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# Are we really competent?

## Assessing organizational ability in delivering IT benefits

Are we really  
competent?

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### Abstract

**Purpose** – The purpose of this paper is to present organizational competencies for gaining information technology (IT) benefits within organizations. Following the analysis of 16 in-depth case studies, a set of six high level, fundamental competencies and 17 facilitating competencies are identified. A framework for orchestrating the organizational competencies is also presented. The results of this research would be useful to academics in developing measures for assessing the level of organizational competence and for practitioners in identifying and nurturing competencies for organizational benefits realization.

**Design/methodology/approach** – The methodology involved two phases. Phase 1 entailed conducting 16 extensive case studies. Case study methodology employed follows guidelines provided by Yin and Benbasat *et al.* Case studies are a suitable means to collect the data since the notion of competencies in delivering IT benefits has not been well understood in the literature. By analyzing and understanding the particular situation and factors in each organization in an in-depth manner, the paper develops a sound interpretation of the abilities that organizations need to have in place to deliver IT benefits.

**Findings** – In order to gain business benefits from IT investments, organizations must develop competencies to exploit IT. These competencies involve individual skills and organizational processes that enable those skills to be effectively applied. This paper identifies 23 competencies categorized into fundamental and facilitating competencies that firms need to have in place if IT services are to be delivered adequately and business benefits achieved. Also developed is a network of competences based on the data collected in the 16 cases studied.

**Research limitations/implications** – Like any research, this paper has its limitations. Given the qualitative and interpretive nature of the research, a lot of assertions are interpretations of the authors. While in the literature, this has been argued as a valid way to undertake research, clearly there are biases that creep into the research.

**Practical implications** – The model of competencies presented forms a good basis for enterprises to fine-tune their abilities for harnessing IT.

**Originality/value** – While management researchers have been researching the notion of organizational competence for a while, it has not been well considered in the information systems arena; it is felt that this research makes a positive contribution to that effect.

**Keywords** Information systems, Competences, Business process re-engineering

**Paper type** Research paper

### 1. Introduction

Over the years, the issue of gaining benefits from information technology (IT) services within an organization has received much attention (Ragowsky *et al.*, 2000; Staples *et al.*,



2002; Ravichandran and Lertwongsatien, 2005; Dhillon, 2005; Ward and Daniel, 2006; Scheepers and Scheepers, 2008). It is important to address this issue since the use of computer-based systems permeates most aspects of business life. Predominant emphasis has however been on assessing the user satisfaction, information quality, and individual/organizational impact as key determinants of success of organizational IT operations. DeLone and McLean (1992, p. 61), through a comprehensive literature review of IT success measures, observe that “in searching for an information systems (IS) success measure, rather than finding none, there are nearly as many measures as there are studies.” DeLone and McLean developed an integrated view of IT success by defining six major dimensions: systems quality, information quality, use, user satisfaction, individual impact, and organizational impact. Later, DeLone and McLean (2003) developed the initial framework and added the concept of service quality and net benefits. The concept of net benefits may reflect the positive or negative impact of IS on customers, suppliers, employees, organizations, markets, industries, economies or even society.

In addressing a similar issue, our intent is to take the debate a step further by considering concepts rooted in the strategy literature to assess the ability of an organization to deliver IT benefits. In furthering this aim, we have adopted the notion of competence to interpret the ability of an organization to deliver satisfactory IT services. Developing and managing IT service delivery is an important process within organizations since it enables an organization to be successful over a long period of time and it is a precursor to creating value for the stakeholders. This objective is achieved through two inter-related activities. First, by managing the current operations successfully and second, by having an ability to change in the face of ongoing challenges and future demands.

In this paper, based on substantial research, a set of organizational competencies for delivering IT services are presented. An overarching framework for organizational competencies is developed. This framework is useful in evaluating the current level of organizational competence in providing IT services. The framework can also be used as a planning tool to think about the future abilities that an organization might need to develop.

## **2. Conceptualizing IT competencies**

The concept of competence assumed particular relevance with the development of resource-based view of the firm. Resource-based theory (RBT) emphasizes the importance of resources that are valuable, cannot be easily purchased, or require a long learning process, as an essential way to achieve superior performance (Barney, 1991; Hamel and Prahalad, 1996). RBT has been used in the IS literature to explain strategic impact of IT in organizations and understand business benefits from IT investments, particularly how IT can influence firm performance (Mata *et al.*, 1995; Bharadwaj, 2000; Ravichandran and Lertwongsatien, 2005; Bhatt and Grover, 2005; Oh and Pinsonneault, 2007).

One of the key challenges of RBT is in defining the concepts of resource, competence, and capability (Wade and Hulland, 2004). These concepts have been well researched in the literature (Wade and Hulland, 2004), but there is little consensus on the definitions. Srinivasan *et al.* (2002) define resources as specific know-how or assets while capabilities include skills exercised through organizational processes that enable firms to use their assets.

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Some researchers consider the concept of competence at the level of individual skills (Boyatzis, 1982); others (McGrath *et al.*, 1995) have considered the notion of competence emerging from an understanding of the business processes and individual skills. Peppard and Ward (2004) argue that competence is an organizational concept that reflects a bundle of skills and technologies while capabilities are related to the strategic application of competencies in order to achieve business objectives. Caldeira and Ward (2003) argue that in order to develop an organizational competence, it is essential to have not only the technical and managerial IT skills, business and general management skills, but also organizational processes to exploit those skills. Such exploitation allows an individual to apply his own personal characteristics and knowledge to resolve a particular task. Dhillon and Fabian (2005) stress the importance, in IT management, of developing skills related to pattern recognition, building coherence, and continuous adaptation.

In the literature, a few frameworks for IT competencies, resources and capabilities have been proposed. Peppard and Ward (2004), based on the previous work of Peppard *et al.* (2002), present a detailed framework of 26 IS organizational competencies that are important to achieve an IS capability. In the context of Peppard and Ward's (2004) paper, capability is a meta-construct, referring the strategic application of competencies to achieve organizational goals. The 26 competencies identified are divided into six major macro-competencies: strategy, defining the IS contribution, defining the IT capability, exploitation, delivery solutions, and supply. Dhillon (2008) have also classified competencies into strategic, exploitation, and supply. Caldeira *et al.* (2006) developed a framework of IS competencies that is relevant for small and medium-sized enterprises (SMEs).

Feeny and Willcocks (1998a, b) introduced a model of the IT function with nine core capabilities. However, the concept of capability in Feeny and Willcocks (1998a, b) is similar to the concept of competence of Peppard and Ward (2004). Core IS capabilities are, according to Feeny and Willcocks (1998a, p. 20), "those necessary and sufficient to ensure that an organization can exploit changing markets of technology and services – to achieve business advantage through IT over time." These are: IT leadership, business systems thinking, relationship building, architecture planning, making technology work, informed buying, contract facilitation, contract monitoring, and vendor development.

Using a knowledge-based perspective, Bassellier *et al.* (2001, pp. 163-4) developed a "model of IT competence" with two major dimensions: explicit IT Knowledge and Tacit IT Knowledge. They argue that:

[...] to address the emerging role of IT in organizations that goes beyond the simple execution of a task and requires a broader awareness, attention to non-task-specific competences is needed [...] bringing knowledge into the competence definition broadens the concept by making it dynamic and interactive.

Explicit knowledge includes: technology, applications, systems development, management of IT, and access to IT knowledge. On the other hand, Tacit IT Knowledge involves experience (personal use of IT, IT projects, and management of IT) and cognition (process view and vision for the role of IT).

By conducting an extensive literature review on previous research and using RBT principles, Wade and Hulland (2004, p. 107) present a typology of "key IS resources." This typology includes: manage external relationships, market responsiveness,

IS-business partnership (manage internal relationships), IS planning and change management, IS infrastructure, IS technical skills; IS development, cost-effective IS operations. However, to Wade and Hulland (2004, p. 109), resources are “assets and capabilities that are available and useful in detecting and responding to market opportunities.”

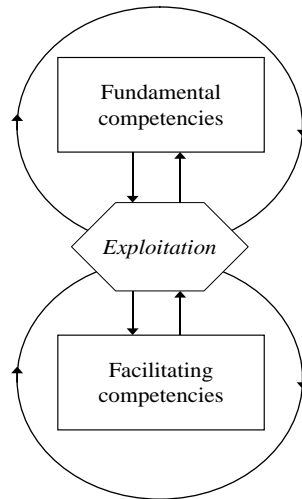
Although presenting relevant similarities, the frameworks, models and typologies analyzed in the literature also show significant differences. This can be explained, not only by the different objectives and contexts where the research was conducted (for example, Caldeira *et al.*, 2006, framework was developed studying SMEs, while Peppard and Ward's, 2004, was designed by analyzing large companies), but also due to the different levels of abstraction and detail involved in the analysis of the data and definition of competencies. For example, Dhillon (2008) conceptualizes organizational competences for harnessing IT, using the case of John Brown Engineering. The competencies presented by Dhillon are at a higher level of abstraction than the ones presented in this paper. We use multiple case studies to develop a mechanism to operationalize competencies in organizations.

In a synthesis of the literature, we found that there are many competencies that an organization might need (e.g. in marketing the products and managing its people). However, an ability to seek benefits from IT for the internal user community is critical to determine the relative success or failure of IT adoption. We therefore argue that there are a group of competencies, termed as facilitating competencies, which are necessary for an organization. In the literature, a lot has been written about strategic and core competencies that help organizations to be differentiated from their competitors. It has also been argued, based on RBT, that asset specificity is the primary means for defining strategic differentiation. While externally oriented competencies are essential, an organizations internal ability to define a strategic agenda for IT use is equally important. We term such competencies as fundamental competencies. As can be well appreciated there is always a need to introduce guidelines for IT professionals to interpret the competencies that might be necessary for delivering services internally. Dhillon and Lee (2000), for instance, define value-based objectives that organizations need to adhere to in ensuring that benefits are delivered. In research by Dhillon (2005) and Ward and Daniel (2006), “benefits management” is presented as a possible means to establish such linkages. We call these linkages exploitation processes. Bundled in the exploitation processes are the competencies for delivery of IT benefits to an organization.

Mainstream strategic management literature has also argued for competencies along similar lines. Mahoney and Sanchez (1997, p. 56), for instance, articulate the notions of fundamental competencies and facilitating competencies as “dissociation of espoused theory and theory-in-use,” which according to them is so prevalent, that it is unknowingly or stoically accepted by managers. Along a similar vein, Orton and Dhillon (2006) term these as “meso-strategic” options.

Based on our synthesis of literature, our conceptualization of organizational competencies necessary for delivering IT benefits is presented (Figure 1). We equate fundamental competencies and facilitating competencies with the espoused theory and theory in-use (Argyris and Schön, 1978). We also argue that espoused theories correspond to the thinking loop. This is where much of the theorizing takes place.

Theories in use represent the doing loop. This is where most of the action takes place. However, in order for successfully articulating the competencies for delivery



**Figure 1.**  
A synthesized perspective  
on IT competencies

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of IT benefits, it is essential that focused exploitation processes get developed. Argyris and Schön (1978) call this double loop learning. In our research, we used the fundamental competencies, facilitating competencies, and exploitation processes to define very specific competencies that might be necessary for delivery of IT services and necessary processes to link both competencies. The literature and our conceptualization, as shown in Figure 1, formed the basis for our data collection.

### 3. Methodology

The study was carried out in two phases. Phase 1 involved conducting 16 extensive case studies. Case study methodology employed followed guidelines provided by Yin (1993, 1994) and Benbasat *et al.* (1987). Case studies were a suitable means to collect the data since the notion of competencies in delivering IT benefits has not been well understood in the literature. By analyzing and understanding the particular situation and factors in each organization in an in-depth manner, we developed a sound interpretation of the abilities that organizations need to have in place to deliver IT benefits.

Key stakeholders for each organization were identified and interviewed. The interviewees included top managers, IT managers, IT suppliers, and key users. All the case studies were conducted and documented over a period of four years. The 16 case study organizations were representative of a broad range of businesses in four countries: UK, Portugal, Hong Kong, and the USA. The cases studied included: four telecommunication companies, four public sector organizations, two hospitals, two engineering firm, one wine producer, one university, one hotel and casino, and one firm in the apparel industry.

Semi-structured interviews were complemented by an analysis of the documents provided by the firm. Semi-structured interviews are able to generate rich data that allows an understanding of the research topic according to the perspectives of the key actors involved. From three to six people were interviewed individually in each firm, using a checklist to assure that all relevant topics would be discussed. The interviews

were open ended. Hand notes were taken and most interviews were recorded on tape. In case of the tape-recorded interviews, informants were not asked to review the statements. All organizations also provided access to internal documents describing the business activity and details related to IT systems and projects. The topic guide used to undertake the interviews appears in the Appendix.

Data were later coded and analyzed using tables highlighting the most relevant issues (as suggested in Miles and Huberman, 1994). The time spent by the researchers transcribing the data also enabled them to have a deep knowledge about the statements provided by each interviewee, making it easier to find, analyze and compare statements, in order to identify competencies and understand their relevance in the case. Data triangulation was executed by comparing the data provided by the different interviewees (as recommended by Patton, 1987). When different perspectives were found, the researchers tried to find further evidence, usually by interviewing the same people in order to clarify the situation and find a plausible explanation. In a few cases, informal telephone conversations were held to clarify some statements previously given in the interview.

The output of Phase 1 was a list of 23 competencies that organizations need to have in place. These competencies were classified into two categories – fundamental and facilitating (based on previous research, Sanchez *et al.*, 1996; Keeney, 1994). Fundamental competencies were the ultimate abilities, which possibly could not impact another competence. These are the major concerns of people responsible for IT delivery. Facilitating competencies, on the other hand, could possibly result in another competence. Although important, these are more means than ends. Finally, a network of competencies was developed, using interviewees' perspectives, and trying to explain relationships between competencies. We argue that organizational competencies in delivery of IT benefits are not independent but interrelated. One contribution of this paper is trying to show the different level of competencies (facilitating and fundamental) and their relationships.

An important question that arises is as to how these competencies should be orchestrated. Merely establishing policies or strategies for the respective competencies or hiring the skilled individuals would not be enough. In the second phase of our research, we established a panel of eight experts representing manufacturing, customer service, hotel, consulting, telecommunications, and health care industry to comment on the initial set of competencies identified and to present their personal opinion in orchestrating the competencies. This process allowed us to not only validate and improve the initial listing of competencies, but also provided an insight into a generic method that could be put in place for realizing the competencies. Such an approach to establishing categories and relationships has been extensively used in IS research (Torkzadeh and Dhillon, 2002) and has been considered a standard approach for establishing content validity (Emory and Cooper, 1991).

The respondents identified a large number of options that could help in orchestrating the competencies. An initial list was developed from the interview responses. Although the respondents had identified the values that they felt would be beneficial in realizing the competence, of relevance to our paper are the two emergent views. First, the respondents felt that identifying, hiring, and grooming the right kind of skilled individuals would certainly be necessary if IT service delivery were to be improved.

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Second, a need for a process to be put in place was felt. This would distinctively combine the skills and the processes for the delivery of an IT service.

Are we really  
competent?

#### 4. Fundamental competencies in delivering IT benefits

Our research identified six fundamental competencies that a firm needs to have in order to deliver good IT services. These include the ability to:

- (1) conduct IT strategic thinking and planning;
- (2) align IT with business processes and objectives;
- (3) deploy cost-effective applications and systems;
- (4) conceptualize the maintenance of data integrity and confidentiality;
- (5) facilitate behavior enrichment for technology adoption; and
- (6) ensure compliance with standard IT methods and procedures;

In the paragraphs below, each of the fundamental competencies are discussed in detail.

##### *(1) Ability to conduct IT strategic thinking and planning*

Although the ability to conduct IT strategic planning is often preached as the cornerstone of good systems analysis, design and implementation, and many organizations consider themselves to be competent in this area, our research found that the majority of the firms studied were lacking this competence. Out of all our cases, there were just a few that could be classified as having the ability to undertake adequate planning and foresee the inherent problems emanating from sub-standard service delivery. This does not mean that companies do not have the skills to undertake planning and hence provide adequate services. In fact, some of the case study organizations (e.g. Motorola ECID and a US-based hotel and casino) perhaps had the best people. Problems arose when there was a lack of a process to facilitate the realization of any planning effort.

To properly conduct IT strategic planning it is important that managers (especially IT managers) are able to look at the external IT environment and understand the opportunities that may be inherent in redefinition of business processes and use of new IT. Many a times, organizations tend to make future plans without any consideration to the nature and scope of IT usage within their firms. The converse of this is also true. Having a responsive strategy group or well aware IT people does not necessarily mean that the ability to consider future options with respect to internal IT use would prevail.

In one of the case studies conducted for this research, John Brown Engineering, the CEO proposed a strategic vision that was concerned with developing a global capability to leverage expertise. At the same time, it was however recognized that the current IT systems, advanced as they might have been, were not in a position to realize the CEO vision. This resulted in a concurrent effort to develop the IT infrastructure to support the strategic plan. Such a situation was at tangent to what was found in the case of Horizon Hospital in the UK, where considerations for future option were completely divorced from existing practices in IT use. The strategic vision foresaw an elegantly networked hospital linked to the National Health Services network, while in reality various hospital departments saw a mushrooming of islets of automation. The differences between the strategic vision and the internal IT use could never be resolved, which resulted



in wasted expenses. Clearly, a good linkage between the choice of future options and internal IT use is a precursor to the overall ability to deliver IT services internally.

In a few medium-sized enterprises studied, IT strategic planning was very informal, without the use of formal IT planning methods. However, some successful firms using and adopting IT clearly perform strategic thinking with respect to IT issues. At least, that was the case of a mould-manufacturing firm that planned and started using 3D computer-aided design/computer-aided manufacturing in an innovative way.

*(2) Ability to align IT with business processes and objectives*

Aligning IT with business processes and objectives is a common topic in the IS literature (Philip, 2007; Ward and Peppard, 2002). However, IT systems are frequently adopted and their future use planned without any due consideration to the current procedures and business processes. It has been found, as was in the case of Reuters (UK), that if consideration is first given to the process of delivering services and products, and IT use is considered as a consequence, then applications tend to have a higher degree of success. This has a knock on effect on the manner in which the IT services are delivered within an organization. In one telecommunication company, there was poor knowledge on the existing business processes and many redundant software applications coexisted. The company had a large number of software applications and frequently when a new application was implemented, the previous one was not discontinued. As a result, there were multiple applications and data made available for the same purpose, thus leading to data redundancy and inconsistency.

*(3) Ability to deploy cost-effective applications and systems*

This competence reflects the ability to deliver software applications and implement systems on time, on budget and according to the business requirements. The literature suggests that a high percentage of IT projects fail. According to *The Chaos Report* (Standish Group International, 2006), only 35 percent of software projects started in 2006, in the USA, can be categorized as successful. This means that they were completed on time, on budget and met user requirements. In order to deliver software applications effectively, it is critical to have good project management skills. Some researchers argue that project management skills are an organisational competence not a specific IT competence (Feeney and Willcocks, 1998a). However, it is not feasible to manage IT projects without IT knowledge. In our research, some cases (e.g. a garment manufacturer in Hong Kong and a telecommunications company in the UK) clearly provide evidence of problems in project management because project managers did not know much about the technology that the organization was trying to implement, thus having to rely on IT experts who were too technology driven and not always providing the necessary input to understand the project as a business project. Hence, this is a fundamental competence in delivering IT services and a major concern to most IT managers. This competence is even more relevant for IT managers because frequently top managers see IT managers as fully responsible for the delivery of IT solutions, not considering the organizational issues relevant in an IT project.

*(4) Ability to conceptualize the maintenance of data integrity and confidentiality*

This competence emerged as another critical competence that organizations need to have. Maintaining the integrity of corporate data is clearly fundamental to the successful

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conduct of business. The loss of data may bring serious problems to the organization. In one of the cases, the hospital that implemented a paper-free software solution, important clinical data were in a digital format. Maintaining data integrity and confidentiality was extremely important for top management, and the ability to ensure data integrity and confidentiality was definitely a fundamental IT competence. Any problem with data integrity and confidentiality is likely to significantly affect patient healthcare, hospital reputation, and result in significant financial losses (for example, as a result of legal problems and cases brought to court).

*(5) Ability to facilitate behavioral enrichment for technology adoption*

Behavioral skills are important to ensure successful deployment of IT. Training IT staff on business skills and user training on desktop management skills are no doubt very relevant in healthy assimilation of IT. But, the underlying theme of such education should result in an appreciation of each other's discipline, which is equally important in maintaining a good user-IT relation. IT, by itself, does not bring any benefits to organizations. Business benefits come from the organizational changes introduced in business processes (although enabled by IT). However, to introduce organizational changes, it is important to adapt and involve users in these new processes. IT professionals are, very often, still perceived as "techies," far removed from business realities. Proper training therefore is important. In the case of Nevada DMV, although the managers and consultants alike recognized that training had to be imparted, training itself was a half-hearted effort. There were no follow-ups and only a sample of the user population was given access to the intensive training facilities. This not only resulted in a lot of disgruntled employees, but also at the time of the crisis, no one was able to deal with the situation.

*(6) Ability to ensure compliance with standard IT methods and procedures*

Clearly, having a set of standards is one thing and ensuring compliance is another. In the IT field, it is important to use the tested and tried methods, techniques, and procedures to ensure that IT systems are well structured and decrease the cost of systems maintenance, which is significant in many organizations. In the case of a US-based casino and gaming software firm, although a number of standards were adopted and developed internally, the organization lacked the ability to ensure compliance. This was because most of the time was spent on "fire-fighting" tasks. The organization demonstrated a "who cares" attitude. Such a situation may not be disastrous, especially when adequate processes and procedures have been developed, as was in the case Nevada FamilyTRACS system. In this case, since individuals were bypassing the standards in the delivery of systems, the detailed procedures that had been developed, helped the organization to maintain an adequate level of services.

A summary of key concerns and the resultant fundamental competencies, as derived from the case studies, appear in Table I.

## **5. Facilitating competencies in delivering IT benefits**

Our research identified 17 facilitating competencies. Such competencies are abilities of an organization that would, in some way, support the fundamental competencies. More often than not, an idiosyncratic combination of the facilitating and fundamental

Case/project studies	Key findings	Fundamental competence (FU)
Motorola ECID	Lack of linkage between skills and business processes. Although there were highly skilled individuals, their work was not necessarily linked to the available business processes	FU1 and FU2
US Hotel and Casino	There were highly skilled professionals but their work was not fully incorporated into the existing business processes. This resulted in lack of compliance to standards or in playing lip service to standard compliance	FU1, FU2, and FU6
John Brown Engineering	Excellent linkage between strategic intent, sourcing of information and its exploitation	FU1
Horizon Hospital	Lack of linkage between strategic intent and execution. Absolutely, no emphasis on getting benefits from IT implementations. Procedures for security patient information	FU1, FU2, and FU4
European Hospital	Data integrity and confidentiality is seen as critical for the hospital	FU4
Mould Manufacturing Company	Innovative use of technology to assure competitive advantage	FU1
Reuters	Initial consideration of business processes resulted in successful implementation and adoption of IT	FU2
UK Telecom Co.	Understand of business processes in light of strategic choice	FU2
European Telecom Co.	Inability to plan options for supply of services resulting in data redundancy, inconsistency of business processes. Lack of subject matter expertise leading to poor project management. Strong needs to implement IT standards	FU2, FU3, and FU6
Portuguese Public Administration Org.	Poor strategic planning for IT. Inability to align IT with business processes and develop cost-effective applications. The cost of software applications was very high, when compared to other organizations with similar systems	FU1, FU2, and FU3
Garment Manufacturer	Lack of subject matter expertise leading to poor project management	FU3
Nevada DMV	Ill-conceived training program, no change management	FU4 and FU5
Nevada FamilyTRACS	Detailed consideration of checks and balances ensure compliance to various social service requirements	FU6
Educational Institution	Poor project management led to lack of effectiveness of software applications	FU3
Wine Manufacturing Company	Inability to deploy cost-effective applications due to lack of knowledge on project management	FU3
London Borough Council	Compliance to standards	FU6

**Table I.**  
Case study summary: evidence showing the need for fundamental competencies

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competencies would result in an emergent capability of the organization to deliver IT services. The facilitating competencies identified were, ability to:

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competent?

- (1) select and manage IT staff;
- (2) provide on going IT training;
- (3) get top management support in IT projects;
- (4) design business processes for effective use of IT expertise;
- (5) maintain systems consistency;
- (6) involve users in IT projects;
- (7) institute service level agreements (SLAs) with IT suppliers;
- (8) identify and set IT standards and procedures;
- (9) develop software in-house;
- (10) select and contract IT vendors and IS consultants;
- (11) decide on software sourcing strategies;
- (12) maintain or decrease system response time;
- (13) ensure user application knowledge;
- (14) identify business IS requirements;
- (15) increase the credibility of the IT department;
- (16) increase service accountability; and
- (17) develop an IS architecture

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*(1) Ability to select and manage IT staff*

The development of in-house knowledge was important in most organizations studied. This knowledge is used not only to develop applications in-house but also to contract out IT products and services. Selecting IT staff is an important competence of the IT department, rather than relying on traditional human resources functions. For instance, in the case of a UK Telecom company, it was important to bring in people who have prior experience or had the ability to manage vendors in India. This was a difficult skill to come by, especially if the hire was made within the UK context. The company however had the ability to go beyond the UK to recruit an individual who had been involved with multiple business process outsourcing projects. Besides, it is important to evaluate technical skills and ensure that the “best people” for the job are selected. Another relevant issue is managing career expectations and motivating people to give their best on IT projects. This is especially critical when we consider the strong dependency organizations may have on software and computer programmers. In one educational institute studied, a new expensive software project was launched. This was because the two computer programmers, who were knowledgeable of the systems and procedures, left the organization. As a consequence, there was no one to properly assess the needs and match the requirements to what was in the market place.

*(2) Ability to provide ongoing IT training*

The development of staff skills to use computers and software applications is important in order to get benefits from IT in organizations. If users feel comfortable with the business software they use, resistance to change will be reduced and the probability

of success with IT adoption is higher. The ability to provide IT training is an important competence to increase user application knowledge.

In the case of Nevada DMV, inadequate training resulted in utter chaos when the system went live. As a consequence, the success of Project Genesis, which was a seven-year \$34 million effort to design a new system, was not only stalled, but also was on the verge of complete failure. The State of Nevada had to take dramatic steps to rescue the project. In a mould manufacturing company, on the other hand, careful planning and implementation of the software resulted in successful adoption of the technology. Therefore, an ability to train individuals in the use of technology and provide ongoing support, and training, are important facilitating conditions for successful IT use in organizations.

*(3) Ability to get top management support in IT projects*

The importance of top management in IT projects is well known (Caldeira and Ward, 2002, 2003; Somers and Nelson, 2002). In the firms that showed higher levels of satisfaction with IT adoption and use, top managers were involved in IT adoption processes. In some cases, the whole board of directors was fully committed to implementing IT in the firm, showing its importance to the organization and transmitting that commitment to all users. Top management involvement is critical to reduce resistance to change as well (Caldeira and Ward, 2003; Somers and Nelson, 2002). Lack of involvement from the top usually resulted in significant problems to IT projects. One relevant facilitating competence is the ability of getting top management trust and support to IT projects. This needs to be worked on by IT managers. Top managers must be told of their critical role in IT adoption and use within the organization and convinced to include IT in their priorities. Evidence from the cases studied shows that it may be the difference between success and failure. Organizations have a political dimension and this is a facilitating competence that is important to successfully delivering IT services.

For instance, in the case of John Brown Engineering the involvement of the top management to implement a global network for virtual work was critical in transforming the company. On the other hand, a lack of commitment by top management in the physical security management system at a hotel resulted in an ill-conceived system, which had to be later abandoned.

*(4) Ability to design business processes for effective use of IT expertise*

Our research found that although there were a large number of rather skilled individuals in organizations, yet the organizations were finding it difficult to leverage them for their benefit. This was particularly evident in the case of Motorola and the UK Telecom Company. One possible explanation is the radical changes experienced by the companies in the past decade that resulted in pooling of resources across departments and divisions. Although such a move resulted in bringing efficiencies, the subtle connections, so essential in linking expertise to business processes were lost.

*(5) Ability to maintain system consistency*

Hardware or software problems affect the normal execution of business processes and the credibility of the IT department. In many organizations that are heavily dependent of IT, any system failure may represent significant losses. The ability to maintain

system consistency is a common and necessary competence in all the firms studied. This demands that organizations engage in developing business continuity plans. In undertaking research for this study, we found that many organizations (e.g. Garment Manufacturer and Horizon Hospital) did not consider business continuity plans to be integral to their IT planning. This is clearly a weakness that needs to be addressed.

*(6) Ability to involve users in IT projects*

Significant problems may occur when users are not involved in IT projects. The ability to involve users, not only in systems development processes, but also IT planning is important for IT success. Although in the literature a number of calls for user involvement have been made and organizations studied for our research seem to have taken this aspect on board, yet in many cases user involvement in systems development has been carried out in a very mechanistic manner. In two of the case studies, a UK hospital and a Hong Kong manufacturing firm, the project manager sampled out his “friends” and “sympathizers” as individuals who would provide input for the systems development process. When user involvement takes this form, it does more harm to the requirement elicitation process than any good. User involvement in the IT planning process was virtually non-existent in the organizations studied. Although there is no denying the fact that user participation in the IT planning process is useful, especially in meeting the expectations of the stakeholders, rather than introducing plans and policies in a top-down manner. In one of the cases studied, it was decided, without any user involvement, that Lotus Notes would be introduced in the whole organizations. The intent was to essentially meet the e-mail needs of the firm. Clearly, Lotus Notes affords far more functionality in groupware and collaborative work, than just e-mail. None of the planners considered the requirements or involved the users. As a matter of fact, it was clearly stated that the organizational expectation was to use Lotus Notes for more than just an e-mail package. One of the memos stated:

[...] it is an expectation that users should exploit the full potential of this software. Rather than using it for emails alone, the collaborative work options would be extremely useful and should be used.

No one in the organization considered it for a moment that collaborative work was not the norm in the organization. It was an idiosyncratic research environment and most individuals competed with each other for funding and grants. This minimized any chance of fruitful collaboration. A mere involvement of the users and various stakeholders would have helped the planners to orient their decision towards a more suitable application package.

*(7) Ability to institute SLAs*

The complexity of IT and the possibility of outsourcing IT services, to reduce costs and focus expertise in the core business processes of the organization, leads to the need of defining SLAs. The establishment of SLAs, and its control, is an important competence to ensure that IT performance will not be below acceptable levels. This was evidenced in the case the UK Telecom Company.

*(8) Ability to identify and set IT standards and procedures*

Nowadays, it is possible to identify many industry standards and frameworks for operational performance and organizational processes (for example, Information

Technology Infrastructure Library, Control Objectives for Information and related Technology, Telecom Applications Map, Shared Information/Data Model, eTOM – Enhanced Telecom Operations Map, etc.). Unless or until an organization is in a position to assess the current state of IT services and compare it with industry benchmarks, it will not be in a position to make any improvements. As a consequence, there is no reference monitor. In the field of IT service delivery, essentially because of the rapid technological changes, there are limited standards. Therefore, organizations need to constantly understand the evolving nature of technologies and the business processes to support the technologies and hence have the ability to establish generally accepted practices. In the case of Nevada DMV's Project Genesis, one of the research sites, it was found that an inability of the organization to suitably scan the environment and adopt adequate standards resulted in the lack of competence at two levels. First, in designing the system and second, in supporting the users when things went wrong.

*(9) Ability to develop software in-house*

Nowadays, a significant number of organizations have decided to outsource or contract out software development. However, for others, in-house development is critical, especially when business requirements are constantly changing and the organization needs to react very fast. Several organizations studied avoided outsourcing their core business applications, especially when these may bring some competitive advantage. Even if the organization does not develop software in-house, the ability to do so will help negotiating contracts and selecting implementation services. Hence, and ability to develop software in-house is recognized as a relevant facilitating competence by many IT managers interviewed. In our study, this ability was clearly illustrated in the case of Motorola and the Mould Manufacturing Company.

*(10) Ability to select and contract IT vendors and consultants*

It is very difficult to manage IT projects without proper contracts with IT vendors or consultants. The contract must establish what the duties of each vendor are. If the contracts are not adequately written, the organization may become a hostage of its suppliers or consultants. In one case study, a Portuguese wine manufacturing firm that implemented an enterprise resource planning (ERP) system for administrative and manufacturing purposes, only after the contract was signed and the project started, the firm noticed that the IT vendor did not have much expertise on the software and there were few (and expensive) consultants available with the necessary expertise to customize the product. Since the contract was not favorable to the manufacturing firm, the project significantly failed in terms of budget, delivery time, and filling business requirements. The situation in SMEs can be even worse than in large enterprises because, in many cases, managers do not have a clue about which IT firms or IT experts could help them in implementing a new software system.

*(11) Ability to decide on software sourcing strategies*

Software sourcing strategies may include custom-designed applications, use of software packages, or outsourcing IT services. This is an ability that many organizations lack. As a consequence, wrong choices for systems are made. This usually results in problems at two levels. First, besides issues of monetary loss, it becomes rather difficult to configure the newly acquired systems to fit in with the existing organization. Because

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of the lack of fit and compatibility of the systems and organizations, service delivery to the users is compromised. Although it may seem that ability to decide between what needs to be custom designed and where packages could be used would have little impact on service delivery, however our research has found a strong relationship. Examples were found in several organizations, for example: Nevada DMV, federated IT infrastructure project at a London Borough Council, and food and beverage systems in a Nevada Hotel. Another sub-set of this ability, especially when implementing ERP software, is being able to understand the proper level of customization of the software that is going to be implemented. Using the standard solution may not cover many business requirements and a deep customization may lead to problems in software maintenance, including the adoption of new releases, besides an eventual dependency on the implementation consultancy firm. This was also a problem in several of the organizations studied. Another option to consider is outsourcing IT services instead of software development (in-house or contracted out).

*(12) Ability to maintain or decrease systems' response time*

In improving the level of IT service delivery, the most commonly used standard in many of the organizations studied was response time. Essentially this time is calculated as the difference between the time when the actual service call is made and the time when the original request was made. Although response time calculated in this manner is a reasonable means to consider if IT services are being delivered in a timely manner, it however does not mean that the service is being delivered in an effective manner. Therefore, besides having an ability to decrease the response time in IT service delivery, complementary competencies for bringing about service accountability and developing SLAs need to be developed. In most of the organizations studied for this research, service accountability and SLA issues were dealt in an *ad hoc* manner (for instance Nevada DMV and the London Borough Council). This was specifically the case when the IT function was internal to the organization. However, in case of outsourced IT departments, accountability and service level were defined more clearly.

*(13) Ability to ensure user application knowledge*

An organization's ability to ensure and subsequently increase the application knowledge of its staff is an importance competence that goes a long way to ensure good service delivery. This competence not only supports the key ability to undertake proper planning but also enables an organization to set standards and facilitate compliance. Very often, there would be individuals in an organization, who would have only a high-level understanding of the application, but lack the ability to deal with the "nuts" and "bolts." The obvious solution is to provide training. However, even instituting a training program or establishing a process to impart training is a competence in itself. In one of the cases studies for this research, the concerned organization, a hotel and casino, introduced an IT system to control inventory for its food and beverage department. On installation, the users were given only cursory training and a few experts in the IT department were expected to help the users with any problems, if and when these arose. The organization did not give any consideration to the complexity involved and when the system went live, the IT department was in no position to solve the concerns. This was a consequence not of their technical incompetence, but of lack of training. There was no established procedure to train (or even make aware) IT



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personnel on the new software. This not only resulted in substandard service delivery, but also affected the credibility of the IT department.

*(14) Ability to identify business IS requirements*

It is extremely important that an organization is able to understand business needs and establish business requirements for IT development, both in contracting out software or developing in-house. Users' involvement in defining business requirements is usually very important. The existence of an IS architecture implemented in the organization that show existing processes and applications will help. A good definition of business requirements is also critical to align IT with business needs. Many of the firms studied, although having processes to define business requirements and understanding its importance, showed significant problems to provide a good description of its business requirements for IT development. Although the definition of business requirements requires a strong involvement from key users, the IT department must have a lead role in bringing up those requirements. In one of the cases studied, a Portuguese Public Administration organization, there were significant problems in the quality of applications, because IT people did not understand their role in identifying business requirements. They were completely relying on users to do so. Therefore, many requirements were incomplete and informally transmitted (frequently by phone). They were latter completed by IT people according to their own beliefs without consulting and checking those with key users. As a result, many software applications developed did not fit organizational needs.

*(15) Ability to increase the credibility of the IT department*

Maintaining the credibility of the IT department is a competence that needs to be developed within organizations. Credibility, for instance, cannot be increased solely by improving communication between user departments and the IT function. As it emerges from the hotel and casino example above, credibility increases by virtue of the right kind of skills and the process to realize the delivery of the service. A highly skilled programmer, for example, may not be very well versed with each and every aspect of IT service delivery. As a matter of fact, at least in the organizations' studied in this research, the misconception existed across the board. The emergent view in most organizations was that if a firm is able to hire technically competent individuals, particularly those skilled in programming, the organization would perhaps be in a better position to provide IT-related services to the users. Clearly, this is naïve. Rather than helping an organization to improve IT service delivery, such a preconception not only hurts the credibility of the IT function, the divide between the users and the IT department widens. Not only the organization ends up hiring the wrong people for the job, the general morale of the concerned individuals dips, which, in itself is detrimental to the firm. This competence is important, both to involve users and top managers, in IT projects.

*(16) Ability to increase service accountability*

In order to improve IT in the organization, it is important to measure its performance and use. Service accountability will enable managers to know what they need in terms of IT resources and evaluate IT performance. Although some companies have well-established service accountability programs (e.g. hotel and casino), but such

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service accountability measures are restricted to very specific functions (e.g. gaming). Clearly, IT services are important across the board and it is important to define corresponding measures for IT service accountability.

Are we really  
competent?

*(17) Ability to develop an IS architecture*

The concept of IS architecture was mainly introduced by Zachman (1987) and further developed and discussed by several other authors (Sowa and Zachman, 1992; Kim and Everest, 1994; Lankhorst *et al.*, 2005; Caldeira and Pedron, 2007). Approaches to IS architecture generally present frameworks to manage and integrate several interrelated dimensions of the enterprise: business processes, data, IT infrastructure, software, and organizational structure. An IS architecture (sometimes referred as “enterprise architecture” – see Spewak, 1992) is a structural reference to the development of IT in an organization. The development of an IS (enterprise) architecture framework is an important step to align IT with business processes and organizational objectives (Scheer and Habermann, 2000; Lankhorst *et al.*, 2005). This was a concern found in several firms involved in this research. In one Portuguese telecommunication company, there was poor knowledge about the existing business processes and many redundant software applications coexisted. The company had a large number of software applications and frequently when a new application was implemented, the previous one was not discontinued. As a result, multiple applications for the same purpose coexisted, thus leading to data redundancy and inconsistency.

A summary of key findings and facilitating competencies appears in Table II.

## **6. Orchestrating competencies**

After the identification of fundamental and facilitating competencies, it is important to understand how these competencies are related and integrated. Competencies are not isolated in terms of operability, there are dependencies, especially in what concerns facilitating competences, and relevant to understand why a firm can become capable of successfully delivering IT services. The realization of all or a subset of the competencies would make the firm more capable in providing service or function/facility that falls within its remit.

The conceptualization shown in Figure 2 considers competence as an outcome. However, in the literature, it has been argued that in situations where the organization might have realized a particular competence, either accidentally or in a planned manner, the stakeholders may enact a reality where they genuinely believe that they did all the right things (Weick, 1979). As a consequence, an outcome is considered to precede retrospective rationalization of the causes.

This paper adopts a causal mode and suggests the combination of skills and processes to enable an emergent competence. The links between the competencies are critical to understand the concept of exploitation presented in this paper. Gaining business benefits from IT adoption is only possible if the firm has a set of interrelated organizational competences established. Business benefits do not come directly from IT adoption but from organizational processes that are improved by the use of IT. The competencies shown in Figure 2, identified in the cases studied, enable the effectiveness of IT in the organization. The level of granularity shown in Figure 2, especially in the facilitating competencies, helps us to understand how these competences may interact

Case/project studies	Key finding	Facilitating competence (FA)
Motorola ECID	Lack of linkage between business processes and individual expertise. Ability to develop systems in house	FA4 and FA9
US Hotel and Casino	Lack of top management support in implementation of the system resulted in it getting abandoned. Lack of clarity as to what needs to be custom designed and where vendors should be used. There was no established procedure to train (or even make aware) IT personnel on the new software. Too much faith in the technical fix resulted in jeopardizing the credibility of the IT department. Lack of IT-related service accountability	FA3, FA11, FA2, FA13, FA15, and FA16
John Brown Engineering	Excellent top management support helped the company transform its operations dramatically	FA3 and FA4
Horizon Hospital	Training imparted, but an emphasis on radical change resulted in acontextualizing the training effort. Lack of a well-conceived business continuity plan. User involvement in system development is essential	FA2, FA5, and FA6
European Hospital Mould	Data protection and data ownership	FA5 and FA16
Manufacturing Company	Lack of a well-conceived business continuity plan. Importance of SLAs. Ability to develop systems in house	FA5, FA7, and FA9
Reuters	Clarity of business processes	FA5
UK Telecom. Co.	Lack of linkage between business processes and individual expertise. User involvement in system development is essential	FA4 and FA7
European Telecom. Co.	Lack of an IS architecture, leading to poor IT management. Inability to design business processes and integrated IT into those processes	FA4 and FA17
Portuguese Public Administration Organ.	Poor identification of business requirements for software application development	FA14
Garment Manufacturer	Importance of user involvement in system development	FA6
Nevada DMV	Lack of proper training. Training was imparted on the Beta version of the system. Lack of standardization. Lack of clarity as to what needs to be custom designed and where vendors should be involved in the project. Service accountability and SLA issues were dealt in an <i>ad hoc</i> manner	FA2, FA5, FA8, FA11, FA12, and F16
Nevada FamilyTRACS	Knowledge of the application	FA13
Educational Institution	Lack of support to hire professionals with requisite skills. Poor involvement of key users in the IS project	FA3 and FA6
Wine Manufacturing Company	Different perspectives of top managers on IS adoption led to insufficient top management involvement. Lack of IT staff and knowledge. Ill-defined contract resulting in inability of the firm to terminate the arrangement. IT people did not understand their role in identifying business requirements	FA3, FA9, FA10, FA11, and FA14
London Borough Council	Lack of clarity as to what needs to be custom designed and where vendors should be used. Service accountability and SLA issues were dealt in an <i>ad hoc</i> manner	FA11 and FA12

**Table II.**  
Case study summary:  
evidence showing  
the need for facilitating  
competencies

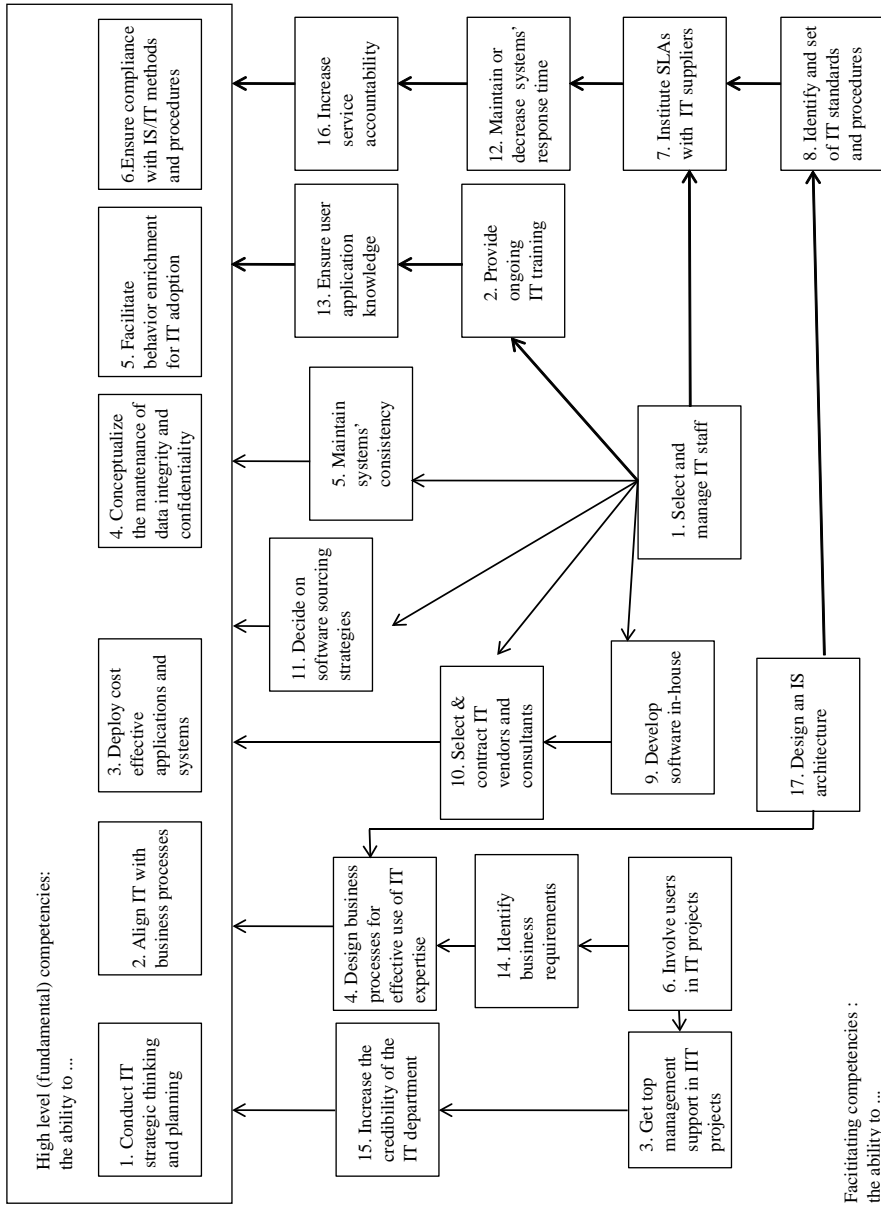


Figure 2. A network of competencies

to provide fundamental IT competencies to the organization and the delivery of business benefits.

In the research presented in this paper, the bundle of fundamental and facilitating competencies has been identified and articulated. Although both, skills and processes are inputs to develop a competence, skills must be incorporated into processes in order to be effective.

Organizational processes enable the exploitation of individual skills. An organization may have skilled human resources, from a technical and managerial perspective, but it is also necessary to design and implement proper organizational processes, for example, integrating people and offering adequate working conditions, so that those skills can result in organizational competences (Figure 3). However, the existence of IS competencies in a firm is not enough to successfully deliver IT services. It is important that top management supports IT projects and decides to affect resources (viz. financial) because a capability of an organization to deliver IT services is based on effectiveness, not only on the potential efficiency of its processes.

Irrespective of the competencies emerging in a causal manner or as an outcome of retrospective rationalization, the findings of this research make valuable contribution. They afford researchers and managers a starting point to proactively consider the kind of competencies that need to be put in place and then work on the necessary skills and processes to be established. If Weick's (1979) conception is true, even then a study of fundamental and facilitating competencies being realized over a period of time (longitudinal study) would help in identifying the kind of skills and processes that come together for the ultimate realization.

### 7. Conclusions

In order to gain business benefits from IT investments, organizations must develop competencies to exploit IT. These competences involve individual skills and organizational processes that enable those skills to be effectively applied. In this paper, we identify 23 competencies, categorized into fundamental and facilitating competencies that firms need to have in place if IT services are to be delivered adequately and business benefits achieved. We also developed a network of competences based on the data collected in the 16 cases studied. As has been argued, these competencies come together in unique ways so as to define success. The network of competencies (Figure 1) helps in evaluating how a given firm may be performing with respect to the standard competencies. The relationships also help in establishing plans for further execution. The development of organizational competences to deliver IT services will reduce the risk of IT projects not being completed on time, cost over budgeted, not fulfilling business requirements, and not bringing significant business benefits to organizations.

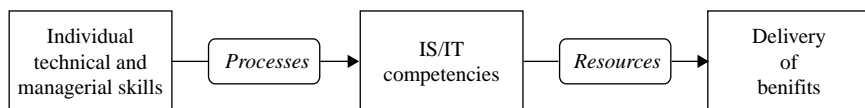


Figure 3.  
How to deliver IT benefits

Source: Adapted from caldeira and ward (2003)

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(The Appendix follows overleaf.)



Area	Sample questions	Seminal references
Fundamental competence	<p>How are strategic directions articulated?</p> <p>How do you ensure that standards are being met?</p> <p>What aspects do you look at for aligning IT with business processes?</p> <p>What abilities do you think are necessary for thinking strategically about IT?</p> <p>What abilities are necessary for data management?</p>	Feeney and Willcocks (1998a) and Argyris and Schön (1978)
Exploitation	<p>What do you do to explore plans and add value?</p> <p>What criteria do you use to assess that IT benefits are being realized?</p> <p>How do you ensure that business changes have been clearly articulated?</p> <p>How do you ensure that the requisite business change skills exist?</p> <p>How do you ensure that there is a link between the proposed benefits and the changes?</p>	Philip (2007), Dhillon (2005), McGrath <i>et al.</i> (1995), Bharadwaj (2000) and Zachman (1987)
Facilitating competence	<p>How do you hire staff?</p> <p>What processes do you put in place for involving users?</p> <p>What abilities do you look at for outsourcing projects?</p> <p>How do you ensure that users have the requisite application knowledge?</p> <p>How do you ensure that there is adequate service accountability?</p> <p>How do you arrive at a decision that a given software needs to be developed in-house or bought from a vendor?</p>	DeLone and McLean (1992), Boyatzis (1982) and Orton and Dhillon (2006)

**Table AI.**

Sample questions used in the interviews

**Notes:** Only a sample of the questions are provided; a complete list can be obtained from the authors

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