After the idea builds interest and momentum, it is channelled into the company's budgeting process. When time comes to appropriate funding for a specific capital project, a formal business case must be developed, presented to the executive committee, and approved for funding. The process can become political at times, with individual executives becoming passionate over certain issues. One hospitality executive once described the process in his company as "interesting with lots of lobbying and horse trading taking place." In the end, however, sound reasoning and judgment must prevail to allow only the *best* projects to emerge and win funding.

Because many hospitality companies have historically had poor track records when it comes to IT project success and benefits realization, executives tend to carefully scrutinize requests for new IT initiatives and place difficult hurdles in the way to ensure only the most viable projects get approved—and understandably so. The justification process is typically a multi-step process that involves multiple people, levels, and departments in the organization. The decisions are confounded by the number of different stakeholders (e.g., guests, employees, franchisees, and shareholders) that must be satisfied and their often conflicting needs. Decisions are most commonly committee-based, and the process itself can be difficult due to the many unknowns involved, the inability to quantify benefits, prior blunders and credibility issues, and limited history/benchmarks that can be used for reference.

Following a traditional approach to capital budgeting, the business case begins with an executive overview or summary of the situation and includes a needs/benefits analysis. The business case goes on to state the objectives, scope, and timing of the project; provide rationale or justification for the project; assess the marketplace in terms of opportunities, threats, risks, and competitor activity; discuss the financial benefits and ROI; and suggest a recommended course of action. The components of a typical business are depicted in Table 13.3 below.

Table 13.3 Proposed Business Case Content/Structure

1. Executive summary
2. Problem/opportunity statement
3. Project definition and scope
4. Needs analysis and alignment to company strategies
5. Competitor activity assessment and industry trends analysis
6. Project budget and funding request
7. Key assumptions
8. Cost–benefit analysis, including financial analysis, cash flows, and net present value (NPV)
9. Risk assessment
10. Alternatives considered
11. Recommendations
12. Project work plan and timeline
13. Signatures of approval
14. Appendices (as needed)

The business case guides executives through the analysis process and is the basis for informing executive judgment used in making the ultimate decision. It ensures that the IT project is properly aligned with the firm's business strategy, a requisite for achieving a successful outcome. The degree of rigour in the process and reliance on tangible measures tends to vary according to organizational attributes such as size, structure, culture, firm strategy, and industry positioning. These variables can be labelled under the construct context variables, which are moderating variables that frame the situation in which an IT decision is to be made and the circumstances surrounding that situation and decision. Context variables, derived from the environment in which a firm operates, set the stage for how the process is carried out, moderating both the evaluation process and the final decision.

Context variables give rise to another category or construct of variables called process variables. Process variables define the actual evaluation and decision-making processes, which are governed by a number of factors. These include the methodology and techniques used to evaluate the alternatives and the ensuing decisions, the participants involved, the actual evaluation and decision criteria, the level of formality of the process, degree of rigour, etc. Process variables can vary according to IT project type or classification. Process variables, in turn, influence project variables contained in the project variables construct. Project variables also influence process variables and

can be directly tied to the IT project or investment decision under consideration. These are the specific attributes or characteristics of a project that define its strengths and weaknesses, opportunities, costs, benefits, and risk. Project variables are defined by the criteria established for the process and lead to a go/no-go decision for the project in question. These consist of quantitative and qualitative, tangible and intangible measures. For example, all of the companies studied indicate the importance of NPV, payback, and strategic alignment as three important decision criteria for any IT project.

The relationships between context, process, and project constructs are depicted in Figure 13.2. The external environment drives the strategy and the context. This is consistent with the strategic management literature which describes firms as living organisms that must be responsive to their environment. It also echoes the teachings of the co-alignment principle. Simply stated, the co-alignment principle suggests that if a firm understands the environmental events affecting its business and shaping the future of its industry, plans and develops its strategies so as to exploit these environmental opportunities and minimize any threats, and appropriately allocates and aligns its resources (e.g., people, capital, technology, etc.) through consistent investment to create product and service offerings (i.e., competitive methods), it will outperform industry players and receive competitive advantage (Chandler, 1962; Thompson, 1967; Bourgeois, 1980; Venkatraman and Prescott, 1990; Olsen *et al.*, 1998). Intuitively, given the concepts expressed in the co-alignment process, the context should drive strategy and the process, which, in turn, guides the project (Kearns and Sabherwal, 2006/2007). In reality, the relationship between process and project is likely to be dyadic, or two-way. Oftentimes, the project may drive the process (Farbey *et al.*, 1992). For example, when a project's benefits

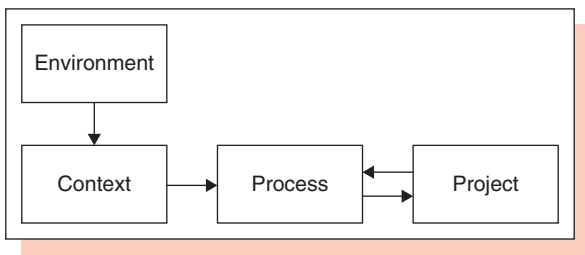

Figure 13.2
The relationship between the context, process, and project constructs.

are obvious, the evaluation process may be streamlined and relaxed. Alternatively, when a project is vague or exhibits a high degree of risk, the process used will likely be more deliberate and calculated.

Identification of the important and appropriate variables is a prerequisite step in closing the measurement gaps commonly found in IT projects, reported by leading scholars (e.g., Mahmood and Mann, 1993; Saunders and Jones, 1992) and often cited by industry practitioners. By clarifying what needs to be measured, one can begin to explore how best to measure these variables; develop suitable tools, techniques, and instruments; and extend this new knowledge—from theory to application—to include all IT projects, regardless of type (i.e., strategic, informational, transactional, infrastructural, or threshold).

Table 13.4 provides a listing of the key context, process, and project constructs and variables associated with IT investment decision making. Since the specific measures used may vary by company and, according to contingency theory, are contextual depending upon the nature of the project and the organization in which the project is under consideration, the variables listed represent a starting point for organizations wishing to develop a balanced scorecard approach (Kaplan and Norton, 1992, 1996) to project evaluation.

Concluding remarks

IT is an important resource vital to a firm's success. No longer can it be viewed simply for its support and utility roles dominant in tactical applications, which focus on the use of IT to gain efficiencies, reduce costs, decrease labour, and improve productivity. Instead, IT is increasingly playing a strategic role in organizations, where it either creates competitive advantage or enables new business opportunities. Attention is now being given to IT's ability to differentiate products and services, to create new product and service offerings, and to build and sustain core competencies. As such, one must treat IT expenditures as capital investments that will add value over the long term, not as period expenses (Applegate *et al.*, 1996; Weill and Broadbent, 1998). Their applications and impact must be considered in a wider context, that of the entire organization.

The convergence of powerful computers, intelligent software, and high-speed, global telecommunications networks is creating a new climate for conducting business throughout the world. To survive and thrive in the long run, the firm of the future will need to be a learning organization, one that must always reinvent itself to create value. How a hospitality company rises to

Table 13.4 Context, Process, and Project Constructs and Variables

Context Variables	Process Variables	Project Variables
Firm strategy	Evaluation and approval processes: methodology, techniques, and measures	Business considerations
Organizational structure	Critical success factors	Competitive advantage
Organizational infrastructure	Process formality	Financial performance
Degree of fragmented ownership	Participants and decision makers	Growth rate
Organizational culture	Level of analysis	Leverage/economies of scale
Internal politics	Degree of rigour	Strategic alignment
Company size and geographic dispersion	Levels of approval	Enabling capabilities
Organizational maturity (life cycle stage)	Evaluation and decision criteria	Customer service
Industry positioning	Role of quantitative vs. qualitative data	Customer satisfaction and loyalty
Resources, capabilities, and core competencies	Length of evaluation period	Opportunity costs and cost avoidance impacts
Portfolio of products and services	Business case format and content	Improved quality of information
IT portfolio and infrastructure	Ranking process	Enhanced decision making
Perceived level of environmental uncertainty		Financial
Perceived level of competitive intensity		Net present value (NPV)
Attitudes towards risk		NPV as a percentage of present value invested
Timing		Payback
Compensation and rewards structure		Cost–benefit analysis
		Cash-on-cash invested
		Cash flows
		Impact on earnings per share (EPS) and stock multiples
		Value creation/economic value added (EVA)
		IT
		Resource availability
		Architectural fit
		Technology life cycle
		Functional and technical requirements
		Reliability
		Response time
		Ease of use
		Flexibility, growth, and migration paths
		Project
		Perceived need
		Classification of project
		Measurement and evaluation criteria
		Project sponsor/champion
		Organizational readiness
		Staffing
		Costs
		Benefits
		Useful life
		Risk
		Project risk
		Technical risk
		Business risk
		Hurdle rate
		External
		Alternatives
		Competitive positioning and market share
		Competitors' moves and industry response

the challenges and opportunities presented by IT will be a key determinant of success.

With escalating costs and investment capital required to support today's complex technologies and infrastructures, hospitality executives must employ sound logic when allocating corporate resources to ensure their decisions will bring value to their firm. No longer can they simply rely on "gut feel" or responses to competitor activity. Instead, they must take a more discriminating approach and identify which technology decisions will truly add value to the firm. Only those clearly able to demonstrate value-adding potential should be adopted. In today's context, adding value implies that each decision made will result in a return for the firm and its stakeholders that is in excess of the cost of capital used to invest in that decision, the opportunity costs, and inflation and is commensurate with the level of risk that must be assumed for the given investment.

Not all technology investments have easily calculable paybacks or some other economic measures because it is nearly impossible to assess a value to information and knowledge. Because the tools are limited and fail to value the intangible aspects, such as the lifetime value of the consumer and the strategic positioning of the firm, decisions cannot be made on quantitative data analysis alone, but that does not mean that rigour and accountability should be relaxed. It just means that executives should employ a variety of criteria or metrics when evaluating and making IT investment decisions.

Seldom is the IT decision-making process entirely rational. Perhaps the term rational is better described by degrees of rationality rather than in absolute terms. It is extremely difficult if not impossible to achieve perfection and exactness when calculating the financial returns and benefits of IT projects. Therefore, some element of subjectivity will always come into play. Accuracy, like rationality, comes in degrees or orders of magnitude. It is important to come as close as possible—or at least get in the ballpark—and improve the process with each new project. What seems to matter most are the processes, measures, and level rigour required. The most significant benefits are (1) a culture that fosters rational decision making; (2) an emphasis on value creation, linking actions and resources to strategic objectives; and (3) attention to costs and benefits. Additionally, the structure, process, and rigour create accountability. Finally, as a result of following the process, an organization develops targets and a baseline for subsequent measurement, thus leading to greater focus, better project management, cost containment, and ultimately, a higher probability of success.

The decision-making and resource allocation processes are not entirely scientific. It is as much an art as it is a science. Financial calculations and analysis are important, but they are not the end-all. While traditional, rational, textbook methodologies are used, they are often insufficient in addressing the problem at hand because these are not always textbook cost-benefit analysis problems. For many of the projects under consideration, the process is too complex and time-consuming with little patience or forgiveness from the marketplace. Therefore, instinct rather than hard numbers drives most of the decisions. Executives must do their best to evaluate every project/funding decision within certain parameters, namely the available information, resources and time, to determine which one(s) will have the highest probability of succeeding. However, the resulting decisions are nothing more than collective, calculated best guesses, akin to hedging bets. In the end, the business case and good business judgment must prevail. In other words, management judgment is informed by measurements, forecasts, and the business case in hopes that both rationality and integrity of the process can be upheld, which, in turn, leads to greater confidence in the decision.

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