

CRANFIELD UNIVERSITY

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**Improving IS Performance in
Organisations: Towards an IS Capability**

School of Management

PhD Thesis



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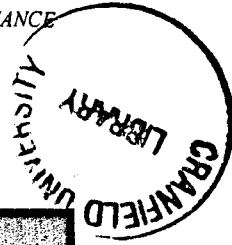
Improving IS Performance in Organisations: Towards an IS Capability

Supervisor: Professor John M. Ward

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**Abstract**

Today, most organisations are fundamentally dependent on their information systems (IS) and would quickly cease to function should the technology that underpins their business activities ever come to a halt. Yet, despite this situation, research continues to highlight that in many organisations senior executives are dis-satisfied with the value they perceive they are deriving from investments in IS and are concerned with the inability of their organisation to capitalise on opportunities provided by technology. The research reported in this exposition addresses this problem of linking IS expenditure with organisational performance. In particular, this exposition demonstrates how the cumulative output of the included research papers has contributed towards improving IS performance and consequently the contribution of IS to the competitiveness of an organisation, illustrating that the research papers represent a substantial, continuous and coherent body of work.

The cumulative output of these papers emphasise that improving IS performance is a complex and multi-dimensional proposition. It is an enterprise-wide concern and, crucially not an assignment that can be delegated to the IS function. Moreover, it is largely a people issue governed by the organisational legacy regarding IS experiences. The experiences of the organisations studied is that it not an easy undertaken, but can take many years to effect. The exposition concludes that all organisations must develop an effective IS capability if they are to leverage value through IS. While this exposition provides insights as to the nature and content of this capability, it notes that further development of this concept is required.

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I would also like to thank my co-authors on one of the included research papers, Chris Edwards and Rob Lambert.

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- to Karin Breu for her encouragement, and constructive and frank comments on an earlier draft of this document;
- to my colleagues in the IS Group whose research and insights have inspired me over the years; I'm sure that they will recognise their contribution not only to this document but also to my perspective on IS in organisations.

Finally, a special 'go raibh míle maith agat' to all my friends who, over the years, have gently prodded me to complete my Ph.D by continually asking whether or not it was finished. Well, it is now!

Prologue

This work is presented under Cranfield University Regulation 39 as last amended on December 15, 1998.

Regulation 39.6 states: "...a staff candidate may be permitted ... to present published work for examination, instead of a thesis, provided that:

- (a) the publications represent a substantial, continuous and coherent body of work on a particular theme; and
- (b) the candidate has been a member of staff for not less than three years and his published work is directly related to his responsibilities as a member of the staff; and
- (c) in the opinion of the Head of School, it would be wasteful of effort and hence detrimental to the candidate's other responsibilities to require him to convert his published work into a thesis; and
- (d) a period of at least one year should have elapsed since initial registration as a staff candidate."

Regulation 39.7 states: "The publications submitted in lieu of a thesis shall be presented in triplicate and accompanied by:

- (a) a list of publications presented; and
- (b) an exposition of the work contained in the publications presented; and
- (c) a declaration specifying whether or not any part of the work has been presented for any other academic distinction or professional qualification, and the extent of the candidate's contribution to any part of the work, which may have been published or performed jointly with others."

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1 Introduction

Today, most organisations are fundamentally dependent on their information systems (IS) and would quickly cease to function should the technology that underpins their business activities ever come to a halt. In the words of Rockart (1988), '[i]nformation technology has become inextricably intertwined with business'. Indeed, in industries such as telecommunications, media, entertainment, and financial services, where the product is already or is being increasingly digitized, the mere existence of an organisation crucially depends on the effective application of information technology (IT)¹. With the growth in eBusiness², the use of technology is becoming just an accepted, indeed expected, way of conducting business transactions.³ Consequently, organisations are increasingly looking towards the innovative application of technology to provide them with a source of competitive advantage. The implications for competitive strategy is that in today's environment, it can be said that "IT is the business strategy" (Earl and Feeny, 2000).

While early IT implementations were clearly focused on the automation of clerical and repetitive tasks, the search for opportunities to leverage IT for advantage began in the late 1970s and early 1980s. The formative writings on IT and competitive advantage mainly presented descriptive accounts of organisations that had achieved competitive advantage through the application of technology (c.f. Bakos and Treacy, 1986; Cash and Konsynski, 1985; Ives and Learmount, 1984; King, 1978; McFarlan, 1984; Porter and Miller, 1985). A central prescription drawn from these early studies was that investments in IT should be planned and aligned to the corporate strategy (c.f. Earl, 1989; Henderson and Venkatraman, 1993; Venkatraman, 1991; Wiseman, 1985). Yet, despite this call for formal strategic planning of IS investments, Ciborra (1994) asserts that successful applications of IT are often due more to serendipity rather than any formal planning. Indeed, a study by Kettinger *et al.* (1994) evaluating longitudinal changes in performance measures of 30 firms that had been cited as "classic" cases of strategic use of IS during the 1980s strongly suggested that a healthy skepticism concerning the competitive advantage payoffs of IT. Their research highlighted that any advantage that these companies may have gained was short-lived, and they concluded that management must more than simply assess the uniqueness or availability of emerging technological innovations in developing strategic IS plans.

¹ In this exposition a distinction is made between information technology (IT) and information systems (IS). IT refers specifically to technology and allied components - essentially hardware, software and communications networks. IS is concerned with information and systems. Checkland and Holwell (1998) point out that many people find difficulty in distinguishing between IS and IT. They suggest that this is because technology seems to overwhelm their thinking about the fundamental information system that the technology is to support. Indeed, information systems can exist outside of technology although today, this is unlikely to be the situation. Checkland (1981) notes that IS exist to serve, help or support people taking action in the real world, and it is a fundamental proposition that in order to conceptualise, and to create, a system which serves, it is first necessary to conceptualise that which is served, since the way the latter is thought of will dictate what would be necessary to serve or support it.

² The concept of eBusiness is incorporated within the definition of IS. eBusiness is the application of IT in the conduct of commerce between organisations and in the management of organisational affairs.

³ This has been referred to as the "strategic necessity hypothesis" (Clemons and Row, 1991a; Floyd and Wooldridge, 1990; Powell and Dent-Miscallef, 1997).

Although organisations may gain some 'first mover advantage' with an application, it can be quickly copied and is therefore not an advantage which is sustainable (Clemons and Row, 1991a; Mata *et al.*, 1995), particularly when patent protection for IS applications is almost non-existent and where keeping an IS innovation secret is difficult, especially for systems used by customers or suppliers. Indeed, there is a strong argument that the use of standard applications packages, a common strategy today, can limit an organisation's ability to innovate (Davenport, 1998; Prahalad and Krishnan, 1999). At the same time, investments made in technology infrastructure are becoming increasingly significant and inappropriate decisions in this area can severely affect an organisation's ability to respond swiftly and flexibly to changing market conditions and can, in fact, become a significant competitive liability (Broadbent and Weill, 1997; Keen, 1991).

The clear message from the research literature is that technology itself has no inherent value⁴ and that "technology alone is not enough" (Powell and Dent-Micallef, 1997) as a source of competitive advantage. The search for sustainability of competitive advantage is therefore unlikely to have a technological foundation but be found within the very fabric of the organization. What this exposition argues, and what is becoming increasingly apparent from the research literature and practice, is that an organisation must have an *IS capability* if it is to maintain competitiveness in today's technologically driven business environment.

The concept of an IS capability represents an organisation's ability to continuously derive and leverage value through IS (Bharadwaj, 2000; Marchand *et al.*, 2000; Ross *et al.*, 1996). Bharadwaj (2000) notes that IS capability "is not so much a specific set of sophisticated technological functionalities as it is an enterprise-wide capability to leverage technology to differentiate from competition" (p. 186). It includes understanding how IS impacts the business, identifying new strategic opportunities, assessing technological innovations, deriving new technology-enabled business models, prioritising opportunities, implementing the appropriate technology, managing IS projects, managing vendors, exploiting investments in technology, ensuring appropriate usage of the information systems and getting people to embrace the right behaviours and values for working with information. All these activities are becoming increasingly crucial in the "New Economy" where information and knowledge have either supplanted the traditional factors of production in an industry or are having a major impact on competition (Evans and Wurster, 2000; Grant, 1996; Toffler, 1990) and where an increasing percentage of business is being undertaken in a computer mediated environment (Evans and Wurster, 2000; Rayport and Sviokla, 1994, 1995).

As an enterprise-wide concept, the IS capability is located within the fabric of the organisation, it is underpinned by a number of factors. First, for an IS capability to exist there is an explicit assumption that there is a strong relationship between the IS function and other business functions. Yet, research continues to indicate that this is not always the case and that a poor relationship can have serious competitive implications. Second,

⁴ Typically, research studies use monetary value of IT investment as a surrogate measure for assessing a firm's IT intensiveness. This is one of the prime reasons for the inconsistent statistical findings about the relationship between IT investment and firm performance. The issue of IT value is discussed in section 2.2.

the foundation of the IS capability will be organisational IS competencies, yet these have not been adequately defined in the IS literature. Third, all organisations have an IS capability; for some it may be a source of competitive advantage, however for others, the capability may be weak, perhaps putting them in a position of disadvantage, or at least seriously undermining their competitiveness. Yet, little guidance is provided by the literature for such organisations regarding the development of this IS capability. Fourth, the global nature of many organisation today is likely to present particular challenges in developing an IS capability. An examination of the IS research literature reveals that there is a dearth of writings exploring the global aspects of IS management.

This exposition illustrates how my research has advanced understanding in these areas and contributed towards providing greater clarity to the development and expression of organisational IS capability and consequently improving the contribution of IS to the competitiveness of an organisation.

1.1 Published work presented

The general thrust of my research has been on understanding the role of IS in organisations and the enablers and inhibitors of success in the application of technology. My early work (circa 1992-96) was in that area of IS generally referred to as *business process reengineering* (BPR).⁵ The origins of the BPR concept date back to the late-1980s with research findings at that time indicating that organisations that were delivering benefits from technology investments were focusing on redesigning business process (Davenport and Short, 1990; Scott Morton, 1991), rather than simply “paving the cowpaths” (Hammer, 1990), before implementing technical solutions.

My research during this period has included exploring the contribution of IS to new organisational forms (Lambert and Peppard, 1993); a detailed exploration of the then emerging concept of BPR (Edwards and Peppard, 1994a); a comprehensive text book on the topic (Peppard and Rowland, 1995); developing an approach which forges a link between strategy and process re-engineering initiatives (Edwards and Peppard, 1994b; 1997); an examination of the implementation of BPR in different cultural contexts (Peppard and Fitzgerald, 1997); and illustrating how BPR can be incorporated within a corporate strategy initiative (1999). I also co-edited a volume *Examining Business Process Re-engineering: Current Perspectives and Research Directions* (Burke and Peppard, 1995) which contained 18 previously unpublished papers exploring various aspects of BPR, including two of my own, the result of the first European academic conference dealing exclusively with BPR. However, my 1996 paper ‘Broadening visions of business process re-engineering’, published in *Omega*, captured my then belief regarding the evolution and development of BPR, suggesting that it may need to

⁵ Despite the origins of BPR in the IS discipline (Davenport and Short, 1990; Hammer, 1990; Scott Morton, 1991), it has attracted widespread research interest from most management disciplines, including strategic management (Ghoshal and Bartlett, 1995; Segal-Horn and Bowman, 1996; Stalk *et al.*, 1992), operations management (Loch, 1998; Womak and Jones, 1994; also Special Issue of *International Journal of Operations & Production Management*, Volume 18/19, 1998), organisation behaviour and human resource management (Belmonte and Murray, 1993; Davenport and Stoddard, 1994; Jarvenpaa and Stoddard, 1993; Willmott, 1995a, 1995b), management science (Davis, 1996; van Ackere *et al.*, 1993), and accounting (Cooper *et al.*, 1993; Kaplan and Norton, 1996).

be reconceptualised. It argued that the honeymoon period was over and that hype and preliminary speculations found in the literature were giving way to emerging empirical research results, that the reality of the experience of BPR was dismissing myths, while practice was advancing the boundaries of our knowledge and understanding of re-engineering. It argued that BPR was broadening on scope from its initial narrow, internal and analytic focus. It developed seven themes that captured the emerging conceptualisation. These themes were presented as shifts: from rhetoric to reality; from IT as driver to IT as enabler; from an analytic process to a holistic process; from reengineering the job to re-engineering mindsets; from internal process perspective to external network perspective; from re-engineering organisations to re-engineering business; from re-engineering processes to strategy-process integration; and from a re-engineering project to a re-engineering capability.

It is somewhat ironic that despite the origins of BPR within the IS field, success has actually has less to do with technology than with addressing organisational and managerial issues. Success in BPR is multifaceted, depending upon a number of factors: leadership and sponsorship from senior management (Hammer and Champy, 1993); aligning processes to strategy (Edwards and Peppard, 1997; Teng *et al.*, 1996); becoming customer focused and listening to the "voice of the customer" (Carr and Johansson, 1995); managing the change (Hall *et al.*, 1993); selecting the right processes to reengineer (Carr and Johanssen, 1995; Edwards and Peppard, 1994a); managing strategic risks (Clemons, 1995); addressing the human dimension (Cooper and Markus, 1995; Willmott, 1995a, 1995b); and ensuring a close IS/business partnership (Martinez, 1995). Failures have more to do with management and organisation aspects than they have to do with technology; while technological problems can be complex, they are generally not insurmountable.

This is not to suggest that technology is not important; many process designs would not be possible without significant use of technology. The emergence of the Internet and wireless communications is leading organisations to search out new opportunities for competitiveness. While providing opportunities, the new virtual environment also presents many challenges. The increasing dependence of organisations on IT, the current hype and promotion by the media of everything 'e', and the continual search from competitive advantage have all combined to raise the profile of information technology in organisations.

The paradox of process re-engineering being, on the one hand, dependent on technology for innovative redesign opportunities, but success on the other, being less about technology and more about addressing organisation and management dimensions, led me to consider why this is so. In particular, I was interested in the relationship between the IS function and the rest of the organisation; to echo Martinez (1995), "[s]uccessful reengineering demands IS/business partnership" (p. 51). It is this understanding of the role of IS and the IS function in organisations, particularly in delivering value, that has been the main focus of my subsequent research (circa 1995-2001).

Papers published during this period and included in the development of this exposition are:

- a detailed study of the research literature to capturing the shifts in the practice and conceptualisation of business process reengineering (Peppard, 1996);
- a detailed exploration of the relationship between the IS function and the rest of the business, focusing particularly on the cultural dimension of the relationship (Ward and Peppard, 1996);
- delving beyond the concept of culture arguing that if organisations are seeking to bridge the gap it is imperative to progress beyond describing it as such and seek a better understanding of why it exists, its dimensions, components and ultimately how it could be reduced or eliminated (Peppard and Ward, 1999);
- exploring the implications of globalisation for IS management in globally distributed enterprises (Peppard, 1999);
- identifying and defining the IS competencies to deliver value through IS (Peppard *et al.*, 2000);
- developing a route-map for organisations that want to improve the contribution of IS (Peppard, 2001).

A more detailed elaboration of the arguments and findings of this body of research, as reported in the published papers, can be found later in this document.

While my research has been wide ranging, the papers drawn upon in this exposition represent those that specifically focus on improving IS performance in organisations and consequently the contribution IS to organisational competitiveness. In accordance with the regulations, a number of publications are presented for examination. These core publications specifically and directly address the theme under which this exposition is submitted, and are drawn upon in describing how IS performance can be improved. Table 1 (at the end of this section) summaries these papers and highlights their contribution to the overall theme of this exposition. Copies of these publications can be found in appendix D. Supplementary publications address issues around the theme, contributing to the arguments developed in this exposition, helping frame my thinking on the nature, content and process of IS management. These papers are not presented with this exposition. Figure 1 illustrates the flow of these research papers in the development of this exposition.

1.2 Structure of exposition

The exposition begins by highlighting the gaps in our understanding and knowledge vis-à-vis improving IS performance and its contribution to competitiveness (section 2). To provide a backdrop to the subsequent discussion, the challenges and implications of new information and communication technologies are first highlighted and the implications for the management of IS developed. The concept of IT value is then explored and the IT value creation process is elaborated upon as this provides insights as to how IS impacts performance as well as how organisation's derive value through IS. As the

traditional provider of IS services, the role of the IS function in delivering business value is evaluated and the nature and extent of the relationship between the IS function and the rest of the organisation is then reviewed. The recent literature that draws on resource-based theory (RBT) and considers the IS function as a bundle of resources is then examined. Existing knowledge relating to improving IS performance is surveyed with an emphasis on research that addresses how the relationship can be improved. Key themes from the IS and competitive advantage literature are then surfaced and conclusions, as they relate to improving the competitiveness of the organisation through IS, are drawn. The section ends by reviewing current writings addressing the management of IS in global enterprises, as the globally distributed enterprise presents distinct challenges for improving IS performance. Section 3 describes how my cumulative research contributes to the development of understanding and insights that aids in illuminating the theme of this exposition and the gaps in knowledge. A synthesis of the findings from these papers is presented, with a focus on weaving a coherent argument to illustrate their contribution towards improving IS performance in organisations. The various research methodologies and approaches employed in these studies are then briefly outlined (section 4). The exposition ends with some overall conclusions (section 5).

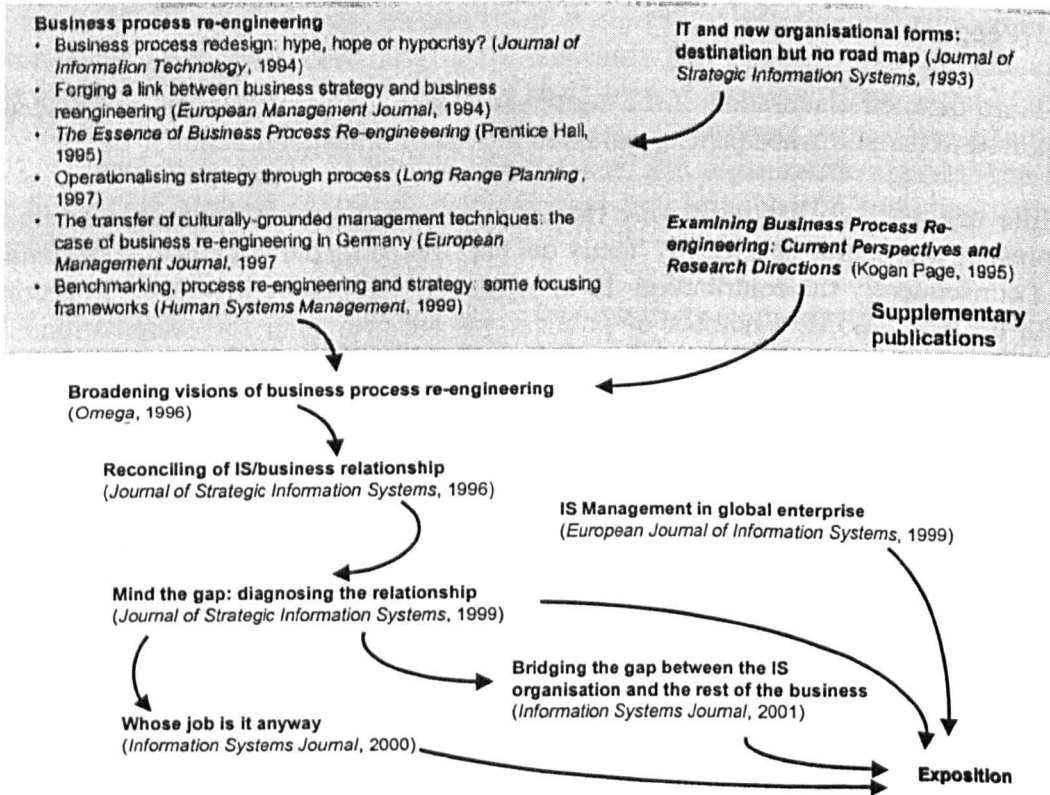


FIGURE 1 Flow of papers submitted.

TABLE 1 Summary of papers and contribution to theme of exposition.

Paper title and journal/publisher	Summary of paper	Significance of paper to theme of exposition
Broadening visions of business process re-engineering, <i>Omega</i> , 1996	Business process re-engineering (BPR) has become a popular management prescription. The fundamental message of BPR is that through the redesign of business processes, significant performance improvements can be achieved. While BPR with its doctrine of radical performance improvement is a powerful message, experiences have been mixed, and this paper suggests that in order to overcome some of the problems the concept may need to be reconceptualised. The honeymoon period is over and preliminary speculations are giving way to emerging research results, reality is dismissing myths while practice and greater understanding are advancing the boundaries. Through an examination of the research literature together with the author's own research, the paper argues that BPR is broadening in scope from its initial narrow, internal and analytic focus. This paper highlights how the concept is broadening and presents a number of themes which seem to best capture the emerging conceptualisation.	<ul style="list-style-type: none"> Highlighted the multi-dimensional nature of IS in re-engineering initiatives; IT is an enabler of process change Relationship between IS function and other business functions is a critical ingredient of success with IS Repositioning of IS function must not be based on control of resources but based on a fundamental evaluation of the broader issues of organisational IS competencies
Reconciling the IT/business relationship: a troubled marriage in need of guidance, <i>Journal of Strategic Information Systems</i> , 1996 (with J. Ward)	Over the past 30 years the relationship between the information systems (IS) function and the rest of the business has been a troubled one which few organisations have managed to satisfactorily resolve. This 'gap' has been explained by the cultural difference existing between the two. Yet despite the criticality of IT to business operations and the strategic opportunities it provides, little attempt has been made to explore this culture gap further with much of the writings and research on the subject dispersed, progressing little beyond the centralisation/ decentralisation debate and offering little by way of guidance. Much of the literature is concerned with issues of control of resources rather than managing the relationship. Some organisations have chosen to rid themselves of the problem through outsourcing but debate has raised the question of the long term consequences of short term decisions which are based on a historical problem. Yet often the 'trouble' has no foundation beyond a level of perceptions. This paper attempts to understand and interpret the problems in the relationship, to describe the gap, to understand the reasons why it exists, and to offer some advice. A framework which can be used as a basis for further constructive research to improve our understanding is developed and discussed.	<ul style="list-style-type: none"> Explored IS function/business relationship from a cultural perspective Illustrated the dysfunctional nature of sub-cultures on intra-organisational relationships Illustrated how the culture gap affected perceptions in one organisation Developed a typology of different relationship options based on different shared values Regarding the centralisation-decentralisation debate, concluded that it is not just a matter of repositioning the IS function but requires a more fundamental evaluation of the broader issues of organisational IS competencies

Paper title and journal/publisher	Summary of paper	Significance of paper to theme of exposition
<p>'Mind the gap': diagnosing the relationship between the IT function and the rest of the business, <i>Journal of Strategic Information Systems</i>, 1999 (with J. Ward)</p>	<p>The senior management of many organisations are continually disappointed with the benefits and value which they perceive they are getting from their investments in IS. This frustration with IS, and in particular with the IS function, has seen many organisations choose to rid themselves of the 'problem' altogether by outsourcing IT activities to a third party. The fact that there is a separate organisational unit responsible for IT activities has led to the emergence of gap between this so call IS function and the rest of the business. Culture is often used to explain the gap as if this somehow justifies an organisation's inability to effectively leverage IS. However, the premise underlying this paper is that culture is an excuse for rather than a cause of ineffective application of IS for business benefits and value. The clear message from this paper is that achieving high performance from IS is not just about the IS function's ability to build, maintain and deliver systems, but is an organisational wide activity requiring a strong business/IS partnership. A framework grounded in the research literature, which identifies the elements to manage in creating high performance from IS, is developed and operationalised. The findings of an exploratory survey are presented and research and practitioner implications developed.</p>	<ul style="list-style-type: none"> • Argued that 'culture gap' is a symptom not a cause of poor relationships • Research reported in the paper delves beyond the façade of culture as an explanatory variable for the poor performance of IS in an organisation • Developed, from quantitative and qualitative data, a framework highlighting the elements contributing to a successful relationship • Highlights the importance of "roles" and role definition in improving the relationship
<p>Information management in the global enterprise: an organising framework, <i>European Journal of Information Systems</i>, 1999</p>	<p>Much has been written over the last decade on managing global enterprises. While the predominant concern of this literature has been strategic in orientation, the management of information is a neglected area. By drawing on a diverse range of literature in the international business, strategic management, organisation design, and IS disciplines this paper develops a conceptual framework for analysing information management in the global enterprise, providing a basis for organising existing literature on the topic and for creating a map of the field. This framework is structured around four domains: global business drivers, global business strategy, global business model and global information strategy. It highlights the role of IT as supporting global business strategies while at the same time IT can also be a major catalyst in the globalisation process itself. In the context of the global information strategy, the paper develops a distinction between business infostructure, IT infrastructure and the IS/IT suprastructure. Significant relationships between the four domains of the framework are surfaced and an agenda for action developed.</p>	<ul style="list-style-type: none"> • Focused on addressing the management of information assets in a global enterprise • Developed a framework for integrating a diverse literature • Derived a model where a global IS strategy is postulated as having three components: a business infostructure, an IT infrastructure and an IS/IT suprastructure

Paper title and journal/publisher	Summary of paper	Significance of paper to theme of exposition
<p>Whose job is it anyway? Organisational information competencies for value creation, <i>Information Systems Journal</i>, 2000 (with R. Lambert and C. Edwards)</p>	<p>Research highlights that most business managers continue to be dissatisfied with the value they perceive they are deriving from their organisation's information systems investments. On examining the literature, the dominant perspective is that creating value through IS is primarily the responsibility of the IS function. Accordingly, to address this chronic malaise, attention generally focuses on the IS function with proposed prescriptions ranging from re-skilling the IS professional through re-engineering the IS function to the ultimate sanction of outsourcing. This paper examines the problem of value creation from IS investments from an organisational as opposed to an IS functional perspective. Drawing on resource-based theory, the paper argues that the effective deployment and exploitation of information should be viewed as a "strategic asset". To leverage value from IS, the paper proposes that organisations must recognise and develop information competencies and that the elements of these competencies are distributed throughout the organisation and not solely resident in the IS function. Through a multi-methodological approach these information competencies are identified and described. The resultant competencies are then studied in an organisational context. The paper ends by drawing conclusions and articulating further research directions and opportunities.</p>	<ul style="list-style-type: none"> • Identified and defined a set of IS competencies for managing information, systems and technology assets • These competencies are "knowledge" oriented competencies/skills and not technologically based • Competitive advantage determined by how well this resource is managed; the extent to which these competencies are present • Competencies must exist; but may not all be sourced in-house • Elements of each competence are located across the organisation • For many IS competencies no one individual has overall responsibility for all component elements hence they are often do not exist or, at best, are weak • Delivering value through IS investments is an organisation wide issue
<p>Bridging the gap between the IT organisation and the rest of the business: plotting a route, <i>Information Systems Journal</i>, 2001</p>	<p>Much of the research advocates a strong IS function-business relationship if the IS function is to make a value-added contribution to the business. While the research also highlights that in many organisations this relationship is poor, little guidance is provided as to how this 'gap' might be bridged. The research reported in this paper is a longitudinal study of three organisations that are actively seeking to bridge the gap, improve the relationship and consequently the value that they are deriving from their IT investments. A normative model, illustrating the route to creating high performance from IT, is constructed from cross-case analysis of the data. The paper ends with some conclusions and implications.</p>	<ul style="list-style-type: none"> • Developed a prescriptive framework from a longitudinal study in three organisations (Framework from "mind the gap" study guided data collection) • Process model to improve IS performance developed • Individual aspects of the model are necessary but not sufficient • Highlights the importance of <i>path dependency</i> in creating a stronger relationship between business and IS function

2 Framing the problem and highlighting gaps in understanding

In this section, the nature of the problem that my research contributes towards addressing is described. The discussion is framed within the environment of contemporary IS management. For example, the concept of the Internet, so much part of today's management nomenclature, was not even open for commercial activity a decade ago.

2.1 IT in action: modeling the dynamics

The dynamics of IT and, hence, the consequences for an organisation, are complex. Figure 2, however, attempts to shed light on this complexity and capture these dynamics. The figure first illustrates the duality of technology in that it not only *supports* the strategy of an organisation [arrow a] but can also *define* the business, as strategic moves may not be possible without technology [arrow b]. For example, organisations like ebay⁶, eSteel⁷ and Chemdex⁸ all deploy business models that are fundamentally defined by technology. Technology also facilitates new ways of organising (Lambert and Peppard, 1993; Hedberg *et al.*, 1997), new process innovations (Davenport, 1993; Hammer, 1991) and can enable the creation of innovative "network-based businesses" (Coyne and Dye, 1998). Lotus Development Corporation, for example, have a development strategy that "follows the sun", where a virtual team work 24 hours-a-day on a project; a day which begins in Dublin, eight hours later work hands over to Los Angeles and eight hours later the work is moved to Singapore eventually returning back to Dublin 24 hours after it first began. This way of organising for work is critically dependent on IT.

However, an organisation does not exist in isolation (unless it occupies a monopoly position) but has competitors and is part of a wider industry system and business environment. Competitors' moves, including new entrants, affect the dynamic within an industry and, consequently, the organisation itself [arrow c], while, at the same time, moves made by the organisation effect competitor moves [arrow d]. Technological innovations can have disruptive effects on an industry [arrow e] (Bower and Christensen, 1995; Christensen, 1997; Christensen and Overdorf, 2000; Tushman and Anderson, 1986)⁹, re-writing the rules of competition (Kelly, 1998) and challenging traditional notions of industry structure (Sampler, 1998). These situations may have been what D'Aveni (1994) had in mind when he introduced the concept of *hypercompetition*, referring to it as "an environment characterised by intense and rapid competitive moves in which competitors must move quickly to build advantages and erode the advantages of their rivals". While this dynamic is driven by new technological innovations (Yoffie, 1996), it is less of a technology revolution than a revolution in the economics of information (Evans and Wurster, 1997, 2000; Sampler,

⁶ www.ebay.com

⁷ www.esteel.com

⁸ www.chemdex.com

⁹ Punctuated equilibrium theories model adaptation and selection over time. Utterback and Abernathy (1975) suggested that the dominant types of innovation, whether technologically complex or simple and whether applied to product or process, depends upon the stage of development.

1998; Shapiro and Varian, 1999) and how information is captured, processed, stored, planned and used in an organisation. This point has been eloquently made by Gates (1999) who noted “I have a simple but strong belief. The most meaningful way to differentiate your company from our competition, the best way to put distance between you and the crowd, is to do an outstanding job with information. *How you gather, manage, and use information will determine whether you win or lose*” (p. 3).

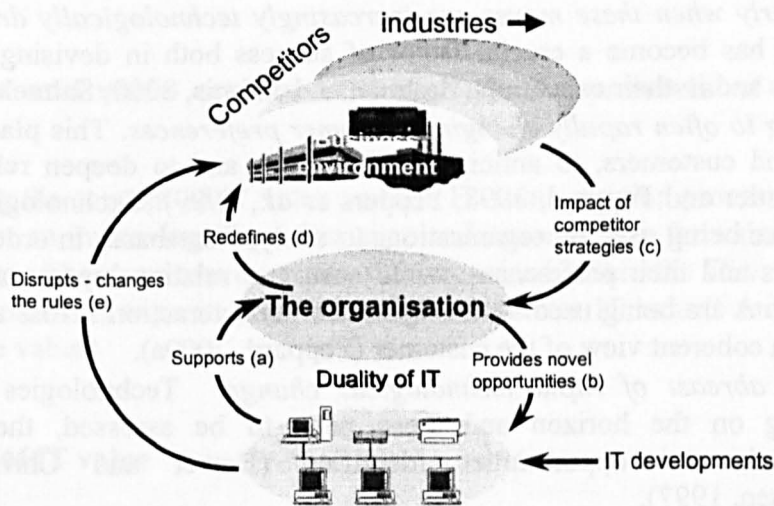


FIGURE 2 The influence and dynamic impact of information technologies on the organisation and business environment.

It is within this context that management must determine how the organisation can best utilise technology to leverage information discontinuities, asymmetries and imperfections for business advantage.¹⁰ Today, more and more business is being undertaken in a computer mediated environment, representing a shift from conducting business in the *marketplace* to the *marketspace* (Rayport and Sviokla, 1994). The *marketspace* denotes the transformation in business activity as moving from the physical marketplace with fixed locations, inventories and products to an information defined transaction space. This shift ranges from basic business transactions such as ordering and invoicing to utilising sophisticated business-to-business (B2B) exchanges¹¹ bringing together industry players in a neutral market setting.

The implications for incumbent organisations of new information and communication technologies are profound. Key implications include:

- *Addressing the new marketspace challenges brought about by technology.* These challenges include a reduction in industry entry barriers (Ghosh, 1998); emergence of new infomediaries (Hagel and Rayport, 1997; Vandermerwe, 1999); establishing trust and building online brands (Dayal *et al.*, 2000; Einwiller *et al.*, 2000; Jarvenpaa and Grazioli, 1999; Kim and Prabhakar, 2000); understanding factors influencing the adoption of online trading (Tan and Teo, 2000); addressing

¹⁰ In the strategic management literature, Chankravarty (1997) recently noted that most of the existing frameworks assume a benign environment that is simple and not very dynamic.

¹¹ Also called e-hubs, see Kaplan and Sawhney (2000).

authentication and security issues (Gupta *et al.*, 2000); dealing with channel conflict (Anslinger *et al.*, 1999; Calkins *et al.*, 2000; Rosen and Howard, 2000;); assimilating new pricing arrangements and price transparency (Kaplan and Sawhney, 2000; Shapiro and Varian, 1999); extending global reach (Quelch and Klein, 1996); and attending to the rise in customer knowledge and power (Hagel and Singer, 1999; Seybold, 1998; Shapiro and Varian, 1999; Slywotzky, 2000).

- *Responding rapidly to competitor moves in the "hypercompetitive" environment, particularly when these moves are increasingly technologically driven.* Speed of response has become a crucial factor of success both in devising new IT driven strategies and in their execution (Hartman and Sifonis, 2000; Salmela *et al.*, 2000).
- *Attending to often rapidly changing customer preferences.* This places pressures to understand customers, to anticipate their needs and to deepen relationships with them (Butler and Peppard, 1998; Peppers *et al.*, 1999). Technologies such as data mining are being used by organisations to analyse databases in order to understand customers and their preferences, while customer relationship management (CRM) applications are being used to manage customer interaction across all channels and provide a coherent view of the customer (Peppard, 2000a).
- *Keeping abreast of rapid technological change.* Technologies are constantly appearing on the horizon and these need to be assessed, their implications ascertained, and opportunities identified (Bower and Christensen, 1995; Christensen, 1997).
- *Incorporating technological innovations in the organisation's business strategy.* Innovative business models are required to appropriate value in the new business ecosystem (Hartman and Sifonis, 2000).
- *Ensuring IT infrastructure investments are "future proofed" and do not become obsolete.* As inappropriate technological investments can become competitive liabilities, consequently technological choices are critical. Organisations must build a robust and flexible infrastructure to enable both current and future applications and technology investments (Weill and Broadbent, 1998). The components of this infrastructure may not necessarily be all sourced in-house.
- *Structuring IS.* Deciding on the optimal configuring for the IS organisation has become an increasingly challenging task for managers (Earl *et al.*, 1996). What activities should be centralised and what activities are more appropriately devolved (GartnerGroup, 1999)? How should balance between centralisation and decentralisation be achieved (Hodgkinson, 1996)? What is the most appropriate IS governance structure for an organisation to adopt (Peppard *et al.*, 1999)?
- *Providing IS resources.* There are many options regarding the provision of IS resources into the organisation as it is no longer necessary to source all supply requirements in house (Earl, 1996b; Lacity and Hirschheim, 1995; Lacity *et al.*, 1994; 1995; 1996). While the strategy of outsourcing has been used for many years, the emergence of "apps on tap" from application service providers (ASPs) and "web hosting" services has the potential to significantly change the resourcing landscape.

The above discussion illustrates the complexity involved in managing IS today. The new business ecosystem is a complex environment, increasingly defined by technology, with many unknowns and where many questions remain unanswered. Technology itself is advancing rapidly, further accelerating changes in the business environment. The rate of technology change is having a profound effect on the knowledge base of the IS

discipline as it struggles to understand the implications and impact of these new technologies and to develop theories and practice to guide action. The speed at which theory and new understanding is developed lags behind practice (Benbasat and Zmud, 1999; Zmud, 1998). Other management disciplines do not face such dramatic changes and erosion in their knowledge bases over such relatively short periods of time. In addition, these implications are not exclusively IS issues, but have implications right across the enterprise.

2.2 IT value and value creation through IT: A synthesis of the relevant literature

Understanding the concept of IT value and the IT value creation process¹² is central to any discussion on improving IS performance and consequently the value derived from IS investments. There are two questions that are raised within the IT value debate that are of concern to this exposition. First, what constitutes IT value? And second, how does IT create value?

The concept of IT value

Despite the vast sums of money spent on information technology every year the payoff has not been conclusively illustrated. In the late 1980's and early 1990's studies reported a "productivity paradox"¹³ (Berndt and Malone, 1995; Brynjolfsson, 1993; David, 1990; Roach, 1987) and fueled a quest for economic analysis to determine whether a link existed between IT investment and productivity and IT investment and the profitability of a firm (Berndt and Malone, 1995; Brynjolfsson and Hitt, 1996, 1998; Dewan and Kraemer, 1998; Kauffman and Weill, 1989; Kelley, 1994; Tam, 1998).

However, since the early 1990's an overwhelming body of research reports a positive relationship between IT and performance at the level of the firm (c.f. Alpar and Kim, 1990; Barua *et al.*, 1995; Bharadwaj *et al.*, 1999; Brynjolfsson, 1996; Brynjolfsson and Hitt, 1996; Eynon and Ambrose, 1998; Hitt and Brynjolfsson, 1996; Mahmood and Mann, 1993; Mukhopadhyay *et al.*, 1995), although some studies still report contradictory findings (c.f. Tam, 1998). The diverse results, particularly in the early investigations, may be explained by measurement error in these studies, lags in the realisation of benefits, distribution of IT benefits in the organisation, misallocation and over-consumption of IT, or organisations making investments in IT with no real strategic focus (Brynjolfsson, 1993; Devaraj and Kohli, 2000). Indeed, Quinn and Baily (1994) have argued that the US service sector received high performance payoffs from IT even during the period when it was most criticized. In addition, there is an emerging complexity with today's increasingly inter-connected world, where value is postulated as being created more in networks (Coyne and Dye, 1998; Normann and Ramirez, 1993;

¹² Research in this genre tends to use the term 'IT' rather than 'IS'.

¹³ The productivity paradox referred to the fact that despite the vast sums of money invested in IT each year, the productivity payoffs were either unclear or did not manifest themselves in studies, particularly in macro economic analysis. Economist Robert Salow noted at the time "we see the computer age everywhere except in the productivity statistics" (*New York Times Book Review*, July 12, 1987).

Stabell and Fjeldstad, 1998) rather than within individual organisations, yet empirical studies to date have not investigated this aspect.

Consideration must be given as to what exactly constitutes IT value. Most of the literature considering the concept of IT value adopts a micro economic perspective (i.e. draws on economic production theory) and attempts to relate IT investment to organisation performance (c.f. Brynjolfsson and Hitt, 1996). This is the usual way of measuring value, probably as it is relatively easy to gain access to such secondary data - most studies tend to use data from year-end financial statements. Yet, whether this is appropriate is open to debate. It is not so much the level of investment in IT as it is how the firm leverages the investment that is the crucial aspect. In addition, performance is not necessarily causally related to productivity. Based on IT spending data in the US, Brynjolfsson and Hitt (1996) showed that, while IT investment is correlated with firm level productivity, it has little correlation with business performance. Improvement in productivity will not necessarily translate into gains in profit measures and increase in the stock market value of the firm (Brynjolfsson and Hitt, 1996). On the other hand, research has shown that IT investment has created value that is passed onto consumers (Brynjolfsson, 1996).

While measuring value can be problematic, executives' perceptions are often used as a proxy for realised value as they have been found to correlate with more traditional economic performance measures such as revenues, net profit and productivity (Tallon *et al.*, 1998; 2000). Consequently, "perceptual data from senior managers ... can be employed as acceptable operationalisations of [business economic performance]" (Venkatraman and Ramanujam, 1987) and has been employed in a number of studies (Tallon *et al.*, 2000).

It may be obvious to state that *appropriate* IT investments must be made for benefits to be forthcoming, unfortunately making such appropriate investments still does not guarantee success. First, we still do not know the precise impact IT in organisations. For example, although Woodward (1965) first suggested the importance of technology in organisation design, researchers have had difficulty in articulating its role. While hypothesised organisational effects of IT have been proposed by a number of researchers (Ein-Dor and Segar, 1981; Federico *et al.*, 1985; Swanson, 1987; Whisler, 1970), empirical research exploring IT in organisations has so far produced inconclusive findings (Bjorn-Andersen *et al.*, 1986; Blau *et al.*, 1976; Dawson and McLoughlin, 1986; Zeffane, 1989).¹⁴ Indeed, Barley (1986) studied the implementation of identical

¹⁴ A number of reasons can be suggested for this situation. First, the multiplicity of research disciplines examining IS in organisations, each with their own preferred concepts and theoretical and methodological basis (Attwell and Rule, 1984, 1991; Bjorn-Andersen *et al.*, 1986). Second, conflicting and unclear definitions and measures of IT and organisational structure (Attwell and Rule, 1984; Bakopoulos, 1985; Bjorn-Andersen *et al.*, 1986; Fry, 1982; Markus and Robey, 1988; Tehrani *et al.*, 1990), context-specific definitions of technology (Orlikowski, 1991a,b) and ambiguous terminology (Scott, 1990). This situation also has implications for comparisons across studies and settings. Third, how change is measured has been a critical shortcoming of much of the research on impacts. In relation to organisation structure, for example, research indicates that questionnaire and institutional measures do not tap the same latent dimensions of structure found across studies (Ford, 1979; Pennings, 1973; Sathe, 1978). Fourth, the diversity and mixes of units and levels of analysis found in studies (Markus and Robey, 1988, Swanson, 1987). Fifth, Bjorn-Andersen *et al.* (1986) contend that very few empirical studies of computer impact relate in any depth to their organisational consequences. Sixth, in general, most contributions to research

technologies in two organisations and found that their organisational impacts were completely different. Second, even when IT spending is shown to improve intermediate variables of organisational productivity, such as increased communication leading to the need for reduced inventories (Dudley and Lasserre, 1989), it does not necessarily lead to increased productivity (Barua *et al.*, 1995).

Value creation from IT

While proving a positive relationship between IT investment and performance improvement may provide the case for making an investment, it provides little guidance regarding the value creation process. The literature suggests a number of ways how IT creates value. These include: improving planning and decision making by improving organisational communication and coordination and by enhancing organisational flexibility (Bakos and Treacy, 1986); by coordinating supplier linkages, reducing search costs, improving quality control (Total Quality Management) and delivery techniques (Electronic Data Interchange, Just In Time) (Mukhopadhyay *et al.*, 1995); redesigning business processes (Davenport, 1993; Davenport and Short, 1990; Hammer, 1990); facilitating the development of new products and services (Barua *et al.*, 1995) or differentiating products and services (Bakos and Treacy, 1986); delivering enhanced manufacturing techniques through Computer Aided Design (Kelley, 1994); establishing and sustaining customer relationships (Ives and Learmonth, 1984); redesigning business networks (Venkatraman, 1991); and extending the scope of the business (Venkatraman, 1991).

Yet, it is important to note that IT value is not a point-in-time concept as much of the literature alludes to; rather, it is process that unfolds over a period of time (Devaraj and Kohli, 2000). IT itself has no inherent value and this value must be unlocked; value is unlocked through usage, or more specifically “appropriate use” (Lucas, 1993; Soh and Markus, 1995) or exploitation (Peppard *et al.*, 2000). Davern and Kauffman (2000) have suggested that ‘conversion contingencies’ which act as intervening and moderating factors in the process by which potential value is transformed, or fails to be transformed, into realised value. Rather than IT investments having a direct impact in performance, there are intervening and moderating variables which influence the ultimate outcomes. Recent research suggests that investments in complementary assets (e.g. management skills, user training, and the application of standards) are critical to understanding the return on IT investments (Barua *et al.*, 1995; Brynjolfsson and Yang, 1997; Davern and Kauffman, 2000). Therefore, investments in technology must be accompanied by investments in other areas such as training, process redesign, and change management programs. Further, Brynjolfsson and Hitt’s (1998) data suggests that it is becoming increasingly important to organise in ways that leverage IT opportunities if value is to be forthcoming.

on the development and use of IS in organisations primarily focus on IT as an instance of technology without an explicit focus on information (Coombs *et al.*, 1992). Seventh, Attwell and Rule (1984), Markus (1984) and others suggest that computer technology have a variety of potential impacts that vary according to the setting in which the technologies are implemented. In a recent paper Robey (1995) discusses several means to address contradictions that occur among studies and within studies.

The most encompassing model to date of IT value creation, linking IT investment to organisation performance, has been proposed by Soh and Markus (1995) who integrated the work of Lucas (1993), Grabowski and Lee (1993), Markus and Soh (1993), Ross *et al.* (1996) and Sambamurthy and Zmud (1997) and developed a process theory of how IT creates business value. Illustrated in Figure 3, the process captures the major ingredients of the recipe for transforming IT investments into organisation performance. The recipe comprises the necessary conditions and probabilistic processes in the following sequence: organisations spend on IT and, subject to varying degrees of effectiveness during the IT management process, obtain IT assets. "Quality IT assets, if combined with the process of appropriate IT use, then yield favourable IT impacts. Favourable IT impacts, if not adversely affected during the competitive process, lead to improved organisational performance" (Soh and Markus, 1995, p. 39).

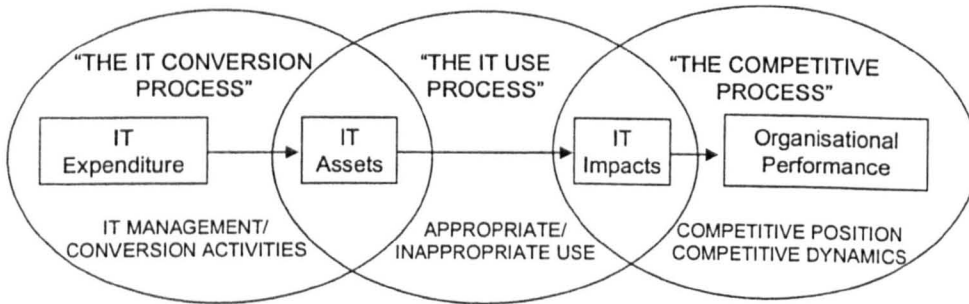


Figure 3 Soh and Markus's process theory of how IT creates business value (Soh and Markus, 1995, p. 37).

Economic studies, although valuable in illustrating the payoff or otherwise of IT, provide inadequate explanations into how IT value is created. The middle process of Figure 3, connecting IT assets to IT impacts, is not well understood – particularly in areas such as what constitutes appropriate use, how use differs depending on the type of IT investment and skill in using IT (Soh and Markus, 1995).

2.3 The IS function and value delivery

It is my contention that the roots of many of the problems that have arisen in organisations regarding the questionable payoffs from IS, particularly over the last 20 years, can be traced to the very existence of the IS function. This is due to the fact that the evolution of the role of technology in business has not been matched with a similar transformation in how technology is managed and integrated into the organisation's "theory of the business"¹⁵. The early Computer Department¹⁶ existed to ensure that the

¹⁵ A phrase coined by Peter Drucker (1994) referring to the assumptions upon which the organisation has been built.

¹⁶ Over the years, the computer department has undergone a variety of name changes. These have included Data Process (DP) Department, Electronic-Data Processing (EDP) Department, Management Information Systems (MIS) Department, Information Systems (IS) Department, and Information Services Department. These label changes were coined to reflect the "new" focus for these departments. However, despite these name changes, many departments still, even today, emphasise technology, while information and systems management is either delegated to this department or is not explicitly managed.

organisation's computer systems were developed and continued to operate. Considerable technical knowledge was required for this function while the purpose of 'the computer' was in processing data with the role of the technologist being that of a "frontiersman".¹⁷ As the contribution of technology evolved from supporting operations to providing competitive opportunities, the evolution of the role of the computer department often did not follow a similar path. Many large organisations today still maintain the legacy of this historical situation, not just in the role, structure and position of the IS function but more fundamentally in the organisational mindset. Today, many IS functions still exist not just to specify and maintain the technological infrastructure but also to devise the strategy to manage the organisation's information resources.

Figure 4 illustrates schematically the position of the IS function in relation to the rest of the organisation (labeled "the business"). It shows that the IS function delivers, either directly or indirectly through third party vendors, a variety of services to the internal business community.¹⁸ These services can be classified as infrastructure services, application services, and auxiliary services.

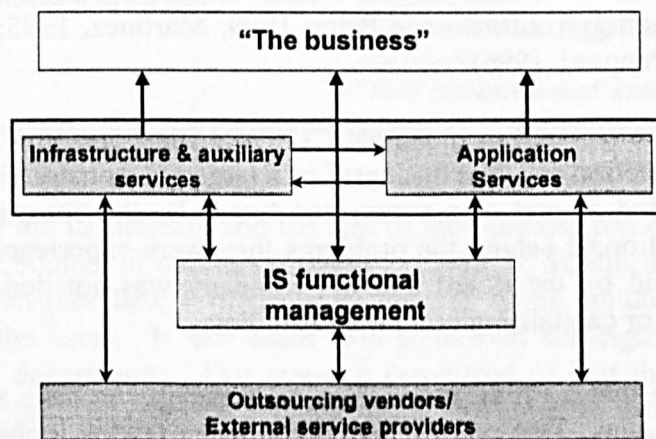


FIGURE 4 The IS function and the provision of applications and services to the business.

As guardians of the technical platform, *infrastructure services* relate to the assembling, operation and maintenance of this technical infrastructure. This infrastructure includes PCs, printers, cabling, modems, and servers as well as the operating and network systems that enables these components to function and facilitate interoperability. The IS function, via applications, provides an assortment of *application services* to users. These services, derived directly from the application of technology, are essentially concerned with the information handling ability of technology and range from e-mail to sophisticated order management facilities to supply chain applications to financial management applications. The IS function also provides a wide range of *auxiliary services* such as help desk, infrastructure architecture, consulting, contingency planning,

Recently, practitioner magazine *ComputerWorld* (1999) examined the requirements of tomorrow's IS function while *CIO Magazine* (2000) explored the future of the IS function.

¹⁷ Phrase taken from an unpublished conference presentation by Bo Hedberg.

¹⁸ Many IS functions are today also delivering IS services to customers, for example with ebanking, and suppliers, for example with e-procurement.

security and back-up, training, vendor management, service development, systems analysis and systems design, and systems development.

As noted in the previous section, despite IT being used in organisations for the past 30 years, in many organisations the senior management team continue to be dissatisfied with the value which they perceive their organizations are deriving from their investments (Compass Group, 1999; Grindley, 1991a).¹⁹ “After spending billions of dollars on information technology, its still difficult for senior executives to connect their company’s technology investments to business performance” (Marchand *et al.*, 2000, p. 69). This situation generally reflects badly on the IS function, with blame usually placed at the door of the IS Director (or Chief Information Officer) and the IS function. Whether a contributor or consequence, there is often a poor relationship between the IS function and the rest of the business (Grindley, 1991a, b; Martinez, 1995; Schein, 1992; Ward and Peppard, 1996). The relationship can be such that the IS function operates in a vacuum from the rest of the business, developing technological solutions with little direction from the business or at best limited involvement in the strategy formulation process.²⁰ Consequently, the relationship between the IS function and the rest of the business is seen as a critical success factor in the adoption and exploitation of information technology (Luftman and Brier, 1999; Martinez, 1995; Stewart and Klaus, 2000; Ward and Peppard, 1996).

Table 2, taken from Ward and Peppard (1996), illustrates the “wall” that existed between the IS function and “the business” in a large UK construction company. These quotes were elicited as part of a survey conducted by the company in an attempt to understand the rationale behind the problems they were experiencing in relation to IT and the belief held by the Board that the company was not deriving value from its investments in IS or capitalising on IS opportunities.

There is evidence that a strong IS/business relationship can have a positive impact on business performance. One of the case study organisations included in Peppard and Ward (1999) provides evidence of the impact on business performance of a close and harmonious relationship. This organisation was recognised as a leader in their industry regarding the application of IT, and has consequently enjoyed major success capturing market share from competitors through its innovative use of IT.

Two of the case study organisations in Peppard and Ward (1999) illustrated situations where the relationship was characterised by both the IS function and the rest of the business as poor. In both cases, “the business” did not believe that the IS function was delivering value, with the reputation of the IS function being ranked low (1.7 and 2.3 on a 5-point Likert scale) as was the service provided by the IS function (2.4 and 3.3 on a 5-point Likert scale) with the business’s assessment of applications and systems in both cases as “less than satisfactory”. For one of the organisations, analysis of the data collected indicated that “business management are not giving strategic guidance and there is a low level of business management commitment. IT management contend that the business in general has low awareness of IT and IT issues: business managers are somewhat neutral on whether IT is a driver of future competitiveness. Business

¹⁹ Notwithstanding comments made in section 2.3 regarding the measurement and assessment of value.

²⁰ This was the situation at the case company in Peppard *et al.* (2000).

managers feel somewhat uneasy dealing with IT (but high standard deviation); agree that they need to increase their knowledge of IT and recognise that they are not proactive in relation to IT but neutral on whether it is the responsibility of the IT function to specify IT requirements (high standard deviation indicating disagreement within the management ranks)" (p. 42-43).

TABLE 2 'Wall' between IS function and "the business" at a UK construction company as articulated by each side (from Ward and Peppard, 1996, p. 38).

The business perception of IS function	The IS function's perception of "the business"
"No confidence in IT"	"View IT as a cost, not an investment"
"It's a waste of money"	"No mechanism for justifying the business case for IT"
"Lack of commercial edge"	"No strategy guidance for IT"
"Too defensive"	"Top management not committed"
"Not practical"	"Users do not understand cost and value"
"[System] is rubbish and unfriendly"	"No business strategy"
"Wants rather than needs dominated"	"IT responsible for "everything", IT the whipping boy"
"Can't get information"	"No cost recovery from [company's] customers"
"They are pre-occupied with the state of the art IT"	"Lack of awareness of what IT can offer"

This gap between the IS function and the rest of the business has been referred to as a 'culture gap' by a number of scholars (Grindley, 1991a, b; Schein, 1992). According to Grindley's research (see Box 1 for selected quotes) "[t]he culture gap leads to non-participation by the users. It also leads to a somewhat self-righteous and defensive attitude in the IT department... Our research convinced us that the culture gap was a very deep-rooted problem, and of a much more fundamental nature than the simple knowledge gap experienced when dealing with other specialists. IT affects everyone's job" (Grindley, 1991a, p. 120).

The IS function can have a culture which is distinct from the overall culture of the rest of the organisation and can thus be considered as a subculture within the overall organisational culture (Schein, 1992). Research has shown that within any organisation, there may be two 'types' of people, IS professionals and business managers/users, who can behave differently, holding different values and beliefs, and can have different "worldviews" (Couger and Zawacki, 1980; Orlikowski and Gash, 1994; Rochester and Douglas, 1990; Straub, 1991). Over long periods of time subcultures may generate behaviours or actions which are dysfunctional to the dominant corporate culture (Young, 1989). However, there is little academic work specifically addressing the issue of IS subcultures (Walsham, 1993, p. 37).

For many organisations, their increased dependence on IS for the conduct of business, the often poor relationship between the IS function and the rest of the business, the perceived inability of the IS function to deliver and the often reluctance of non-IS staff to get involved in information and systems related activity contribute to a continuous cycle of unfocused effort leading to a questionable situation regarding the future success

of the organisation in the new digital environment. The growing maturity of the outsourcing market, the emergence of ASPs, web hosting services, and server farms, coupled with the rise of e-business and its inherent demands for faster and more flexible technology, can call into question the very existence of the IS function in its traditional guise. Recently, there have been a number of special reports in highly respected practitioner journals examining the future role of the IS function (*ComputerWorld*, 1999; *CIO Magazine*, 2000). GartnerGroup (1999) has published a study introducing the concept of "IS lite", "a lightweight, premium-quality variant of the IS function" which they believe many organisations will adopt in the future. And more recently, *Harvard Business Review* published a perspective piece questioning whether the position of CIO, the traditional leader of the IS function, is now obsolete (*Harvard Business Review*, 2000). There is general agreement among all these sources that the traditional role of the IS function is changing, with the CIO assuming an ever more crucial role as technology becomes ever more intertwined with business. Yet, this does not overcome the deep divisions that can exist which can impact any transition.

BOX 1 Exposing the gap: selected quotes from subjects interviewed in Grindley (1991a).

"The users say we can do all this on a PC. The techies say no you can't, there are bigger, wider issues which you can't understand. This is the culture gap: they're both trying to get in on the same game. The IT department's defense is to say it's all too complex for you. But the user is tired of hearing us say we can't deliver."

"The culture gap is caused by unrealistic user expectations fuelled by misleading IT advertising."

"What I found was this great void, where the IT techies would talk a lot of gobbledygook, and then say it'll be a four-year project. All the techies could do was go round at the lowest possible level and say: what systems do you need? Never did it come from the top down. No one ever said: This is what we need to run our business."

"I believe the key reason for the culture gap is that both parties do not understand the role of the other. IT staff fail to see the ultimate responsibility of the users to run the business: the users fail to understand many of the technical responsibilities in IT necessary to provide a secure and acceptable service."

"IT continues to be focussed more on the technology than the information: its availability and its use to support business objectives."

"The most fundamental problem is that business management see it as IT's job to deliver solutions. They don't understand their role as driving the business changes needed to make the IT element of the solution effective."

2.4 The IS function as a bundle of resources

Recently, a number of researchers have provided a difference perspective of IS in organisations, particularly in regard to improving IS performance, by drawing on resource-based theory (RBT). Originating from within the strategic management discipline, the basic premise of RBT is that what explains why some organisations are competitively more successful than others is not the dynamics of the industry within which the organisations compete (Rumelt, 1991) but the processes of resource accumulation and deployment inherent in an organisation that lead to idiosyncratic endowments of proprietary assets (Barney, 1991; Collis and Montgomery, 1995;

Dierickx and Cool, 1989; Peteraf, 1993; Prahalad and Hamel, 1990; Wernerfelt, 1984). Within the genre of RBT, the IS function can be portrayed as a bundle of resources. These resources include skills and knowledge as well as the structures, processes, procedures and bonding mechanisms within the function. Configuring these resources to delivery required competencies is a management challenge.

Traditionally, organisations have been structured such that all the resources necessary for managing IS are located within one area of the business: the IS function. The advent of outsourcing has meant that many resources lie outside the direct control of the IS function. This strategy sees the IS function, for example, buying-in knowledge from consultants or outsourcing the provision of the IT infrastructure to a third-party vendor or hiring programmers as contractors to help with development work, and this knowledge and skill must also be integrated and coordinated with internal resources.

Feeny and Willcocks (1998) explored the concept of IS competence in their research. They identified what they referred to as nine “core IT capabilities”: IS/IT leadership, business system thinking, relationship building, architecture planning, making technology work, informed buying, contract facilitation, contract monitoring and vendor development. The knowledge and skill resources required for these competencies are implicitly assumed to reside within the IS function. In addition, no explicit reference is made to those competencies required within the business as a whole in order to create value through the exploitation of information.

Sambamurthy and Zmud (1994; 1997) were the first researchers who explicitly looked at IS competencies²¹ from an organisational perspective. In their research they identified 7 categories of ‘IT management competencies’: business deployment, external networks, line technology leadership, process adaptiveness, IT planning, IT infrastructure, and data centre utility. Each of these categories contained a number of competencies, giving 29 in total. While providing an innovative perspective, three main criticisms can be leveled at this research. First, the definitions of their competencies lack rigor. For example, one competence they cite is labeled ‘existence of electronic links with the organisation’s customers’; I would argue that this is not a competence but is the outcome of having a particular competence. Second, the inter-relatedness of these competencies has not been illustrated; how do they ‘fit together’ and what is their relationship? Third, their list of competencies makes no explicit reference to the exploitation of information; this is ultimately how value is created (Davern and Kauffman, 2000; Marchand, 2000; Marchand *et al.*, 2000; McGrath *et al.*, 1995; Soh and Markus, 1995).

2.5 Bridging the relationship gap and improving IS performance

Despite the continued reference in the IS literature to the existence of a ‘gap’, empirical studies explicitly addressing how organisations can ‘plot a route’ towards bridging this gap are lacking. The ‘stages of growth model’, first articulated by Nolan (1973) and later extended by Gibson and Nolan (1974) and Nolan (1979), is probably the first piece of research to attempt to relate the transition of IT management processes to the

²¹ They use the term “IT management competencies”.

maturity of IT in the organisation. This model suggested a pattern of practices for the management of 'computing', depending on positioning relative to an S-shaped expenditure curve. Zmud (1984) considered the changing type of activity performed by IS staff, arguing that, during the 1980s, it changed from a 'manufacturing' based activity set to a 'distribution' set. He proposed a different type of IS organisation structure to reflect the need to deliver services rather than develop and deliver products. Others, including La Belle and Noyce (1987) and Keen (1988) discuss both the merits of different organisational structures and the changing nature of the skills required by IS specialists.

A more detailed assessment of the evolution of IS management practice is described by Galliers and Sutherland (1991) who synthesised Earl's (1989) planning model with Nolan's (1979) six stage model and the McKinsey '7S' model for analysing the interacting management attributes. Their conclusions, tested in a number of organisations, are essentially that: each of the attributes needs to change as the organisation becomes more dependent on its IS systems and more mature in its planning for them; if any of the attributes is unsatisfactorily addressed in an early stage of the evolution, then the organisation will be less able (even unable) to achieve success in later, more demanding, stages; positive attributes developed in the early stages should not be discarded later, since the organisation will have a legacy of products from the earlier stages to support; and for an organisation to succeed, without a major hiatus of disruption of IT supply, it should address all the 7S elements coherently at each stage before moving forward.

More recently, Cross *et al.* (1997) have described the transformation of the IS organisation at British Petroleum (BP). Building on this work, Earl and Sampler (1998) have used the distinction between 'supply', namely the provision of IT operations, systems development and user support, and the 'demand' side, namely the identification and prioritisation of applications and of opportunities to exploit emerging technologies in order to define a prescriptive model. They argue that both supply and demand have to be managed, a process which they refer to as 'market management' and propose a four stage model which helps companies balance supply and demand in managing IS. However, although an illuminating model, it is only based on the experience of one organisation.

2.6 IS and competitive advantage: In search of sustainability

The strategic management discipline has long sought to elicit the sources of sustainable competitive advantage²² and there is a significant body of research focusing on this objective. As technology begun to play an increasingly critical role in organisations in the late 1970's, it too was seen as providing a source of competitive advantage (Cash

²² Hamel and Heene (1994) have written that "[s]ustaining a profitable existence and thus creating welfare and reduced poverty in society is the basic mission of any company. Academics (as well as consultants) should develop concepts, techniques, approaches and frameworks to assist business people in fulfilling this basic mission. Based on this general mission, a theory of strategic management should primarily focus on the dynamics of 'sustainable competitive advantage' as one of the most prominent driving forces for long-term profitability and survival" (p. 315).

and Konsynski, 1985; McFarlan, 1984; Wiseman, 1985). Indeed, the IS literature pre-1990 reflects a general optimism concerning IT's potential for creating competitive advantage. More recently, there has been interest in exploring the essence of sustainability from IS (c.f. Clemons and Row, 1991a; Mata *et al.*, 1995), although this domain of study is not well developed.

What is not made obvious from either literatures is that a clear distinction between *sustainability* and *competitive advantage* must be drawn and we must understand the interplay between these two terms. Competitive advantage is an outcome²³; sustainability is an ongoing state existing "after efforts to duplicate that advantage have ceased" (Barney, 1991, p. 102). As an outcome, a particular competitive advantage may be short lived, and is increasingly likely to be so in today's technological world. When competitive advantage is enduring, it is not that a particular outcome is enduring,²⁴ although it may be, but that there is "something" in the very fabric of the organisation contributing towards ongoing and continuous advantage. What is therefore required is to determine the process that leads to that situation where the organisation has ongoing outcomes giving advantage in the marketplace.

Sustainability, from an IS perspective, can be defined as simply an organisation's ability to continually deliver value through IS thus leading to advantage. The challenge for researcher and practitioner alike is to understand what contributes towards the development and expression of this sustainability. Some insights have been provided by the IS literature (see Box 2 for some additional quotes).

Kettinger *et al.* (1994) concluded that the attainment of sustained IS based competitive advantage may be more a process of building organizational infrastructure in order to enable innovative action strategies. More recently, Powell and Dent-Micallef (1997) investigated the linkages between IT and firm performance in the retail industry, asserting that IT alone is not enough. From their study, they concluded that some firms have gained advantage by using IT to leverage intangibles, complementary human and business resources, such as organisational flexibility, integrating business strategy planning and IS/IT strategy, and supplier relationships.

In a conceptual analysis, Mata *et al.* (1995) concluded that only IS management skills are likely to be a source of sustained competitive advantage, a position referred to by Keen (1993) as the "management difference". They described these skills as the ability of IS managers to understand and appreciate business needs; their ability to work with functional managers; ability to co-ordinate IS activities in ways that support other functional managers; and ability to anticipate future needs. They suggest that in the search for IS-based sources of sustainable competitive advantage, organizations must focus less on IT, *per se*, and more on the process of organising and managing IT within a firm. Further support for this position is provided by Dvorak *et al.* (1997) who note

²³ Barney (1991) notes that an organisation is said to "have a competitive advantage when it implements a value creating strategy not simultaneously being implemented by any current or potential competitors" (p. 102)

²⁴ Barney (1991) notes that it is not the "period of calendar time that defines the existence of a sustained competitive advantage, but the inability of current and potential competitors to duplicate that strategy that makes a competitive advantage sustained" (p. 103).

that what distinguishes organisations with high performance IT is not technical wizardry but the way they manage their IT activities. Ross *et al.* (1996) and Bharadwaj (2000) contend that for an organisation to apply IT to enhance competitiveness lies in the development of an effective IS capability.

Box 2 Quotes from the literature (listed in chronological order).

- "When every leading firm in an industry has access to the same technology resource, the management difference determines competitive advantage or disadvantage." (Keen, 1993)
- "The attainment of sustained IT-based competitive advantage may be more a process of building organisational infrastructure in order to enable innovative action strategies as opposed to "being first on the scene"" (Kettinger *et al.*, 1994)
- "Successful application of IT are often due more to serendipity rather than any formal planning" (Ciborra, 1994)
- "Only IT management skills are likely to be a source of sustainable competitive advantage (SCA)." (Mata *et al.*, 1995)
- "Some firms have gained advantage by using IT to leverage intangibles, complementary human and business resources, such as flexible culture, strategic planning-IT integration, and supplier relationships" (Powell and Dent-Micallef, 1997)
- "What distinguishes companies deriving significant value from IT is not technical wizardry but the way they handle their IT activities" (Dvorak *et al.*, 1997)
- "Companies must do more than excel at investing in and deploying IT. They must combine those capabilities with excellence in collecting, organising and maintaining information, and with getting their people to embrace the right behaviours and values for working with information" (Marchand *et al.*, 2000)
- "Results from this study ... suggest that that inconsistent statistical findings about the relationship between IT and firm performance may be attributed to our incomplete understanding of the nature of a firm's resources and skills and to the fact that IT investment dollar serves as a poor surrogate for assessing a firm's IT intensiveness. ... IT-capability is not so much a specific set of sophisticated technological functionalities as it is an enterprise-wide capability to leverage technology to differentiate from competition" (Bharadwaj, 2000)

However, the IS literature to date has not defined organisation IS capability beyond an expression of its core objective of enabling an organisation to continuously derive and leverage value through IS. Nor has it conceptualised the fundamental components or characteristics of organisational IS capability. This presents a serious challenge for organisations who seek to understand and develop an IS capability as there is little guidance as to how organisational resources contribute towards both its development and manifestation.

2.7 IS management in the global enterprise

Today, many organisations have global strategies with their business interests and operations spanning multiple sites with locations in multiple countries. In addition to organic expansion in pursuing their global aspirations, organisations often engage in alliances, joint ventures and/or acquisitions.

The global organisation seeks to manage the interdependencies among geographically dispersed multi-site operating units, for example between manufacturing facilities, distribution centres and sales offices all at different locations. Information is the mechanism through which this integration is achieved and IT is increasingly being used to integrate and manage geographically dispersed operations. At the same time IT is reducing communication and transaction costs and enabling new structures and processes providing global organisations with new organising possibilities (Boudreau *et al.*, 1998; Eccles and Nolan, 1994; Malone *et al.*, 1987; Jarillo, 1998). New models for value creation are possible with value being created in 'networks' (with nodes that are globally dispersed) as opposed to 'chains' (Coyne and Dye, 1998; Normann and Ramirez, 1993; Stabell and Fjeldstad, 1998).

Two assumptions underpin the development of this sub-field of the IS discipline. The first and more general assumption is that managing in the global context is different from managing a single sited organisation and thus presents a different set of issues to be addressed. The second assumption, which is specific to the management of IS, is that there are value for money benefits and business advantages to be gained by managing IS on a global basis.

Yet, this management of information which is so crucial to the functioning of global enterprises is neglected in the IS research literature. As recently as 1991 Deans and Kane reported that a comprehensive review of the relevant literature revealed very little academic research. Similarly, the international business literature has tended to ignore information systems and the IS functional area. Palvia (1998) portrays the cumulative research base to date as being descriptive and opportunistic. Any reference to information management is generally portrayed as a technical issue and seen as being primarily concerned with communication networks and technological infrastructures. While these are important aspects, a more comprehensive treatment is required. A survey at the beginning of the 1990's showed that more than half of the 100 major multinational corporations surveyed in 1991 did not, or rarely considered IS/IT in strategy development (Amdahl, 1991). This survey also reported that the percentage of corporations that regard IS/IT as a component of their global strategy development was as low as 14%.

Most of the IS/IT research literature is 'domestic' in orientation (Deans and Ricks, 1993; Deans and Kane, 1991; Emery, 1990; Roche, 1996), i.e. addresses the management of IS/IT from a single site or business unit within an individual country. Some research has identified issues with managing IT in the global context (Ives and Jarvenpaa, 1991; Roche *et al.*, 1991), issues specific to Chief Information Officers (CIO) of global organisations (McFarlan, 1992), and there has also been some recent publication on managing international IS projects (Tractinsky and Jarvenpaa, 1995) and the effect of electronic communication on coordinating global companies (Janssens and Brett, 1994). In addition, there are a limited number of cases studies dealing with aspects of global IS/IT management (Bechler and Marchand, 1994; Clemens and Row, 1991; Huycke and Oliff, 1993; Ives and Jarvenpaa, 1994; Jelassi and Dutta, 1993; Ross, 1995). Despite this dearth of literature, 'Global Information Technology' is emerging as a sub-discipline within the IS field recognition of the increased importance of IS in globalisation and in managing the global organisation. There is now a journal devoted

to the area, the *International Journal of Global Information Technology*. In addition, a working group has been established under the auspices of the International Federation for Information Processing (IFIP) to promote research and the exchange of best practice in this area.

In summary, the existing research literature reveals little by way of guidance for managing IS/IT in the global enterprise. One paper has noted that "...the literature [on managing Global IS/IT] remains fragmentary, offering only partial and potentially contradictory normative implications for managers" (Ramarapu and Lado, 1995). Indeed, a more recent study concluded that "...the global information systems challenge appears to be more complex than commonly suggested ... there are no easy and straightforward prescriptions for practitioners involved with global information systems" (Earl and Feeny, 1996).

2.8 Summary

The important role of IS in organisations today is without question. Yet many senior executives still perceive that they are not getting value from their investments in IS and that their organisations are not leveraging opportunities provided by IT. The process theory of how IT creates business value developed by Soh and Markus (1995) illustrates clearly the situation that organisations encounter (Figure 3). Both "the IT conversion process" and "the competitive process" are well researched. However, both are also subject to considerable external influences, particularly the IT industry and the external business environment. The "IT use process" is less understood, yet it is this process in particular that organisations' need to control and manage in improving the contribution of IS to competitiveness. The discussion in this section of the exposition has highlighted a number of key points to be considered in address this task:

- There is no doubt, but in many organisations there is a relationship problem between the IS function and the rest of the business and this relationship problem can have severe implications for deriving value through IS. This relationship problem has been described as a 'culture gap' existing between employees from the IS function and those from other functional areas. However, there is little work at a subculture level in exploring the subculture of the IS function (Walsham, 1993).
- The relationship between IS and "the business" is complex and multi-layered. It has not been assessed in the detail that enables effective action to be taken.
- Experiences with BPR over the last decade have only served to highlight the multi-dimensional nature of success with IS. A central requirement is that both the IS function and other functional areas to work "in partnership" (Martinez, 1995). Beyond such assertions, this enterprise-wide perspective on IS management is lacking in the IS literature.
- Given that reference is made to the existence of a 'gap' there is a poverty of literature addressing how this gap can be bridged or indeed, how the performance of IS can be improved.

- There are issues which are peculiar to managing IS management in the global enterprise yet there is a dearth of research which specifically addresses IS management in an international setting.

A recent commentary by Sambamurthy and Zmud (2000) noted that the ‘new frame for examining the organising logic for IT activities must focus on the core underpinnings of successful IT management practice today: identifying and developing an organisation’s core IT capabilities²⁵ (*rather than managing IT tasks*); a recognition that these capabilities will be assembled, delivered and then disassembled through a variety of interorganisational networks (*rather than through the IT function acting quasi-independently in a command and control manner*); and the conviction that the most significant organising mechanisms will be those associated with integration (*rather than differentiation*)’ (pp. 112-113, emphasis added by author).

The research papers submitted with this exposition contribute towards addressing the gaps highlighted above as well as contributing to this “new frame” for examining the organising logic for IS activities.

3. Improving IS performance in organisations

This section illustrates how my research, as published in the included papers, has contributed towards a cumulative understanding of how to improve the contribution of IS to the competitiveness of an organisation.

3.1 Exploring the ‘gap’ between the IS function and the rest of the business

Ward and Peppard (1996) was an early attempt to explore in-depth the relationship between the IS function and the rest of the organisation. “This paper ... used the metaphor of a ‘troubled marriage’ to describe frequently observed relationship problems between [the] IS [function] and the business” (Ward and Peppard, 1996, p. 61). The paper noted that while the notion of the “culture gap” has been used by a number of scholars to explain the oft observed poor relationship, it highlighted that detailed analysis of the culture gap has yet to progress beyond describing its symptoms and consequences with most discussions diverting to addressing the issues surrounding centralisation and decentralisation or discussing the merits or otherwise of outsourcing versus insourcing.

The paper also noted that organisations have a cultural legacy which means that not only do they have to manage the present and for the future, but that they also have to deal with the consequences of the past relationship. It argued that like any relationship which is in difficulty, there is a need to understand the cause of the trouble, understand

²⁵ From the discussion in their paper the authors’ are actually referring to what I have labeled IS competencies.

the various perspectives and perceptions and then decide how to proceed. It lamented the fact that many organisations have chosen to rid themselves of an ill understood 'problem' by outsourcing all or part of their IS to a third party with a belief that the problem is immediately resolved.

The discourse in the paper explored the cultural context of the IS/business relationship from a number of different viewpoints encountered in the culture literature²⁶: perceptions, roles, and metaphors. The "cultural web", developed by Johnson (1992) was proposed as a device that can be powerful in surfacing the cultural dimensions of the 'gap' and engaging organisational actors in a debate. Devised to assess the inter-related components of a whole organisation's cultural attributes in the context of its business environment, it is also a powerful tool to enable the business and the IS function articulate and understand the nature and extent of the cultural gap that exists between them.

The 'web' is based on the premise that while individuals may hold different sets of beliefs, there is at some level a core sets of values, beliefs and assumptions commonly held throughout the organisation which Johnson refers to as the *paradigm*. The paradigm governs and influences an organisation's view of itself and its environment. Ward and Peppard (1996) suggested that the business and IS functions often subscribe to different paradigms. Through their respective paradigms each creates a relatively homogeneous approach to the interpretation of the complexity that the organisation faces. Since it evolves through time and is reinforced by history, it provides a repertoire of actions and responses to the interpretations of signals, which are experienced by members and seen by them as demonstrably relevant.

The paradigm is surrounded by a web of 'cultural artifacts', composed of three 'hard' and three 'soft' components through which the organisation promulgates, deliberately or unintentionally, its core beliefs. Power and organisational structures and the control systems reflect how the organisation should work. The other three – symbols, stories and myths, rituals and routines – are less rational and reflect what people inside and outside the organisation actually see and is often remembered most about the way the organisation conducts itself. A detailed discussion of these artifacts can be found in Johnson and Scholes (1993).

The paper describes the 'culture gap' obtained from data collected from a pharmaceutical organisation that had sought to bring both IS staff and business staff closer (see Figure 5). From the analysis, it was evident that the organisation had worked hard at restructuring its IS function, improving the control of activities and getting line managers involved in decision-making about IS. However, the symbols, stories and rituals, the 'softer' elements as perceived from "the business" viewpoint, had changed little over this time. Senior management were unaware of this and the impact that it had on the ability of IS to work effectively in the organisation.

²⁶ Smircich (1983) has pointed out that the concept of culture has been borrowed from anthropology where there is no consensus on its meaning.

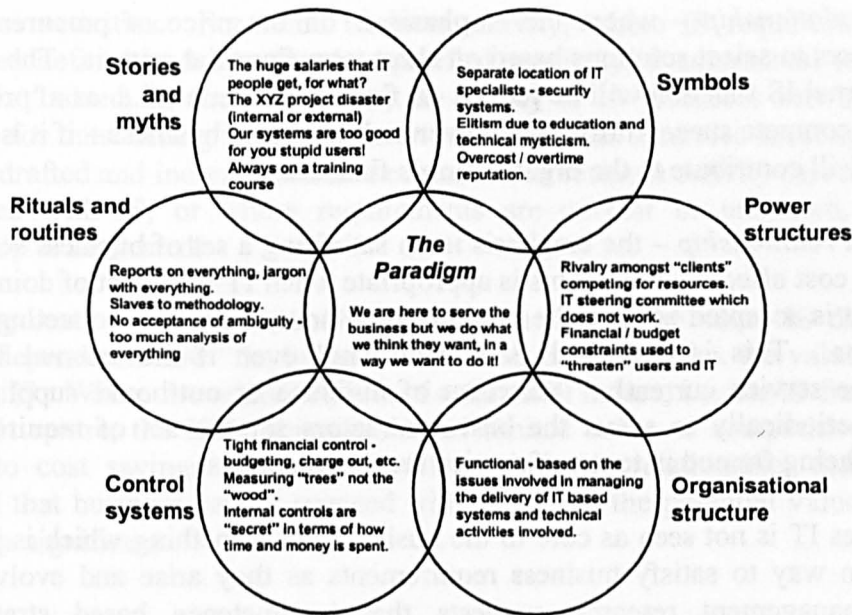


Figure 5 The cultural web analysis of IS in a pharmaceutical organisation (adapted from Ward and Peppard, 1996, p. 57).

The paper concluded by suggesting a framework illustrating a set of relationship options based on shared values of all organisational members. Four relationship types were identified (see Figure 6): financial, contractual, organisational and intimate. An organisation might need to be operating in all four dimensions at any one time and this implies a complex set of relationship aspects to be understood. Brief descriptions of the relationship types are contained in the paragraphs below.

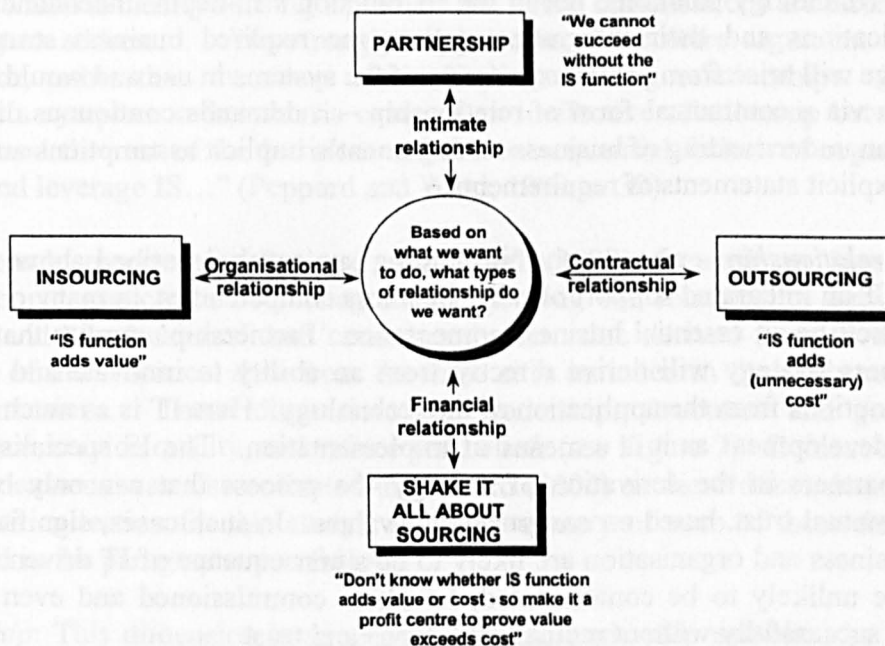


FIGURE 6 Sourcing in a mixed economy (from Ward and Peppard, 1996, p. 60).

Financial relationship – where the emphasis is on the price of procurement of IT, enabling users to select solutions based on short term financial criteria. The corollary is that an internal IS function will be judged on financial criteria – i.e. as a ‘profit centre’. If it cannot compete successfully, it will eventually have no business – if it is successful, its ‘profit’ will contribute to the organisation’s finances.

Contractual relationship – the emphasis is on satisfying a set of business service needs in the most cost effective way. This is appropriate when IT is a ‘cost of doing business’ – a cost that is accepted but is to be minimised without detriment to meeting contracted requirements. This is described as ‘outsourcing’ even if the internal IS function provides the service currently. Selection of in-house or out-house suppliers will be reviewed periodically to select the best contractors for the set of requirements, the ‘contracts’ being framed in terms of service level agreements.

In both cases IT is not seen as core to the business but something which is procured in an optimum way to satisfy business requirements as they arise and evolve. Recent strategic management research suggests that ‘competence based strategies’ are becoming important in achieving sustainable competitive success (Hamel and Prahalad, 1994; Stalk *et al.*, 1992). In many cases business capability will derive from or depend upon competence in IS and therefore the other two types of relationships need to be considered.

Organisational relationship – where the implications is that the value of IT is embedded in unique ways into the chosen areas of business competence, or as the means of delivering the integration of other competencies. Continuing alignment between the deployment of IT and the development of those competencies will be essential for business success. In this case, the ‘value added’ of IS is not just the delivery of effective technology solutions, but in the IS function’s in-depth understanding of how the applications and their integration deliver the required business strategy. This knowledge will arise from actual experience of the systems in use and would be difficult to sustain via a contractual form of relationship – it demands continuous dialogue and requires an understanding of business management’s implicit assumptions and values as well as explicit statements of requirements.

Intimate relationship – whereas the ‘insourcing’ approach described above is intended to make IT an integrated support of other business competencies, in many organisations IT will itself be an essential business competence. ‘Partnership’ implies that aspects of the business strategy will derive directly from an ability to innovate and create new business options from the application of the technology. Here IT is as much an input to strategy development as it is a means of implementation. The IS specialists involved will be partners in the derivation of strategy – a process that can only be achieved through mutual trust, based on congruence of values. In such cases, significant change to the business and organisation are likely to be a consequence of IT driven innovation. These are unlikely to be contemplated, let alone commissioned and even less likely achieved successfully without mutual confidence and trust.

Each type of relationship implies different roles for IS specialists and employees within “the business”. A key determinant of the nature of the relationship will be the role of IS

in business activities. For some business activity, where IS requirements are well known and defined and can thus be specified precisely, a contractual relationship is suggested. Indeed, in such situations, the supply of IS resources can be a potential candidate for outsourcing to a third party particularly as a service level agreement can be easily drafted and incorporated in a contract. For business activity that is inextricably intertwined with IS, or where requirements are unclear or unknown, an intimate relationship is suggested.

A key implication of this line of argumentation is that the value IS delivers to the business depends on how “the business” views IS in general, i.e. the values and beliefs regarding IS. Where the relationship is of a financial nature, i.e. the IS function is seen as a profit centre, the IS is perceived as of limited value to competitiveness, confined perhaps to cost savings. However, with an intimate relationship, there is a clear statement that business cannot succeed without IS and the potential value of IS to the business is significant.

3.2 Delving beyond the ‘culture gap’

Despite Ward and Peppard (1996) exploring the cultural context of the IS/business relationship, Peppard and Ward (1999) “attempted to progress beyond merely using the label “culture gap” as a variable in explaining the problems which can exist between the IS function and the rest of the business and explore in detail its nature and context. Ward and Peppard (1996) concluded that “...culture is a convenient descriptions of the symptoms but not an explicit cause of the gap” (p. 53). “One of the problems with attaching the culture label is that it then becomes a *fait accompli*, and almost acceptance of the situation. The ‘culture gap’ becomes a convenient label with which to attach to a situation which is clearly causing a problem but which organisations are either unable or unwilling to address. ... We strongly suggest that the culture argument is often an excuse for, rather than the cause of, ineffective working relationships. In essence, culture is a symptom rather than a cause of an ineffective relationship between the IS function and the rest of the business and the consequential failure of organisations to exploit and leverage IS...” (Peppard and Ward, 1999, p. 30).

The research reported in Peppard and Ward (1999) focused on identifying the organisational aspects to be managed in improving the relationship between the IS function and “the business” and consequently the value derived from IS investments. Analysis of the empirical data from the three sites included in the study revealed five core dimensions. These dimensions are leadership, structures and processes, IS governance, service quality, and values and beliefs (see Figure 7). Evidence supporting these dimensions was also collected in Peppard (2001) as these dimensions guided the initial data collection for this study. A brief summary of each of these dimensions is contained in the paragraphs that follow.

Leadership: This dimension is concerned with the leadership exhibited by both the IS Director (or CIO) and Chief Executive Officer (CEO) in relation to IS activities. For the IT Director, his vision, ability to mobilise his team and capacity to engage and influence senior business managers in conversations regarding IS was seen as

paramount. The leadership provided by CEO in relation to IS initiatives, particularly those initiatives that are strategic in nature, can often determine the success or failure of investments. The evidence from the case data also highlighted that the nature of the relationship between the CEO and the IS Director can be a deciding factor in determining whether IS ultimately adds value to the business.

The case of MJI, reported in Peppard (2001), highlighted the situation where there was strong IS leadership. One team leader noted “I think [IT Director] is forward thinking enough to be looking at all the new technologies [and] brave enough to take the decision to go with things.” Both the IT Director and CEO regularly discussed technology and frequently attended IS focused seminars and conferences together. The organisations IS strategy document captures the philosophy of IS in the business “... information systems cannot afford to wait for a clear and detailed specification of “*Strategy*” from the business and customers it is trying to serve. It is more a question of applying ‘IS/IT’ foresight to the situation, in order to make reasoned assumptions to an appropriate course of action.”

A contrasting situation existed at PSD (also reported in Peppard, 2001) where the IT Director was seen as weak, lacking in providing IS leadership, and having lost the confidence of senior management. The CEO was seen as supportive of IT “in general terms ... because it is fashionable at his level” (senior business manager).



FIGURE 7 A framework for managing the relationship between the IS function and the rest of the business (adapted from Peppard and Ward, 1999, p. 54).

Structures and processes: To facilitate IT/business integration, the data highlighted that appropriate structures and processes are required. Although the conventional view of a process is ‘a set of activities’, the evidence suggested that this perspective is not appropriate or indeed applicable in service or knowledge oriented environments.²⁷ In such contexts I have argued that it is more appropriate to view the concept of process in terms of roles, rather than activities, with a process portrayed as “a collection of roles

²⁷ This mechanistic notion can be traced back to the era of scientific management and, in particular, the work of Frederick Winslow Taylor.

collaborating and interacting to achieve a particular goal” (Peppard, 1999b, p. 300). This viewpoint can be extended to make explicit reference to behaviours. Within this conceptualisation, a process is an organised collection of knowledge and behaviours that satisfies a defined business purpose, performed according to specific targets. Such a view is of particular relevance in knowledge work, where knowledge and skills are critical to the ability of the organisation to perform (Lawler, 1994) or in areas where there is a high degree of interaction with customers. For example, specifying the precise activities in customer service processes is difficult, if not impossible (Solomon *et al.*, 1985). Guidelines as to the behaviour to be exhibited can be given, however attitude is often the crucial ingredient in determining whether or not a customer is satisfied. Thus, roles are embedded in processes and incorporate expected behaviours.

Evidence from Peppard and Ward (1999) and Peppard (2001) suggests that addressing the roles²⁸ of individuals is central to improving the relationship and consequently the performance of IS. All employees perform a variety of roles in an organisation. The data suggested that those outside of the IS function can have roles related to activity that might be considered as being traditionally located the domain of IS. Peppard *et al.* (2000) and Peppard (2001) suggest that the role of all employees in an organisation incorporates an IS dimension and that information management, including collecting, organising and maintaining information, must be explicitly incorporated into the roles of all employees. However, Peppard *et al.* (2000) laments that fact that while “information technology provides a powerful vehicle for processing information, the focus on technology has often moved the emphasis away from the real issue of exploiting information for value creation to the delivery of technology. In general, information technology has no inherent value in itself; for example, just having PCs on employees’ desks does not confer any value to the organisation. The value must be unlocked and it is only business managers and users who can ensure that this occurs. In short, the ‘T’ of IT has become the focus of attention rather than the ‘I’. Unfortunately, information is a Cinderella with few champions whilst the ‘T’ has lots of mercenaries (the technology supply industry, IS functions and outsourcing vendors, to name but a few). Yet the irony is that information is a factor of production while technology is a cost of doing business. Organisations must redress the balance in favour of the ‘I’ if value is to be created” (p. 293).

²⁸ The concept of roles and role theory is useful in understanding the behaviour of individuals in both groups and organisations. The history of role theory dates to the 1930s, when sociologists and anthropologists studied roles as a key to explaining the origins of social behaviour (Linton, 1936; Mead, 1934). Since then, role theory has emerged as a recognized discipline (Biddle and Thomas, 1966). Building on the sociological roots of role theory, Graen (1976) developed a ‘role systems model’ in which role behaviour is the result of organisational demands, social demands and personal demands. Katz and Kahn (1978) applied similar ideas to their organisational role theory, which emphasizes organisational factors, interpersonal factors, and attributes of the person. In an organisation, an employee’s role is indicated by a position title and specified by a “job description” (Cherrington, 1994). Employees are likely to have to perform different roles in the job at different times. It has already been noted that “in order that the organisation can achieve its goals and objectives the work of individual members must be linked into a coherent pattern of activities and relationships. This is achieved through the ‘role structure’ of the organisation” (Mullins, 1993, p. 186). Roles can be tightly defined or loosely defined and have different degrees of discretion associated with them (Kakabadse, 1982; Korac Kakabadse, 1997; Korac Kakabadse and Kouzmin, 1996). A role encompasses the expected behaviours attached to a position or job.

IS governance: IS governance is concerned with outlining responsibilities and accountabilities, defining the set of rules guiding information, systems and technology decision making in an organisation and managing the interdependencies across the range of IS decisions. In short, it is about achieving coherence across the scope of IS decisions. Research published in a conference proceedings (Peppard *et al.*, 1999) highlighted that IS governance has six components:

- **content:** the decision areas which are being governed. Included here are both IS demand and technology supply (IT infrastructure) decisions, for example, project management, operating systems, prioritisation, IS planning, etc.
- **responsibilities:** the individuals or bodies responsible and accountable for decisions.
- **co-ordination:** the mechanisms and processes for insuring coherence across all decision areas. It is concerned with defining the committees, groups, and other mechanisms for ensuring a co-ordinated approach to IS decision making, including roles to be played by individuals and groups. For example, unco-ordinated decisions around technology can lead to incompatible technologies being implemented which can have a serious impact on enterprise integration..
- **policies:** definition of policy statements, parameters and guiding principles for decision making in the different decision areas.
- **execution:** defining who is responsible for the day-to-day execution of IS activities.
- **control:** the mechanisms for policing decisions to ensure compliance.

Service quality: Section 2.3 illustrated that the IS function provides a range of services for the organisation. The quality of many of these services, such as help desk, problem resolution, consulting and systems analysis is assessed by the recipients based on their perceptions (Zeithmal *et al.*, 1990) and is based on a comparison between what is expected and what is actually provided (Parasuraman *et al.*, 1991). Consequently, managing the quality of IS services has become an increasingly important task for the IS function.

The three case studies reported in Peppard and Ward (1999) illustrated contrasting perspectives on service quality. The data revealed that only in Financial, where IS was perceived as delivering significant value to the business, had the IS function a strong sense of service. In the words of one IT manager "service is what it is all about." There was continuous feedback of information to the IT department with regular contact, both formally and informally, between IS staff and staff from other functional areas. The quantitative survey highlighted the strong empathy which business staff felt IT staff had of their issues when delivering the service. This was in contrast to the situation at Manufacturing, where service was defined in terms of network up-time and system response times rather than explicitly on meeting the needs of internal customers.

Values and beliefs: The research reiterated the findings of other researchers, highlighting the importance of ensuring that the right "mindset" exists in the organisation regarding the management of IS. Values and beliefs can significantly shape attitudes and hence behaviour and practices. For example, if business managers do not believe that IS is strategic, this will be reflected in how they manage and deal with IS issues as well as in collecting, processing, storing and sharing information. It has already been noted that as well as the 'baggage' that employees bring with them

from previous experiences, their behaviour can also be shaped by myths, stories, rituals and routines which exist within both the IS function and the rest of the organisation.

The case of Manufacturing, reported in Peppard and Ward (1999), where IS was perceived as not delivering value, the IS function was seen as peripheral to the rest of the organisation. Business management indicated that they would rather adopt a “hands-off” approach to IT and believe that IT projects should be managed from the IS function. One business manager commented that the IS function should be “more proactive in IT projects. IT should drive all IT projects... [and] not put responsibility on area owners”. This situation was supported by a comment from a senior IT manager “the problem with my colleagues in the business is that they see IT as a cost, not a resource”.

Research related to each of these dimensions can be found in the IS literature (see Table 3). However, the research reported in Peppard and Ward (1999) indicated that each dimension on its own is not sufficient to address the organisational aspects of the relationship and that a more holistic perspective is required. For example, hiring a new CIO will not automatically solve problems regarding the inability of IS to deliver value; however, he/she may help in the creation of an environment for success. The other four dimensions must also be addressed. In addition, Peppard (2001) highlighted the importance of the CIO being a strong visionary as well as having the credibility to mobilise his staff and engage senior business managers in dialogue. Further research is needed to explore the nature of the relationship between these dimensions.

TABLE 3 Organisational dimensions and key literature references.

Organisational dimension	Literature references
Leadership	Applegate and Elam, 1992; Earl and Feeny, 1994; Feeny <i>et al.</i> , 1992; Korac Kakabadse, 1997; Stephens <i>et al.</i> , 1992
Structure and processes	Blanton <i>et al.</i> , 1992; Brown and Magill, 1994; George and King, 1991; Hodgkinson, 1996; Venkatraman, 1997; Von Simson, 1990
Service quality	Pitt <i>et al.</i> , 1995; van Dyke <i>et al.</i> , 1997; Whyte <i>et al.</i> , 1997
IS Governance	Brown, 1999; Peppard <i>et al.</i> , 1999; Sambamurthy and Zmud, 1999
Values and beliefs	Grindley, 1991a; Orlikowski and Gash, 1994; Venkatraman, 1997

3.3 Improving the contribution of IS: misplaced focus

Over the years, organisations have implemented programmes to improve the relationship between the IS function and the “business” and consequently the performance of the IS function. However, implicit in many of these programmes is an assumption that the issues and problems with IS in the organisation originate from within the IS function. “Recognising the imperative to generate value from IS, organisations often engage in an examination of their IS function and many have looked towards the re-engineering of IS processes. However, such re-engineering efforts

generally only address the supply of technology into the business: the IS function becomes better at building and operating applications. Yet, these applications may only be contributing marginally to the achievement of organisational goals and objectives as the focus is on building and operating applications and technology rather than delivering significant business benefit" (Peppard *et al.*, 2000, pps. 292-293). In addition, there is no consideration of responsibilities of "the business" regarding IS activity, a key aspect of IS governance.

Delivering value through IS and improving the contribution of IS is not solely about the IS function improving its own performance. Peppard and Ward (1999) noted that in organisations where it was perceived that IS was not making the contribution to the business that senior managers believed it could and should, that the IS function "emphasised technical matters, focusing on the provision and delivery of technology" (p. 53). As noted in Peppard *et al.* (2000), delivering value from IS is an enterprise-wide issue and not a process that can be abdicated to a single functional area which, in most organisations, is generally the IS function. "In isolation, even a fully committed IS function can achieve very little without significant involvement and commitment from the business side ..." (quoted in Peppard, 2001, p. 61). The XY Bank case study from Peppard (2001) illustrated the problems of attempting to create a high performance IS function without significant involvement and commitment from "the business". The senior management team of the IS function recognised that they can only progress so far down the road towards becoming a value-added entity before the organisation as a whole assesses how IS is managed and role and responsibilities assigned. This situation was perhaps best captured in a statement by one IT manager at the bank who remarked "[w]hat use is a world class IS organisation, if working in a 'scum bag' organisation" (quoted in Peppard, 2001).

Further, Peppard and Ward (1999) noted that with some of the initiatives being implemented "[m]any organisations are attempting to transform their IS function and create a high performance IS unit. However, we believe that this is addressing the wrong question. This question is how can high performance be derived from IS. Phrased accordingly, it is a fundamentally different question and provides a different way of looking at the issues and consequently a different answer ensues" (Ward and Peppard, 1999, p. 55).

Before embarking on any programme to improve the contribution of IS, and consequently the value delivered to the business, it must be recognised that managing IS is complex and multi-dimensional, and this was highlighted in Peppard (1996), particularly when using IT in process re-engineering initiatives. From an analysis of published research, the paper noted that "[t]he original message of BPR is that by redesigning business processes using the power of IT, organisations can achieve 'breakthroughs' in performance. While this message is appealing, the dynamics of organisations are much more complex. Focusing on 'process' demands new work practices which have implications for human resources, recruitment, training and staff development. Remuneration and reward systems must be devised in order to be consistent with new ways of working and to ensure that desired behaviors are fostered. Traditional financial oriented performance measurement systems become inappropriate and are required to be redrawn to reflect the new realities. Before considering re-

engineering of business process issues of strategy must be addressed. The post-BPR organisation raises fundamental questions concerning leadership and management” (p. 266).

3.4 Organisational IS competencies

Drawing on RBT, Peppard *et al.* (2000) set out to identify and define a set of IS competencies necessary to create value at an organisation level. Using a multi-methodological approach, this research identified 25 generic IS competencies. These 25 competencies were labeled “micro” IS competencies and they were grouped under six higher-level “macro” IS competencies. Figure 8 illustrates the framework which demonstrates the relationship between the six macro IS competencies. This framework is an extension of the traditional ‘business – IT alignment’ models and explicitly incorporates the notion of exploitation as it is only through exploitation that value is delivered. Table 4 defines these macro IS competencies while the definitions of the 25 micro competencies are contained in Table 5.

This research highlighted that IS competencies do not reside in single functional areas as may be defined by an organisation’s structure. “It is important to view information [system] competencies from an organisational rather than an IS functional perspective and that the competencies necessary to deliver value are likely to transcend functional organisational boundaries” (Peppard *et al.*, 2000, p. 315). While the IS function is traditionally seen as providing IS resources, resources for IS competencies are distributed across the organisation. “Some component elements of each competence may reside in “the business” while others may reside in the IS function. Yet all elements must exist in a holistic context of a particular competence is to exist” (Peppard *et al.*, 2000). This has implications for not just managing the IS function but for the management of IS.

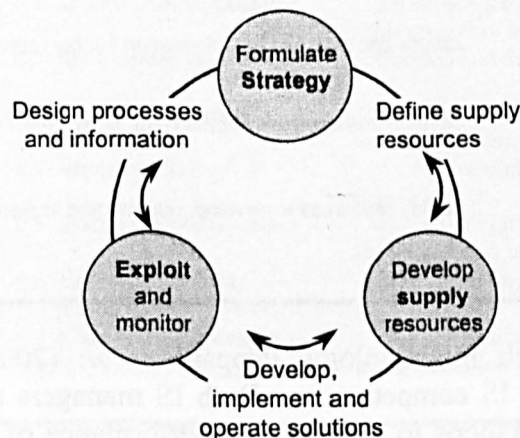


FIGURE 8 A framework for positioning competencies (from Peppard *et al.*, 2000, p. 305).

Despite the focus of my early work on the relationship between the IS function and the rest of the organisation, “[t]he IS function’s ability to build relationships with the business is not a competence” Peppard *et al.*, 2000, p. 315). This finding is in contrast

to the assertion of some IS scholars (for example, Feeny and Willcocks, 1998; Ross *et al.*, 1996; van der Heijden, 2000). Building and fostering relationships with business managers and users is enshrined within the roles of many IS staff. This point was clearly illustrated by a senior IT manager at XY Bank, quoted in Peppard (2001), who noted “[o]ne of the problems we have got, I think, is that basically we are doing all the hard work to try and get the trust and everything else, but somebody from the rest of GIS (Group Information Services) could, in a moment, destroy a lot of that by saying the wrong things: I wouldn’t have bought this system, or I wouldn’t do that, or why are you doing that...”. However “the ability to build relationships with suppliers and vendors is a competence” (Peppard *et al.*, 2000, p. 315).

These IS competencies exist outside of the prescribed organisation structure, cutting across traditional organisation boundaries with constituent resource elements located organisation-wide and not solely in the IS function. “From this organisation wide perspective, the folly of ... assigning responsibility to the IS function for information [system] value creation becomes obvious” (Peppard *et al.*, p. 315). As IS competencies do not exist in any one functional area, this presents management with the challenge of developing these competencies within an existing “functional” structure. “The important contribution which *business* managers make to each of the individual information [system] competencies should be recognized” (Peppard *et al.*, 2000 p. 315).

TABLE 4 Macro IS competence definitions (adapted from Peppard *et al.*, 2000, p. 302).

Formulate strategy	...evaluate strategic information and technology-based opportunities as part of the business strategy formulation process and define the decision-making environment
Design processes and information	...translate the business strategy into processes and information based needs
Define supply resources	...translate the business strategic vision into long-term information supply resource requirements
Develop supply resources	...create and maintain the information supply resource
Exploit and monitor	...develop and apply exploitation plan and monitor value creation
Develop, implement and operate solutions	...deploy resources to develop, operate and implement solutions

Using an action research methodology, Peppard *et al.* (2000) evaluated a single organisation vis-à-vis its IS competencies. Both IS managers and business managers participated in joint workshops to assessed the performance of each of the 25 micro-competencies in order to identify problem areas. Figure 9 schematically summarises the consensus view across the organisation for each of these competencies. The outer ring of the chart indicates the required level of performance, with the shaded area indicating the performance as assessed by participating managers.

TABLE 5 IS competencies (from Peppard *et al.*, 2000, pps. 307-308).

Macro IS competence	Micro IS competence	The ability to...
1. Formulate strategy	1.1 <i>Business strategy</i>	... influence business strategy and its formulation to make the best use of information
	1.2 <i>Technology innovation</i>	... incorporate the potential of technological innovations in the business strategic vision
	1.3 <i>Investment criteria</i>	... establish appropriate investment criteria for investments in information
	1.4 <i>Information management policies</i>	... define IS/IT management policies that enable effective delivery of the IS, IT and business strategies
2. Design processes and information	2.1 <i>Prioritisation</i>	... understand which elements of organisational knowledge are critical to delivering the strategy
	2.2 <i>Information alignment</i>	... align the information required to the business strategy
	2.3 <i>Business process performance improvement</i>	... develop and support business strategy performance improvement
	2.4 <i>Information innovation</i>	... incorporate the potential of information innovations in the business strategic vision
	2.5 <i>Business process design</i>	... design business operations and processes required to deliver the business strategy
3. Exploit and monitor	3.1 <i>Exploitation planning</i>	... explicitly identify and plan exploitation of information
	3.2 <i>Benefit evaluation</i>	... monitor and evaluate the costs and benefits on an ongoing basis
4. Define supply resources	4.1 <i>Infrastructure design</i>	... design long-term supply capabilities to meet future demands
	4.2 <i>Technology analysis</i>	... monitor and understand technological advances to select appropriate infrastructure directions
5. Develop supply resource	5.1 <i>Sourcing</i>	... determine and evaluate supply sourcing options
	5.2 <i>Supplier relationships</i>	... manage and develop relationships with suppliers
	5.3 <i>Technology standards</i>	... determine and maintain appropriate standards, controls and methods for application development
	5.4 <i>Technical architectures</i>	... develop and maintain technical architectures
	5.5 <i>IS/IT staff development</i>	... develop IT technical skills
6. Develop, implement, and operate solutions	6.1 <i>Service level definition</i>	... define service level requirements to support the achievement of business benefits
	6.2 <i>Applications development</i>	... develop and deliver IS/IT solutions to the business
	6.3 <i>Defining Information requirements</i>	... identify and exploit the value of information and information systems
	6.4 <i>Apply technology</i>	... deploy technological solutions to deliver business benefits
	6.5 <i>Systems implementation</i>	... implement information systems, including the associated new ways of working
	6.6 <i>Continuity/security planning</i>	... plan continuity and security procedures
	6.7 <i>Change management</i>	... manage business change issues for implementation

At these workshops critical issues were discussed concerning each of the micro competencies and the output enabled the participating managers to make a persuasive presentation to the Board dealing with required improvements based on an agreed assessment of the current situation. The overall consensus was that the organisation had an ability to manage the sourcing and supply of systems and technology, but the IS

function was getting little guidance from business management and that the exploitation of the technology was poor.

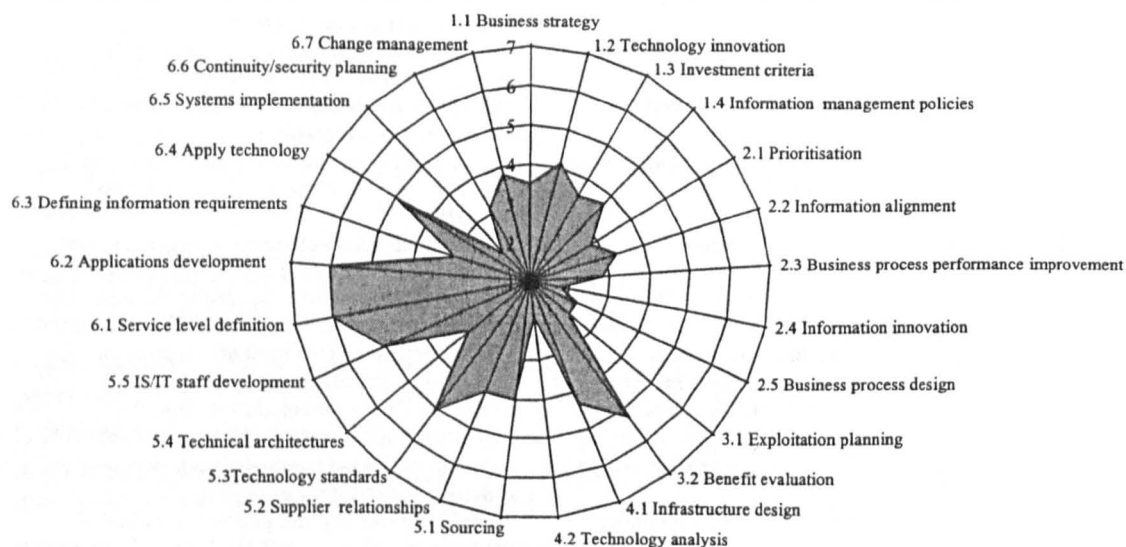


Figure 9 Summary of assessment of performance of micro IS competencies within the study organisation (from Peppard *et al.*, 2000, p. 310).

The evidence also suggested that significant resource elements for the competencies related to the sourcing and supply of systems and technology may reside primarily within the IS function. The case highlighted that the organisation performed this IS competence relatively well, probably indicating that this was due to the fact that resource elements were under the control and responsibility of the CIO. Other IS competencies were assessed as being performed less well, and the paper suggested that this was probably due to the fact that resource elements which formed these particular competencies were dispersed throughout the organisation and were not adequately integrated and coordinated.

3.5 Bridging the 'gap' between the IS function and the rest of the business

It has already been noted that, with the exception of Earl and Sampler (1998), research to date has produced 'stage models' which are descriptive and static and do not capture the process of change nor do they provide guidelines for organisations to improve IS performance. The research reported in Peppard (2001) develops a process model that provides a 'route map' for organisations attempting to bridge the gap, increase the performance of the IS function and consequently the contribution of IS to the business.

This research was a longitudinal study of three organisations. A process model containing 6 stages, illustrating the route to creating high performance from IS, was constructed from cross-case analysis of the data (see Figure 10). Although an empirically derived model from data from three study sites, it does represent the first attempt to provide guidance to construct a route to creating a strong relationship and

improve the performance of IS. The stages and key events are summarised below (the detail backed up data and evidence is contained in Peppard (2001)).

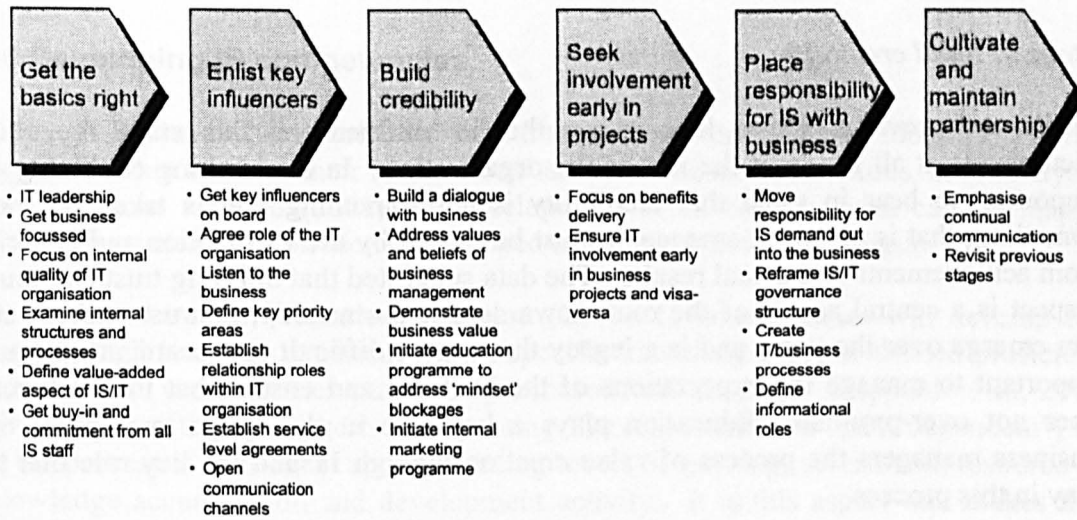


FIGURE 10 A process model illustrating how the gap can be bridged (from Peppard, 2001).

Stage 1: Get the basics right

The first stage involves focusing on the IS function itself, ensuring that it can deliver basic IS services. These are primarily technology focused and tactical, and include network up time, availability and reliability of applications, and help desk response times. This usually requires an examination of internal structures and processes, particularly in the areas of project management and quality of its customer service. The evidence from the cases was clear in asserting that it is futile attempting to improve the relationship if the ability of the IS organisation to meet basic business expectations is either weak or non-existent. This usually entails establishing metrics to measure and assess performance. It is also important for the IS function to get business focused, however obtaining the buy-in of all IS staff is crucial, if the IS capability is to develop further. A central ingredient is the leadership, credibility and vision of the IS Director.

Stage 2: Enlist key influencers

Within any organisation there are particular individuals who are pivotal to what happens in the organisation, the so-called opinion leaders or key influencers. If the transformation of the IS organisation is to progress, the evidence from the cases suggested that it is important to get these influencers on board before proceeding to the later stages; the visibility that these individuals bring is not only to add impetus to the process but can also decide the fate of the initiative. Enlisting key influencers generally requires that there is some agreement reached as to the role and function of the IS organisation. This is seen as not only giving clarity to the role and establishing expectations but also identifying areas of potential conflict that may have implications

at later stages, for example centralising some aspects of IS spend previously distributed across the organisation or the imposition of technology standards.

Stage 3: Build credibility

While the previous stages focused on the key influencers, this stage focuses on incumbents at all levels in the rest of the organisation. In establishing credibility it is important to bear in mind that credibility is not something that is taken but rather something that is given; in essence, it must be earned by the IS function and is derived from achievements and actual results. The data suggested that building trust and mutual respect is a central aspect of the route towards true partnership; distrust on both sides can emerge over the years and is a legacy that can be difficult to discard. It is equally important to manage the expectations of the business and ensure that the IS function does not over-promise. Education plays a key role in this stage to impress upon business managers the process of value creation through IT and the key role that they play in this process.

Stage 4: Seek involvement early in projects

Having credibility is not an end in itself; rather it establishes the launch pad for passing through the final stages. Without a credible IS function, business managers are unlikely to risk being involved or will be cautious in getting involved in IS related matters, not to mention assuming responsibility for activities and decisions traditionally made by the IS function. The case study evidence suggested that the IS function should actively seek out the involvement of the business in IS projects. Equally, the IS function should get involved in projects when invited to by the business.

Stage 5: Place responsibility for IS with the business

The case data highlighted the importance of business managers taking responsibility for aspects of IS which traditionally may have been delegated to the IS function. This requires reframing the IS governance structure, as many "IS decisions" taken by the IS function should often be the concern of business managers. The organisation-wide nature of IS competencies and the distribution of component resources has already been noted, and resource elements from "the business" are required for IS competencies to be enacted.

Stage 6: Cultivate and maintain partnership

Like any relationship, the relationship between the IS function and the rest of the business must be continuously worked on. Both technology and the business environments are continually changing requiring appropriate responses to be made. Yet, there is the danger of business management getting complacent and not recognise

their contribution to IS success – reiterating the fact that the resources underpinning IS competencies are enterprise-wide.

3.6 Developing IS competencies

Although Peppard (2001) collected data from three companies that sought to improve the relationship between their IS functions' and other business functions, in re-analysing the data from Peppard (2001) the development of IS competencies can be mapped against the transformation model developed in Peppard (2001) (see Figure 11).

As explained by the evidence in Peppard (2001), IS competencies will develop over time through learning, experience, firm specific knowledge, and/or trained proficiency in a skill. IS competencies cannot be purchased "off-the-shelf" (Peppard *et al.*, 2000). Resource-base theory suggests that creating IS competencies is "path dependent", that is, the process is contingent upon preceding levels of learning, investment, resource and knowledge accumulation and development activity. It is this aspect that makes them extremely difficult to imitate.

The early stages of the process model seeks to establish the necessary conditions to improve IS performance. The activities and initiatives during these stages have a twin objective – to improve the IS function's ability to meet fundamental business expectations and to begin the process of engaging business managers in dialogue vis-à-vis IS.

During the first stage, the macro IS competencies 'develop supply resources' and 'development, implement and operate solutions', begin to be developed and as the organisation passes through later stages both competencies are further enhanced. These two competencies are centered on the supply of technology and developing business solutions. By focusing on 'key influencers' in the organisation and listening to the business (Stage 2) the IS function begins the process of engagement with senior business executives in order to ensure that it has significant involvement in the strategy process – the competence 'formulate strategy' begins to be developed. These early stages depend heavily on the IT director's leadership skills, vision and ability to mobilise the staff of the IS function.

Stage 3 of the model actively seeks to improve the credibility of the IS function, breaking down the 'mindset' blockages of middle management and users which can be present due to the historical legacy of IS in the organisation. The evidence from Peppard (2001) suggests that this can be a significant task and should not to be underestimated. The 'development, implement and operate' competence is further enhanced by getting the active involvement of the business in implementation. The competencies 'design process and information' and 'define supply resources' can be initiated with both IS and business staffs in partnership; however this competence will not be effective if the 'formulate strategy' competence has not at least begun to manifest itself as both are dependent strategic direction from "the business". Neither competence can be driven successfully solely from an IS functional perspective. Unlocking the

value from IS and realising the benefits can only be achieved through exploitation by “the business”.

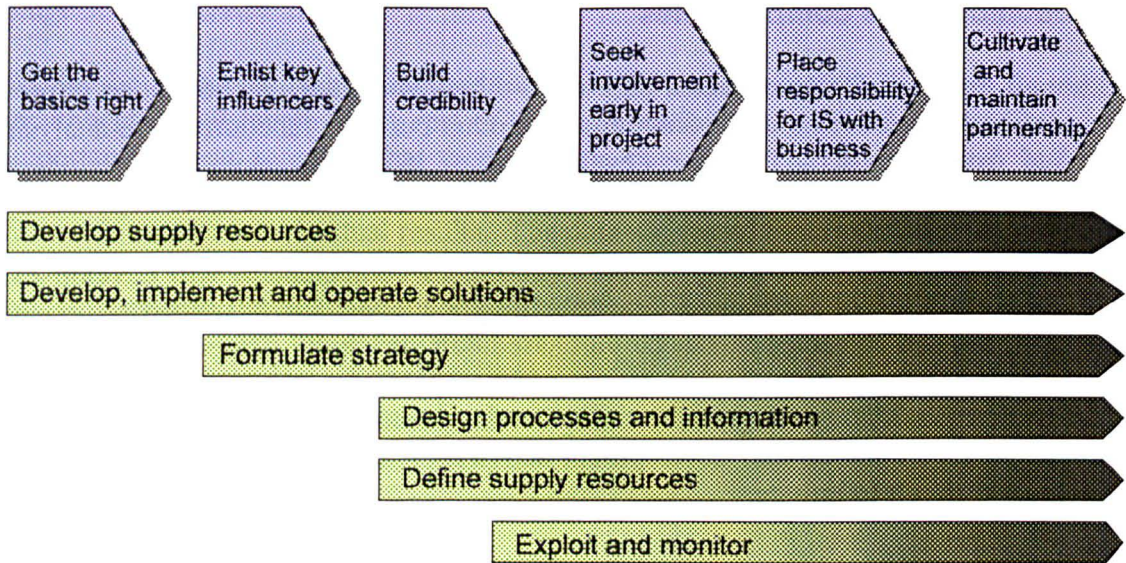


FIGURE 11 IS competencies (from Peppard *et al.*, 2000) mapped against the process model for transforming the value-added contribution of IS (from Peppard, 2001).

While the figure shows competence development beginning at various stages, once initiated, it is then a continuous process of competence evolution. As the organisation progresses through the stages in the model, the competencies become more developed and stronger with both their performance and contribution improving. Once a competence has been developed it requires continual nurturing and enhancement, incorporating new learning and experiences (Stage 6).

3.7 A framework for managing IS in a global context

Peppard (1999) constructed a framework for analysing IS in globally distributed enterprises in order to understand the content and context of IS management. “Drawing on a diverse and comprehensive literature base, the conceptual framework presented in the paper extends the traditional prescription of aligning information management strategy with business strategy suggesting that, particularly in the global context, both the drivers of the globalisation process as well as how the business organises itself in the international arena exert a major influence. The framework recognises the central role which IS can play in global operations. IS can both support and enable new strategies, new structures and offer new tradeoff possibilities. At the same time, IT provides opportunities in organising for global operations enabling new configuring and control strategies and provides novel ways to leverage capabilities. The global business drivers are themselves strongly influenced by developments in technology, affecting the globalisation process itself” (p. 89-90). Illustrated in Figure12, this framework has four dimensions: global business strategy, global business drivers, global business model and

global IS strategy. Although described in detail in Peppard (1999) these dimensions are briefly summarised below.

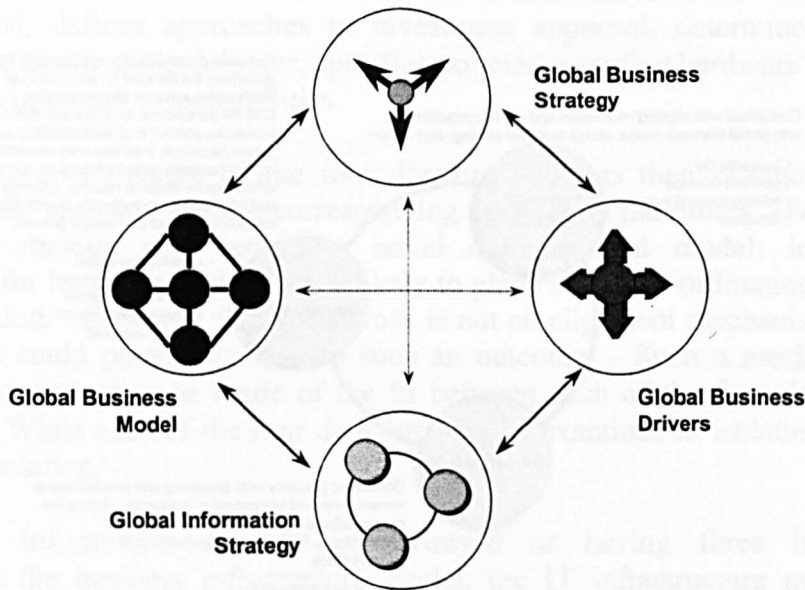


FIGURE 12 An organising framework for information systems management in the global enterprise (from Peppard, 1999, p. 80).

Global business strategy: defines the scope of the business (i.e. products, services and markets) as well as business governance (i.e. the nature and extent of relationships with external entities). As highlighted in section 2.1, IT can both support and define the global business strategy.

Global business drivers: address why the organisation has chosen to become a global enterprise (for example, access to foreign markets, sourcing of resources, exploiting economies of scale, and/or raising capital at lower costs). In the framework, global business drivers are categorised under the headings of local flexibility, global integration and efficiency, global effectiveness, and leveraging of knowledge. These drivers both promote and constrain the globalisation process, framing strategic choices. IT can impact the drivers by enabling them to be addressed in different ways.

Global business model: refers to the structure, processes and configuration of global activities. It also addresses issues of co-ordination brought about through selecting specific configurations and the cultural considerations due to operating in different jurisdictions. IT enables novel co-ordination strategies as well as facilitating new process and structural opportunities.

Global information strategy: concerned with how information, information systems and technology support the global business model, facilitate the global business drivers, and consequently aid in the achievement of the overall global business strategy of the organisation. The global information strategy has three components: the global business

infostructure model, the global IT infrastructure model and the global IS/IT suprastructure model²⁹ (see Figure 13).

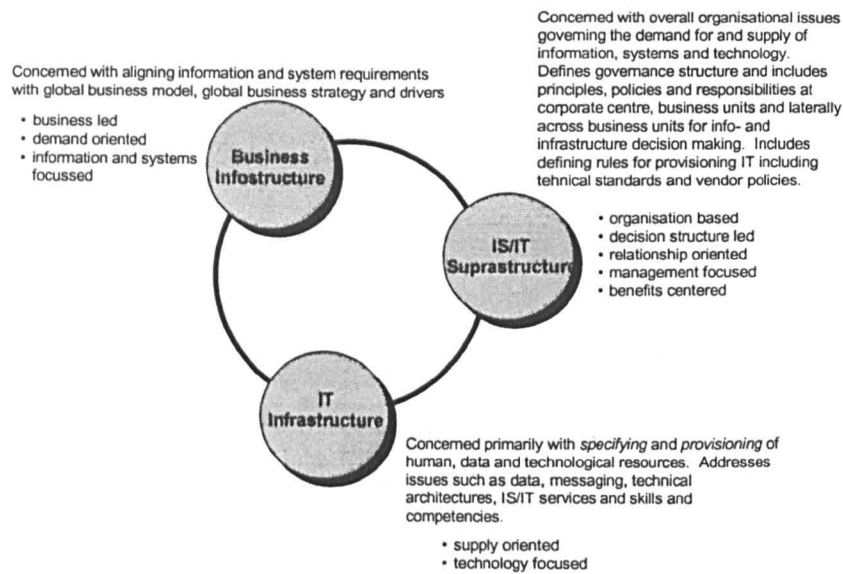


FIGURE 13 The global information strategy (from Peppard, 1999, p. 86)

The definition of the global business model will demand specific information and systems requirements depending on the decision choices made in relation to the global business drivers and the global business strategy. Information systems must be harmonised with the structure of the organisation they support (Anand and Mendelson, 1997; Chismar, 1994; Karimi and Konsynski, 1991) and are the mechanism for managing organisational interdependencies (Rockart and Short, 1989). The global infostructure is business driven defining how information and systems support the organisation in its pursuit of competitive strategies. It involves identifying for global and local business processes their associated information and system requirements. Some business processes will be truly global while other will be less so in order to incorporate the requirement for local flexibility.

The global IT infrastructure model is concerned with the technical and human resources necessary to develop, maintain and support the required applications and technologies to enable and support the global infostructure model. Activities addressed by this model include IT development and maintenance, local and wide area networks as well as the provision of IT services such as the help desk and IT training. From a conceptual perspective, the IT infrastructure provides the shared foundation of IT capability for building business applications (Broadbent and Weill, 1997).

The IS/IT suprastructure encapsulates defining the framework for operating and decision-making within the global company; in short, defining governance. It defines reporting relationships, budgeting process, cost recovery mechanisms, defines the IS planning process, identifies who is involved, defines a benefits management process for

²⁹ The suprastructure is essentially the IS governance structure.

delivering benefits from IT, and signals how relationships are managed. It determines local and global responsibilities and the relationship between headquarters and business units and between the business unit themselves. It also addresses how IS requirements are prioritised, defines approaches to investment appraisal, determines appropriate project management methodologies, specifies policies regarding hardware and software, and allocates roles and responsibilities.

“The interdependent nature of the four domains suggests that changes to any one dimension will probably require corresponding changes in the others. For example, a new global strategy may require a novel organisational model; increasing the requirement for local responsiveness is likely to place a high co-ordination overhead on the organisation. However, this framework is not an alignment mechanism but further development could potentially lead to such an outcome. Such a mechanism would enable an assessment to be made of the fit between each of the four domains of the framework. While each of the four domains may be examined in isolation they do not function in isolation.

The global information strategy is portrayed as having three interdependent components: the business infostructure model, the IT infrastructure model and the suprastructure. It is perhaps issues surrounding the suprastructure which are least addressed in the research literature. Guidance in the design of the global IT organisation, defining specific decision making responsibilities and establishing parameters for both infostructure and infrastructure decisions is an area requiring more research. This paper has suggested a concept centred around defining principles, policies and responsibilities for both infostructure and infrastructure decisions at both the centre and business units and laterally across the organisation” (Peppard, 1999, p. 90)

3.8 Summary

This section has illustrated the contribution of my papers towards the theme of improving IS performance, and its contribution towards competitiveness, in organisations. It traced the path of my research from initially exploring, in-depth, the relationship between the IS function and “the business” to the development of a process model to “bridge the gap” and improve IS performance. Along the way, my research has delved beyond the “façade of culture” to gain a better understanding of the organisational dimensions of the relationship; identified and defined a generic set of IS competencies; and explored IS management in a global company. The next section reviews the methodologies adopted by these papers.

4. Methodologies used in research papers

In each of the papers I have utilised a variety of methods depending on the research objective(s) and the research setting. These have ranged from conceptual augmentation to position research themes at a particular point in time (c.f. Peppard, 1996) to a longitudinal study conducted over several years (c.f. Peppard, 2001). Table 6 below

illustrates the range of methods employed in the studies included with this exposition. These research methods and the rationale for their choice have been detailed in each of the papers.

TABLE 6 Submitted papers and the research methods they employed.

Paper title and research objective(s)	Research methods employed
Broadening visions of business process reengineering (Peppard, 1996) <ul style="list-style-type: none"> <i>To explore the development of the concept of BPR</i> 	<ul style="list-style-type: none"> Conceptual argumentation based on a detailed review and synthesis of 144 pieces of literature
Reconciling the IS/business relationship: a troubled marriage in need of guidance (Ward and Peppard, 1996) <ul style="list-style-type: none"> <i>To explore the relationship between the IS function and the rest of the organisation</i> 	<ul style="list-style-type: none"> Conceptual argumentation Identified an existing framework from strategic management discipline to illuminate issues Evidence collected from one organisation
'Mind the gap': diagnosing the relationship between the IS function and the IT organisation and the rest of the business (Peppard and Ward, 1999) <ul style="list-style-type: none"> <i>To develop a framework to diagnose the nature and extent of the gap between the IS function and the rest of the organisation</i> <i>To identify the organisational elements to be managed in improving the relationship</i> 	<ul style="list-style-type: none"> Initial research framework, synthesising the literature, developed Questionnaire data collection instruments, keyed to research framework, constructed to collect quantitative and qualitative data Questionnaire administered at all management levels across three organisations Analysis of questionnaire data to identify themes and issues in each organisation Semi-structured interviews with key informants in three organisations based on the analysis of questionnaire data
IS management in the global enterprise (Peppard, 1999) <ul style="list-style-type: none"> <i>To develop a map of the sub-field of IS management in the global enterprise</i> 	<ul style="list-style-type: none"> Conceptual argumentation Framework developed by synthesising 169 pieces of literature from a diverse literature base, including information systems, strategic management, and international business
Whose job is it anyway? Organisational informational competencies for value creation (Peppard <i>et al.</i> , 2000) <ul style="list-style-type: none"> <i>To identify, define and describe IS competencies</i> 	<ul style="list-style-type: none"> Initial competence framework developed firmly grounded in literature 2 stage research design Stage 1 involved an eclectic use of methods: case studies, focus groups. Data collected through interviews, focus group deliberations and discussions Stage 2 involved action research in a single site
Bridge the gap between the IS organisation and the rest of the business: plotting a route (Peppard, 2001) <ul style="list-style-type: none"> <i>To construct an empirically derived model of the transformation process to improve the performance of IS in organisations</i> 	<ul style="list-style-type: none"> Longitudinal case studies conducted in three organisations Data collected by semi-structured interviews with key informants; documents, reports Data analysis within each case Data analysis across cases Inductive/deductive analysis in constructing model

For empirical studies, two important determinants of research design are purpose and timeframe. By mapping both these aspects Franz and Robey (1987) developed a typology of research strategies. Illustrated in Figure 14, four specific research strategies are highlighted. Positioned on this figure are the four empirical research papers included as part of this exposition.

Ward and Peppard (1996) used an existing framework from the strategic management literature (the “cultural web”) and applied it in the context of exploring the relationship between the IS function and the rest of the business from a cultural perspective. Data was collected from a single organisation and this framework was used to analyse this data.

Peppard and Ward (1999) constructed an initial framework, derived from synthesising the existing literature, and key questions, eliciting both quantitative and qualitative data, to this framework. Data was collected by administering a questionnaire in three organisations. Having analysed the data and identified emergent issues in each organisation, an interview protocol was constructed. In-depth interviews were then conducted in each of the three sites with key informants using this protocol. The data was subsequently analysed and a framework, highlighting the elements to be managed in improving the relationship between the IS function and the rest of the business, was developed.

	Time frame	
	single period	multiple period
discovery	1 4	3
Purpose		
testing	2 4	

Key: 1 = Ward and Peppard, 1996; 2 = Peppard and Ward, 1999; 3 = Peppard, 2001; 4 = Peppard *et al.*, 2000.

FIGURE 14 Empirical research strategies (after Franz and Robey, 1987).

The research reported in Peppard *et al.* (2000) had the purpose of both discovery and application. The research design was divided into two stages. The first stage was to identify, define and validate the set of IS competencies for value creation. A variety of methods were used including case studies and focus groups. The second stage involved an in-depth investigation of these competencies within a single organisational setting and action research was the investigative method selected.

The study reported in Peppard (2001) was undertaken over multiple periods using a longitudinal research design (see Figure 15). The research sought to construct a generalised model from empirical data and thus adopted a theory building approach. Data was collected from a variety of sources including interviews, documents, reports,

and presentations. Central were the semi-structured interviews with key informants. These interviews had an unstructured element, with questions keyed to themes that had emerged from previous interviews or from documents and reports, which gave interviewees considerable latitude over what they wanted to say and how they said it. Further probing of interviewees, often requiring an additional interview was sometimes necessary in order to seek clarification and elaboration.

The resultant model was developed following a three-stage analysis strategy together with an eclectic use of tools and techniques. During the first stage, within case analysis of the data from each of the study sites was undertaken. This was to capture the process of change as it unfolded in each of the organisations and to discern and describe patterns in the data. The second stage involved cross-case analysis of the data, locating and examining similarities and differences across the three cases using a variety of cross-case searching tactics. General themes and lessons both common and different across the three sites were also identified, giving particular attention to the different contexts. During the third stage of the analysis, a model was developed to organise the data into a generalised model of the transformation process, based on the evidence from the three cases.

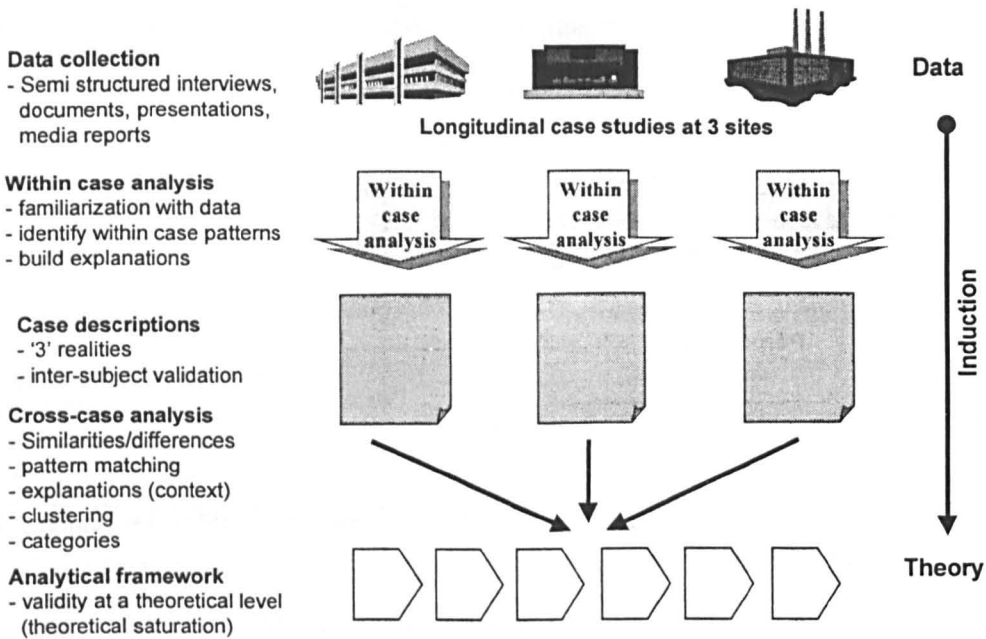


FIGURE 15 The research design for Peppard (2001) (reproduced from Peppard, 2001).

5. Conclusion: towards an IS capability

The theme of this exposition has been on improving IS performance in organisations; and this exposition has been used to illustrate that my research papers “represent a substantial, continuous and coherent body of work on [this] particular theme.”³⁰ Improving IS performance is concerned with improving the contribution of IS to the

³⁰ Cranfield University Regulation 39.6.

competitiveness of an organisation. This is a complex and multi-dimensional proposition. It is not just about improving the performance of the IS function or developing an IS strategy or deploying the latest technology or developing applications faster or going “on-the-Net” or ensuring that employees embrace appropriate behaviours regarding information. Improving IS performance incorporates all of these aspects and more – it is an enterprise-wide concern. This has been a central message of the cumulative body of my research papers.

This enterprise-wide perspective resonates with the recent appearance in the IS literature of the concept of *IS capability*. However, as previously noted, the literature has not articulated the exact nature of IS capability beyond an expression of its core objectives of enabling an organisation to continuously derive and leverage value through IS. Nor has it defined or conceptualised its fundamental components or indicated how an organisation can begin to construct such a capability. This presents a serious challenge for organisations that seek to understand and build such an organisational capability, as there is little guidance as to how organisational resources contribute towards both its development and manifestation. Yet all organisations have an IS capability. For some it might be strong, perhaps even a source of competitive advantage - in the nomenclature of RBT it can be considered *core*. For others, the capability may be weak, putting them in a position of disadvantage, or at the very least seriously undermining their competitiveness.

If I reflect on the papers included with this exposition, I have been implicitly seeking to define and characterise aspects of organisational IS capability, although, over the years I have approached this task from a variety of perspectives. It was only in Peppard (2001), the last paper chronologically included for this exposition, that I posed what might seem an obvious question of *why do organisations actually require a close relationship between their IS function and the rest of the business?* For example, the assumption underpinning Ward and Peppard (1996) is that a strong relationship between the IS function and the rest of the organisation is required in order for the organisation to deliver value from its IS investments. This assumption is still valid; however, Peppard (2001) noted that “[r]eviewing the case histories from the three studies [it is] reasonable to assert that they are not seeking a strong relationship *per se*, but rather the consequence of a strong relationship. The assumption is that a strong relationship creates the conditions for IS to make a value-added contribution to the business. In essence, the organisation is attempting to create an IS capability...”

On reflection, Ward and Peppard (1996), Peppard and Ward (1999) and Peppard (2001) were using the nature and strength of the relationship between the IS function and other business functions as a surrogate for organisational IS capability. Thus, if both the IS function and “the business” considered that they had a positive relationship, the implication was that a strong IS capability existed. Yet, if IS was not perceived as making a major contribution to the business, perhaps even as inhibiting competitiveness, and the relationship assessed as weak, improving the contribution of IS poses a problem: if a close relationship depends on IS success and IS success depends on close relationship, how does a organisation begin the process of improving IS performance? This was the challenge addressed in Peppard (2001).

An effective IS capability is becoming increasingly crucial for all organisations, particularly those competing in industries such as telecommunications, media, entertainment and financial services, where the product is already or is being increasingly digitised, and where the mere existence of the organisation can depend on the effective application of technology. This requirement has been reiterated recently by Marchand *et al.* (2000) who noted that “[t]he rush to e-business today only emphasises a basic fact of organisation life: all business organisations – be they dot-coms or established companies – require excellent information [systems] capabilities” (p. 80). Indeed, the IT Director at one of the case study organisations in Peppard (2001) was adamant that “[s]uperior information systems capability is central to the achievement of [company name] business objectives and will be critical to survival in an increasingly competitive environment” (quoted in Peppard, 2001). The initiative that he led, reported in Peppard (2001), set about developing this capability.

Over a decade ago, Rockart noted that IS “is far too important, in 1988, to be left to the information technologists” (p. 59). Unfortunately, despite the passage of time, many organisations not only leave the planning, deployment and implementation of IS to IS professionals and the IS function, but also the achievement of the achievement of results as a result of the system. Calls for the ‘line to take leadership’ (Rockart, 1988) with regard to IS or for ‘an end to this delegation’ (Anonymous, 1995) of IS decision-making to the IS function have either fallen on deaf ears or have had mixed success when an organisations attempts to get business managers and users involved in activity traditionally seen as falling within the remit of the IS function.

A major reason for this situation is that the conventional orthodoxy regarding the organisation and management of IS is inappropriate for today’s business and technological environment. As noted by Sambamurthy and Zmud (2000), success in delivering value through IS is not about managing IS tasks and not about the IS function acting quasi-independently in a command and control manner.

Although delivering value through IS may be enterprise-wide endeavor, the IS discipline has so far lacked an effective mechanism to provide this enterprise-wide perspective. This predicament is largely due to the nature of IS research. The tendency has been to focus on discrete and narrow areas within the discipline, reflecting the practice in most management disciplines where research delves deeper and deeper into a topic, improving our knowledge of the particular area without necessarily providing a holistic perspective. For example, while acknowledging the importance of the CEO in IS related matters, focusing research solely on the CEO is likely to increase our knowledge of the role of the CEO in relation to IS activities and management, but does not necessarily ensure that improved competitiveness will automatically follow. An “IT-oriented” or “IT-savvy” CEO (using the terminology of Earl and Feeny (2000)) may perhaps be a necessary condition, possibly even mandatory, but unlikely to be a sufficient condition. The concept of IS capability, together with RBT as its underlying theoretical construct, offers much promise in providing an additional perspective on improving the contribution of IS to competitiveness and in explaining the sustainability of competitive advantage through IS. In particular, by focusing on internal organisational resources, it suggests that an organisation can create the conditions for its

own success. In addition, it provides a perspective as to how resources contribute towards the development and manifestation of an organisation's IS capability.

As an enterprise-wide concept, IS capability challenges the functional perspective that still dominates in most organisations. Often, what an organisation needs to do to overcome problems does not fit neatly into identifiable responsibility areas as defined by traditional functional organisation. This is particularly true when seeking to deliver business value through IS. For organisations with strong functional areas, this presents a serious challenge. Peppard *et al.* (2000) highlighted that IS competencies transcend functional boundaries with component resources dispersed across the organisation. However, integrating and coordinating these resources is not an insignificant.

Moreover, building an effective organisational IS capability is not an easy undertaking. From case study evidence, Peppard (2001) concluded that, given the changes required, it can take many years to develop an effective IS capability particularly if an organisation is beginning from a situation where the relationship is poor and IS is perceived as not delivering value. One of the case study organisations had put in place a four-year plan to effect the necessary organisational changes. "Bridging the gap' [and developing an effective IS capability] in an organisation is likely to take time and is primarily a people issue governed by the organisational legacy regarding IS experiences" (Peppard, 2001).

In his poem *Among School Children* Nobel prizewinner for literature W.B. Yeates (1865-1939) wrote the line "How do we know the dancer from the dance?" a line which resonates with an enduring debate within the IS discipline regarding the nature of the discipline. Yeates was postulating that a dance is nothing without a dancer, and similarly a dancer is insignificant without a dance to dance. How can we assess a dancer without seeing him/her actually dance? Similarly, how can we judge a dance without actually seeing it being performed? More profoundly, how do we then draw a distinction between the one who dances and what he/she is dancing? One cannot exist without the other. Between an organisation and its IS a similar dependency is present. In today's technology driven environment, an organisation is unlikely to exist without IS; IS themselves cannot exist outside of their organisational context. In improving the contribution of IS to competitiveness, IS cannot be managed in isolation from the rest of the organisation.

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Appendix A

Declaration

Improving IS Performance in Organisations: Towards an IS Capability

I hereby declare that no part of this work has been presented for any other academic distinction or professional qualification.

 Joseph W. Peppard

15th March, 2001

Appendix B

List of publications presented

- Peppard, J.W., (1996) 'Broadening visions of business process re-engineering', *Omega International Journal of Management Science*, **24**, 3, 1996, pp. 255-270.
- Ward, J. and Peppard, J., (1996) 'Reconciling the IT/business relationship: a troubled marriage in need of guidance', *Journal of Strategic Information Systems*, **5**, 1, pp. 37-65.
- Peppard, J.W. and Ward, J.M., (1999) 'Mind the gap': diagnosing the relationship between the IT organization and the rest of the business', *The Journal of Strategic Information Systems*, **8**, pp. 29-60.
- Peppard, J.W., (1999) 'Information management in the global enterprise: an organising framework', *European Journal of Information Systems*, **8**, pp. 77-94.
- Peppard, J.W., Lambert, R., and Edwards, C.E., (2000) 'Whose Job is it anyway?: organizational information competencies for value creation', *Information Systems Journal*, **10**, 4, pp. 291-323.
- Peppard, J.W., (2001) 'Bridging the gap between the IS function and the rest of the business: plotting a route', *Information Systems Journal*, forthcoming.

Appendix C

Signed declarations of contributions of papers' co-authors

Ward, J. and Peppard, J., (1996) ‘Reconciling the IT/business relationship: a troubled marriage in need of guidance’, *Journal of Strategic Information Systems*, 5, 1, pp. 37-65.

This paper brought together the prior research work of both authors. The contribution of each author to the overall paper was as follows:

J. Ward	50%
J. Peppard	50%

Signed:

J. Ward _____ Date 21.3.01

Peppard, J.W. and Ward, J.M., (1999) "Mind the gap": diagnosing the relationship between the IT organization and the rest of the business', *The Journal of Strategic Information Systems*, 8, pp. 29-60.

The contribution of each author to the overall paper was as follows:

J. Peppard 80%

J. Ward 20%

Signed:

J. Ward _____ Date 21.03.01

Peppard, J.W., Lambert, R., and Edwards, C.E., (2000) 'Whose Job is it anyway?: organizational information competencies for value creation', *Information Systems Journal*, 10, 4, pp. 291-323

The contribution of each author to the paper was as follows:

J. Peppard	45%
R. Lambert	45%
C. Edwards	10%

Signed:

R. Lambert _____ Date 21.03.01

C. Edwards _____ Date 21.03.01

Appendix D

Copies of core papers

- Peppard, J.W., (1996) 'Broadening visions of business process re-engineering', *Omega International Journal of Management Science*, 24, 3, 1996, pp. 255-270.
- Ward, J. and Peppard, J., (1996) 'Reconciling the IT/business relationship: a troubled marriage in need of guidance', *Journal of Strategic Information Systems*, 5, 1, pp. 37-65.
- Peppard, J.W. and Ward, J.M., (1999) "'Mind the gap': diagnosing the relationship between the IT organization and the rest of the business", *The Journal of Strategic Information Systems*, 8, pp. 29-60.
- Peppard, J.W., (1999) 'Information management in the global enterprise: an organising framework', *European Journal of Information Systems*, 8, pp. 77-94.
- Peppard, J.W., Lambert, R., and Edwards, C.E., (2000) 'Whose Job is it anyway?: organizational information competencies for value creation', *Information Systems Journal*, 10, 4, pp. 291-323.
- Peppard, J.W., (2001) 'Bridging the gap between the IS function and the rest of the business: plotting a route', *Information Systems Journal*, forthcoming.



Broadening Visions of Business Process Re-engineering

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Business process re-engineering (BPR) has become a popular management prescription. The fundamental message of BPR is that through the redesign of business processes, significant performance improvements can be achieved. While BPR with its doctrine of radical performance improvement is a powerful message, experiences have been mixed, and this paper suggests that in order to overcome some of the problems the concept may need to be reconceptualized. The honeymoon period is over and preliminary speculations are giving way to emerging research results, reality is dismissing myths, while practice and greater understanding are advancing the boundaries. Through an examination of the research literature, together with the author's own research, the paper argues that BPR is broadening in scope from its initial narrow, internal and analytic focus. This paper highlights how the concept is broadening and presents a number of themes which seem to best capture the emerging conceptualization. Copyright © 1996 Elsevier Science Ltd

Key words—business process re-engineering, implementation, strategy

INTRODUCTION

MANAGEMENT PRESCRIPTIONS seem to come and go like the seasons. The arrival of every new prescription brings with it the claim that it has the ingredient which all others are lacking. Each is usually premised with the assertion that to achieve competitive advantage in the marketplace this is the medicine for your company. No wonder management are often sceptical of new

ideas. Even within an organization, resistance is often not to the initiative itself *per se*, but to the fact that it will probably soon be forgotten only to be replaced by yet another initiative. Cynically, one might argue that this is due to management wishing to be seen to be doing something or at least demonstrating that they are familiar with the latest fashions. Alternatively, it can also be interpreted as the result which consultants have had in selling concepts.

Business process re-engineering (BPR) is a 'theme' which has been around since the late 1980s.¹ Although it is now six years since the concept was popularized by Hammer through the pages of *Harvard Business Review* [61] it is still receiving great attention from both the academic community and the popular management press. That it has outlived the life of many 'fads' would suggest that it has perhaps struck a responsive nerve and that there may indeed be some substance behind the hype which continues to surround it², and BPR is firmly on

¹Many would argue that BPR has in fact been around in other guises for many years. However, the label "business process re-engineering" is a recent addition to the management vocabulary and does make the concept available to a wider audience [39].

²Of course, many of BPR's proponents would argue that it is not a fashion. For example, Davenport [26] notes that "process innovation will be a concern of good managers for many years; what is remarkable is that it has taken so long to develop approaches to it" (p. 306). International management consultants Price Waterhouse now incorporate "business process transformation" (their version of BPR) within their recently introduced *Change Integration* methodology [125].

the management agenda. A recent study reported that 69% of US companies and 75% of European companies have at least one re-engineering initiative [25] and it is also gaining impetus in Japan [1, 118].

At the heart of BPR is the notion of discontinuous thinking—of recognizing and breaking from the outdated rules and fundamental assumptions that underlie the design of organizations. Proponents stress that breakthroughs in performance cannot be achieved by cutting fat or automating existing processes but by challenging old assumptions and shedding old rules that made business underperform in the first place. While this may sound logical, by the end of 1994 BPR was attracting a good deal of criticism [4, 84]. Indeed Hammer, perhaps BPR's most charismatic proponent felt the need to defend the concept [60, 63]. He argued that most of the criticism is misplaced and is based "on a misconception of what re-engineering really is, and much of the rest reflects a limited assessment of its significance."⁴

Yet, despite what its detractors might argue we have this theme, called business process re-engineering, which is receiving attention from all management disciplines. The traditional business school functional areas of strategy, information systems, accounting and finance, operations management, human resources, and marketing are all studying the impact which the debate BPR is provoking has on their disciplines and also what they can contribute to the debate.

While BPR, with its doctrine of radical performance improvement, is a powerful message, this paper argues that the initial conceptualization, as detailed in the seminal writings, is giving way to a broader perspective. Via an excursion through the BPR literature⁵ and

research it first highlights how BPR has changed in emphasis over the last five years. It suggests that BPR is broadening in perspective, moving from its narrow, internal and analytic focus, and examines developments which are contributing to a new conceptualization. The paper points to the need for greater integration of BPR initiatives with the strategic direction of an organization, a call which is being increasingly highlighted by experiences with BPR.

BROADENING VISIONS OF BPR

Dominant debates in the BPR literature have been concerned with whether or not BPR is anything new [38, 53, 75, 102], how it compares with other improvement philosophies [100], the role of IT [46] and systems thinking [31, 131] and the implications for human resource management [119, 141–143]. Yet, BPR seems to be broadening in scope from its initial narrow, internal and analytic focus as propagated in the seminal literature. The honeymoon period is over and preliminary speculations are giving way to emerging research results, reality is dismissing myths while practice and greater understanding are advancing the boundaries of its application.

Recent research has yielded valuable insights, notably Jarvenpaa and Stoddard's [71] research based on interviews with more than 200 companies as well as rigorous research on 35 re-engineering initiatives; Hall *et al.*'s [57] study of over 100 re-engineering initiatives; Drew's [33, 34] survey of BPR implementations in financial service organizations in North America and Europe; the European Union sponsored COBRA (Constraints and Opportunities in Business Restructuring—an Analysis) project exploring the link between BPR and new ways of working which used information on over 100 European BPR exercises [5]; CSC Index's survey of 624 US and European companies [25]; Dixon *et al.*'s [32] analysis of 23 re-engineering projects and Willcocks' [140] survey of BPR activity in the UK. There have also been many substantial case studies written which highlight different aspects and experiences with BPR, all of which contribute to a body of work from which lessons and best practices can be drawn (for example [6, 28, 36, 90, 91, 129, 133]).

⁴Hamel and Prahalad [59] suggest that re-engineering "has more to do with shoring up today's business than creating tomorrow's industries".

⁵In a review of organizational design approaches, Keidel [79] expresses similar sentiments, arguing that organizational design initiatives often fail to achieve their objective "because they trivialize the concept".

⁶Because BPR is a theme and not a discipline like Strategy or Human Resource Management, its literature is not neatly defined and comes from many sources. The BPR literature referred to in this paper is the body of writings which primarily addresses the redesign of business processes, implementation and management and comes from a variety of traditional management academic disciplines.

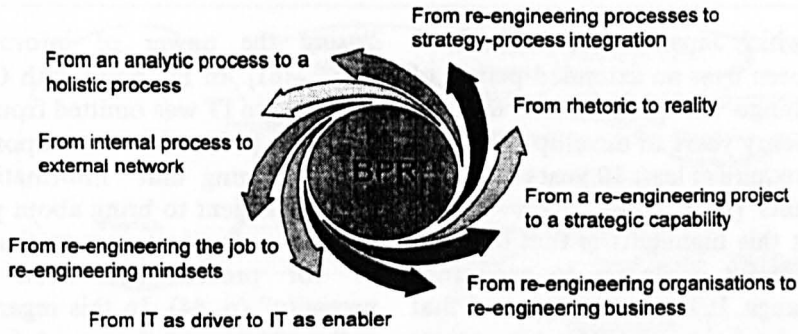


Fig. 1. Broadening visions of business process re-engineering.

All these studies agree that through the redesign of business processes significant performance improvements can be achieved. Whilst experiences with BPR among the companies studied have been varied, most of the research attempts to highlight lessons and determine the critical factors which lead to success. What is clear is that BPR is contextual. It offers no prescriptions for the way organizations should work day-to-day but rather is concerned with how organizations can get shifts in performance based on moving from one way of working to another [107, 108].

Given the attention now devoted to this philosophy, it is likely that usage of the phrase BPR which captures the essence of the philosophy may fade. Yet, the fundamental forces driving towards this re-appraisal of organizing for work are here to remain. Already, many companies are beginning to use their own labels to describe their performance improvement initiatives with similar objectives to BPR. Regarding BPR's future, Davenport and Stoddard [29] suggest three options. First, another synthesis of ideas will emerge that includes the precepts of re-engineering with others. Second, re-engineering will be absorbed into existing change methods. Third, re-engineering will be combined with quality and other process-oriented improvement approaches into an integrated process management approach.

Whatever the final outcome, evidence from the literature would suggest that BPR is shifting ground from its original manifestations as expoused in the early literature. The initial focus

on re-engineering work is broadening and in this section these movements are charted and explored. Figure 1 summarizes these key shifts.

From rhetoric to reality

The language used in relation to BPR is undoubtedly revolutionary in tone, even evangelical, particularly if one examines the seminal writings. The words and phrases are specifically chosen to reflect the radical connotation of the theme. Words like transformation, radical, violent, aggressive, innovation, and obliterate are central in the vocabulary of BPR. Yet in reality, while most re-engineering initiatives may have radical performance improvement as an objective, the route that has been taken is much more incremental.⁶

This duality between radical performance and radical change is not a simple matter of being necessarily bound up together. Radical organizational change, particularly if not managed, can have devastating consequences. The reality, which is supported by research findings, is that while radical performance improvement is sought through BPR programmes, it is usually not through big-bang changes, but rather through a much more incremental approach. Change is a *continuous process* rather than a *static event* as suggested by proponents of the radical view. Questioning some of the assertions and revolutionary rhetoric in his book, Davenport has recently argued that rarely is clean sheet change found [29]. Since the publication of their book Hammer and Champy have been reported as differing on this issue with Hammer continuing to expouse how violent the re-engineering process needs to be [2].

Japanese experiences of Just In Time, an improvement philosophy centred around the notion of process, clearly shows that the

⁶Eccles and Nohria [39] argue that rhetoric is not incidental to the production of phenomena to which the concept of *reality* is all too readily ascribed. The inextricable links between language and actions are very often guided by rhetoric.

improvements which Japanese companies have achieved have been over an extended period of time. Shiego Shingo has pointed out that "it took Toyota twenty years to develop JIT fully, and others will require at least 10 years to obtain satisfactory results"[122].

Perhaps what this highlights is that organizations have different capacities to encourage and support change. It has been suggested that organizations who have a TQM or customer care programme in place are more likely to succeed at BPR [40] although it is important to recognize that these programmes themselves have often resulted in disillusionment, particularly if abandoned for no other reason than to jump on the next 'wave'. Other organizations may already have a culture which fosters and supports teamworking and empowerment. Readiness for change is therefore clearly an important consideration, and frameworks have been developed to help in accessing an organization capacity for BPR [8, 20, 35 and 92, pp. 68–75]. Of course, organizations in crisis may have no choice but to change, and quickly; however even change in this context does not guarantee survival.

From IT as driver to IT as enabler

BPR as a phenomenon was observed and labelled at the Massachusetts Institute of Technology (MIT) *Management in the 1990s Research Program*, which focused on examining the role which IT would play in organizations during the 1990s.⁷ The MIT researchers used the term quite precisely to describe the use of IT to transform the way in which an organization works internally rather than simply to automate the way it already worked.⁸ Venkatraman [132] saw BPR as one level of what he referred to as 'IT induced business reconfiguration', although in a recent paper the word *induced* was replaced by *enabled* [133], a subtle, but significant distinction.

A similar de-emphasizing of the central role of IT has also been expoused by Hammer. In his initial definition, he specifically defined BPR as

"using the power of information technology..." [61]. In his book with Champy [62] the reference to IT was omitted from this definition. Contrast this with Davenport [26] who, in acknowledging that "information and IT are rarely sufficient to bring about process change" (p. 95), proceeds to assert that "...the use of IT for process innovation [is] a virtual necessity" (p. 44). In this regard, a number of authors have used the term *information technology enabled business process redesign* to specifically refer to the use of IT to change organizational processes for substantial improvement [56] acknowledging the fact that processes can be redesigned without the need to implement IT.

The general consensus is that IT is an enabler (although there appear to be different definitions of enablement from 'doing' to 'supporting') and a creator of opportunities. While IT permits new ways of working and organizing which are not possible manually [27, 61, 124], the key argument in support of the enabling theme is the lack of sustainable competitive advantage from IT [15, 45]. Business advantage through IT is relative and in most industries it is not possible to exist let alone excel without it. Indeed, many of the famous, supposedly competitive-edge IT systems of the 1980s in fact represent a long-term investment in business process capability [19, 44].

Despite this, both hardware and software vendors have not been slow in promoting BPR as a way of unlocking the potential of IT. They are capitalizing on the disappointment which many managers have with their IT investments and the general consensus that they are not getting 'value for money' [52]. Economists speak of a 'productivity paradox' to describe the huge investment made since the early 1980s in technology, while at the same time productivity, particularly of the white collar worker, has remained relatively unchanged.⁹

Perhaps predictably, surveys of the role of IT in BPR initiatives have reported that IT plays an important, if not central, role in each stage of a re-engineering effort [3, 10, 11, 72, 106]. These roles include educating other members of the re-engineering team about leading edge information technology and how it can be appropriately applied to business processes, selection and use of business process and data modelling tools [93], simulating alternative

⁷A summary of this project can be found in [119].

⁸The MIT researchers actually referred to BPR as *business process redesign* [27, 132].

⁹Quinn and Baily [110] have recently argued that in fact the US service sector received high performance payoffs from IT even during the period when it was most criticised.

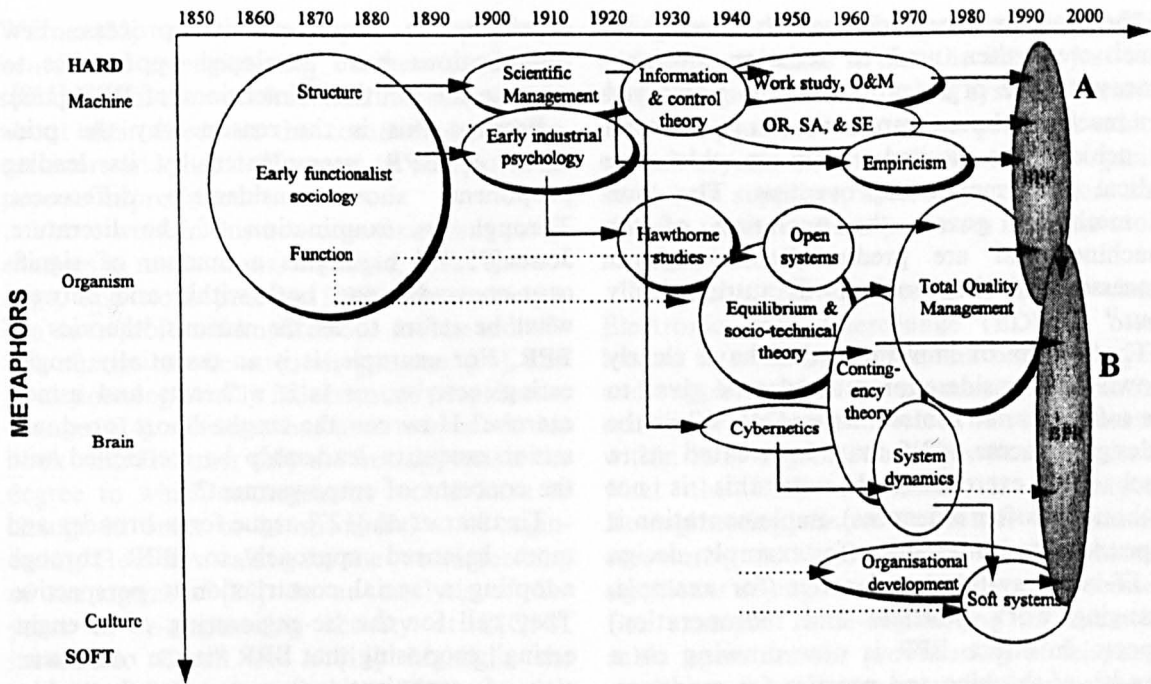


Fig. 2. The intellectual inheritance of BPR (Source: [107] p.162).

process designs [86], providing technical vision, leadership and project management [89] and to build the systems that are envisioned by the re-engineering team.

What BPR has highlighted is the need to first get the process 'right' before implementing IT [37, 112]. With traditional systems analysis approaches current ways of working were captured and documented and this provided the basis for automation. With BPR new process blueprints may have no basis whatsoever in the old. Some, notably software vendors, argue that with technologies like workflow, existing processes can be automated prior to redesign and capitalizing on the power of the software, the process can be re-engineered at a later stage [128]. While not doubting the power of modern software tools, this practice merely hides fundamental problems inherent in the process design in the first place.¹⁰

From an analytic process to a holistic process

The dominant logic adopted in most of the

early papers on BPR is clearly analytic in orientation. The process based organization is approached quite prescriptively, with an underlying assumption that processes can be pulled apart and rebuilt almost like Lego™. This orientation can be traced back to BPR's roots in the domain of IT [120] and its initial label as "the new industrial engineering" [27]. Such a view is certainly in conflict with the need to move towards a more integrated philosophy in managing organizational change, particularly when dealing with people, and evidence from research and experience bears this out [54] [55].

Figure 2 attempts to position BPR in relation to the dominant eras in organization and management theory in order to identify its intellectual inheritance [107]. This figure also maps these eras against organizational metaphors as articulated by Morgan [101]. As this figure illustrates, early manifestations of the concept were clearly drawn from mechanistic thinking on organizational engineering, chiefly centred around IT and industrial engineering (blob A). It is not surprising that it drew on these areas for guidance, subscribing to the structured and mechanical philosophies underpinning systems analysis and O&M. The focus on IT-enabled business process re-engineering meant an implicit inheritance

¹⁰A question which emerges is the role of the IT organization. There has been a call for a re-engineering of the IT organization [88, 42]. Yet this repositioning must be not be based on control of resources but requires a more fundamental evaluation of the broader issues of organizational IS/IT competencies [136].

of the tools and methods used to develop IT which were then used to redesign business processes. The organization is thus portrayed as a machine whose components can be changed to achieve the desired result: in this case radical performance improvement. The laws of mechanics govern the operation of the 'machine' and are predictable: re-engineer processes and the benefits will automatically flow.¹¹

The lessons of implementation have clearly shown that consideration must also be given to the softer 'human centred' issues [24]. While the redesign process itself may be treated as a mechanical exercise (and even this is not without its softer influences), implementation is dependent on both harder (for example, design of IT-based systems) and softer (for example, changing work practices and remuneration) aspects. In effect, BPR is now drawing on a breadth of thinking and practice for guidance. The lessons from research strongly suggest that a more holistic view of BPR must be adopted if initiatives are to have a chance of success. Such a perspective draws on antecedents in both hard and soft disciplines (see blob B).

The call for a holistic view of organizations is not novel, it was the central message of systems theory [135], and system dynamics [43], and was reinforced by organizational models which highlighted the integrative nature of organizations such as those proposed by Leavitt [83] and Pascale and Athos [105]. The limited success of these models, however, is because they do not take explicit account of the social and political foundations of organizations.

Lessons from research into organizational change, and BPR will undoubtedly involve considerable amounts of change, and have clearly highlighted its political nature [117]. Indeed, the act of redesign itself will often be subject to political wrangling, with interest groups influencing the design process in order to maximize the likelihood of securing decisions, outcomes and resources which are compatible with their goals. Such activity can result in selecting a sub-optimal design or adversely affecting the implementation of what might be

considered a more effective process. Few organizations have developed approaches to manage the political dimensions of BPR [138].

Perhaps this is the reason why the principles of BPR promulgated by its leading proponents show considerable differences. Through an examination of the literature, Jones [75, 76] highlights a number of significant contradictions, both within and between what he refers to as the various 'theories' of BPR. For example, is it an essentially 'engineering' activity, or is it a 'hearts and minds' exercise? How can the emphasis on top-down, senior executive leadership be reconciled with the concerns of empowerment?

Tinaikar *et al.* [127] argue for a broader and more balanced approach to BPR through adopting a social constructionist perspective. They call for the 're-engineering of re-engineering', proposing that BPR "is the *reconstruction* of organizational processes through a *mutually integrated effort* by various organizational coalitions to achieve and maintain *negotiated improvements*". Reconstruction emphasizes that BPR is an intentional effort to change a 'constructed' process and highlights the social dimension involved in the creation and maintenance of organizational processes, i.e. relationships of processes, technology, people, objects, etc., and how change in such relationships impacts much more than organizational efficiency.

From re-engineering the job to re-engineering mindsets

The BPR literature is clear in stating that those who will operate in the new process oriented organization will work in teams, be empowered, be multi-skilled, and have their compensation tied to customer satisfaction. This shift has implications beyond re-engineering and challenges the traditional concept of designing organizations around job structures, a view which is also being promoted in the human resources literature [82]. Willmott [143] laments the lack of consideration given by the BPR literature to the human aspects of organizing. Focusing on the re-engineering of human resources, he argues that the transition from specialist function-based to business process-oriented organizing practices necessarily depends upon 'human resources' who enact, and are also (re)constituted by, BPR. Conti and

¹¹In his analysis of the underlying philosophy of BPR, Galliers [47] sees it as being similar to the classical view of strategy, where profit maximization is the goal with little concern for cultural and contextual issues other than to deal with them as obstacles to change.

Warner [22] warn that despite the potential benefits of re-engineering business processes, reductions in the workforce can "raise questions about their effect on the commitment of the survivors and their willingness to co-operate in process improvement".

Yet to work in this new organization requires changes in motivations, attitudes, skills, knowledge, and work practices [139]. Such changes can have profound implications for the individual: change can be intensely personal [35], and re-engineering usually fails because people resist change [114]. Champy has asserted that in his book with Hammer they did not appreciate the degree to which management would have to change in order to be successful at re-engineering. He is now calling for the "re-engineering of management" [16]. In an analysis of five years of re-engineering activity at CIGNA insurance, Caron *et al.* [14] highlight the criticality of changing mindsets. They state that it is crucial to acknowledge that "all employees will have to participate in a mindset change to enable the success of the initiative" (p. 248).

Grint [54] argues that for re-engineering to work as a radical and long term change the focus should be more about re-engineering the way managers think and work than about re-engineering the way processes operate.¹² Similar sentiments have been expressed in the strategy literature by Hamel and Prahalad [58] who see long term competitiveness depending on managers' willingness to continually challenge their managerial frames; by Bartlett and Ghoshal [7] who assert that to work in the new organisation requires a change in mindset; and by a number of scholars in relation to inter-organisation linkages [69, 74]. More pertinent is whether or not individuals can engage in 'collective forgetting' [55].

From internal process perspective to external network perspective

A legacy of MIT's 'Management in the 1990s' research project is that a clear distinction now exists between BPR and what is usually referred to as business network redesign (BNR). While BPR was clearly focused on the redesign of internal organizational processes, BNR is

concerned with the wider business network. The underlying premise is that the firm is just one entity in an industry value system. Business network processes are those processes which extend beyond the boundaries of the organisation into suppliers, customers, regulators and alliance partners. Such processes may also cross national boundaries.

In reality this distinction is not as clear. Electronic data interchange (EDI) is often looked to to automate the link between buyers and suppliers. Yet, this practice of automating existing work practices which are incorporated within inter-organisational processes is exactly what the BPR movement is challenging. Re-engineering *the process* rather than merely *automating the data exchange* usually demands significant re-engineering of internal processes. For example, in re-engineering its link with cable operators for provisioning of telephone services, a large telecommunications company found that not only did it have to rethink, and in consequence redesign, many of its own internal processes but so too did the cable operators.

McHugh *et al.* [92] have proposed the concept of the *holonic business system* as a natural extension of BPR. The holon concept refers to processes within processes, with the holonic network seen as a set of companies that act integratedly and organically. Each company in the network provides a different process capability and the network is constantly re-configured to manage each business opportunity a customer presents. In fact, they see the customer moving from their traditional passive role to becoming a prosumer, i.e. a proactive customer, working closely with sellers to define the products and services they are buying. They argue that the concept allows businesses continually to de-invent and re-invent themselves as they face increasingly ambiguous markets. A critical challenge, however, becomes identifying how the re-engineered core business processes can contribute to a strategic repositioning of the business.

From re-engineering organizations to re-engineering business

The inward-looking focus of BPR has clouded the profound influence which IT and new management strategies are having on the nature of business itself. By reducing the costs

¹²In a revealing case, Cooper and Markus [24] describe the case of Japanese company Higashimaru Shoyu who first focussed on changing peoples attitudes towards change.

of co-ordination, IT is leading to an overall shift towards proportionately more use of markets—rather than hierarchies—to co-ordinate economic activity [87]. Illustrative is the implication which automation of the London Stock Exchange had in the extinction of the traditional role of the market maker. Through the extended use of advanced information and telecommunications technologies the traditional *marketplace* is being replaced by the *marketspace* [113]. The *marketspace* denotes the transformation in business activity as moving from the physical marketplace with fixed locations, inventories, and products to an information defined transaction space.

This shift has profound consequences. The *content* of the transaction is different (information about the product replaces the products themselves); the *context* within which the transaction takes place is redefined (on-screen interaction replaces face-to-face contact); and the *infrastructure* that enables the transaction is different (computers and communications replace physical locations).

Through a variety of strategies the dominant logic of business is being redefined. Traditional business networks are being reconfigured through organizations focusing on core competencies, by forming strategic alliances and by outsourcing. For example, Nike Inc., the largest supplier of athletic shoes in the world, concentrates on its core competencies of research and design of high-tech sports footwear and the marketing and distribution of these to customers [111]. The actual manufacturing process is outsourced to mainly Asian sub-contractors.

Commenting on this manifestation, Normann and Ramirez [103] argue that a sequential value system, together with a fixed set of activities, is no longer appropriate to today's business. They suggest that the key strategic task is the reconfiguration of roles and relationship amongst this constellation of actors in order to mobilize the creation of value in new forms and by new players.

The implication of this is that instead of looking to re-engineer their organizations, organizations should first look for opportunities to re-configure the business network within which they compete. For example, there is not much point in a record company re-engineering its manufacturing process if its future competitor is a cable company downloading selections on cable, effectively bypassing them in the value system. In an IS historiography of Baxter Healthcare, Venkatraman and Short [134] illustrate how redesigning external processes had the potential to redefine its business scope and reposition the firm in the industry value chain.

Davidson [30] sees BPR as the first of a three-phase transformation process that starts with structured automation and re-engineering efforts, building on new infrastructure and capabilities to enhance and extend the original business, and then redefines it to create new business. This is in contrast to Venkatraman [132] who is explicit in asserting that the move through BPR to BNR to business scope redefinition¹³ is not sequential. He argues that a company can approach BPR from two different, and sometimes contradictory, perspectives [133]. The first avenue is to seek efficiency, which is the thrust of the majority of today's efforts. The second avenue, is to re-engineer to enhance capabilities which aim to create strategic capabilities for future competition.

From re-engineering processes to strategy-process integration

The seminal literature on BPR is clearly centred on the process of re-engineering business processes, adopting an operational view of improvement, in particular the redesign of product and service delivery processes. Whilst this still remains the focus, the linkage between re-engineering and business strategy is becoming increasingly recognized [41, 49]. Many re-engineering initiatives are undertaken without any regard to the organization's strategic direction. If we examine the cases of Mutual Benefit Life, Ford, IBM Credit, and Hallmark, described by Hammer to illustrate successful examples of the re-engineering of business processes, this becomes obvious.

Insurance company Mutual Benefit Life is perhaps indicative of a company which successfully re-engineered its process to issue a life insurance policy, reducing the time from 24 days

¹³Business scope redefinition refers to extending the scope of business that the organization operates in through the use of IT. For example, new products/services to new or existing markets, or existing products and services to new markets. Marchand [88] makes the distinction between four levels of re-engineering, and business scope re-definition fits into his fourth level.

Table 1. Business re-engineering vs business process re-engineering

Business re-engineering	aligning processes to the business strategy identify process configuration to provide process capability high-level view of the organization and its underlying processes defines the business architecture
Business process redesign/re-engineering	redesign of individual processes for step improvement in performance usually relates to high-level processes although principles apply to all processes

(Source adapted from [40])

to four hours [61]. While this re-engineering project had definite benefits, shortly afterwards MBL filed for Chapter 11 Bankruptcy. MBL misread the implications of the depression in US real estate prices and the corresponding impacts on public confidence in its financial position. A streamlined process had no impact on the firm's survival.

The re-engineering of Ford's accounts payable process, possibly the most widely quoted example of BPR, illustrates the case of re-engineering a process without having any significant impact on the bottom line. Similar sentiments have been expressed by Womack and Jones [144] in relation to the implementation of lean production. The implication is that reported benefits of BPR must be seen in the light of the scale and scope of the process being redesigned.

IBM Credit successfully re-engineered their credit evaluation process. However, while offering credit packages was once core to IBM when it sold mainframes, in this era of low cost PCs it is no longer central to their business. Hallmark, another of Hammer's examples, re-engineered its design-to-manufacture-to-customer process. This may prove fruitless if its future competitors are companies which allow buyers to download 'clipart' from servers and customize to their own requirements. Already, the company is experiencing problems with return on equity falling to a historical low in 1994 [17].

While an organization's strategy can give direction to a BPR initiative, there is also a crucial link between an organization's resources and its business strategy. In short, it does not make sense for an organization to launch a particular business strategy if it is unlikely to be able to develop the competencies to implement and bring it to fruition. In practice, how a firm is organized can both enable and constrain particular strategies. Mintzberg [95] argues quite strenuously that strategy can rarely be decided in isolation from existing structures,

writing the "structure follows strategy...as the left foot follows the right".

Hammer [60] sees re-engineering offering "an alternative perspective on formulating strategy, one based on operating processes rather than on products and markets" (p. 96), a view which is shared by others [32, 73, 81, 108]. Johansson *et al.* [73] look to BPR to redress the balance between operational excellence (*how* to compete) and the usual strategic focus on what products to sell, to whom they should be sold, and where they should be sold. Without all these elements, however, the search for sustainable competitive advantage is likely to be a fruitless one. Strategy, whether implicit or explicit, sets the direction for the enterprise but it is through processes, people and technology that the strategy 'lives' for customers, suppliers and staff alike. Yet, if we examine the kernel of this argument it is precisely what the resource based theory of the firm is advocating [21, 51, 137].

This perspective analyses firms from the resource side rather than from the product side, (in which traditional strategy approaches are grounded), and is perhaps best captured by the notion of core competencies [59]. It proposes that what sustains competitiveness is not a firm's endowments, but its competencies. Competencies are combinations of resources (physical assets, people, brands, reputation), systems (codified means of deploying or activating the resources, e.g. the manufacturing system), and know-how (a non-imitable capability enabling the firm to deliver a competency). Metaphors from the discipline of genetics, such as DNA, genetic diversity, and gene replacement therapy, have been used to describe competencies or the acquisition of competencies to provide the enabling platform upon which specific strategies can be built [59, 81]. The difference, however, between Hammer's view of re-engineering and that of those who subscribe to core competencies is Hammer's lack of strategic context and the criticality of linking BPR with business strategy.

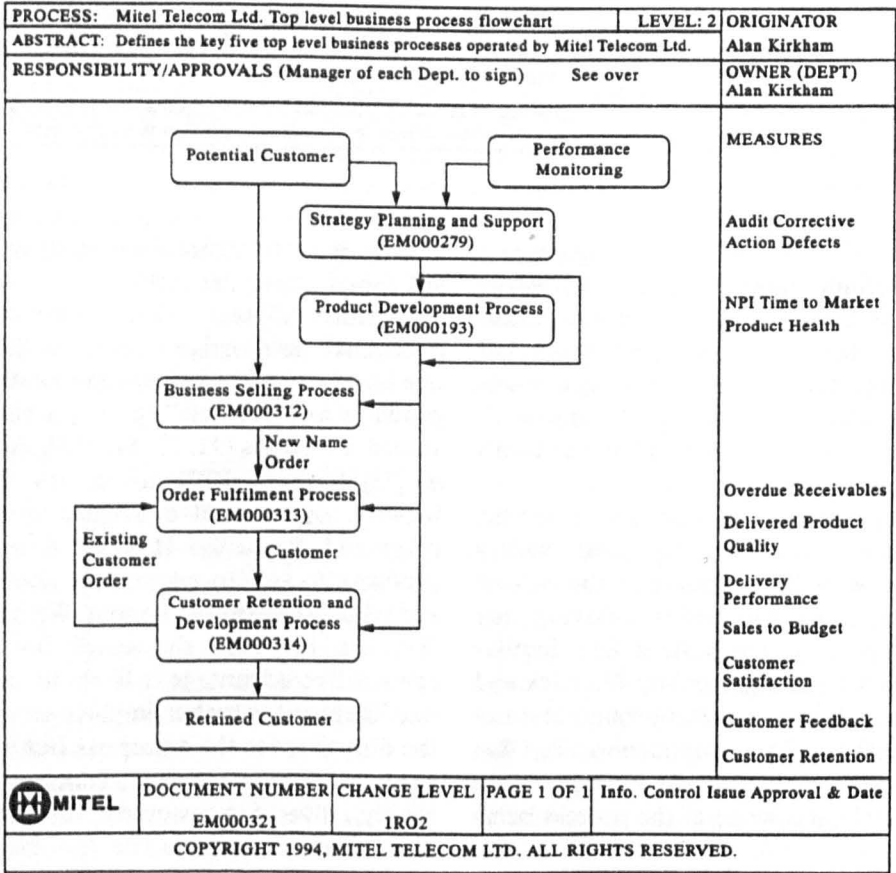


Fig. 3.

Having identified core competencies, the key challenge becomes one of incorporating these within a process configuration. Indeed, Stalk *et al.* [123] define competencies¹⁴ as business processes which are strategically understood. As a first step in articulating this link a distinction between business re-engineering and business process re-engineering can be made [40]. Illustrated in Table 1, business re-engineering involves the development of an organizational architecture and it entails identifying and linking the strategy of the business with the required organizational processes to ensure that this strategy is actually delivered. With this perspective, the organization engages in a fundamental re-thinking and redesign of the business and its underlying processes. This is very much a top-down view driven by senior management. Such an exercise was undertaken

by Mitel Communications, and their process architecture is illustrated in Fig. 3.

BPR, on the other hand, refers to the redesign of any organizational process. This can include anything from a total supply chain process to a single process within an individual function or department. In the case of Mitel this would entail the re-engineering of any one of the five processes identified in Fig. 3.

Proposing the integration of BPR with business strategy assumes that the strategy formulation process is rational and prescriptive, that the strategy is explicit and that it is agreed among the senior executives. While this view of strategy is appealing, descriptively, research has illustrated otherwise. In an interesting analysis of the strategy process, Whittington [138] treats the subject as a contested and imperfectable practice. He proposes four generic approaches to strategy, classifying perspectives based on whether the process of strategy is deliberate or emergent and whether or not the outcome is one of profit-maximization or has more pluralistic goals.

¹⁴Stalk *et al.* [123] make a distinction between *core competencies* and *capabilities*. This paper takes the view that they are one and the same and uses them interchangeably.

While many scholars have become disillusioned and are concerned about the direction of strategy research and practice [95–99, 116, 115], strategy, whether explicitly or implicitly expressed, is vitally important. Prahalad and Hamel [109] have called for strategy paradigms to be re-examined, suggesting that the concepts and tools of analysis may need a basic re-evaluation. They suggest that many of the assumptions embedded in traditional strategy models may be incomplete and/or outdated as we approach the new competitive milieu. Such assumptions include: strategy is about positioning a business in a given industry; the focus of strategy tools and analysis is existing industries; the primary focus of strategic analysis is the business unit; strategy outcomes can be explained on the basis of economic analysis; and strategy is the result of an analytical process, execution of strategy is an organizational process.

From a re-engineering project to a re-engineering capability

Many organizations treat their re-engineering initiative as a project after whose completion the organization can 'get back to normal'. Such complacency is to be avoided. In the words of Hammer and Stanton, BPR "must become a core competence of the twenty-first century corporation, one of its defining strengths" [64].

Many managers have expressed concerns regarding managing in the post-BPR organization. How do organizations manage the result of a re-engineering initiative? How does it begin to manage processes as opposed to functions?

What comes after re-engineering? In TQM, for example, process management is seen as a specific discipline that supports TQM relying on feedback from measurements, assessments and other analysis to guide improvement activities [66].

CONCLUDING REMARKS

Through research and experience the concept of business process re-engineering is itself being re-engineered; and this development should be encouraged. The original literature is generally descriptive, focusing on what BPR *is* and *why* it is necessary rather than expressly considering the broader organizational implications. This is to be expected, especially given its origins; the phenomenon of BPR was not derived from any theoretical basis but rather based on observations of how some leading companies were implementing IT in innovative ways.¹⁵ The cases described in the seminal literature, for example Ford, Rank Xerox, American Express, and Hewlett Packard did not explicitly engage in BPR programmes. Rather, independently each recognized the need to focus on processes in leveraging benefits from IT; or at least that was how it was interpreted by the MIT researchers. Attaching the label 'business process re-engineering' to these observations made the phenomenon available to a wider audience. Add to this the evangelical rhetoric and in effect the descriptive *end* result became an instant objective for many more organizations. We now have the benefit of these organizations' experiences in undertaking BPR as they seek to move towards this 'utopia'.¹⁶ Failures are particularly incisive and can provide tremendous opportunities for learning.

The 'horizontal organization' is often portrayed as the organization in which BPR is institutionalized [12, 70, 104]. What BPR strongly emphasizes is that it is through processes that an organization's work is conducted.¹⁷ The division of labour, which is characterized by a functional orientation, has mitigated against the smooth flow of work and led to inefficient work practices taking place. Adopting a process perspective provides a view of the organization which cuts across traditional functional and departmental boundaries focusing on how work is performed.

Yet, it should not be forgotten that

¹⁵It might be argued that a pseudo-grounded theory [50] approach was adopted by the early researchers.

¹⁶In many ways this might be viewed as classic theory building. A number of organizations were studied and inductively a phenomenon observed and labelled. The experiences of others in implementing that phenomenon leads to the refinement of the initial concept.

¹⁷In his book *Head to Head: The Coming Economic Battle Among Japan, Europe, and America*, Thurow [126] makes a strong reference to the criticality of process for competitiveness, commenting that "[i]n the past economic winners were those who invented new products. But in the twenty-first century sustainable competitive advantage will come more out of new process technologies and much less out of new product technologies. Reverse engineering has become an art form. New products can easily be reproduced. What used to be primary (inventing new products) becomes secondary, and what used to be secondary (inventing and perfecting new processes) becomes primary" (p. 45).

traditional business functions do have advantages. They foster specific knowledge and skills providing a pool of expertise, vital for specialization of labour benefits and can mean fewer specialists may serve the needs of a number of areas. Functions also provide the means to develop career paths which enhances specialist excellence. Therefore, there seems to be a continuum, where at one end is the functional based organization and at the other is one which is process oriented. Where should organizations position themselves? Indeed, people are asked to become members of teams, not because they are generalists but rather due to the fact that they have specialist skills or knowledge. It is probable that the organization of the future will be composed of some configuration of both processes and functions. Yet what form this might take is unclear.¹⁸ What is clear, however, is that this new form will have major implications for the people who will work in these processes. For example, career paths may need to be altered so that employees can perhaps alternate between working as multi-functional team members and periods of intense knowledge-building within their specific departments.

The original message of BPR is that by redesigning business processes using the power of IT, organizations can achieve 'break-throughs' in performance. While this message is appealing, the dynamics of organizations are much more complex. Focusing on 'process' demands new work practices which have implications for human resources, recruitment, training and staff development. Remuneration and reward systems must be devised in order to be consistent with new ways of working and to ensure that desired behaviours are fostered. Traditional financially oriented performance measurement systems become inappropriate and are required to be redrawn to reflect the new realities. Before considering re-engineering of business process issues of strategy must be addressed. The post-BPR organization raises fundamental questions concerning leadership and management. The large scale upheaval often necessitated in migrating to a new

Table 2. Initiatives currently being promoted by 'business school' departments

Traditional business school departments	Selected initiatives promoted by discipline
Human resource management	Empowerment Teamworking [78] Pay for performance [80] The learning organization [121] Cultural change
Strategy	Core competencies [59] Creating the future [59] Strategic alliances Customer intimacy [130] Resource based view [21, 137]
Organization behaviour	The virtual organization The shamrock organization Organizational learning [121]
Information systems	Strategic alignment [67] Outsourcing [111]
Operations management	Total quality management Just in time Time compression management [94] Continuous improvement Benchmarking [13] Service-profit chain [68] Customer retention [65]
Marketing	Relationship marketing [18]
Accounting	Activity Based Costing (ABC) [23] The balanced scorecard [77] The performance pyramid [85]

organization demands rigorous change management programmes.

It can be argued that BPR has been the *gestalt* for bringing together much of what has been happening in organization and management over the last decade. It has definitely struck a responsive nerve among practitioners and academics alike. Table 2 maps some of the initiatives which have been promoted over the last decade by traditional business school disciplines. What is crucial is that many of these usually emerge in some form or another in undertaking a BPR programme. This might suggest that a reason why many organizations have problems with BPR is that difficulty lies in bringing together all these elements under the one initiative.

In essence, BPR is just one of a number of management trends currently in vogue to deal with new competitive challenges and new information technologies. New market requirements have precipitated the call for new organizational forms; concern in the strategy literature with the strategy process; the recognition of the social and human dimensions of organizations; empowerment and the virtues of teamwork expoused as essential to the well

¹⁸During a recent roundtable discussion on leveraging processes for strategic advantage, Garvin commented that "[m]uch remains to be learned about how these new organisations are crafted and led" [48, p. 77].

being and performance of human resources; new information and communications technologies have profound implications for both organizations and in the conduct of business; the criticality of business operations as highlighted by experiences from Japan and the crusade for the lean enterprise.

This paper has traced the progress of BPR over the last six years and presented a number of points of departure from the original ideal as expressed in the seminal literature. Redesigning business processes has profound implications in an organization above and beyond the focus on process. Coupled with this is the fact that the theme has not yet found a 'home' in any one of the traditional academic management disciplines, with research highlighting that all the management disciplines are involved and implicated in redesigning business processes.

Experience with BPR points towards the integrative nature of organisation, suggesting that what may be required is a process theory of the firm to incorporate and bring together seemingly disparate initiatives. Further research is required to develop such an integrated process management perspective which reflects the realities of organisational dynamics.

There is a danger that in the long run BPR could lose its identity.¹⁹ Its central tenet is concern with process. However, the exclusive focus on process without considering the broader themes identified above is likely to increase the probability of the initiative being less successful than it might otherwise be. BPR is beginning to emerge as a principal element in a framework of approaches that are complementary and broadly consistent in seeking performance improvement.

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¹⁹Willmott [142] argues that BPR is broadly consistent with a number of so called "post modern" developments in management theory.

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Reconciling the IT/business relationship: a troubled marriage in need of guidance

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Abstract

Over the past 30 years the relationship between the information technology (IT) organisation and the rest of the business has been a troubled one which few organisations have managed to satisfactorily resolve. This 'gap' has been explained by the cultural differences existing between the two. Yet despite the criticality of IT to the business little attempt has been made to explore this culture gap further and much of the writings and research on the subject are dispersed, progressing little beyond the centralisation/decentralisation debate and offer little by way of guidance. Much of the literature is concerned with issues of control of resources rather than managing the relationship. Some organisations have chosen to rid themselves of the problem through outsourcing but recent debate has raised the question of the long term consequences of short term decisions which are based on a historical problem. Yet often the 'trouble' has no foundation beyond a level of perceptions. This paper attempts to understand and interpret the problems in the relationship, to describe the gap, to understand the reasons why it exists, and to offer some advice. A framework which can be used as a basis for further constructive research to improve our understanding is developed and discussed.

Keywords: IT organisation; Culture; Business value; Relationship management

1. Introduction

Since it was first used in organisations the focus of information technology (IT) has shifted from being a technical concern to being recognised as a critical business issue. From the early 1980s information management through the use of IT has been seen as being crucial to competitiveness and taking on a strategic significance for organisations (Cash and Konsynski, 1985; Earl, 1987; Porter and Miller, 1985; Rockart and Scott Morton, 1984) and offering new competitive advantages (Ives and Learmonth, 1984; Malone et al., 1987; Johnston and Vitale, 1988; McFarlan, 1984). Yet despite the

Table 1

‘Wall’ between IT organisation and internal customers as articulated by each camp

Internal customer views of IT	IT professionals’ view of customers
“No confidence in IT”	“View IT as a cost, not an investment”
“It’s a waste of money”	“No mechanism for justifying the business case for IT”
“Lack of commercial edge”	“No strategy guidance for IT”
“Too defensive”	“Top management not committed”
“Not practical”	“Users don’t understand cost and value”
“[System] is rubbish and unfriendly”	“No business strategy”
“Wants rather than needs dominated”	“IT responsible for “everything”, IT the whipping boy”
“Can’t get information”	“No cost recovery from [company’s] customers”
“They are pre-occupied with state of the art IT”	“Lack of awareness of what IT can offer”

undoubted criticality of IT to the business, the IT organisation,¹ as the provider of IT resources, often does not have a harmonious relationship with the rest of the business.

Perhaps a reason for this problem is that IT in general and IT professionals in particular were often late coming into an organisation. The business already had its own value system and behaviour and in many instances the emergence of the IT organisation could be seen as being imposed on the rest of the business; a ‘forced’ rather than ‘mutually desired’ marriage. In many organisations the current IT organisation has grown out of a specialised group of professionals dedicated to ensuring that the ‘computer’ was able to function.² The professionals staffing the IT function are often more attracted to work with the technology than to contribute to the success of the business. In short, they see their future careers in the context of IT and do not give much consideration to the organisation in which they work, perhaps one reason for the traditionally high turnover of IT staff. If they do, it is likely to be in relation to the ability of the organisation to keep up with the latest technologies. There is little personal advantage to be gained in working for an organisation which is not state-of-the-art in the technology it uses. It may not be challenging to work in a ‘low-tech shop’ and IT skills can become quickly outdated, thus diminishing the ‘marketability’ of the IT professional. Indeed, perhaps the analogy can be made with that of actuaries who have are often seen as having more loyalty to the profession than to the institution where they work.

Of course, the attitudes of the rest of the business have not helped. Many managers are technologically inept or averse (McLeod and Jones, 1986), feel incapable of understanding – let alone managing – IT,³ and in a great many instances this is by

¹ We are using the words IT organisation loosely to refer to the body of individuals providing IT resources and services to the business. Included are IT departments, DP departments, MIS departments, IS organisations or any other grouping providing such services, which exists inside the organisation.

² Backhouse et al. (1991) assert that the study of IS came about from the need to solve mainly technical problems.

³ Conclusion drawn by Lacity et al. (1995) in relation to managers who take a conventional view of IT as a commodity in the decision to outsource.

choice: they run the business while the IT organisation provides them with IT solutions.⁴ The reputation which the IT organisation has attained has not helped matters. Many IT projects often come in over budget, over time and when eventually developed very often fail to satisfy user requirements.⁵ IT projects regularly focus on delivery of the technology using special 'methodologies' with little attempt to manage the delivery of benefits. A recent benefits management survey of UK companies highlighted that only 10% of companies actively managed the delivery of benefits from IT projects (Ward et al., 1995). Perhaps blame could be laid at how investments in IT are appraised.⁶ Even the traditional IS/IT planning process focuses on how the organisation can use technology and not how the business could best benefit from IT.

Table 1 illustrates the 'wall' which existed between internal customer views of IT and the IT professionals' view of these customers in a large construction company. These selective quotes were elicited as part of a survey conducted by the company in an attempt to understand the problems they were experiencing in relation to IT.

A picture can be painted of two different worlds. One, the world of business and the never ending quest for competitive excellence. The other, the world of technology where there is similar striving for excellence, albeit technical excellence.⁷ Each treats the other with suspicion or indifference perhaps due to the lack of mutual understanding. A recent IT survey reported that 79% of managers surveyed see IT as a support function (Price Waterhouse, 1993). Many IT organisations may indeed be happy with this situation: it gives them the licence to experiment with the latest technologies.

Culture is often used as a variable to explain the troubled relationship between the IT organisation and the rest of the business (Grindley, 1991a). IT directors clearly perceive a problem – a recent survey reporting that 47% of them stated their main problem was the culture gap existing between the IT and business professionals; and its importance – 56% believe the culture gap is inhibiting their companies from gaining competitive edge from IT (Grindley, 1991b). This survey concluded that 'the culture gap is a very deep rooted problem, of a much more fundamental nature than the simple knowledge gap experienced when dealing with other specialists'.

The concept of culture has been receiving increasing attention in the management

⁴ A recent perspective in Harvard Business Review addressed the role of the CEO in relation to IT. The general conclusion was that technology now requires general management leadership. John Rockart proclaimed that the CEO of 1995 must incorporate the capabilities of IT into his 'theory of the business' (p. 166). See 'The end of delegation? Information technology and the CEO', Harvard Business Review, September–October, 1995, pp. 161–172.

⁵ An OTR Group study, quoted by Willcocks and Margetts (1994), showed that for projects in excess of £660,000, 90% were over budget, 60% were over time, and 20% were inappropriate.

⁶ For an enlightened collection of papers exploring the theme of evaluation of IS investments see Willcocks, (1994).

⁷ Backhouse et al. (1991) have noted that the IS community in general seems to 'be clustered around those whose main concerns are with the technology and those who wish to introduce business-school type thinking' (p. 24). In a recent content analysis of IS job advertisements, Todd et al. (1995) reported that contrary to expectation, the relative frequency and proportion of stated technical knowledge requirements in ads have increased dramatically, while the relative frequency of business and systems knowledge requirements has actually decreased slightly.

literature since the early 1980s, for example in the area of strategy and managing and understanding change, particularly strategic change (Johnson, 1992; Pettigrew, 1985). Few would argue that IT/business relationship is not suffering increased pressures due to changes in the competitive environments and the potential offered by IT. Yet detailed analysis of the cultural IT/business gap has yet to progress beyond describing its symptoms and consequences and most discussion is diverted to addressing centralisation and decentralisation issues or discussing the merits or otherwise of outsourcing versus insourcing.

In the IT world today there is much discussion about the issues associated with legacy systems.⁸ Organisations also have a cultural legacy. This suggests that not only do they have to manage the future but organisations also have to deal with the consequences of the past relationship. Like any relationship which is in trouble we need to understand the cause of the trouble, understand the various perspectives and perceptions and then decide how best to proceed. Given that there is a gap, understanding its nature should help in identifying how it might be bridged. Must one party change or do both have to make some concessions? Many organisations have already decided to deal with the 'problem' by completely outsourcing the IT organisation. But the wisdom of treating IT services as a commodity service best managed by a large supplier has been questioned (Lacity and Hirschheim, 1993; Hewett, 1994; I/S Analyzer, 1993; Bettis et al., 1992).

In this paper we first briefly review the concept of culture and assess the cultural aspects of the evolving role of the IT organisation from a number of different perspectives. The changing role of IS/IT in the business also has implications both for the organisation and its culture and these are examined. A number of different perspectives are presented which can help in interpreting the cultural gap. We then present a framework which we have found useful in gaining mutual understanding and determining the action required in an attempt to bridge the 'gap'. Finally, we suggest a model which could form a useful starting point for further research to explore the IT/business relationship more fruitfully in the future.

2. Culture

Culture has become a key concept in the language of today's manager. It is a term which is used as the excuse for many occurrences in organisational life. Yet if culture *is* a major influence on the behaviour of the organisation, there is a need for managers to manage the 'cultural' context of the organisation in order to achieve required objectives.

Despite the widespread use of the term in today's management literature, the word culture in fact originates from social anthropology.⁹ Studies during the late 19th and early 20th century of so called primitive societies highlighted ways of life that

⁸ See for example, Heygate, (1993) and Hsu and Howard, (1994).

⁹ Smircich (1983) has pointed out that the concept of culture has been borrowed from anthropology where there is no consensus on its meaning.

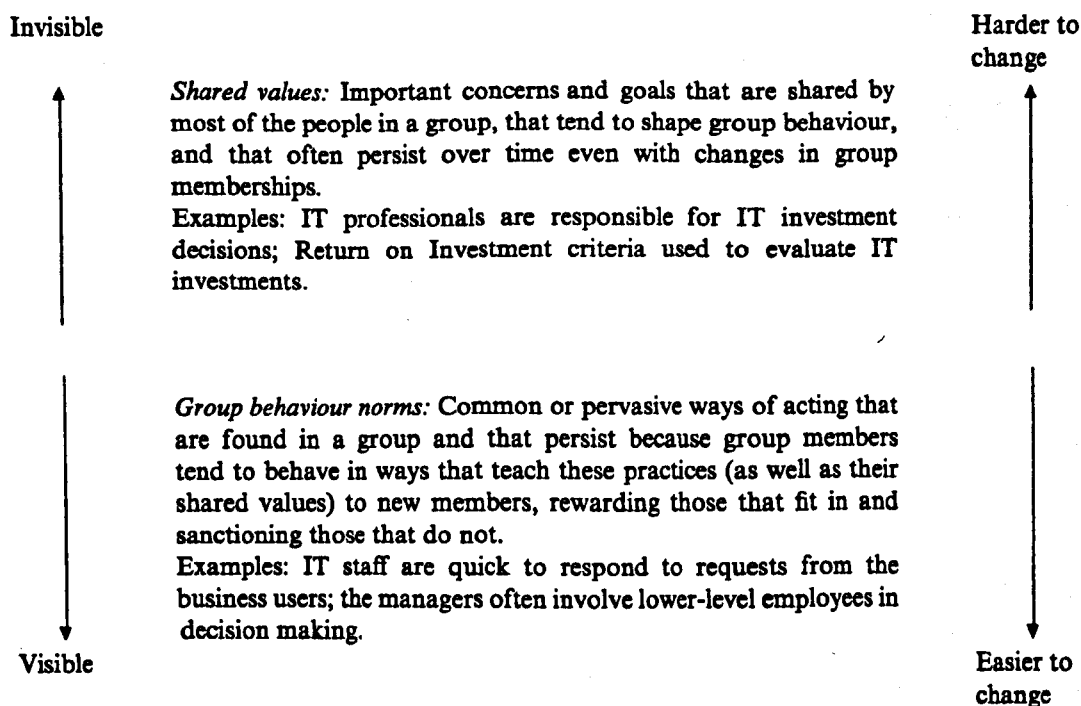


Fig. 1. Culture in an organisation (adapted from Kotter and Heskett, 1992).

were not only different from the more industrial and technically advanced parts of the USA and Europe but were very often different among themselves. The culture of these societies was deemed to explain the difference, and in a holistic sense, the qualities of any specific grouping of people that are passed from one generation to the next.

The notion of culture was popularised in the general management literature by Anthony Athos's (1981) *The Art of Japanese Management*, William Ouchi's (1981) *Theory Z* and Peters and Waterman's (1982) *In Search of Excellence*. In particular, Peters and Waterman's work focused on culture (or shared values) as a variable, which could be manipulated just like structure or systems or style. Hofstede (1991) used four dimensions of culture to analyse different values and to explain different attitudes to work issues in organisations in 50 countries: power structures, collectivism versus individualism, femininity versus masculinity, and uncertainty avoidance.

Organisational culture can be defined as the shared values and beliefs which take the form of rules of behaviour in a work group or organisation. At an elementary level, corporate culture can be viewed as 'the particular way things are done' in organisations. Culture will be influenced by many variables such as the 'baggage' people bring with them from their educational and social background or traditions and myths about the management style of the organisation, reporting structures, etc. It is shaped by numerous pragmatic actions over time based on what does and does not work. These beliefs and assumptions lie within a cultural web which in some sense represents the organisation's social energy and personality and the assumptions and beliefs which it holds (Johnson, 1992). Culture helps to concentrate individual energy in particular directions since the culture bottom line is expected

behaviour of organisation members. Indeed, Smircich (1983) proposes the view that organisations are cultures.

Kotter and Heskett (1992) propose that it is useful to think of culture at two levels which differ in terms of their visibility and their resistance to change (see Fig. 1). At the deeper and less visible level, culture refers to values that are shared by people in a group and that tend to persist over time even when group membership changes. At this level culture can be difficult to change, due largely to the fact that people do not recognise the values which they hold. At the more visible level, culture represents the behaviour pattern and style of an organisation that new employees are automatically encouraged to follow by their fellow employees. At this level, while difficult to change, it is less difficult than the deep-seated values.

2.1. Does culture have an impact?

A critical question relates to an implicit assumption made at the outset of this section and that is that culture *does* have an impact. The evidence would suggest strongly that this is the case (Davis, 1984; Pettigrew, 1985; Hofstede, 1991). Kilman et al. (1986) distinguish three interrelated aspects of impact: direction, pervasiveness, and strength.

The *direction* of impact is the course that culture is causing the organisation to follow. The *pervasiveness* of impact is the degree to which the culture is widespread, or shared, among the members of the organisation. The *strength* of impact is the level of pressure that a culture exerts on members in the organisation, regardless of the direction.

Kotter and Heskett's (1992) recent studies which examine whether or not a relationship exists between corporate culture and long-term economic performance indicate four trends:

- Corporate culture can have a significant impact on a firm's long-term economic performance.
- Corporate culture will probably be an even more important factor in determining the success or failure of firms in the next decade.
- Corporate cultures that inhibit strong long-term financial performance are not rare; they develop easily, even in firms that are full of reasonable and intelligent people.
- Although difficult to change, corporate cultures can be made more performance enhancing.

If one can draw any conclusion it is that culture does have a powerful impact over the behaviour of an organisation. When Digital Equipment Corporation moved its XSEL expert order-entry and configuration system from the USA to Europe, it encountered considerable difficulties because of *cultural differences*. What was correct for sales people to do in the USA was done by administrators in Europe (Mumford, 1991). The calling off of the recent proposed merger between The Leeds Permanent and National & Provincial Building Societies was said to be due to irreconcilable differences in culture between the two and their '*distinct approaches*'

to business.¹⁰ The hostile bid by Paramount for Time Inc. was blocked by arguments relating to the dramatic consequences the take-over would have for the *culture* of Time, which would have serious repercussions for the customers, shareholders and society.¹¹ In a 1993 study of business process reengineering, Delphi Consulting reported that two-thirds of the respondents cited *cultural resistance* as the major challenge to succeeding at business process reengineering (BPR) (Radosevich, 1993).

2.2. Sub-cultures

The view of organisations as a unified set of values makes problematic the recognition of different subcultures within organisations. Much of the literature on organisational culture has been criticised by Young (1989) who notes that writings suggest either a view of organisations as a single culture which ignores the existence of subgroups with different interests, or a collection of sectional groups who basically strive for their own gain. Subcultures are groups of people whose culture differs from others or the organisation as a whole. This will be expressed in their holding of different expectations, values and goals. These values may be about seemingly superficial things such as preferred style of dress in that subculture, or their preference for being allowed to take their own decisions rather than being given strict guidelines. However, in an organisational context, these cultural differences may signify the potential for conflict and can pose obstacles to communication. Over long periods of time subcultures may generate behaviours or actions which are dysfunctional to the dominant corporate culture.

A critical question is whether IT professionals are different from others in the organisation and, if so, whether this difference might in some sense have cultural underpinnings. Couger and Zawacki (1980) espouse the position that there are indeed two 'types', who behave differently. This position has been challenged by Ferratt and Short (1988) who, based on a field survey, asserted that IT and non-IT employees are not different and consequently should not be managed differently. However, their methodology has limitations for broad generalisations to be made, not least the use of 'work-unit environment' as a surrogate measure for identifying differences.

Although there is little academic work specifically addressing the issue of information systems (IS) subcultures (Walsham, 1993b, p. 37), the IT organisation is often described as having its own culture, which can be quite distinct from the rest of the business resulting in quite different codes of behaviour. The IT profession has developed a language of its own which is dominated by acronyms which only contributes to and reinforces the development of an IT subculture.

There may be an implicit assumption that the thinking and problem solving styles of the IT professionals and users of their systems are similar. Very often, IT professionals fail to see the political nature of organisations and usually assume that all problems have a technical solution. IT professionals are trained to be highly disciplined, and this is reinforced by traditional systems development methodologies.

¹⁰ Reported in the *Financial Times*, October, 1993.

¹¹ Reported in *Time*, 24 July, 1989.

They tend to have a low tolerance for ambiguity and often shy away from dealing with emotions. According to Rochester and Douglas (1990) they have a strong task orientation and prefer neat, tidy, lasting solutions to problems. This can have major implications if there is a high-level of resistance to a new IT application. While communication between users and the IT professionals must be two way, this must be reconciled with the project management dimensions: IT projects have milestones and targets must be met if system implementation is to be kept on schedule.

Straub (1991) examined the 'mindset difference' between those who are professionally trained in computing and those who are not. In a philosophical analysis he asserted that the reference discipline of those trained in IT resulted in them viewing the world in particular ways which differed from those not trained in such a way. In a somewhat similar vein, Orlikowski and Gash (1994) assert that organisational actors hold different frames of reference and that these guide their development and use of technology.

Therefore, at a sub-group level, culture may lead to behaviour which is dysfunctional to the organisation. Given that the IT organisations and the rest of the business can have different cultures, it is worthwhile examining the evolution of the IT/business relationship from a cultural perspective.

3. Cultural aspects of the evolving role of the IT organisation

There has been much analysis of the changing role of IT in organisations over the last 30 years, resulting in a number of 'evolution' models. Most authors agree that there have been probably three distinct 'eras' in this brief and rapid evolution. These can be summarised as the Data Processing, Management Information Systems and Strategic Information Systems eras (Ward et al., 1990; Galliers and Somogyi, 1987). These descriptions emphasise the changing nature of the role of IT in terms of its use, its business contribution and the resulting management issues. However few studies have specifically dealt with the changing issues at the IT/business boundary in the organisation. Much of the apparently relevant literature deals with the issue of control of IT, i.e. the issue of centralisation or decentralisation of IT resources in the organisation (McFarlan et al., 1983; McFarlan and McKenny, 1983). Whilst clearly the organisational positioning of the IT people will affect their relationship with the business colleagues they 'serve', the arguments tend to assume that who manages the resources determines the nature of the relationship. Again, little analysis has been done and it can be observed that even when IT resources have been decentralised, there is often an uneasy and uncomfortable relationship between the IT specialists and business colleagues and managers. As mentioned earlier, it is interesting that the Price Waterhouse IT Review 1993/94 raises both issues of centralisation versus decentralisation of IT resources (and it describes the roughly equally balanced arguments for both) and the culture gap (which is associated with the increasing problems arising from legacy systems). It would appear that another cycle of argument about the merits of centralisation versus decentralisation may well obscure any reasonable debate of how to improve that IT/business relationship, wherever IT resources are located.

The few writers who have addressed the cultural aspects of the role of the IT organisation and people in relation to the rest of the organisation, offer some valuable insight. Zmud (1984) considered the changing type of activity performed by IT staff, arguing that during the 1980s it changed from a 'manufacturing' based activity set to a 'distribution' set. He proposed a different type of IT organisation structure to reflect the need to deliver services rather than develop and deliver products. Others including La Belle and Nyce (1987), Keen (1988) and a summary article in *EDP Analyzer* (1986) discussed both the merits of different organisational structures and the changing nature of skills required by IT specialists. But again little is said about the inter-relationship between IT and the business.

Hirschheim et al. (1988) are more specific and begin to address the relationship issues, albeit by describing the need for IT departments to respond effectively to changing demands from the 'business'. They describe three stages of the evolving relationship:

1. *Delivery* – when IT services are mainly internal and their focus is on improving their ability to deliver and support the IT based systems. This does not imply delivering what the business needs!
2. *Reorientation* – when IT attempts to develop good relationships with the main business functions (easier with some than others) and provides a variety of services to meet demands from the functions, albeit without regard to the business importance of those demands.
3. *Reorganisation* – when IT tries to develop an integral relationship with business management to ensure that the supply of services matches overall business priorities and responsibilities are shared and balanced between IT specialists and business managers.

Most mature organisations are probably struggling in the third of these states, but often encumbered by a cultural legacy, as well as systems legacy, inherited from the first two.

Another more detailed assessment of the evolving relationship is described by Galliers and Sutherland (1991) who synthesised Earl's (1989) planning model with Nolan's (1984) six stage model and the well known '7S' model for analysing the interacting management attributes, some of which clearly have a cultural dimension (style, skills, staff and shared values). Their conclusions, tested in a number of organisations are essentially that:

1. each of the attributes needs to change as the organisation becomes more dependent on its IT systems and more mature in its planning of them;
2. if any of the attributes is unsatisfactorily addressed in an early stage of the evolution, then the organisation will be less able (even unable) to achieve success in the later, more demanding, stages;
3. positive attributes developed in the early stages should not be discarded later since the organisation will have a legacy of products from the earlier stages to support;
4. for an organisation to succeed, without major hiatus of disruption of IT supply,

Table 2

Summary of Galliers and Sutherland's (1991) staged model

Stage 1 'Adhocracy'	Very few, if any, shared values since the focus of IT is internal and they are unable or unwilling to seek a coherent relationship with the business. They relate more closely to IT suppliers.
Stage 2 'Starting the foundations'	The 'priesthood' of IT begins to develop and IT staff perhaps cultivate a unique culture based on technology worship – often seriously at odds with the business.
Stage 3 'Centralised dictatorship'	When IT management often reacts to business managers concern over 'excessive spending' on IT and views of poor delivery performance by becoming defensive and exerting control over what it does to address the balance.
Stage 4 'Democratic dialectic and co-operation'	IT specialists recognise the need to work in co-operation with business managers towards achieving business goals but still expect the business to co-operate with IT's set of values.
Stage 5 'Entrepreneurial opportunity'	Recognition in the business that IT can deliver new, potentially strategic, benefits through innovative use often leaves the IT department looking after the legacy and struggling to provide any value to the newly 'liberated' users.
Stage 6 'Integrated harmonious relationship'	Rarely achieved due to the difficulties and reconciling differing values, overcoming historical precedents and prejudice and requiring a new openness in all aspects of IT activity

it should address all of the 7S elements coherently at each stage before moving forward.

Table 2 summarises the six stages described by Galliers and Sutherland focusing on the conclusions with respect to the 'shared values' at each stage. In many organisations it is the long term effects of behaviour in Stages 2 and 3, as perceived by business manager, that make the relationship changes required in Stage 4 onwards difficult to achieve. The table emphasises perhaps the more negative aspects of the observed realities in Stages 4 to 6 in organisations than the desired, almost idyllic, relationships described by Galliers and Sutherland as prerequisites for success.

Technological developments coupled with increasing disappointments and frustration with IT delivery capability saw the advent of end-user computing during the late 1970s. Individual departments, and latterly individual users, assumed responsibility for their own application development. The proliferation of personal computers saw for the first time responsibility for IT development move away from the IT organisation. The issue of control of resources, referred to earlier, became a central theme, although it was usually shrouded in the attendant problems of incompatibility of hardware and software and issues of data integrity.

In the context of the rapidly evolving use of IT in the 1980s and the changing nature of the IT applications many organisations turned to outside suppliers to deliver the newer often more complex systems. This was in part due to the skills required, which perhaps did not exist in the internal IT function, and was often seen as necessary since the in house IT resources were fully occupied maintaining the old systems and had no

time to work on the often 'urgent' new systems. Whether or not the arguments were really valid, or the business managers preferred to work with other parties than the in-house IT function, this caused further problems between in-house IT specialists and the business. IT specialists could not fail to notice that the most interesting and often business significant work was now being done by outsiders. Although while some IT staff probably did not mind – being happy to work within their old skill set – many resented this change and became further alienated from the business.

Up to this point, in the mid-1980s, organisations may have employed additional external resources to supplement their own staff in varying ways, but few got rid of their own staff as a result. Only in the late 1980s did 'outsourcing' of IT resources become a seriously considered alternative, but it has been rapidly taken up by many organisations who are unhappy, for any one of a range of reasons, with their in house IT people particularly if IT is viewed as a commodity (Lacity et al., 1995). It appears that whilst it is rarely overtly stated, the original causes which make outsourcing eventually a preferred option, have been built up in the poor relationship between IT and the business. It could be observed that many IT departments were 'culturally outsourced', often due to their own actions, long before an issue triggers consideration of physical outsourcing. It is then an easy and relatively painless step for management to announce the divorce! Interestingly, a recent outsourcing survey highlighted the importance of cultural fit in deciding on an outsourcing vendor as opposed to evaluating tenders based on a straight lowest cost basis (Fitzgerald and Mitchell, 1994).

Today, most businesses have a far richer choice of 'sourcing' options for IT products and services than 10 years ago. This implies a further set of changes in the role of any in-house IT function and also more complex decisions for business managers. Of course a crucial question is where responsibility for IT should lie (Griffiths, 1994). Some organisations accommodate the problem by declaring the IT function a 'profit centre' and demand that it earns a living from external and internal customers. This is effectively outsourcing by another means, making the relationship an 'arm's length', customer-supplier business relationship; perhaps it should be called 'shake it all about' sourcing! Yet research shows that they are often sub-optimal in terms of satisfying the host organisation's needs (Feeney et al., 1987). Dearden (1987) argues that making IT a profit centre is the first step in an inevitable journey to oblivion.

Venkatraman and Loh (1993) consider this changing nature of the IT function whereby it moves from managing a technical or product portfolio to a 'relationship portfolio'. They suggest that the IT function should focus on managing its relationship with its 'customers' (in the business) and its suppliers (in the IT industry). It needs to clearly define its 'locus of competence' or value adding capability between the two and also to fulfil a new role in enabling the development of inter-organisational systems between the firm and its trading partners. They contrast this new role with the skills and values of a traditional IT organisation but also argue that simplistic outsourcing leaves a competence gap inside the organisation.

In a similar vein Moad (1994) argues that the changing nature of the technology

Table 3
Maturing with technology (after Hedberg)

Phase	Mission	Purpose of application	Organisational impact	The technologist	Nature of design
Phase 1	To design	To exploit new technology	By surprise	"Frontiersman"	Exploratory
Phase 2	To design carefully	To minimise social impact	By mistake	Tailor	Defensive
Phase 3	To design deliberately	To change organisation	On purpose	Agent of change	Strategic

infrastructure, especially 'mainframe' to 'client server', is causing the creation of the 'Virtual IS Organisation'. He suggests that the IT resource is becoming dispersed and de facto includes business people and external resources which need to be co-ordinated within and outside the organisation via some as yet unspecified process! In many ways his views are similar to von Simson (1990) who described a more structured version of how to manage a 'centrally-decentralised IS organisation'. But in both cases the implicit rationale is about control of activity and resources and adapting to a changing IT environment rather than to establishing an effective relationship. Moad does point out that many IT organisations are uncomfortable with this new concept and many of them attempt to regain control of the dispersed components of the virtual organisation through an insistence on managing the new technology infrastructure.

One final viewpoint that is worth considering in this section, and a view that perhaps offers more insight into the culture gap problems than most, is that described by Hedberg.¹² He presents his three-stage view of how organisations mature with new technology from the point of view of the technologist (see Table 3). Whilst the particulars are interesting in themselves the table perhaps explains in a simple way why organisations have found it exceedingly difficult to fully integrate the IT function with the business. In Phase 1, the technologist is exploring or pioneering, attempting to exploit the technology and the rest of the business is the normally unwilling subject of this haphazard and uncertain exploration – not a satisfactory start to the relationship. Eventually the technologist (and the rest of the business) realises the limits of the technology and care has to be taken to avoid unacceptable effects on the rest of the organisation – the technologist becomes defensive – again not a very equal or mutually responsible relationship. Finally in the third phase the technology can clearly deliver strategic change if managed well, but the technologist is seen as the agent of that change – a source of potential revolution in the organisation. Once more this is a threatening role which is difficult to accommodate comfortably. Hence even if the technologist has the wit to recognise these changing roles and can acquire the skills needed, almost by definition he or she is an intruder or even a threat to the rest of the organisation. The natural reactions of any organism

¹² Unpublished conference proceedings.

in such circumstances is to (a) pretend it's not there and/or (b) reject it at the earliest opportunity.

4. Implications of the changing contribution of IT to business success

Perhaps the easiest way of describing the changing contribution is through the application portfolio concept (Ward et al., 1990; Ward, 1992). Most organisations' IT based systems have evolved from a *support* role through *key operational* to *strategic* (to some extent at least) and for a stage of their life cycle some were of a *high potential* nature (even if the potential was not realised). Fig. 2 describes the basic portfolio and overlays an interpretation of the results of Earl's work on planning approaches (1993) and Parson's (1983) work on implementation methods – the rationale is described by Ward (1992). The resulting sets of planning and implementation 'best fit' synthesis has implications for the relationship of the IT function to the business – it needs to forge different management and operational relationships if it is to succeed in all types of IT application based on required business contribution.

Crescenzi (1988) used the 7S attributes to analyse why a majority of 'Strategic

STRATEGIC	HIGH POTENTIAL
<p><i>Applications which are critical to achieving future business strategy</i></p> <p>Planning approach 'Organisational' or 'Business' led</p> <p>Implementation approach 'Centrally planned'</p> <p>Project Manager 'Developer'</p>	<p><i>Applications which may be important in achieving future business strategy</i></p> <p>Planning approach 'Business' or 'Technology' led</p> <p>Implementation approach 'Free market' or 'Leading edge'</p> <p>Project manager 'Entrepreneur'</p>
<p><i>Applications on which the organisation currently depends for success</i></p> <p>Planning approach 'Method driven' or 'Administrative'</p> <p>Implementation approach 'Monopoly'</p> <p>Project manager 'Controller'</p>	<p><i>Applications which are valuable but not critical to success</i></p> <p>Planning approach 'Administrative'</p> <p>Implementation 'Scarce resource' or 'Free market'</p> <p>Project manager 'Caretaker'</p>
KEY OPERATIONAL	SUPPORT

Fig. 2. The applications portfolio and implications. Planning approach – after Earl (1993); Implementation approach – after Parsons (1983); Project management – after Ward (1992).

Table 4

Strategic information systems: success and failure by the 'seven Ss' (after Crescenzi)

Success	S	Failure
Top down management. Focus on business goals. Evolutionary development.	Strategy	Focus on systems and technology.
Team.	Structure	Hierarchy.
Selling and education. Accepting ambiguity.	Skills	Technical only.
Reward risk taking. Intuitive justification.	Systems	Structured/inflexible approaches.
Loose, flexible.	Style	Discourage risk/creativity.
Visionary/champions.	Staff	Financial justification.
Accommodate different views in small team.		Specified duties and roles.
Unselfish — share ideas and power.	Shared values	'Superstars' not teams — different views not accommodated.
Accept imperfection	(culture)	Separation of user/IT. Technical excellence of systems (perfection).

Systems' investments failed (only five out of 30 were described as successful in an Index Group Study). His overall conclusions – the details of which are shown in Table 4 – were that the range of attributes of IT organisations and staff which are appropriate in a reactive, problem solving, job shop environment are quite inappropriate when the projects require a proactive, creative change driven approach. This is not really surprising but it is surprising that in 83% of the sample (25/30) this was not recognised before the project failed. There is some correlation with Galliers and Sutherland's (1991) view of the changing nature of the 7Ss, albeit that theirs is a view of historical evolution and the other reflects the 'current' situation in organisations. However, the comparison does reinforce the assessment that most IT organisations' and their staff's attributes normally align more closely with those that seem appropriate in the key operational and support segments.

It should not be surprising therefore that unless the IT organisation culture adapts to the different environment implied by the strategic and high potential types of applications, the more the business functions will take on the responsibility for them and reject IT involvement. It is more likely, after all, that business people will possess the types of attributes needed in the top half of the matrix. Equally the IT function is likely to have a skill-set and mind-set determined by the current portfolio, which will be dominated by a legacy of key operational and support systems. This is reinforced by Grindley's suggestion of contrasting differences in approach to decision-making about IT matters between IT specialists and business people – 'polarised concepts' (Grindley, 1991b).

Viewed from this standpoint, slightly different if complementary conclusions can be drawn, as compared with the previous section.

1. It is simplistically attractive to argue that 'the business comes first and IT people must understand that', implying that IT should adopt values etc. which are determined solely by the rest of the business. But this would deny the fact that in some

aspects at least, the IT skill and mind sets have to satisfy the need for stability and efficiency in key operational and support systems. Here the traditional IT values need perhaps to be adopted more wholeheartedly by the business if the optimum contribution is to be achieved from IT in the organisation. Hence whilst there is a need for the IT people to change significantly, as below, there is likely to be a need for change of attitude in the business to accommodate the inevitable consequences of extensive business use of IT. Reconciliation is needed of both the perception and reality of the relationship.

2. In the newer 'future critical' areas for the use of IT in the business the values of business development, innovation and consequent risk-taking and change have to be shared successfully within the relationship. Here the IT community cannot argue that others must become reconciled to IT's view. It is the business managers who will, inevitably, decide what IT is to be used for and the IT specialists must adopt ways of working which enable the business to succeed. In the process they must also provide the knowledge to enable the business managers to make informed judgements about IT feasibility – not tell the business managers what will and will not work, or how things must be done. In the strategic and high potential segment the 'IT process' is of secondary importance to the business development and change process. All this implies that IT specialists adopt a different set of values, or else in many instances the IT department will be rejected as a partner in favour of outsiders, who can appear to adjust their value set, like chameleons, to any set of surroundings. Once rejected from the strategic quadrant of the matrix the IT function will probably have to fight a rearguard action across the whole matrix, justifying its value added everywhere.

The long-term consequences of the IT function not being able to understand the realities and perceptions applying to these new areas will be that the organisation will become reliant on outside suppliers for success in its pursuit of its business strategy. Therefore whilst it is incumbent on the IT people to change, it is the responsibility of organisational management to create the climate for that change to occur – or the business as a whole will probably suffer in the long term.

Whilst these conclusions are reasonably obvious in many ways, achieving reconciliation in this increasingly pressured environment, requires new ways of thinking on both sides of the relationship and ways of thinking which are not immediately perverted by the troubles of the past.

5. Routes towards gaining mutual understanding of the situation

Cultures and issues surrounding culture are difficult to define and understand. Dealing with fuzzy, intangible things like 'mindsets' is a complex task, yet the Peters and Waterman (1982) work referred to earlier was clear in its suggestion that culture is a variable which could be manipulated. The message from their work is that 'excellent' organisations exhibit a particular type of culture which any company aspiring to excellence should seek to emulate.

While this might be a logical implication, of critical concern is the extent to which management can influence members values which are necessary for the survival of the organisation and how influential are traditions and beliefs about how things have been done in the past in influencing current action. Sounding a word of caution, Fitzgerald (1988) has argued that those who urge direct management of corporate culture largely fail to appreciate that the deep-seated values, beliefs, and assumptions underlying that culture can rarely if ever be engaged by such an approach. He proposes that 'we can't talk intelligently about changing cultures until we understand how to change underlying values.' Despite this reservation we suggest that it is useful to explore the cultural context of the IT/business relationship from a number of different viewpoints.¹³

5.1. Perceptions

The perspective of culture as shared meaning has been suggested (Smircich, 1983). This view is linked to symbolic anthropology (Geertz, 1973) and when applied to organisational analysis, culture is conceived as a pattern of symbolic discourse needing interpreting, reading or deciphering. Organisation theorists have emphasised that environments are not given realities, but created through processes of attention and interpretation (Pfeffer and Salancik, 1978).

Perception is a critical variable in examining culture because people's behaviour is based on their perception of what reality is and not reality itself. Perceptions will also play a leading role in how individuals react to and enact changes in culture. For example, adopting this basic premise in examining resistance to change is to take the perspective of the individual in an attempt to understand change, a view shared in disciplines such as anthropology and ethnography. Human behaviour is guided by the constructs and meaning which individuals use to interpret their surroundings.¹⁴ Thus this hermeneutic approach involves the mutual understanding of different peoples 'frame of reference' which guide their meaning. For example, while business strategy is developed in response to what senior management perceive the competitive environment to be, research shows that even managers from the same firm can perceive their environment quite differently and will therefore seek to implement different strategies to meet competitive challenges.

5.2. Roles

A key task in examining the IT/business relationship is to examine the roles performed by the IT organisation. At this basic level, the Price Waterhouse (1993) study, referred to earlier, showed that there is a rift between the IT organisation and the business concerning what exactly is the role and function of the IT organisation. Both have different interpretations of what these roles entail or should entail. For example,

¹³ In addition to these, other viewpoints could be used to examine this gap, such as examining issues of power (Keen, 1981; Markus, 1983; Markus and Bjorn Andersen, 1987) or cognitive schema. Power and politics are articulated in the 'cultural web' framework developed later in the paper.

¹⁴ See the work of Boland on 'Sense-making' (1984) and 'Phenomenology' (1985).

providing infrastructure services scores most mentions among IT executives and the rest of the company, yet there is no agreement as to what these services are.

IT directors are unsure amongst themselves whether the role of the IT organisation is primarily to be engaged in a process that brings about business change, or to be the implementor of the consequences of change or merely to facilitate the activities of others. This dilemma of lack of agreed role clearly impacts the IT/business relationship and causes confusion and uncertainty. In a recent paper Earl (1992) called for the business to be put back into IT. The phenomenon of BPR is perhaps further recognition of the need to rethink how IT is applied in organisational settings (Hammer, 1990; Peppard and Rowland, 1995).

One of the roles of the IT organisation is the development of information systems. Many view information systems development (ISD) as a technical process. Most development methodologies promote the distinction between IT and the rest of the business by delineating the roles and responsibilities and using 'deliverables' or process decision points as the vehicle for reconciliation and agreement. This view has been challenged by a number of scholars who present systems development as a form of social action. Hirschheim et al. (1991) hypothesise that ISD can be more effectively understood by applying seven basic building blocks of social action theories: knowledge, power, subjective meaning, human interests, consensus, conflict, and resistance. They suggest that it is the interplay of these seven elements which make up the fundamental basis of systems development.

5.3. Metaphors

One of the problems we face in both studying and working in organisations is their complexity. There are just too many factors and their relationships are too complex or ambiguous for us to understand in their entirety. To understand and make sense of the world we need to simplify it and draw a conceptual line around what we are interested in and, within that line, what we wish to examine. To do this we consciously and subconsciously use metaphors and analogies to help focus our thoughts and understanding. This use of metaphor implies 'a way of thinking and a way of seeing that pervade how we understand our world generally' (Morgan, 1986) and can provide interesting ways of 'reading' organisations as part of an interpretative epistemology (Walsham, 1993). Boland (1989) argues that metaphors are not just colourful ways of expressing ourselves but underlie the ways in which we can think and act, and thus we 'cannot not use metaphors', a view also subscribed to by Lakoff and Johnson (1980).

Drawing insights from a variety of disciplines including organisation behaviour, sociology, cybernetics, management theory, and political science, Morgan (1986) considers a wide range of different approaches to the study of organisations. He contends that in talking about culture we are really talking about the process of reality construction that allows people to see and understand particular events, actions and utterances in distinctive ways. This has echoes of Weick's (1969) concept of 'enactment' which describes the subjective way in which we draw meaning from previously lived experiences and thus determine our attitudes to ongoing activity. We

suggest that one reason for the perceived culture gap is that the IT organisation and the business subscribe to different metaphors. Each has a different *Weltanschauung*. Perhaps the IT organisation sees the rest of the organisation like a machine to be manipulated in a similar way to how they view the other machine which they work with, i.e. the computer. Expected outcomes are seen to be predictable. The business, on the other hand, subscribes to a different metaphor, perhaps more to do with flux, and therefore expect the IT department to be as adaptable and accommodating as possible.¹⁵

6. A framework for understanding

Until both sides recognise that there is a problem the gap is likely to remain. When one speaks about culture, much of the discussion is invariably at a level of abstraction which makes it difficult to articulate any response. Examining perceptions, roles and metaphors is a helpful beginning to understanding this gap and can be brought together using the 'cultural web'. This framework, developed by Johnson (1992)¹⁶, has proved valuable in understanding the cultural aspects of business performance. Devised to assess the inter-related components of a whole organisation's cultural attributes in the context of its business environment, it is also a powerful tool to enable the business and the IT organisation articulate and understand the cultural gap that exists between them.

The web is based on the premise that while individuals may hold different sets of beliefs, there is at some level a core set of values, beliefs and assumptions commonly held throughout the organisation which Johnson refers to as the *paradigm*. The paradigm governs and influences an organisation's view of itself and its environment. We suggest that the business and IT organisation often subscribe to two different paradigms. Through their respective paradigms each creates a relatively homogeneous approach to the interpretation of the complexity that the organisation faces. Since it evolves through time and is reinforced by history, it provides a repertoire of actions and responses to the interpretations of signals, which are experienced by members and seen by them as demonstrably relevant.

The paradigm is surrounded by a web of 'cultural artefacts', composed of three 'hard' and three 'soft' components through which the organisation promulgates, deliberately or unintentionally, its core beliefs. Power and organisational structures and the control systems reflect how the organisation should work and can be defined and described in rational, objective terms. The other three – symbols, stories and myths, rituals and routines – are less rational and reflect what people inside and outside the organisation actually see and often remember most about the way the organisation conducts itself. This web is illustrated in Fig. 3 and below we briefly describe each of these artefacts.

¹⁵ For an interesting view on the use of metaphors in information systems see Walsham (1991).

¹⁶ More detail can be found in Johnson and Scholes (1993).

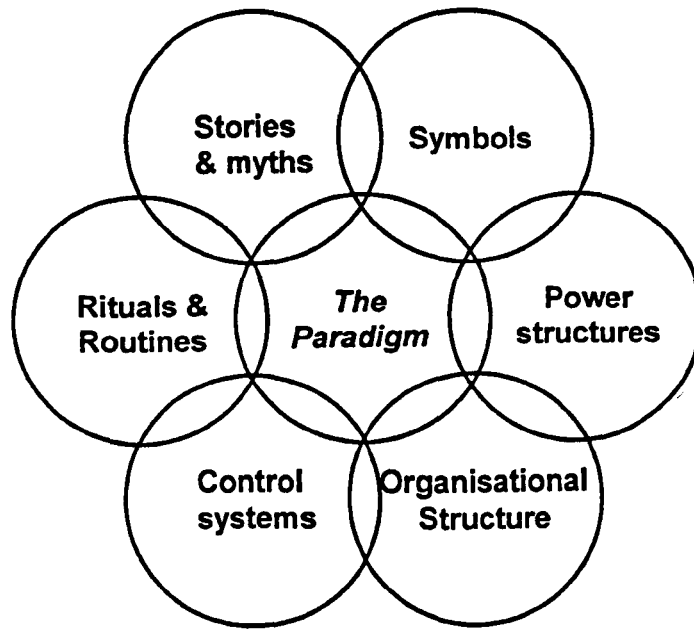


Fig. 3. The cultural web. Source: Johnson (1992).

Stories and myths. In every organisation there are stories, some true, others either variations of the truth or simply myths. Examples are the big IT failures, the products that flopped, the legendary leaders and mavericks. In particular, new employees hear stories about those who broke the cultural norms and the consequences of their actions. Most have evolved the years and have become part of the organisation's folklore.

Symbols. Every organisation has its symbols, although they are often so much ingrained in day-to-day life that they may not be recognised.¹⁷ The dress code, job titles, executive parking spaces, the MD's Rolls Royce are all symbols. At one particular insurance company there were five different categories of restaurants and as one progressed up the management hierarchy the quality of both food and dining room surroundings improved considerably. Symbols also include company specific language which reinforces entrenched attitudes, like addressing directors as 'sir'. Indeed, it has been argued that much of the information in organisation is symbol (Feldman and March, 1981).

Rituals and routines. Rituals are those aspects of organisational life which hold a special significance and may include the monthly board meeting, the annual company barbecue, or the need for partners in some consultancies to sign off anything that goes to a client. In many instances they serve no purpose other than being a part of a ritual which may at one time have had relevance. Robey and Markus (1984) argue that elements of the system design process can be interpreted as rituals which enable actors to remain overtly rational while negotiating to achieve private interests.

¹⁷ Hirschheim and Newman (1991) have examined symbolism in information systems development.

Control systems. Organisations have particular control systems to monitor and encourage performance. Pay and reward systems, budgetary control systems and the management hierarchy are all examples of such systems and serve to highlight what is valued by the organisation. The historical relationship between IT and the finance department has produced almost a double set of controls for IT and financial management.

Organisational structures. Organisations do have formal structures which do have an impact on behaviour. Functions, departments, geographically based business units, product-based business units, flat management hierarchies, large bureaucratic hierarchies, are all examples of how the structure of an organisation can impact the paradigm. The position of the IT organisation in the organisational structure and the structure of the IT organisation itself are often designed to manage IT not support the business.

Power structures. Power is concerned with where influence resides, particularly where it can reduce uncertainty. Because the power structures tend to reinforce the paradigm they are often targets for change. This is particularly difficult given that those who may be required to change often hold the power.¹⁸

6.1. Changing culture

In attempting to change their culture many organisations manipulate the 'hard' elements of the web, i.e. the power structures, the control systems and the organisational structures, neglecting to address the more intangible elements. Indeed, by treating the problem as a centralisation or decentralisation issue or in considering the outsourcing route, this is exactly that scenario. All elements of the web must be examined and acted on if cultural change is to take place and this change translated into tangible actions and results.

For example, Morgan (1986) argues that managers can influence the evolution of culture by being aware of the symbolic consequences of their actions and by attempting to foster desired values. In one particular engineering company the IT department was viewed as a support service to the business and was looked upon as the 'mover of boxes'. When a new IT director was appointed he immediately outsourced this 'movement of boxes' to give a clear message to the rest of the organisation that the IT department was involved in more value-added work. This symbolic gesture sent a powerful message to the rest of the organisation and had the immediate effect of changing the perception which the business held of the department.

¹⁸ For an excellent case study of MIS implementation focusing on issues of power see Markus (1983). Markus has also looked at the exercise of power by systems professionals (Markus and Bjorn-Andersen, 1987).

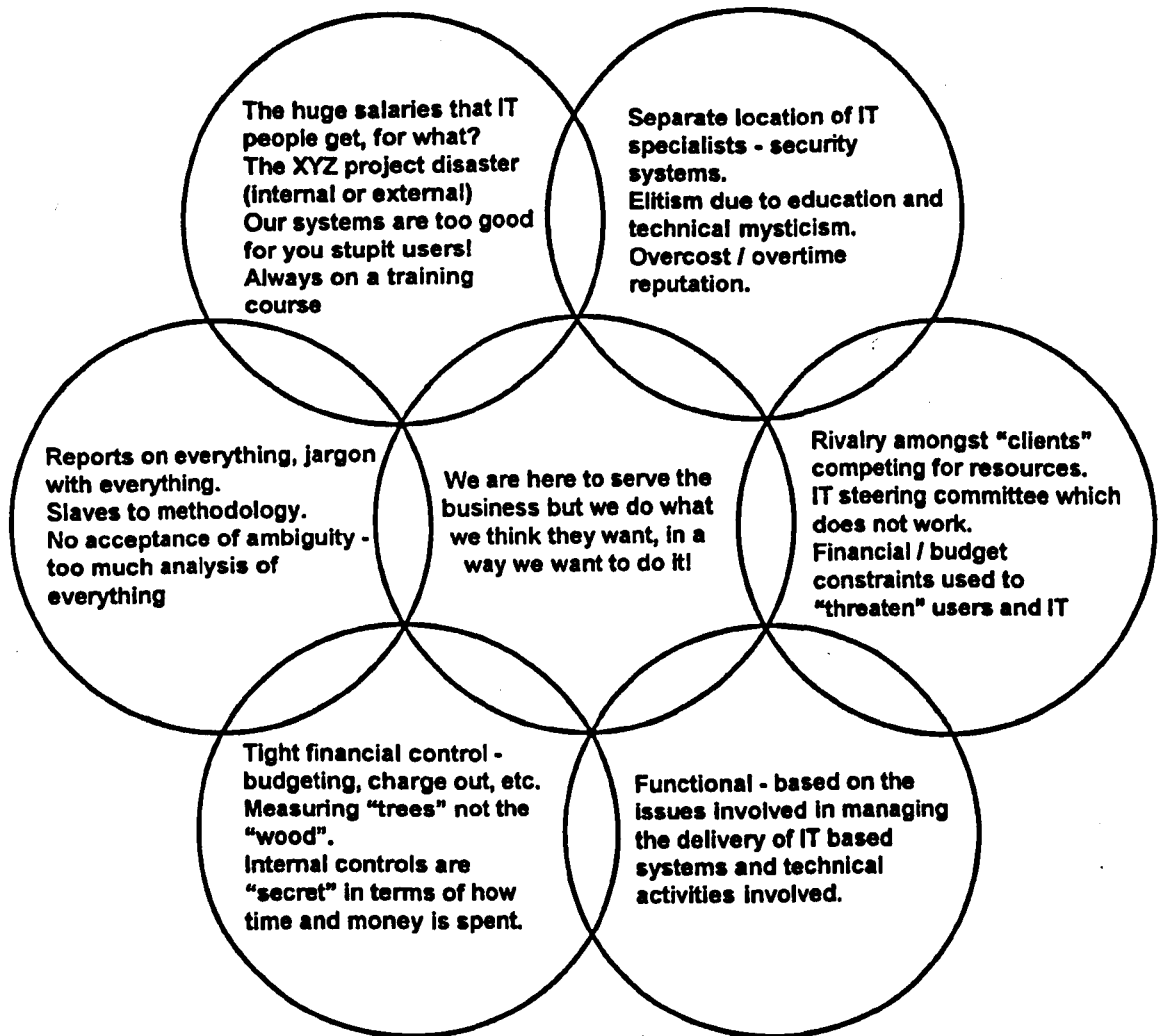


Fig. 4. A 'classic' IT department.

6.2. Cultural audits

The web can be used as a powerful tool in order to conduct an audit of the culture of an organisation. It can highlight both the hard and softer influences on the corporate culture. An example of using the technique to describe the views a business had of its IT department, obtained from a 'customer survey' is given in Fig. 4. This is derived from adapting the questions Johnson suggests to elicit the contents of the web (Johnson and Scholes, 1993).

Clearly the business did not think highly of its IT department. In fact the management of the IT department had been working hard restructuring the IT organisation, improving the control of activities and getting line managers involved in decision making about IT. However, the symbols, stories and rituals as perceived from the 'customers' had changed little over time – the management was unaware of these and the impact that had on its ability to work effectively in the business. This is partly to be expected given that IT managers are generally logical, rational thinkers and they

therefore focus on the more rational elements of the web. Even when these are made more effective, the other components will colour both internal and external perceptions of the function, based on past performance. Unless conscious efforts are made to change these elements of the web to make them consistent with the intended paradigm the organisation will not be more successful. This takes time and in the process it is necessary to 'unmake' history, eradicate old perceptions as well as create the required future. Traditionally IT management have not focused their attention on these softer aspects of their relationship with the business, resulting in the IT department's contribution being less valuable and less valued than it could and should have been.

Understanding perceptions and the reasons they are held is often the first step in reconciliation of the views and determining changes needed to improve the working relationship. The 'web' has proved a valuable technique in facilitating the articulation of those views and structuring them for review. In many cases it shows that in terms of the Galliers and Sutherland (1991) and Hirschheim et al. (1988) evolutionary models, business and IT views of the situation are significantly often 'out of phase' in terms of intention or delivered reality and/or perceptions of both.

7. Some conclusions and areas for further research

The relationship in internal IT organisation has with other business functions is under stress due to a number of forces:

1. *the rate of technological change*, which has not relented for 30 or more years and demands that organisations keep up to date with technology developments. This tends to reinforce the argument for a separate group responsible for IT.
2. *the ever extending and changing role of IT in organisations*. Using Sullivan's (1985) terms, the degrees of 'infusion' (business dependence) and 'diffusion' (dispersion of technology and related decision making) are producing a 'complex' internal environment. This results in a variety of roles for IT specialists and requires a range of services to deliver and support the systems and users activities, which can cause confusion, even conflict in making choices and decisions.
3. *the increasingly demanding business environment* is causing more rapid business and organisational change than ever before. This in turn requires a more dynamic and flexible approach from IT specialists, to deliver more adaptable solutions, more quickly. In many cases the existing systems legacy, which determines the existing IT mind and skill sets, also require major change to support the results of business process reengineering and organisational restructuring. Or worse still, radical business change cannot be effected due to the constraints of existing systems and technology. As a result IT can be seen as an inhibitor of change, at the same time as it is required to become an enabler of future change.
4. *the range of supply options for IT has increased dramatically*, perhaps fuelled by recession and the resulting drive to reduce all costs including IT. Outsourcing is not new, packaged software has been in common use for many years, but the range of services available today can enable large parts of IT's traditional function to be

provided by outside suppliers. This is seen as a threat by the internal IT specialists and often as a 'simple' solution, not just to cost problems, by organisational management. But it is interesting to note, as mentioned earlier, that whilst costs reduction and/or improved skills may be the primary drivers for outsourcing 'cultural fit' is often a key criterion in selecting an outsourcing partner (Fitzgerald and Michell, 1994).

Essentially forces 1 and 3 are supply driven pressures whereas 2 and 4 are demand driven. Forces 3 and 4 have become more intense recently and are increasing the stress on what is already often a strained relationship between the IT organisation and the business. Forces 1 and 2 have existed to a large degree throughout the evolution of IT in organisations, during which the 'culture gap' has developed. The 'culture gap' itself is a simplistic, if convenient notion describing a variety of complex issues which are influenced by external pressures as described above. The argument in this paper is that there are ways of describing the gap such that at least the problems can be diagnosed and then acted upon. Understanding different perceptions and then adjusting both how IT and business people behave is one step towards achieving the necessary congruence of shared values. This search for the means of reconciliation is suggested as more pertinent to real world issues than further debate on the merits of centralisation and decentralisation of resource control – a debate which itself perhaps increases the width of the gap?

In order to move forward constructively, in relation to the issues of today we perhaps need to look at a variety of types of relationship between IT professionals and business management. Fig. 5 suggests a way of describing a set of relationship options based on different shared values. An organisation might need to be operating in all four dimensions at any one time which implies a complex set of cultural issues to be understood. Briefly the suggested relationship types are:

1. *Financial* – where the emphasis is on the price of procurement of IT, enabling users to select solutions based on short term financial criteria. The corollary is that an internal IT department will be judged on financial criteria – i.e. as a 'profit centre'. If it cannot compete successfully it will eventually have no business – if it is successful its 'profit' will contribute to the organisation's finances.
2. *Contractual* – the emphasis is on satisfying a set of business service needs in the most cost effective way. This is appropriate when IT is a 'cost of doing business' – a cost which is accepted but is to be minimised without detriment to meeting contracted requirements. This is described as 'outsourcing' even if the internal IT department provides the services currently. Selection of in-house or out-house suppliers will be reviewed periodically to select the best contractors for the set of service requirements, the 'contracts' being framed in terms of service level agreements.

In both these cases IT is not seen as a core competence of the business but something which is procured in the optimum way to satisfy business requirements as they arise and evolve. Recent strategic management research suggests that 'competence based strategies' are becoming important in achieving sustainable competitive success

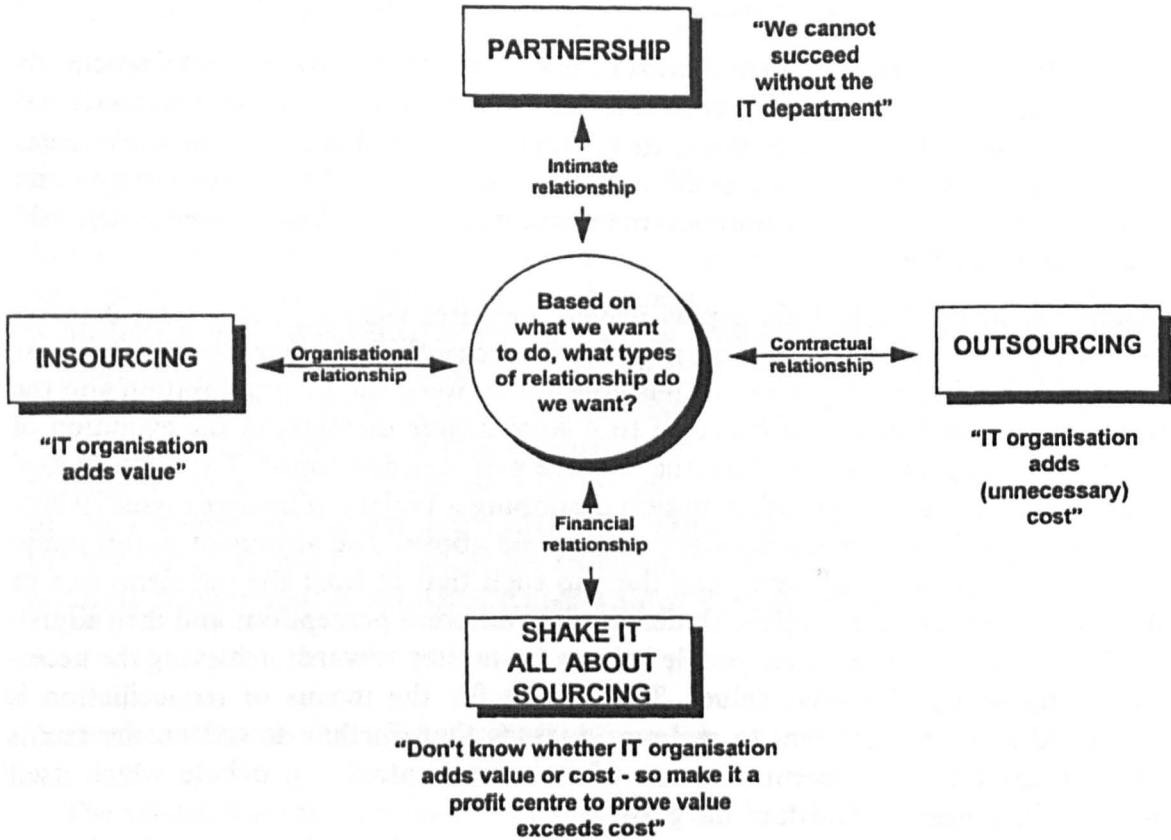


Fig. 5. Sourcing in a mixed economy.

(Hamel and Prahalad, 1994; Stalk et al., 1992). In many cases business competencies will derive from or depend upon competence in IT (Treacy and Wiersma, 1993) and therefore the other two types of relationship need to be considered.

3. *Organisational* – where the implication is that the value of IT is embedded in unique ways into the chosen areas of business competence, or as the means of delivering the integration of other competencies. Continuing alignment between the deployment of IT and the development of those competencies will be essential for business success. In this case the 'value added' of IT is not just in the delivery of effective technology solutions, but in the IT organisation's in-depth understanding of how the applications and their integration deliver the required business strategy. This knowledge will arise from actual experience of the systems in use and would be difficult to sustain via a contractual form of relationship – it demands continuous dialogue and requires an understanding of implicit assumptions and values as well as explicit statements of requirements.
4. *Intimate* – whereas the 'insourcing' approach described above is intended to make IT an integral support for other business competencies, in many organisations IT will itself be essential business competence. 'Partnership' implies that aspects of the business strategy will derive directly from an ability to innovate and create new business options from the application of the technology. Here IT is as much an input to strategy development as a means of implementation. The IT specialists

involved will be partners in the derivation of strategy – a process that can only be achieved through mutual trust, based on congruence of values. In such cases, significant changes to the business and organisation are likely to be a consequence of IT instigated innovation. These are unlikely to be contemplated, let alone commissioned and even less likely achieved successfully without mutual confidence and trust.

This relationship based view to some extent synthesises the views of other researchers and observers. Each type of relationship implies different roles for IT specialists, can be considered in terms of different metaphors and requires different shared values. Each would be expected to result in different realities and perceptions throughout the cultural web. Further research into each of these different types of relationship might prove valuable. Existing research has tended to treat the IT function as a more or less homogeneous, evolving entity or has addressed only some of the factors involved e.g. control of resources. There would seem to be connections to be made between the nature of the applications portfolio and the types of relationships required to determine and deliver it. Such examination might explain why some organisations are more successful than others in aligning IT investment with business and organisational strategic development. Many organisations have appointed 'IT directors' or 'Chief Information Officers (CIO)' and recent research suggests that competence and cultural fit of the individual are significant determinants of perceived success or otherwise in the appointment (Earl and Feeney, 1994). Research does not however reveal whether IT as a whole contributes more to the business following such appointments. More research would be worthwhile.

Perhaps a more basic question relates to where responsibility for IT should lie. Over the years the pendulum has tended to swing between centralisation and decentralised and distributed approaches. Initiatives, such as the hybrid manager, attempted to pull this pendulum in one direction or another. We have suggested that it is not just a matter of repositioning the IT organisation but requires a more fundamental evaluation of the broader issues of organisational IS/IT competencies.

This paper has used the metaphor of a 'troubled marriage' to describe frequently observed relationship problems between IT and the business. We have suggested some guidance on how to understand the causes and implications of what is generally described as the 'culture gap'. It can be concluded perhaps that many IT organisations with poor relationships are 'culturally outsourced' long before some event triggers the divorce and real outsourcing. Perhaps with better understanding of the causes of the culture gaps plus new views of the types of relationship required, reconciliation rather than divorce might be feasible. This is important if divorce leads to the removal of a key future competence, simply because the organisation failed to understand and address culture gap issues.

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**Strategic
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‘Mind the Gap’: diagnosing the relationship between the IT organisation and the rest of the business[☆]

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Abstract

The senior management of many organisations are continually disappointed with the benefits and value which they perceive they are getting from their investments in IT. This frustration with IT, and in particular with the IT function, has seen many organisations choose to rid themselves of the ‘problem’ altogether by outsourcing IT activities to a third party. The fact that there is a separate organisational unit responsible for IT activities has led to the emergence of gap between this so called IT organisation and the rest of the business. Culture is often used to explain the gap as if this somehow justifies an organisations inability to effectively leverage IT. However, the premise underlying this article is that culture is an excuse for rather than a cause of ineffective application of IT for business benefits and value. The clear message from this article is that achieving high performance from IT is not just about the IT function’s ability to build, maintain and deliver systems, but is an organisational wide activity requiring a strong business/IT partnership. A framework grounded in the research literature, which identifies the elements to manage in creating high performance from IT, is developed and operationalised. The findings of an exploratory survey are presented and research and practitioner implications developed. © 1999 Elsevier Science B.V. All rights reserved.

Keywords: IT organisation; Relationship management; Culture gap; IT service delivery; IT performance

[☆] Anyone who has ever travelled on the London Underground will recognise the ‘Mind the Gap’ announcements warning passengers of the gap between the carriage and the platform. We think that this phrase is appropriate for the IT/Business gap, as we are constantly being warned about it and like the gap which exists with the London Underground it has yet to be bridged. Yet some organisations, like some underground transport networks, for example Munich’s U-Bahn or the Metro in Milan, do not experience this problem.

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1. Introduction

In a previous article (Ward and Peppard, 1996) we explored the relationship between the IT organisation and the rest of the business. Building on the concept of culture, we illustrated how the 'gap' could be explained by the cultural differences which exist between these two groupings. Indeed, we argued that many IT organisations are "culturally outsourced" long before a decision is actually made to cut the connection and get rid of the problem with IT by outsourcing some or all IT activity to a third party. However emerging research results are highlighting the folly of long term total outsourcing decisions which are based on an historical and little understood problem (Earl, 1996a; Lacity et al., 1996; Venkatraman, 1997). While clearly there is a culture gap, in this article we argue that if organisations are to attempt to bridge this gap it is imperative to progress beyond describing it as such and seek a better understanding of why it exists, its dimensions, components and ultimately how it might be reduced or eliminated.

One of the problems with attaching the culture label is that it then becomes a fait accompli, almost an acceptance of the situation. The 'culture gap' becomes a convenient label with which to attach to a situation which is clearly causing a problem but which organisations are either unable or unwilling to address. In using the culture argument there is an implicit assumption that cultural differences manifest themselves in behavioural differences. This assumption is not necessarily true. We strongly suggest that the culture argument is often an excuse for, rather than a cause of, ineffective working relationships. In essence, culture is a symptom rather than the cause of an ineffective relationship between the IT organisation and the rest of the business and the consequential failure of organisations to exploit and leverage IT for business benefits and value creation. In this article we delve beyond the label of culture as an explanatory variable and explore in greater depth the problems which exist in relation to IT in organisations.

The article begins by examining some of the recent IS research literature which is grounded in the Resource-Based View (RBV) of the firm to explore the role of IT, and in particular the IT organisation, in the pursuit of sustainable competitive advantage. Research which examines the resourcing and structuring of the IT organisation is then reviewed to provide a backdrop to our research. A framework for diagnosing and describing the gap is then presented and developed. We describe how we operationalised this framework and conducted an exploratory study to diagnose and describe the gap in three organisations. The study results are then presented, the implications of these results examined and future research directions outlined.

2. IT and sustainable competitive advantage

Throughout the 1980s there was a plethora of articles and papers purporting to link IT and competitive advantage (Ives and Learmonth, 1984; Johnston and Vitale, 1988; McFarlan, 1984). These papers drew on implementations of IT to illustrate how companies were achieving significant advantage in the market place. Baxter Healthcare's ASAP, Thomson's TOP, Merrill Lynch's Cash Management Account, Otis Elevator's Otisline and American Airlines' SABRE system became part the folklore of competitive advantage

and many organisations sought to emulate them by developing so called “strategic information systems”. However, recent studies have cast a shadow over these successes (Dvorak et al., 1997; Kettinger et al., 1994; Powell and Dent-Micallef, 1997). It is not that the advantage was not real, but the source of the advantage was misinterpreted.

A study by Kettinger et al. (1994) evaluated longitudinal changes in performance measures of 30 firms that had been cited as “classic” cases of strategic use of IT, some of which have been referred to in the preceding paragraph. Their analysis indicated that a healthy scepticism concerning the competitive advantage payoffs of IT is in order. They asserted that managers must more than simply assess the uniqueness or availability of emerging technological innovations in developing strategic IT plans. They concluded that the attainment of sustained IT based competitive advantage may be more a process of building organisational infrastructure in order to enable innovative action strategies as opposed to “being first on the scene”, the so called ‘first mover strategy’ in the strategic management literature.

More recently, Powell and Dent-Micallef (1997) investigated the linkages between IT and firm performance in the retail industry. Again they poured cold water on the IT and competitive advantage debate, asserting that IT alone is not enough. From their study they concluded that some firms have gained advantage by using IT to leverage intangibles, complementary human and business resources, such as organisational flexibility, integrating business strategy planning and IT strategy, and supplier relationships.

In a conceptual examination of the ability of IT to generate sustained competitive advantage for firms, Mata et al. (1995) examined the IT and competitive advantage argument under the headings of customer switching costs, access to capital, proprietary technology, technical IT skills and managerial IT skills. They concluded that only IT management skills are likely to be a source of sustained competitive advantage, a position referred to by Keen (1993) as the “management difference”. They described these skills as the ability of IT managers to understand and appreciate business needs; their ability to work with functional managers; ability to co-ordinate IT activities in ways that support other functional managers; and ability to anticipate future needs. They advised that in the search for IT-based sources of sustainable competitive advantage, organisations must focus less on IT, per se, and more on the process of organising and managing IT within a firm. Further support for this position is provided by Dvorak et al. (1997) who note that what distinguishes organisations with high performance IT is not technical wizardry but the way they manage their IT activities.

It is this latter theme which has been taken up by a number of scholars and in the following section we examine some of the research in this area.

3. IT resourcing, structures and relationship management

The centralised IT organisation can be seen as primarily a legacy of technology development where its main function was to ensure that economies of scale were achieved for a significant investment in a mainframe computer. Add in the fact that technology was traditionally viewed as automating existing work practices providing efficiency and cost savings benefits and the reasons for bureaucracy and lack of flexibility were accepted.

However, as information technology itself has assumed increasing importance in organisations, the debate about how best to organise and manage IT activities has gathered momentum. Discussions invariably swing between centralisation and decentralisation and have generally been motivated by three main drivers. In some organisations it has been driven by technical concerns, with new technologies like client–server systems supporting a more decentralised structure. In others, the proliferation of inexpensive hardware and software has seen the emergence of ‘end user computing’ with individual departments taking on responsibility for meeting their own computing needs. Thirdly, for others, the motivation has been more politically oriented with debates centred around the control of resources rather than any particular organisational strategy.

Both centralised and decentralised decision making structures have advantages as well as their disadvantages and recent calls have sought to capitalise on the advantages of both whilst avoiding some of the associated drawbacks. Von Simson (1990) has proposed the notion of the “centrally decentralised” IT organisation while more recently Hodgkinson (1996) has suggested a federal structure. While appealing, at present this federal concept is more of a theoretical construction than having direct practical applicability. One of the central reasons for this is that the delivery of benefits and value from IT is not the sole preserve of the IT organisation. In the past the function of the IT organisation was to run the organisation’s computing systems, whereas today, with IT playing a central role in the competitive strategies of many organisations, business management has a critical role to play (Boynton et al., 1992; Dutta, 1996; Earl, 1989; Keen, 1993; Ward and Griffiths, 1996) and the traditional roles adopted by IT specialists must be re-appraised (Bashein and Markus, 1997; Ross et al., 1996). While the IT organisation can deliver the technology, the benefits and value from this technology must be unlocked. Only business management can do this.

Ross et al. (1996) contend that the ability to apply IT to enhance competitiveness derives from the development of an effective IT capability: the ability to control IT-related costs, deliver systems when needed, and effect business objectives through IT implementation. Their research suggests that this capability derives from careful management of three key IT assets: a highly competent IT human resource, a reusable technology base, and a strong partnering relationship between IT and business management.

The notion of managing IT resources as a *value centre* has been proposed by Venkatraman (1997). He suggests that there are four independent sources of value from IT resources and each requires different management approaches and priorities. In a somewhat similar vein, Lacity et al. (1996) present a framework for considering IT sourcing decisions based around purchasing strategy (purchasing a resource or a result) and purchasing style (relationship or transaction). This work builds on Venkatraman and Loh’s (1994) contention that with the growing array of IT supply options available organisations are increasingly moving from managing a technical portfolio to managing a relationship portfolio. The challenge is to understand and balance the demands of this portfolio and manage its contents.

The message from these studies is that, as IT assumes an increasingly central role in the strategies of companies, how they organise for IT becomes crucial. The task is not just the provision of IT and IT services to the business, but to ensure that the benefit and value of any investments are leveraged. This demands moving beyond the narrow

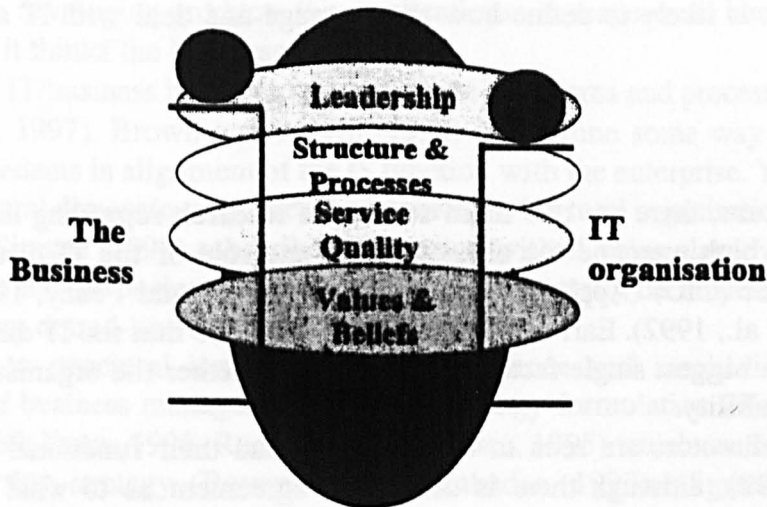


Fig. 1. A research framework for diagnosing the gap.

centralisation–decentralisation debate. Addressing the IT organisation in isolation limits what can be achieved. Whilst only the business can unlock value from IT, the IT organisation does have a crucial role to play. In most organisations there is clearly a ‘gap’ but attaching the culture label is a convenient approach but one which may obscure issues that can in reality be addressed. In the following section a framework is presented which can aid in diagnosing and describing the gap in greater detail.

4. A framework for diagnosing the gap

Through synthesising a diverse literature in the IS field an initial framework was developed to characterise the gap. This framework has four dimensions: leadership; structures and processes; service quality; and value and beliefs (see Fig. 1). These four dimensions are addressed within the context of the organisation’s strategy. While an agreed strategy is necessary as a starting point for bridging the gap, strategic alignment by itself does not ensure a strong relationship between the IT organisation and the rest of the business sufficient to be able to sustain and implement that strategy.

Leadership is concerned not just with the leadership of the IT organisation but also the leadership which the chief executive officer (CEO) exhibits vis-à-vis IT. For example, is the CEO supportive of IT initiatives? Structures and processes are concerned with how the organisation organises for IT, including IS/IT strategy development, delivery of IT benefits, structures for service delivery, mechanisms for business and IT organisation to come together, etc. Service quality recognises that the provision of some IT services will be based around a customer–supplier relationship. This might entail meeting predefined or expected criteria and service levels, some of which may be enshrined in formal service level agreements. The values and beliefs of organisational members have a tremendous impact on many dimension of IT in organisations, including how it is managed. For example, if business managers do not believe that

IT is strategic this is likely to define how they manage and deal with IT and associated issues.

4.1. Leadership

In the IS literature, there are two main streams of research regarding leadership. The first are studies which examine the characteristics and role of the IT director or Chief Information Officer (CIO) (Applegate and Elam, 1992; Earl and Feeny, 1994; Grindley, 1991; Stephens et al., 1992). Earl and Feeny (1994) conclude that the IT director's ability to add value is the biggest single factor in determining whether the organisation views IT as an asset or a liability.

Successful IT directors are seen to contribute beyond their functional responsibility (Feeny et al., 1992), although there is often little agreement as to what actually their role and function is in an organisation (Price Waterhouse, 1993). IT directors too often see their role as custodians of the organisation's technology. However, with the increasing range of IT supply options now available and the prevalence of outsourcing, Venkatraman and Loh (1994) contend that the role of the IT director has shifted from managing a technical portfolio to managing a relationship portfolio.

Applegate and Elam (1992) surmised that ideal candidate for the senior IS position in a company is apparently an individual who has a combination of business, technology and leadership skills. Their research suggested that newly appointed IS executives are just as likely to come from outside as inside the organisation and to have business experience outside the IT function. However, the ability of the IT director to build relationships with both business managers and suppliers is seen as a crucial attribute (Mata et al., 1995; Ross et al., 1996; Venkatraman, 1997).

A second area of research relates to the role of the CEO in relation to IT activity. Of particular interest is the relationship between the CEO and IT director, specifically whether or not the CEO is supportive of the IT director and IT initiatives (Feeny et al., 1992). Central are the beliefs which the CEO has about IT and its importance to the business. This is an issue which is covered in the dimension of *values and beliefs*.

Korac Kakabadse (1997) and Korac Kakabadse and Kouzmin (1996) have looked extensively at the performance of top teams and two dimensions which she has identified which are of relevance to the leadership debate is the extent to which IT directors feel part of the top management team and the overall coherence among the top team (Korac Kakabadse, 1997). In many organisations the IT director is not part of the 'inner sanctum', very often reporting to the finance department. The extent of the involvement of the IT director in the business strategy formulation process can give a good indication of where IT is positioned in the organisation (Enns and Huff, 1997).

4.2. Structures and processes

Structures and processes are the mechanisms through which organisational activity takes place. Inadequate or inappropriate structures and processes can severely impinge on the success of IT in an organisation (Blanton et al., 1992). Traditionally structures in relation to IT have been devised around the concept of technology delivery with a reactive

IT organisation developing products (i.e. applications) in response to business requests or worse to what it thinks the business requires.

To facilitate IT/business integration, appropriate structures and processes are necessary (Venkatraman, 1997). Brown and Magill (1994) have gone some way in developing a model of antecedents in alignment of the IS function with the enterprise. Yet this exclusive focus on structural dimensions ignores the importance for total organisational involvement in IS/IT. Von Simson (1990) subscribes to a design with IS roles played by both a central IS organisation and the business units, prescribing a “centrally decentralised” IS organisation, with strong dotted-line reporting relationships.

In addition to structural issues, there are also processual mechanisms such as the involvement of business management in IS/IT strategy formulation (Ward and Griffiths, 1996; Earl, 1989; Dutta, 1996; Rockart and associates, 1995) which can impact the overall ownership of that strategy (Bowman and Kakabadse, 1997); alignment of the IS/IT strategy with business objectives (Venkatraman, 1991; Henderson and Venkatraman, 1993; Ward and Griffiths, 1996); and responsibility for delivering business benefits (Farbey et al., 1993; Ward et al., 1996).

4.3. Service quality

Over the last decade, the marketing and quality literature have devoted reams to the issue of service quality and delivery. Within the quality movement there are the notions of the ‘internal customer’ and ‘service level agreements’ which are often devised to set parameters around the expected relationship. The development of IT outsourcing has also seen the development of legally enforceable agreements specifying the level of service, which the client can expect from the vendor.

Recently there has been some interest in applying the concept of service management and quality to IT (Pitt et al., 1995; 1998; Van Dyke, 1997; Whyte et al., 1997). This is to be expected in much of what is now provided by the IT organisation that can be characterised as a customer–supplier exchange. The traditional role of the IT organisation as the developer and maintainer of IT systems has been usurped by a variety of factors and its function now includes a significant service component. IS research has tended to focus on products rather than service and only recently has this service aspect been addressed.

What can be difficult for IS specialists to appreciate is that service quality is customer defined and is assessed based on perceptions (Clutterbuck et al., 1993). It is founded on a comparison between what the customer feels should be offered and what is actually provided (Parasuraman et al., 1988). To this end, the customer is the ultimate arbiter of quality and no matter how good the service provider feels they have been in providing a service it is the perception of the customer that is important in assessing its quality.

The measurement of service quality is a contentious issue (Lam and Woo, 1997). In the IS literature there have been debates as to the applicability of instruments such as SERVQUAL (Orlikowski and Baroudi, 1991) and SERVPERF (Cronin and Taylor, 1992) from the service marketing and service quality literature to IS (Kettinger and Lee, 1997; Pitt et al., 1997; 1995; Van Dyke, 1997). While Pitt et al. (1995) conclude that SERVQUAL is an appropriate instrument for IS service quality, Van Dyke (1997) have raised a number of

methodological issues, although these have been addressed in a reply to their paper (Pitt et al., 1997).

Despite these debates, there is general agreement that there are four dimensions to service quality in relation to the provision of IS/IT services:

- *Reliability*. The ability of the IT organisation to perform the promised service dependably and accurately.
- *Responsiveness*. The willingness of the IT organisation to help customers and provide prompt service.
- *Assurance*. The knowledge and competence of IT specialists and their ability to inspire trust and confidence.
- *Empathy*. The caring, courtesy and individualised attention the IT organisation gives to the customer.

It is important to note that service quality is not assessing user satisfaction with application or systems, but the *service provided by the IT organisation*. This raises the question of roles as our preliminary research has suggested that at this level there can be significant disagreement with little convergence as to what the role and function of the IT organisation actually is, particularly in service provision.

4.4. *Values and beliefs*

The final dimension to the framework is concerned with the values and beliefs of organisational incumbents. Values and beliefs can significantly shape how attitudes develop and hence behaviour and practices. These beliefs are shaped throughout ones career based on the experiences which one has with IT. Previous experience both with IT and within the industry or the organisation is likely to have a major influence.

Values and beliefs should not to be confused with culture. While the concept of culture is now firmly in the management nomenclature, it in fact originates from anthropology, where there is no consensus as to its meaning (Smircich, 1983). Culture is a concept which encompasses values and beliefs, but is also shaped by stories, myths, symbols, control systems, structures and politics (Johnson, 1992).

Individual values and beliefs are indeed a powerful force and should not be underestimated. For example, if business managers do not believe that IT is strategic this will reflect in how they manage and deal with IT and IT issues (Venkatraman, 1997). Taking this a stage further, Bashein and Markus (1997) have introduced the concept of credibility in relation to IT specialists. They contend that expertise alone does not inspire trust and credibility, concluding that the successful IT specialists work on their trustworthiness while at the same time build good relationships with clients. To foster this credibility, IT specialists must therefore believe that trustworthiness and relationship building are necessary practices to engage in.

These four dimensions are interdependent and cannot be looked at in isolation (each is necessary but not sufficient). For example, inadequate structures and processes can impinge on the effective delivery of IT services even if there are congruent values and beliefs between the IT organisation and the rest of the business. This research also sought

to establish the relationship amongst these dimensions in order to better understand the interaction amongst them.

5. The gap survey

The objective of our research was to use the framework as the lens with which to examine both the business and IT organisation in relation to all aspects of IT deployment and use in an organisation. The framework is used as a mechanism to diagnose and describe the 'gap' and following on from this to surface an agenda for dialogue and debate with an organisation.

Instruments have been developed for user satisfaction surveys (Doll and Torkzadeh, 1988; Davis, 1989) but these seek to establish the satisfaction which users have with applications developed by the IT organisation and to determine the factors of success. There are also IT service quality survey instruments (Kettinger and Lee, 1997; Pitt et al., 1995, 1997; Van Dyke, 1997) assessing the extent to which the IT organisation is delivering a quality service. As outlined above, service quality is just one aspect of the framework.

In this regard we operationalised the framework in order to collect data and information relating to the dimensions, paying due regard to prior research. Items for inclusion in the data collection instruments were determined from the literature. Appendix A contains the list of items, categorised under the dimensions of the framework. It was not the objective to derive an individual metric for each of the four dimensions but to use the data collection instruments to provide data to construct as rich a picture as possible of the situation which exists. A mixture of questionnaires and interviews were used, providing both quantitative and qualitative data (Gable, 1994; Kaplan and Duchon, 1988; Lee, 1991).

We also wished to address the fact that even within the business there can also be gaps between organisational levels, for example there can be a gap between the CEO and the front-line staff (the actual business users), a situation which has been confirmed by Whyte et al. (1997). Therefore, rather than simply surveying a sample of personnel from 'the business' side and personnel from the IT organisation, we also wished to discriminate between the various 'levels' in each group. We believe that this is necessary as different levels in the organisations may have different views and perceptions on questions related to the gap. This occurs for a number of reasons, including the position of the incumbent and role of IT in their day-to-day activities. In this regard, 6 distinct stakeholder groupings can be identified: CEO, business management, and users/front-line staff on the business side and IT director, IT managers and IT staff (applications development, analysts, other support and helpdesk).

Notwithstanding the above comments, for this exploratory study, we decided to restrict the survey to CEO (or equivalent), business management, IT director (or CIO) and IT management. This was done for a number of reasons, including the complexity of organisation involvement; the risk of the research, particularly for the participating organisation, as they must be seen to act on the results. We also wished to focus on the Keen's (1993) thesis that it is the "management difference" which explains why some organisations are better at leveraging IT opportunities than others. However, as is noted

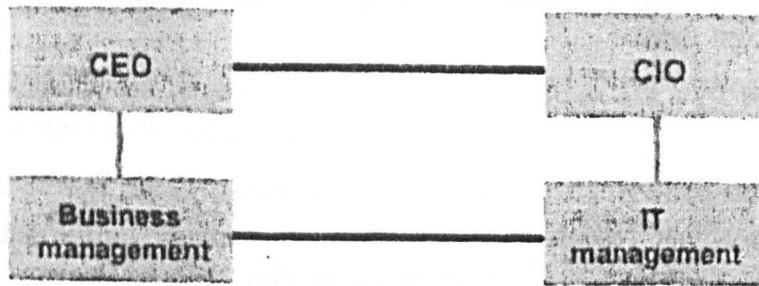


Fig. 2. Structure of survey instruments: key stakeholders.

below, one of the study organisations afforded us the opportunity to interview staff in all six-stakeholder groupings. Fig. 2 illustrates the structure of the survey instrument regarding key stakeholders.

Different versions of the survey instruments were developed, each focusing on a particular stakeholder group. Questions were essentially similar but were phrased to recognise the peculiarities and sensitivities of incumbents' positions. The questionnaires addressed the four dimensions of the framework plus some supplemental questions:

- background personal information;
- personal preferences (beliefs and values);
- views on IT in general;
- views on how IT is managed in respective organisation;
- questions relating to role and function of IT organisation, role of IT director, relationship between CEO and IT director.

The questionnaire was a mixture of statements to be ranked on five-point Likert scales (for example, a scale ranging from strongly disagree to strongly agree) and open-ended questions.¹ Whilst the information collected from the four stakeholder groups was similar, the structure of the questionnaires were different to reflect the role, responsibility and position of the respondents. The questionnaires were piloted by a structured walk-through, with respondents talking through their understanding of the questions posed and illustrating how they would respond to the questions. Any inconsistencies or ambiguities were subsequently addressed.

Interviews were also conducted in the survey organisations in order to gather further information, particularly contextual information, and also to elaborate on themes arising from the analysis of questionnaires. These interviews were conducted after the questionnaires had been administered.

The research process was that questionnaires were first administered in each of the three organisations to the CEO (or equivalent), business management, the IT director and IT management. The completed questionnaires were sent directly by the respondents to the authors and all were anonymously answered. Once the questionnaires had been analysed interviews were conducted with key informants in order to determine contextual information and also to elaborate on some of the themes emerging from the analysis of the questionnaires in order to provide a rich case database.

¹ A copy of the questionnaire is available from the authors.

Table 1

Data collection details (figures in parentheses indicate response rate)

	Questionnaires		Interviews	
	Business mgmt	IT management	Business mgmt	IT management
Distribution	59 (71%)	30 (78%)	4	4
Manufacturing	62 (65%)	29 (60%)	19	23
Financial	34 (74%)	22 (89%)	12	6

5.1. The survey organisations

The research was undertaken in three organisations and given the sensitive nature of the topic under study the confidentiality of their involvement was assured. The focus of the selection process was the study of theoretically useful cases. These cases were therefore chosen for theoretical, not statistical reasons (Glaser and Strauss, 1967). Selection was based upon three criteria: purposeful sampling (Vail, 1989),² availability of multiple sources of information, and probably most important, a willingness to co-operate.

The first organisation, to be known as Distribution, is a distributor of magazines and newspapers and employs 1500 staff. The IT unit employs 90 people and is divided into three main areas: the planning area, responsible for the medium and long-term planning of IS/IT; the development area, where traditional software development takes place; and support area, housing the local area network (LAN) team, PC team and the help desk. The second organisation, to be known as Manufacturing, is one of the world's leading providers of communications equipment, semiconductors, and advanced electronic systems and services. In the UK it employs more than 2000 staff, with 110 working directly in the IT organisation. The third organisation operates in the financial services industry and is to be known as Finance. It is a leading global independent reinsurance intermediary, with representative offices throughout the world. 28 staff work directly in the IT organisation.

5.2. Data collection

The questionnaire was administered to the CEO, IT director and a sample of both business management and IT management in each organisation. Details of number of questionnaires received and number of interviews undertaken with key informants are detailed in Table 1. Note that a larger number of interviews were undertaken in Manufacturing and Financial as both organisations are part of additional research studies being undertaken by the authors. The IT director in all three organisation was also interviewed as was the CEO in manufacturing and financial.

² This is a mixture of two ideas. Slightly more formal than 'purposeful (or purposive) sampling...sample extreme cases, sampling typical cases, sampling for maximum variation, sampling critical cases, sampling for important or sensitive cases' (Lincon, 1985, p. 146). And slightly less formal than theoretical sampling: 'each case must be carefully selected so that it either (a) predicts similar results (a literal replication) or (b) produces contrasting results but for predictable reasons (a theoretical replication)' (Yin, 1994, p. 46).

Table 2

Summary comparisons between three survey organisations (scores are mean values)

	Distribution	Manufacturing	Financial	
<i>Is the IT organisation delivering value to the business? (1 = not at all; 5 = to a large extent)</i>				
CEO	3.0 ^a	3.5	5.0	
Business management	2.7	3.5	4.5	
IT director	5.0	3.0	4.0	
IT management	4.0	4.2	4.0	
<i>Service provided by IT organisation (1 = very poor; 5 = excellent)</i>				
CEO	3.0 ^a	3.5	5.0	
Business management	2.4	3.3	3.7	
<i>Performance of IT organisation (versus competition) (1 = worse; 2 = same; 3 = better)</i>				
CEO	2.0 ^a	3.0	3.0	
Business management	1.8	2.0	3.0	
IT management	2.8	2.0	3.0	
<i>Assessment of the systems and applications developed by the IT organisation (1 = very poor; 3 = satisfactory; 5 = excellent)</i>				
CEO	4.0 ^a	2.0	5.0	
Business management	2.9	2.8	4.2	
<i>Relationship between IT organisation and the business (1 = adversarial; 5 = harmonious)</i>				
CEO	3.0 ^a	2.5	5.0	
Business management	3.1	3.0	3.7	
IT director	2.0	3.0	4.0	
IT management	3.0	3.5	4.0	
<i>Reputation of the IT organisation (1 = very poor; 5 = excellent)</i>				
CEO	2.0 ^a	2.0	5.0	
Business management	1.7	2.3	3.7	
<i>CEO support of IT initiatives (1 = not at all supportive; 5 = very supportive)</i>				
IT director	3.0	3.0	5.0	
IT management	2.9	4.0	4.5	
<i>CEO support of the IT director (1 = not at all supportive; 5 = very supportive)</i>				
IT director	4.0	3.6	4.5	
	Reliability	Respon'ness	Assurance	Empathy
<i>Service quality: distribution</i>				
CEO	2.7 ^a	3.0 ^a	3.0 ^a	4.0 ^a
Business management	2.1	3.0	3.4	3.4
IT director	2.3	4.0	na	na
IT management	2.4	3.3	na	na
<i>Service quality: manufacturing</i>				
CEO	2.3	3.3	3.2	2.5
Business management	2.9	2.6	3.5	3.0
IT director	2.7	3.0	na	na
IT management	2.9	3.7	na	na

Table 2 (continued)

	Reliability	Respon'ness	Assurance	Empathy
<i>Service quality: financial</i>				
CEO	4.0	4.7	5.0	5.0
Business management	2.9	3.3	3.7	3.4
IT director	2.0	3.0	na	na
IT management	2.9	3.5	na	na

* Data for the CEO from Distribution was provided by his Executive Assistant. The extent to which this reflects the views of the CEO is unclear.

6. Analysis and interpretation of the data

The data collection instruments elicited both quantitative and qualitative responses. The analysis of the qualitative data is grounded in the interpretative tradition (Burrell and Morgan, 1979) with the objective of achieving understanding rather than prediction. We recognised that with the interpretative approach the researcher can never assume a value-neutral stance and is always implicated in the phenomena being studied (Orlikowski and Baroudi, 1991; Walsham, 1985). In reality what we are presenting are interpretations of interpretations. Van Maanen (1979) refers to interviewee's constructions as 'first-order data' and the construction of the researcher as 'second-order concepts'. Perhaps Geertz (1973, p. 9) best captured this dilemma by wryly noting that 'what we call our data are really our own constructions of other people's constructions of what they and their compatriots are up to'. We acknowledge that the prior assumptions beliefs values and interests always intervene to shape studies. However, we have tried to minimise such occurrence by utilising a variety of data analysis techniques as suggested by Miles and Huberman (1984) and Yin (1994). We also present data in summary tables in order to enable the reader to judge the validity of our interpretations.

7. Individual organisation assessment

The first stage of the data analysis was to examine each organisation in isolation and attempt to diagnose and describe the gap between the IT organisation and the rest of the business. This analysis is based on examining both the questionnaire and interview data. Table 2 presents some summary comparisons of the quantitative data from the three organisations.

7.1. Distribution: the "disconnected" IT organisation

The overall assessment from analysing the questionnaires and interview data is that the IT organisation at Distribution is somewhat disconnected from the rest of the business. It is widely recognised and agreed among both business and IT management that IT offers tremendous opportunities but that the organisation is not good at capitalising on these. Furthermore, the role and function of the IT unit within the organisation is not clearly

defined and shared between business management and IT management. The analysis suggest that the issues which need consideration include:

- business leadership;
- structures and processes;
- business management commitment and involvement.

Summarising the overall results, the analysis suggests that 'the business' does not truly appreciate IT (2.0).³ and gives little strategic guidance to the IT organisation (2.4). There is low understanding of IT among business managers (2.8) and low awareness of IT opportunities (2.6). The IT organisation scores high on *empathy* and *assurance* (i.e. 'nice guys') but not on *responsiveness* or *reliability*. It was revealing that the CEO did not personally complete the questionnaire and that both the IT director and IT management see the CEO as being less than supportive of IT initiatives.

On a more positive note, business managers believe that they should be more involved in IT decisions (4.9); that IT requirements should not be specified by IT (1.57); and that projects should not be managed by IT staff (2.29). Most business managers see IT as an integral part of their job (3.4 but high standard deviation indicating a wide variety of views), that IT is central to the core business activities (4.7) and that IT offers potential but that the organisation is not good at exploiting these opportunities (4.3).

7.2. Manufacturing: the "unloved" IT organisation

The overall assessment from analysing the questionnaires and interviews from Manufacturing is that the IT organisation feels undervalued and that it is not getting either business *commitment* or *involvement*. The IT organisation is treated as a support function and service provider and not seen as central to the business. The business feels that the IT organisation can solve their problems without them providing any input as to what those problems actually are. The result is that the IT organisation is developing systems which *it believes* the business requires and suffering the consequences and the resulting poor reputation. The analysis indicates that the issues that need consideration are:

- service delivery;
- working relationships;
- structures and processes, particularly mechanisms to enable the business to articulate information requirements;
- business management commitment and involvement.

Summarising the overall results, the analysis indicates that business management are not giving strategic guidance (1.6) and there is a low level of business management commitment (2.7). IT management contend that the business in general has low awareness of IT and IT issues (2.3): business managers are somewhat neutral on whether IT is a strategic resource (3.25) and disagree that IT is a driver of future competitiveness (2.7). Business management feel somewhat uneasy dealing with IT (2.5 but high standard deviation); agree that they need to increase their knowledge of IT (4.3) and recognise

³ Figures in brackets refer to average on five-point Likert scale.

that they are not proactive in relation to IT (2.5) but neutral on whether it is the responsibility of the IT organisation to specify IT requirements (3.0 but high standard deviation indicating disagreement within the management ranks).

7.3. Financial: the “high achieving” IT organisation

Financial stood out from the other two survey sites in that business management are more satisfied with the performance of the IT organisation than the IT organisation is with its own performance. A quick glance down the appropriate columns of Table 1 clearly illustrates this. The IT organisation sees itself as a true “value-adder”; a partner in the business a view which is also shared by the business.

The analysis suggested that the following need consideration:

- process to maximise benefits delivery;
- possible complacency among business managers vis-à-vis the IT organisation.

The IT organisation has a excellent reputation among business management (4.4) and is seen as delivering what it promises (1.67, negative scale). IT management feel that the business truly appreciates IT (3.5), that senior managers are committed (3.5) but lack somewhat in the provision of strategic guidance (2.5). The majority of IT management have a long experience of industry and the majority of IT staff know the company mission statement. This is a company which does not recruit either school leavers or graduates directly into the IT department but insists that new employees have at least three years experience working in a business area.

Business management feel that they are grasping all IT opportunities (1.5, negative scale), although the IT organisation is not convinced in this matter (3.0), and that delivery of benefits is their responsibility (2.2, negative scale). However at present, not all IT projects are led by business managers (2.5). When business managers were asked to comment on how the service provided by the IT organisation could be improved, a number responded that it was already satisfactory and had no recommendations to make.

8. Cross case analysis

In this section we analyse the data across the three organisations for evidence which suggests why there are differences in the performance and contribution of the three IT organisations. We first examine the three study organisations under the four dimensions of the framework.

We then explore other themes to emerge from the analysis of the data. Note that, rather than presenting an exhaustive description, themes appropriate and interesting to the objective of this paper are detailed. It is also worth highlighting that one of the unexpected situations arising from this research was an IT organisation which received high praise from business management! This has provided us with a benchmark with which to compare the other two organisations.

8.1. Leadership

Interestingly, all three IT directors were seen as exhibiting different degrees of leadership qualities by both their IT management team and business managers. All three were regarded as highly competent and accomplished managers, and indeed their willingness to use this research as a mechanism to improve both the performance of their IT organisation and also the contribution of IT is illustrative of this. All had a deep understanding of both the business and industry having spent most, if not all, of their careers working in the industry. However, it is worth noting that the IT director at Distribution was the only non-IT “technical” specialist, had been recently appointed to job and it was felt that at this stage of his appointment his lack of technological competencies severely undermined his “credibility” among the ranks of IT management.

When a Team Leader at Financial was asked what the organisation would do if the IT director left, he responded immediately “panic”. Comments like “constantly looking around the corner”, “innovative thinker” were used to describe the IT director. One Team Leader responded “I think [IT director] is forward thinking enough to be looking at all the new technologies [and] that he is brave enough to take the decision to go with things”.

On examining the leadership support exhibited by the CEO in relation to IT and the IT director a somewhat different picture emerges. The non-response of the CEO of Distribution has already been noted and was seen by both business management and IT management as indicative of his view on IT and related matters. Indeed, at the monthly board meeting the current Warehouse Project, an IT project involving a significant financial investment, has been the last item on the agenda and due to lack of time it is usually carried over to the subsequent meeting. “This system is underlying the core operations of the business!” The CEO is supportive of the IT director in the sense that he lets him get on with the business of running the IT organisation and does not wish to get involved in IT matters. It is “just not his job”.

At Manufacturing, the CEO is generally seen as supportive of both the IT director and IT initiatives, however this support is not translated into active involvement with IT matters. The CEO and IT director meet regularly to discuss IT, meetings which are viewed very positively by the IT director. The vision and commitment of the CEO, however, is not communicated by him either to the business management team or IT management team. One IT manager commented that “[the company] has a global objective to become a world class software supplier. However it is not saying how ‘how can we use IT to develop processes that enable that?’” At the time of data collection the CIO was attempting to forge a closer relationship with the business noting that the “[business] may want you to be a [partner] but keeps putting up inhibitors to keep you as a reactive supplier”.

The support of the CEO at Financial is very visible. Both the CEO and IT director have attended IT conferences and seminars together and on a recent presentation to a Canadian client, the CEO brought along a business applications manager to demonstrate the organisation’s recently completed Extranet. The CEO recognises that his company is first and foremost an information business and actively supports initiatives to better leverage this information resource.

8.2. Structures and processes

If we look at the reporting structure of the three companies, we see that only in Financial is the IT director is a member of the executive board. Indeed, his title is Director of IT and Operations, reflects the close link between IT and the nature of the business. He is also a member of the “inner sanctum” and is directly involved in the business strategy formulation process. However, the company has no formal IS strategy but “IS strategy pillars” which give guidance to the overall direction of IT spend but “do not constrain opportunities”.

Table 3 summarises selected aspects of structure and processes. One of the interesting features in comparing the three organisations was the ad hoc nature of the co-ordination mechanisms at Distribution and Manufacturing. While all three had formal strategic IS/IT planning processes and prescribed project management methodologies, the nature of mechanisms such as steering committees, IT policy committees, etc. was different.

Given that significant technical aspects of IT operations was outsourced at Financial, the IT department did not have to concern itself with delivery of the technology and was in many ways forced to focus on “information” and “relationships”. There are no service level agreements even with third party vendors as the organisation is keen to stress long term relationships. The IT organisations is clear in its mandate to help the business in exploiting information and there is an active attempt to create a culture of “we help you to help yourselves”.

Financial has also established a liaison group composed of users from all parts of the business, IT staff and major vendor representatives. This group, meet twice a month to discuss IT issues in general and the core systems in particular. It provides a forum for

Table 3
Summary of selected aspects of structure and processes

Selected aspects of structures and processes	Distribution	Manufacturing	Financial
Location of IT budget	IT department	IT department	Business (but IT director also director of operations, controlling about 70% of budget)
Policies and procedures?	None	Some technical policies Ad hoc and informal committees	Technical policies IS policy committee
Co-ordinating mechanisms	Business systems managers for each business area	Project-based committees for specific projects	All IT staff are “relationship builders” No technical IT staff Liaison group of business, IT and vendor staff
Service level agreements?	None	For major business systems and desktop	None

users; “it is a chance for people to come together and suggest enhancements to the system. Any bugs that are reported on the system are dealt with” (team member).

At manufacturing there are irregular “informal” meetings between the CEO and the IT director where both decisions on how IT would support the business and budgetary spend are determined. As already mentioned, this ‘vision’ is not communicated to senior business management in any formal way. Indeed, one business manager conveyed his view of the organisation as “loose federation of warring tribes-arranged in a functional hierarchy”. Business managers also feel that there is a culture of “hijack the resource”. One commented that “investment justification is done on a ‘first come first served’ basis, even though the budget may have been allocated otherwise and priorities assigned differently.

At Distribution, each of the business areas has a “business systems manager” whose role is to act as the interface between the business and IT function. These managers work with the business areas to help them articulate their IS requirements. However, at the time of data collection most resources were devoted to the Warehouse Project as well as Year 2000 and EMU projects. One Business Systems Manager referred to his role as that of a “referee” rather than someone who is actively trying to “build bridges”.

The IT organisation at Distribution has its own budget with the IT director having complete discretion on spending. While this had also been the situation at Manufacturing, this had recently changed with the budget for IT spend now being part of the business budget. At Financial, there is an IT budget but because it is managed by both the business and IT, it can be topped up during the budgeting year.

While the research did not delve into the detail design of processes, it is worth noting that only at Financial did both business managers and IT managers reveal an understanding of the organisation’s business processes. At Manufacturing there is poor understanding of business processes and a general acceptance that these processes are a poor fit to current business needs; yet no one was prepared to do anything about this situation. According to one business manager the business “does not recognise nor understand business process...functional silos strong”. At the time of data collection Distribution has just initiated a business process re-engineering project, an objective of which was to develop process awareness throughout the business.

8.3. Service quality

Given the nature of expectations and perceptions it is more appropriate to examine the dimension of service quality within a single case with a number of data points collected over a period of time. However, from Table 2 we can see that there were differences across the three organisations with regard to the service quality dimensions of reliability, responsiveness, assurance and empathy.

Only at Financial was there a strong sense of service. Indeed, with most of the technical aspects of IT are outsourced the focus is clearly on meeting internal customer requirements. IT management are committed to service quality; in the words of one IT manager “service is what it is about!” There is continuous feedback of information to the IT department with regular contact between staff to interact on a daily basis with users (for example, help desk staff) and IT management. The aforementioned liaison committee also ensures that the IT agenda is driven by business requirements.

At both Manufacturing and Distribution service is seen as keeping the network up and running or application availability. Consequently, service is defined in terms of up-time or response times rather than meeting the needs of customer. Illustratively, at manufacturing there are service level agreements for major business systems and for the desktop. However, these are defined by the IT organisation with no review process.

At Distribution, service is defined in terms of having a help desk. While a log is maintained of all application and technical problems, the focus of any follow through is addressing these problems rather than attending to customer real needs.

8.4. Values and beliefs

If we contrast the values and beliefs of the three organisations we can begin to see some interesting differences across them. Table 4 summarises the mean scores for the values and beliefs of the three organisations.

Views about whether IT is an expense to be managed or a resource providing strategic opportunities surfaced some interesting observations. There is disagreement across the cases as to whether or not IT is an expense to be managed. Surprisingly, at Financial, there is strong agreement that IT is an expense to be managed, however, this represents the predominant view that the technology is an enabler of the strategy and processes of the organisation. Both management camps are adamant that the management of IT is something which the organisation will never relinquish. It should also be remembered that all technology requirements are outsourced.

At Manufacturing, the IT organisation was very much seen as peripheral to the business. Business management would rather adopt a hands-off approach to IT and believe that IT projects should be managed by IT specialists. One business manager commented that the IT organisation should be “more proactive in IT projects. IT should drive all IT projects...[and] not put responsibility on area owners”. In contrast, an IT manager noted that “the problem with my colleagues in the business is that they see IT as a cost, not a resource. Accordingly IT is a ‘bit player’ in developing the [business] strategy”. Confirming the attitude of the business in general, another noted that “trying to get users involved is very difficult indeed”. Regarding outsourcing and dealing with suppliers, one IT manager commented in the strongest terms that the relationship is “fine as long as they realise we are the dominant party”!

There was some uniformity in the belief among IT management across all three organisations of their need to increase their knowledge of the business. On the dimension relating to the need to increase knowledge of IT we find that only the business management at Distribution tend to disagree (2.86). While business management at both Manufacturing and Financial both agree that they need to increase their knowledge of IT, deeper probing through the interviews revealed that this is for two different reasons. At manufacturing business management felt that they did not know enough, even at a basic level of IT awareness. At Financial there was a significant understanding of IT but business management felt that they required even more both to keep abreast with the latest developments and also if they were to make a contribution to the application of IT in the organisation.

Table 4

Values and beliefs for business management and IT management (mean scores based on 5 point Likert scales: 1 = strongly disagree; 5 = strongly agree; BM = business management; ITM = IT management; **significant at $p = 0.005$)

Dimensions of values and beliefs	Distribution		Manufacturing		Financial	
	BM	ITM	BM	ITM	BM	ITM
IT is an integral part of job	3.43		3.50		3.33	
Uneasy dealing with IT	1.71		2.25		2.17	
Need to increase knowledge of IT	2.86		4.25		4.00	
Prefer to let IT deal with IT issues	3.43		2.50		3.17	
IT presents a level of complexity	2.29		3.00		2.50	
Working with most up-to-date IT		3.80		3.67		4.00
Unease with soft side of IT implementation		2.60		1.67		2.00
Need to increase knowledge of business		3.40		3.67		3.00
Difficulty with users who are not IT literate		2.20		1.50		2.00
IT an expense to be managed	3.43**	1.40**	3.75	3.33	3.00**	4.50**
IT is best outsourced	3.29	1.40**	1.75	2.00	3.17	4.00
Business management should be involved in IT	4.86	3.80	4.25	4.17	4.50	4.00
IT is a strategic resource	4.00	4.40	4.00	3.17	3.00	4.00
IT investment should be driven by IT advances	2.14	3.40	3.25**	2.83**	3.50	3.00
IT projects should be managed by IT specialists	2.29	2.80	3.00	3.00	2.50	2.50
Delivery of benefits IT's responsibility	1.43**	2.80**	2.25	2.00	1.83	1.50
IT organisation should specify IT requirements	1.57**	3.60**	3.00	2.00	1.67	2.50
IT should be aligned with business	5.00	4.60	4.75	4.83	4.50	4.50
Business management should understand IT	4.00	4.20	4.25	3.83	4.67	4.50

In relation to the outsourcing of IT the scores reflect current practices and experiences in the three organisations. At Distribution there is a significant difference between the views of business management and IT management. This is undoubtedly a reflection of recent experiences which this organisation has had with a large IT project which at the time of data collection was in danger of floundering, while at the same time the considerable success had been experienced in outsourcing the network and allied services. At Financial it reflects current practice where, as it has already been noted, there is considerable outsourcing.

Table 5

Role and function of IT organisation: summary of business management responses

Distribution	Manufacturing	Financial
<ul style="list-style-type: none"> • To provide tools to enable enhanced processes • To provide systems meeting business needs “Support delivery of business objectives and strategic imperatives” “To keep the business running” • To ensure that “IT solutions are appropriately delivered to quality, timescales and cost” • “To provide vision of IT direction” 	<ul style="list-style-type: none"> • Service provider Assisting as requested Centre of expertise for all IT “To provide the technical skills ...to improve processes” “Basic provider of systems to support the business processes” • Help achieve competitive advantage for the business 	<ul style="list-style-type: none"> • To support the business and operations of the company and customers To work in tandem with the business users to achieve common goals • To investigate and evaluate advances in technology • To encourage and lead business managers to take advantage of IT • Service delivery Seamless service to our customers To provide IT solutions for the business and customers To “provide the best possible IT that our budget can reasonably support” • To give us a competitive edge

8.5. Role and function of the IT organisation

Both business management and IT management in the three organisations were asked to outline what they saw as being the role and function of their respective IT organisation. The underlying premise for this questions is that beliefs about the role and function of the IT organisation defines expectations. If both business and IT management do not agree on this aspect then it may be a reason for the dissatisfaction with the performance and contribution of the IT organisation. Both are working from different agendas. Table 5 summarises the responses from business management across the three case sites.⁴

The overall view of business management in Manufacturing is that the IT organisation is a service provider, supporting the business. This is probably a reflection in the fact that they do not see IT as a driver of future competitive advantage or as being strategic. The predominant responses of business management themselves would seem to mirror this view, and words like ‘to assist as requested’, ‘to provide expertise’, ‘to deliver cost effective solutions’ and ‘to advise on new technology’ would seem to capture this mentality.

Contrast this with the tone of the responses at Financial. Business management see a much more proactive role for the IT organisation. Responses like “investigate and evaluate advances in technology” and “to encourage and lead business managers to take advantage

⁴ Note that in the tables that follow some of the text is in categories while others are actual quotes from interviews or questionnaires where they succinctly capture a category.

Table 6

Function and role of IT organisation: summary of IT management responses

Distribution	Manufacturing	Financial
<ul style="list-style-type: none"> • “Develop effective and useable business solutions” • “Develop new programmes” • “Support and maintenance of programmes” • “Continually seek improvements in hardware and software” • To exploit business opportunities • “Cutting cost” • “Add value in all interactions with the business” • “Working with the business to achieve business strategy” • “Development of quality systems to agreed timescales” 	<ul style="list-style-type: none"> • To deliver cost effective solutions • “To provide business partners to the core business functions” • To improve performance/business processes/profitability • To mentor users in technology • To provide high levels of support • To provide expertise • To advise on new technology 	<ul style="list-style-type: none"> • To assist in streamlining business processes via IT • Provide competitive edge through strategic developments • Underpinning/enhancing strategic business goals • Managing suppliers • Deliver effective business systems • Customer support • “User training and awareness through business/IT alignment” • Introduction and leadership [of] new IT/IS developments • Maximising operational efficiencies

of IT’ capture the fact that business management expect IT leadership from the IT organisation. As has been previously mentioned, this happens in an environment where there is significant IT outsourcing. Distribution is somewhere in the middle ground, with the tone of responses spread between a reactive role, i.e. “define systems which meet defined business needs” to a small few who see a more proactive role, i.e. “to provide a vision of IT direction”. This is reflected in the IT director’s continual battle with the business to get business management involvement and commitment. There is not unanimous agreement amongst business managers that IT is important, in fact most see it as a hindrance.

Table 6 summarises IT management’s responses to the same question. Again the tone of the responses across the three organisations is different. What is interesting here is that in general the three IT organisations see themselves as having a more proactive role in the activities and strategies of the business than do the responses from business managers. This is then seen in the frustration which is felt by IT management in their dealings with business management particularly in gaining their commitment and involvement. This may be a reflection of the fact that some IT specialists realise that IT is central to business today but they need the involvement of business staff. However, many in Distribution and Manufacturing still project a traditional role focusing on developing and maintaining applications. Equally, business managers are afraid of taking on too much responsibility for IT. At manufacturing, for example, on business manager noted that “innovation is seen as counter to the business culture – rewards are based on getting it right with no points for failure”.

When we compare the IT and business management responses within each of the three organisations the consistency in the tone and content of those from Financial is evident.

Table 7

Criteria used to judge the success of the IT organisation: summary of business management responses

Distribution	Manufacturing	Financial
<ul style="list-style-type: none"> • Delivery to deadlines • Meeting development specifications Including quality Fit for purpose • “Number of faults received when live” • “Ability to respond to ad hoc developments/fault fixing” • “Delivering quality systems to the business” • “Developments meet business requirements” 	<ul style="list-style-type: none"> • Availability of systems • Response to problems • If they help me “Their ability to help and assist my problems” “Do they support me in reacting my goals” • “Good applications which find general take up” 	<ul style="list-style-type: none"> • “That the IT team keep up to date on new systems available” • “Confidence and contentment of team members” “The feedback from my team, who are the users” “Feedback of external customers” • Service delivery “Delivering applications on time” “Quality of the delivery” “Lack of downtime of PC or other systems”

There is a strong element of congruence between what business management and IT management see as being the role and function of the IT organisation.

8.6. Criteria used to assess the performance of IT organisation

Data was also sought to compare the criteria which IT management perceive are used by the business in assessing their performance with the actual criteria used by business management. Table 7 illustrates the contrasting responses of the three organisations.

The tone of the responses from both Distribution and Manufacturing are reactive, confirming the view that the IT organisation is viewed by business management as a support centre focused on delivering technology. The expectation is that the IT unit will *respond* or *support* the business, and this is the criterion against which performance is judged. It is perhaps also worth noting the responses which refer to ‘my problems’ and ‘my goals’ at Manufacturing are a reflection of the culture of the organisation. One manager referred to the culture as a “results driven” one. Technical criteria also dominate the responses, for example, delivery to deadlines, and number of faults.

Contrast this with the responses from Financial. Here, business management are looking to the IT organisation for leadership, particularly in exploiting IS/IT opportunities. Note also the ‘softer’ less technical criteria which dominate the responses: “confidence and contentment of team members”, “the feedback from my team, who are the users”, and “feedback of external customers”.

Table 8 summarises the responses of IT management to the same question, i.e. the criteria which they perceive that business management use to assess the success of the IT unit.

Looking across the cases we can see come some commonality and differences. IT management at Manufacturing sees themselves being judged by business management primarily on technical issues, such as system response time and meeting project

Table 8

Criteria used by business management to judge the success of the IT organisation: summary of IT management responses

Distribution	Manufacturing	Financial
<ul style="list-style-type: none"> • “Delivery of projects to timescales” • “Speed of delivery” • “Speed of support” • “Fault resolution response” • “Number of faults” • “Fit for purpose systems” 	<ul style="list-style-type: none"> • Delivery of applications Time, cost, quality • Speed of response to user queries/operational issues • System response times • Provide support infrastructure 	<ul style="list-style-type: none"> • Speed of performance • Effectiveness of solutions • Level of support we provide • Ability to develop quality software on time • Ability to understand business requirements • “Making their jobs easier!”

management criteria (time, cost and quality of applications developed). There is a similar thrust to the responses at Distribution, yet even here speed of response referred to technical response resolution. Yet while the responses at Financial also reflect this technical aspect additional business focused criteria are also recognised, for example “ability to understand business requirements”, “effectiveness of solutions”, and “speed of performance in solving user problems”. IT management also recognised that it was more than just delivering projects on time and within budget but the “effectiveness of the solution developed”.

What is also interesting here is the contrast between the criteria used by both business management and IT management in assessing performance. In Distribution and Manufacturing the measures being used are different and this might explain both behaviour and differing expectations. For example, business management don’t expect to be actively involved in IT projects and don’t believe that the delivery of benefits is their responsibility.

8.7. *Issues and concerns which IT management have with the management of the business*

IT management were asked to outline and elaborate on the top three issues which they have with the business. At Distribution and Manufacturing IT management repeatedly noted the “allocation and commitment of resources” (finance, people and time), “unclear project goals”, the inability of users to specify requirements and changing specification after working has begun. This is capped with “unrealistic expectations of IT”. At Financial, however, the issues and concerns of IT management were more fundamental and strategic in nature. They were critical of “data quality in certain areas of the business” and castigated business managers for “spending unnecessarily on key operational software”, a reference to the key operational dimension of the applications portfolio (see Ward and Griffiths, 1996 for a discussion of this framework). Interestingly, there was also a feeling that the business was not sufficiently aware of “changing business practice” and that they were not aware of and did not appreciate the “importance of current technologies” particularly the likely impact on the business.

9. Conclusions and further research directions

In this paper we have attempted to progress beyond merely using the label “culture gap” in describing the gap which exists between the IT organisation and the rest of the business and explore in detail its nature and context. We have taken the view that culture is a convenient description of the symptoms but not an explicit cause of the gap. From a substantial review of the research literature an initial framework to aid in diagnosing and describing the gap has been developed. We have operationalised this framework, constructing research instruments, which we administered in three organisations. Both quantitative and qualitative data were collected from a mixture of questionnaires and interviews.

Our analysis of the data from the organisations has enabled us to begin to develop a typology of IT organisations based around the relationship which it has with the business derived from understand both business and IT management viewpoints. We have characterised these as the “disconnected”, “unloved” and “high achieving” IT organisations. Our study was obviously limited to three organisations but it is likely that with a larger sample a more complete typology could be developed.

Each organisation agreed the characterisation and valued the detailed analysis and diagnosis of the apparent existence of a ‘gap’ between the business and IT organisation. Indeed, the three organisations took a significant risk in taking part in such exploratory research. While the results were not what Distribution and Manufacturing had hoped for, both have used the analysis from the research to construct an agenda to bring together at a workshop both the business and IT organisation as a first step toward bridging the gap. Financial has recently acquired an organisation with an extremely poor IT record and is using the framework and results of the survey to guide in the integration of the IT units of both organisations. We would also hope to reassess these organisations at a future date to understand the effects of actions taken.

In analysing the data it was apparent that while the framework was robust in the sense that it did help in diagnosing the nature of the gap, it was incomplete. Significantly, there was a clear gap in the lower performing IT organisations in relation to views of the role and function of the IT organisation and the role of people. This disparity of views is not only visible across the organisations but also between the business and IT management and also among the IT management teams and business management teams. Consequently this is a dimension which should be made explicit in the framework.

The tone of the responses with regard to roles was also interesting. The IT management of the low performing organisations emphasised technical matters, focusing on the provision and delivery of technology. Within Financial, however, IT management saw their role as being proactive and not just to support the business but to actively drive strategy in relation to IT. The IT director and senior IT management are involved in the business strategy process and the majority of IT management know the mission statement, which was not the case with the other two organisations.

Mis-alignment at this level translates into neither business management nor IT management agreeing as to what exactly is the role of the IT organisation; “both are singing off different hymn sheets”. Fig. 3 illustrates the revised framework for identifying the issues to be managed in relation to the IT/business gap.

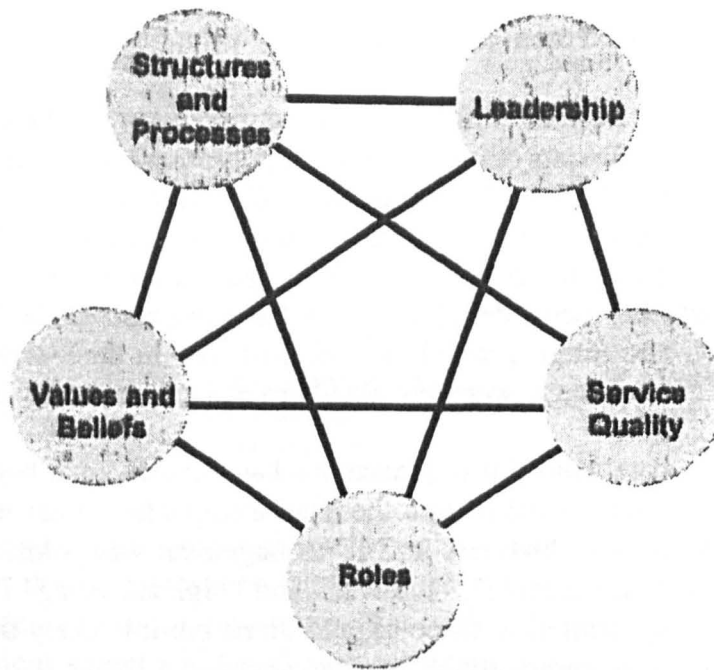


Fig. 3. A framework for managing the relationship between the IT organisation and the rest of the business.

More traditional research tends to focus on only one of the five dimensions of this framework. We have attempted to provide a more holistic perspective. For example, there is research exploring the role of the IT director (see Earl and Feeny, 1994) and we have attempted to integrate this within the overall framework. While these five dimensions are interrelated, this research has not addressed the nature and extent of the relationship between them.

One of the startling differences between the three research sites is the existence of what Davenport (1997) has referred to as an “information ecology” in Financial. Business management focus not so much on the technology but on information and the management of information. Information is seen as central to the competitiveness of the organisation. Indeed, at Financial all IT activities are outsourced, with the IT specialists managing a portfolio of relationships as defined by Venkatraman and Loh (1994). A recent recruit to the IT unit of Financial commented that the organisation focuses on the “value-added nature of information”. Business management recognise the opportunities which technology offers in relation to managing this information and expect the IT organisation to evaluate new technologies with this in mind.

Additionally, surveys, particularly in the area of service delivery, treat the “customer” as a single homogeneous group (Pitt et al., 1998). We believe that such approaches are inadequate as neither do they recognise the complex, multi-layered nature of the IT/business relationship nor do they discriminate amongst the different groupings of business and IT people involved and interacting in the relationship. While this current research has highlighted differences between CEO and business management and IT director and IT management, additional interviews in Financial with non-management staff has indicated that the research should also be extended to incorporate an additional two stakeholder groups: business users and analysts, development staff, help desk staff, etc.

We also plan to carry out further surveys in a range of organisations in an attempt to develop the further typologies and provide comparative assessment, “relationship benchmarks”, which organisations can use to take action to address gaps and ultimately improve the value they derive from IT.

Many organisations are attempting to transform their IT organisations and create a high performance IT unit. However, we believe that this is addressing the wrong question. This question is how can high performance be derived from IT. Phrased accordingly, is a fundamentally different question and provides a different way of looking at the issues and consequently a different answer ensues.

Each of the five dimensions of the framework are necessary but certainly not sufficient. For example, the IT director at Manufacturing is highly regarded and respected and provides leadership to the IT unit. He has assembled a strong IT unit which is highly skilled and technically very competent, yet the IT organisation has a poor reputation and is not seen as delivering value. This irony cannot also be lost on Distribution, where, despite a similarly skilled and competent division, there is a similar diagnosis.

The exploitation of IT for business benefits and value is not just about the optimum configuration of activities in the IT organisation. Rather, it is an organisational wide issue requiring an organisational wide response. Responsibility for IT success cannot be delegated to the IT organisation. Our framework captures the critical dimensions which should be addressed to maximise the value-added contribution of IT in an organisation.

Appendix A

This appendix lists out the questionnaire and interview items together with relevant literature references and sources. These items are grouped under the four dimensions of the framework outlined in the paper (Fig. 1). It also highlights the organisational groupings from whom information and data in relation to the items was elicited from (Table A1).

Table A1

Questionnaire and interview Items	Reference	Elicited from			
		CEO	BM	ITD	ITM
<i>Leadership</i>					
Involvement of business management in IS/IT strategy process	Dutta, 1996; Earl, 1989; Rockart and associates, 1995; Ward and Griffiths, 1996	×	×	×	×
Involvement of IT management in the business strategy formulation process	Enns and Huff, 1997	×	×	×	×
Ownership of IS/IT strategy	Bowman and Kakabadse, 1997	×	×	×	×
Responsibility for delivering benefits and value from IT	Farbey et al., 1993; Ward et al., 1996	×	×	×	×
Peer acceptance of IT director	Stephens et al., 1992; Feeny et al., 1992	×	×		

Table A1 (continued)

Questionnaire and interview Items	Reference	Elicited from			
		CEO	BM	ITD	ITM
IT director as part of senior management team	Stephens et al., 1992; Feeny et al., 1992; Earl and Feeny, 1994	×	×		
Leadership creating a learning culture in IT organisation	Agarwal et al., 1997	×		×	
Support from CEO of IT director	Earl and Feeny, 1994		×		×
Support from CEO of IT initiatives	Earl and Feeny, 1994		×		×
Experience in senior management positions	Korac Kakabadse, 1997	×		×	
Role of IT director	Stephens et al., 1992; Venkatraman and Loh, 1994	×		×	
CEO attitude towards IT	Feeny et al., 1992		×	×	×
Business perspective, experience of IT director	Applegate and Elam, 1992			×	
Support and commitment of business management	Ward and Griffiths, 1996			×	×
Percentage of career in an IT related job	Applegate and Elam, 1992,	×	×	×	×
<i>Structures and processes</i>					
Responsibility for delivering benefits and value from IT	Farbey et al., 1993; Ward et al., 1996	×	×	×	×
Role of IT organisation	Ward and Peppard, 1996; Hodgkinson, 1996; Feeny and Willcocks, 1997	×	×	×	×
Relationship between IT organisation and the rest of the business	Rockart et al., 1996; Ross et al., 1996; Venkatraman, 1997; Venkatraman and Loh, 1994; Ward and Peppard, 1996	×	×	×	×
Control structures between IT and the business	Hodgkinson, 1996; Von Simson, 1990			×	
Integrating mechanisms (committees, meetings, liaison personnel)	Blanton et al., 1992	×	×	×	×
Governance structures	Earl, 1996b; Venkatraman, 1997	×		×	
Configuration of IT organisation	Hodgkinson, 1996; Earl et al., 1996			×	
Reporting of IT director	Applegate and Elam, 1992	×	×	×	×
Allocation of IT responsibilities among business and IT management	Boynton et al., 1992	×	×	×	×
Diffusing IT throughout the organisation	Boynton et al., 1992	×	×	×	×
Scanning technology	Boynton et al., 1992	×	×	×	×
Delivery and implementation of new systems	Rockart and Hofman, 1992; Rockart et al., 1996	×	×	×	×

Table A1 (continued)

Questionnaire and interview Items	Reference	Elicited from			
		CEO	BM	ITD	ITM
<i>Service quality</i>					
Responsibility for delivering benefits and value from IT	Farbey et al., 1993; Ward et al., 1996;	×	×	×	×
Credibility of IT specialists	Bashein and Markus, 1997	×	×		
Role of IT organisation	Venkatraman and Loh, 1994; Ward and Peppard, 1996	×	×	×	×
Relationship between IT organisation and the rest of the business	Earl et al., 1996; Grindley, 1991; Ross et al., 1996; Schein, 1992; Venkatraman, 1997; Venkatraman and Loh, 1994; Ward and Peppard, 1996	×	×	×	×
Delivery of service quality	Grover et al., 1986; Kettinger and Lee, 1997; Pitt et al., 1998; Van Dyke, 1997; Whyte et al., 1997; Zeithaml et al., 1990;	×	×	×	×
Existence of service level agreements	Lacity et al., 1996	×	×	×	×
Reliability	Kettinger and Lee, 1997; Pitt et al., 1995; Van Dyke, 1997; Zeithaml et al., 1990	×	×	×	×
Responsiveness	Kettinger and Lee, 1997; Pitt et al., 1995; Van Dyke, 1997; Zeithaml et al., 1990	×	×	×	×
Assurance	Kettinger and Lee, 1997; Pitt et al., 1995; Van Dyke, 1997; Zeithaml et al., 1990	×	×		
Empathy	Kettinger and Lee, 1997; Pitt et al., 1995; Van Dyke, 1997; Zeithaml et al., 1990	×	×		
IT as a service operation	Rands, 1992				
Managing outsourcing vendors	Lacity and Hirschheim, 1995; Lacity et al., 1996; McFarlan and Nolan, 1995	×	×	×	×
<i>Values and beliefs</i>					
[Business] attitude towards IT	Grindley, 1991, 1995	×	×		
Responsibility for delivering benefits and value from IT	Farbey et al., 1993; Ward et al., 1996;	×	×	×	×
Role of IT organisation	Ward and Peppard, 1996	×	×	×	×
Contribution of IT organisation		×	×	×	×
Strategic importance of IT	Venkatraman, 1997	×	×	×	×
Business perspective	Applegate and Elam, 1992	×	×	×	×
Role of IS executive	Rockart, 1982	×	×	×	×

CEO = CEO or equivalent, BM = business management, ITD = IT director, ITM = IT management

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Information management in the global enterprise: an organising framework

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Much has been written over the last decade on managing global enterprises. While the predominant concern of this literature has been strategic in orientation, the management of information is a neglected area. By drawing on a diverse range of literature in the international business, strategic management, organization design, and information system (IS) disciplines this paper develops a conceptual framework for analysing information management in the global enterprise, providing a basis for organising existing literature on the topic and for creating a map of the field. This framework is structured around four domains: global business drivers, global business strategy, global business model and global information strategy. It highlights the role of information technology (IT) as supporting global business strategies while at the same time IT can also be a major catalyst in the globalisation process itself. In the context of the global information strategy, the paper develops a distinction between business infostructure, IT infrastructure and the IS/IT suprastructure. Significant relationships between the four domains of the framework are surfaced and an agenda for action developed.

Introduction

As we leave the 20th century many economists argue that we are entering a truly 'global economy'. At the same time, however, others are questioning whether or not such an exalted destination will ever be reached, pointing towards increasing regionalism, the difficulties with negotiating the last GATT agreement, and persistent rumblings of protectionism. Yet despite these concerns it would seem that forces are already at play ensuring that a truly global economy, rather than an economy that is a little more international, is about to dawn. Three interrelated phenomena capture the essence of the emerging economy in its inextricable march towards globalisation.

First, dramatic increases in the scale and scope of technology—its cost, risk, and complexity—have rendered even the largest national markets too small to be meaningful economic units (Negroponte, 1995; Tapscott, 1996). Second, the explosive growth of translational strategic alliances signals a fundamental change in the mode of organization of international economic transactions (Lorange *et al.*, 1992). Finally, the emerging global economy is integrated through information systems and information technology, facilitating co-ordination through markets rather than organization hierarchies (Jarillo, 1988; Malone *et al.*, 1987; Gurbaxani & Whang, 1991; Bradley, 1994). Value is postulated as being created more in networks (Normann & Ramirez, 1993; Coyne & Dye, 1998; Stabell & Fjeldstad, 1998) rather than in hierarchical entities. The result is an elec-

tronically networked world economy where national markets are losing meaning as constituent units and geography is no longer the basis for the organization of economic activity. A most visible manifestation of this development was the recent comment made at the annual conference of the German wholesale and foreign trade association, where the association's president stated that German 'companies were losing lucrative niche markets because the Internet made it easier to compare prices and consequently was increasing competition' (Norman, 1996).

Consequently, globalisation and the global enterprise have become a significant domain of research over the last 20 years. The predominant concern of this literature has been strategic in orientation, dealing with issues of location (Porter, 1986a, b; De Meyer *et al.*, 1996; Meijboom & Vos, 1997), co-ordination (Roth *et al.*, 1991; Jaikumar & Upton, 1994; Meijboom & Vos, 1997) control (Doz & Prahalad, 1981; Egelhoff, 1984; Eisenhardt, 1985), governance (Gomes-Cassares, 1989; Lorange *et al.*, 1992), product/market breadth and marketing (Bradley, 1991), supply chain (Christopher & Braithwaite, 1991), innovation (Rugman, 1981; Nohria & Ghoshal, 1997), legislation and government policies (Doz, 1986), international alliances and joint ventures (Kogut, 1988; Nielsen, 1988) and national cultural differences (Hofstede, 1984; Alder, 1986). Critically, outside of some isolated pieces of work, the management of information which is so crucial to the survival and functioning of such enterprises, is neglected. Any reference to information management is

generally portrayed as a technical issue, and seen as being primarily concerned with communication network and technological infrastructures. Consequently, in practice responsibility is usually delegated by senior business managers to technically competent staff in the information technology (IT) organization. The irony is that decisions about IT are essentially business decisions. Further, there is confusion with regard to the use of the phrase 'international technology management' as it is generally conveyed as being concerned with research and development (R&D), innovation and technology (defined in terms of knowledge) transfer.

The objective of this paper is to contribute to our understanding of IS/IT management in the global enterprise and consequently the development of this sub-field of research. By drawing on a diverse and comprehensive range of literature in the international business, strategic management, organization and IS disciplines this paper develops a conceptual framework for analysing IS/IT management in the global enterprise, representing the first attempt to integrate such a wide multidisciplinary base of research. It provides a basis for organising existing literature on the topic and for creating a map of the field. It highlights the role of IS/IT as supporting global business strategies while at the same time IS/IT can also be a major catalyst in the globalisation process itself. Significant relationships between the domains of the framework are surfaced and an agenda for action developed.

The global context

Two assumptions underlie the construction of this paper. The first and more general assumption is that managing in the global context is different from managing a single sited organization thus presenting a different set of issues to be addressed. The second assumption, which is specific to the management of information, is that there are value for money benefits and advantages to be gained by managing information on a global basis as opposed to a domestic country or single site. The evidence would suggest that this is the case (Buss, 1982; Keen, 1992; Ives *et al*, 1993; Andreu *et al*, 1994; Deans & Karwan, 1994; Earl & Feeny, 1996).

To put this paper in context and to highlight the enormity and complexity of global operations consider the following scenario (adapted from Dyment, 1987):

The global corporation, head-quartered in Germany, markets and sells a product that is designed in Milan, Italy, with components manufactured in Taiwan and Korea. It is assembled in Canada, Germany and Ireland and sold as a standard model in South America, and as a model with considerable options in the US, Europe and Australia. Transfer pricing of the components and assembled product is determined with an eye to minimise tax liability. The principal financing is provided from the Euro market based in Frank-

furt. Add in the complexities of having transactions in different currencies, with foreign exchange hedge contract gains and losses that sometimes offset trading losses or gains.

While this scenario captures just some of the complex issues involved in global operations at a business level translating business demands into information and systems requirements becomes a daunting task, yet it is one which confronts many organizations on a daily basis.

Managing in the international arena presents a number of concerns and problems not usually faced when operating in a single domestic market. These include:

- Addressing different legislative demands, taxation systems, accounting requirements, currency systems, and environmental standards, particularly outside the borders of the European Union (EU). While the EU is seeking the harmonisation of many of these aspects, the fact is that many anomalies still remain among member countries. Virgin Express, the no frills airline based in Belgium, has long complained about that country's tax and social security regime and recently announced that it would be establishing a new business base in Ireland (King, 1998).
- Dealing with cultural differences both within different operating units and national cultural differences. Even within Europe there is a mosaic of different cultures and ethnic backgrounds. Culture influences both business practices and customer preferences. Language also presents its own challenges.
- Addressing international economics and politics. Consider the intervention of the French government when Hoover announced that it was moving manufacturing from France to Scotland. The stability of political and economic systems varies throughout the globe as does the extent of state intervention, particularly in attracting foreign direct investment (FDI).

Accentuating the global 'problem' are further observations in relation to operating internationally.

- It is very often difficult to distinguish between what one might consider as being 'domestic' and 'international' firms. Even the home base is often deceiving. For example, Honda manufactures more automobiles in the US than in Japan, employs more US workers than Japanese, generates more revenue in the US than it does in Japan, and even exports US designed and manufactured cars to Japan
- In many industries, international business can sometimes be described as a tangled web of international links, often associated with competing firms. For example, despite competing against each other head-to-head, Nike, Adidas and Reebok often use the same manufacturers in South East Asia. In the com-

puter industry, IBM, Digital, Hewlett Packard and Apple are at the same time involved in both collaborating and competing alliances.

Globalisation has become a strategy for many companies of all sizes as they seek to expand their participation in foreign markets. The extent of this 'globalisation' varies from having a sales office in a local market to developing a sophisticated network of business operations fully integrated on a global basis. In the process of becoming increasingly global, many firms are often seen to follow a developmental path from 'international' to 'multinational' to 'global' to 'transnational' (Bartlett & Ghoshal, 1989). Briefly, the international stage is characterised by an increasingly autonomous international division, separate from domestic business; the multinational stage is characterised by an increasing duplication of the value chain across countries and local autonomy; and the global stage is denoted by increasing geographic integration of activities and strategies; the transnational model is characterised by "... increasingly specialised units worldwide ... linked to into an integrated network of operations that [enables] them to achieve their multi-dimensional strategic objectives of efficiency, responsiveness and innovation" (Bartlett & Ghoshal, 1989, p 89). For most international companies, however, the transnational model is more an aspiration than a reality (Turner & Henry, 1994).

Even the smallest economic unit is not immune from the effects of globalisation as they increasingly face competition from 'foreign' companies for market share. And with the advent of the Internet, every firm with a World Wide Web presence can be seen as a global player (Quelch & Klein, 1996).

Information management in the global enterprise

The global organization seeks to manage the interdependencies among geographically dispersed multi-site operating units, for example between manufacturing facilities, distribution centres and sales offices all at different locations. Information is the mechanism through which this integration is achieved and IT is increasingly being used to integrate and manage geographically dispersed operations. At the same time IT is reducing communication and transaction costs and enabling new structures and processes providing global organizations with new organising possibilities (Malone *et al.*, 1987; Eccles & Nolan, 1994; Boudreau *et al.*, 1998; Jarillo, 1998). New models for value creation are possible with value being created in 'networks' as opposed to 'chains' (Normann & Ramirez, 1993; Coyne & Dye, 1998; Stabell & Fjeldstad, 1998).

Yet, this management of information which is so crucial to the functioning of global enterprises has until

recently been neglected in the research literature. As recently as 1991 Deans and Kane reported that a comprehensive review of the relevant literature revealed very little academic research. Similarly, the international business literature has tended to ignore the IS functional area. Palvia (1998) portrays the cumulative research base to date as being descriptive and opportunistic. Any reference to information management is generally portrayed as a technical issue and seen as being primarily concerned with communication networks and technological infrastructures. While these are important aspects, a more comprehensive treatment is required.

A survey at the beginning of the decade showed that more than half of the 100 major multinational corporations surveyed in 1991 did not, or rarely considered, IS/IT in strategy development (Amdahl, 1991). This survey also reported that the percentage of corporations that regard IS/IT as a component of their global strategy development was as low as 14%.

Most of the IS/IT research literature is 'domestic' in orientation (Emery, 1990; Deans & Kane, 1991; Deans & Ricks, 1991; Roche, 1996), i.e. addresses the management of IS/IT from a single site or business unit within an individual country. Some research has identified issues with managing IT in the global context (Ives & Jarvenpaa, 1991a, b; Roth *et al.*, 1991), issues specific to chief information officers (CIO) of global organizations (McFarlan, 1992), and there has also been some recent publication on managing international IS projects (Tractinsky & Jarvenpaa, 1995) and the effect of electronic communication on co-ordinating global companies (Janssens & Brett, 1994). In addition, there are a limited number of case studies dealing with aspects of global IS/IT management (Clemens & Row, 1991; Huycke & Oliff, 1993; Jelassi & Dutta, 1993; Bechler & Marchand, 1994; Ives & Jarvenpaa, 1994; Ross, 1995). Despite this dearth of literature, 'global information technology' is emerging as a sub-discipline within the IS field recognition of the increased importance of IT in globalisation and in managing the global company. There is now a journal devoted to the area, the *International Journal of Global Information Technology*. In addition, a working group has been established under the auspices of the International Federation for Information Processing (IFIP) to promote research and the exchange of best practice in this area.

In summary, the existing research literature reveals little by way of guidance for managing IS/IT in the global enterprise. One paper has noted that "... the literature [on managing global IS/IT] remains fragmentary, offering only partial and potentially contradictory normative implications for managers" (Ramarapu & Lado, 1995). Indeed, a more recent study concluded that "... the global information systems challenge appears to be more complex than commonly suggested ... there are no easy and straightforward prescriptions for

practitioners involved with global information systems' (Earl & Feeny, 1996).

Information management in the global enterprise: an organising framework

In spite of the above conclusion, there are two central themes which emerge from what little research exists in the global information technology field. The first suggests the criticality of matching global IS/IT strategy to global business strategy (Ives & Jarvenpaa, 1991a, b; Earl & Feeny, 1995). The second advocates the linking of global organizational design strategies with tactics for providing information technology support (Karimi & Konsynski, 1991; Chismar, 1994). Different structures influence information flows within the organization (Egelhoff, 1982, 1991; Lee & Leifer, 1992; Neumann-Alkier, 1997) and IT plays a crucial role in allowing organizations to implement global business strategies which depend on complex organizational and decision-making structures (Chismar, 1994). The logic is that in implementing a global strategy the organization constructs a specific business model which is supported and enabled by IT while at the same time cognisance is taken of the opportunities provided by IS/IT in enabling innovative global strategies and novel structures (Rayport & Sviokla, 1994, 1995; Evans & Wurster 1997). IT is also driving the globalisation process with technologies such as the Internet and World Wide Web allowing even the smallest company the opportunity to operate on a global scale (Quelch & Klein, 1996).

Figure 1 presents a framework for analysing information management in global enterprises. This frame-

work builds on the work of Earl (1989), Pyburn (1983) and Ward and Griffiths (1996) in aligning IS/IT strategies and business strategies, that of Henderson and Venkatraman (1993) and Broadbent and Weill (1993) in developing strategic alignment models, Earl (1996a) in his articulation of the organizational fit framework (OFF) and the approach of Ives *et al* (1993) for global IS strategy formulation. It combines this research with the international business literature, the strategic management literature, the organizational design literature and the IS/IT literature in developing this framework.

The framework highlights the two key influences of the global information strategy as being the organizations global business model and its global business drivers, thus developing the contention that host organizational characteristics influence 'IS organizational arrangements' (McFarlan & McKenny, 1983; Lee & Leifer, 1992; Earl *et al*, 1996). It also recognises the opportunities which IT offers in providing new strategic options while at the same time facilitating new possibilities in terms of organization for strategy implementation. IT can impact the global business model in that it enables new organizational structures and opens new configuration possibilities, particularly in relation to supporting virtual structures. The drivers of the globalisation process itself are greatly affected by technological developments. IT, for example, facilitates the drive towards mass customisation (Boynton *et al*, 1993).

The four domains of this framework are interdependent. A change in any one dimension may require a corresponding change in any or all of the other three. This aspect is discussed later in the paper. In the sections that follow each of the domains is explored in isolation

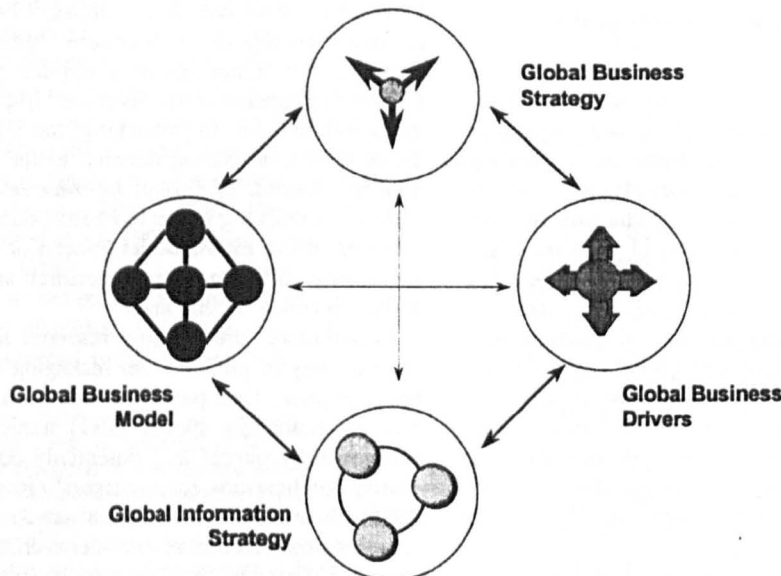


Figure 1 An organising framework for information management in the global enterprise.

as within each there are a number of issues to address. The impact which IT has on each of the domains is also examined. While the focus of analysis is on the management of IS/IT it is crucial to understand the business and organizational context before attempting to address IS/IT issues (Earl, 1989; Henderson & Venkatraman, 1993; Ward & Griffiths, 1996).

Global business strategy

There has been much debate recently concerning the nature and content of strategy: what it is? (Hamel, 1996; Porter, 1996); and whether or not it really matters? (Whittington, 1993). Aside from the issues raised in this debate, there is considerable agreement that an organization requires an overarching vision in order to give it not only guidance but to also frame the globalisation process. In this context, strategy can be defined in terms of choices pertaining to the positioning of the business in the product and market arena. It addresses issues such as the extent of comparative relationships (joint ventures and strategic alliances) and distinctive competencies defined in terms of the basis under which the organization competes (for example, delivery reliability, relationships, price, quality, etc). Prescriptions suggest that in developing the global strategy, it is paramount to first identify those aspects of strategy which should be globalised (Yip, 1995, p 6).

There are two central features to a global business strategy (GBS) which can be gleaned from the literature: scope of the organization's activities and governance (see Figure 2). Scope basically refers 'to the business the organization wants to be in'. It is concerned with issues of products and markets: what products/services will the organization sell?; where does the organization want to compete?; on what basis?; and in which markets? The second dimension, that of business governance, refers to the kind of relationships which the organization wishes to have with external business partners. While such relationship can vary from loose to tight (Venkatraman, 1991) organizations usually have a range of different relationships (Bensaou & Venkatraman, 1996). Depending on the governance stance the extent and nature of joint ventures (Gomes-Cassares, 1989) and strategic alliances (Jarillo, 1988; Lorange *et al*, 1992) are determined.

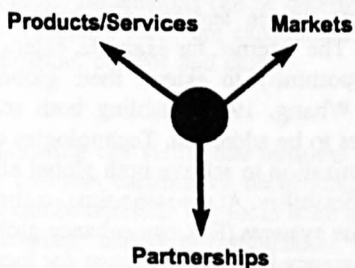


Figure 2 The global business strategy.

Information and communications technologies are having a profound impact on the strategic options of the global firm opening up new opportunities and avenues (Sampler, 1998). Technologies like the Internet now permit even the smallest of organizations to extend their reach and scope of operations enabling them to reach new market segments and new geographical regions (Quelch & Klein, 1996). Information has also become embedded in many traditional products and services; for example most of the global package delivery companies now permit customers to track their packages as they move towards their destination. IT also enables new product and service offerings to be made. Many banks are now using their automated teller machine (ATM) network to provide products and services which fall outside the realm of traditional banking services. In Spain, for example, ATMs can be used to purchase theatre and cinema tickets.

IT can also be critical in facilitating partnerships (Henderson, 1990; Konsynski & McFarlan, 1990). It empowers companies to compete, ironically, by providing them with new ways to cooperate. 'Information partnerships' facilitated by the sharing of customer data, can provide a basis for differentiation (Konsynski & McFarlan, 1990). For example, it can provide organizations the opportunity to participate in joint marketing programmes, take advantage of new channels of distribution, capitalise on opportunities for cross selling, or offer novel incentives and services.

Once defined, an organization's global business strategy gives direction to the global business model, i.e., how it organises for global operation. Yet in developing the GBS, sight must not be lost of the drivers of the globalisation process: the global business drivers.

Global business drivers

A company 'goes global' for a number of reasons including access to foreign markets, to sourcing resources, to exploit significant economies of scale, to raise capital at lower costs, to exploit a strategic advantage like a technological lead, to capitalise on lower factor costs, to extend the reach of the business, etc. (Porter, 1980; Doz, 1986; Kogut, 1985). Consequently, brands, distribution, marketing, manufacturing and decision-making must be viewed from a global perspective.

The globalisation process requires that decisions concerning a number of global business drivers (GBD) are made. These drivers both promote and constrain the globalisation process framing the strategic choices. In addressing these drivers, a balance must be struck between a number of countervailing forces. These forces are local flexibility, global integration and efficiency, global effectiveness and the leveraging of knowledge (see Figure 3). It should be noted that the concept of 'global business driver' in this paper is much broader than that of Ives *et al* (1993) who view global business

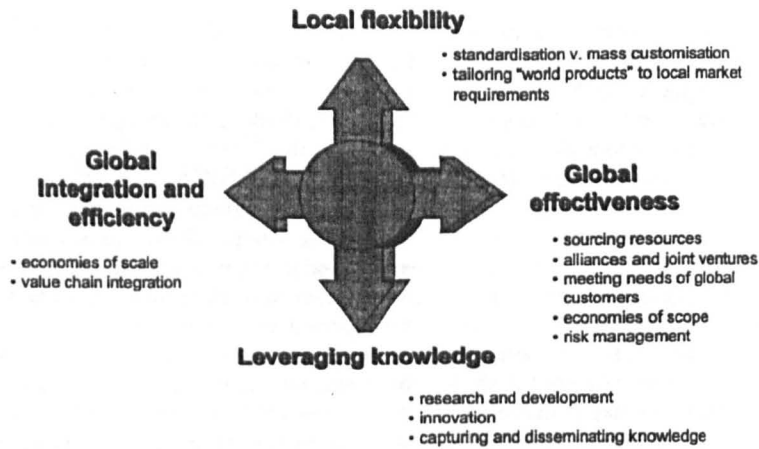


Figure 3 Tensions in a global company: defining the global business drivers.

drivers as 'those entities that benefit from global economies of scale and scope, and that contribute to global business strategy' (p 146).

Local flexibility: entails addressing the extent of the requirement to be responsive and adaptive to customer requirements and local market conditions. For example, adopting 'global' products to local markets or the ability to respond rapidly to changing customer preferences. Diversity among national markets in market structure, industry structures, distribution channels, manufacturing processes and customer needs may require local responsiveness (Doz & Prahalad, 1984). Costs and other factors can affect the extent to which local flexibility is feasible. However, brands may enable global standardisation of products and services.

Global integration and efficiency: is concerned with minimising duplication of effort and leveraging scale economies. Operating internationally demands the close integration of all activities along the value chain no matter where they are geographically undertaken. International scale economies are derived from cost reduction achieved through the accumulation of volume across country locations and international aggregation of market segments (Kogut, 1991).

Global effectiveness: entails ensuring that overall operations meet effectiveness aspirations. The critical issue is to ensure that the 'whole is greater than the sum of the part' capitalising on synergies between operating units. For example, the global sourcing of raw materials, or the mandatory requirement to manufacture in a host country before being permitted to sell into that country, or addressing global customer needs in a local market. International scope economies arise when existing international operations benefit from the introduction of additional activities or products, since the cost of additional products may be less than the individual costs, or can arise from the fact that the cost of the joint pro-

duction of two or more products can be less than the cost of producing them separately (Ghoshal, 1987).

Leveraging knowledge: Bartlett and Ghoshal (1987) stress the need for the global corporation to manage the flow of 'intelligence, ideas and knowledge'. A critical task is to ensure that there is no 're-invention of the wheel' and that knowledge and learning is captured and simultaneously shared throughout the organization. Despite this assertion very little is known about how knowledge actually develops in globalising firms (von Krogh *et al*, 1996). The organization may also choose to enter into strategic alliances (Kogut, 1988) or devise a cooperative strategy (Nielsen, 1988) to develop knowledge or have access to knowledge which it lacks.

Balancing these four tensions requires strategic trade-offs, for example between the requirement for local flexibility and scale economies or balancing scale with strategic and operational flexibility, but it is only in addressing these trade-offs that an organization can begin to determine its global business model and it is this business model which defines information and system requirements and strongly influences the deployment of IS/IT (Karimi & Konsynski, 1991; Chismar, 1994). Information technology can impact these drivers by permitting the organization to address them in different ways (see Table 1). It can at the same time facilitate strategies which can lessen tensions which exist in the physical world. The Internet, for example, offers organizations the opportunity to extend their global reach (Gurbaxani & Whang, 1991) enabling both scale and scope economies to be addressed. Technologies can also enable the organization to achieve both global effectiveness and local flexibility. At the same time, technologies such as enterprise systems (ES), can enhance global integration and efficiency but pose problems for local flexibility (Davenport, 1998).

Table 1 IT and global business drivers: some opportunities

Global business drivers	Opportunities provided by IS/IT
Local flexibility	<ul style="list-style-type: none"> ● Flexible manufacturing systems permitting low volume, high variety production in small batch size ● Mobile computing enabling sales teams to focus on local customers ● Point of sale (POS) systems collecting local customer information for local decision making
Global-integration and efficiency	<ul style="list-style-type: none"> ● EDI enabling exchange of design and inventory information between operating units ● Workflow systems ● Video conferencing ● Enterprise Resource Planning systems such as those from Baan and SAP AG
Global effectiveness	<ul style="list-style-type: none"> ● The Internet as an electronic market ● Business scope extension through the Internet ● International private virtual networks ● IT applications providing a single point of contact for global customers
Leveraging knowledge	<ul style="list-style-type: none"> ● E-mail for organizational communication ● Groupware facilitating the sharing and exchange of knowledge ● Expert systems capturing knowledge and making it available to the wider organization ● Access to information via online data bases ● Corporate Intranets

The global business model

The global business model (GBM) refers to the structures and processes in place in order to operationalise the strategy of the business. It is through this model that the day-to-day activities of the global organization are facilitated. There have been many empirical studies that have examined the relationship between strategy and organizational design in multinational corporations (MNC) (Stopford & Wells, 1972; Egelhoff, 1982, 1988; Daniels *et al.*, 1984, 1985). In developing the global business model five specific dimensions can be determined from this research literature; these are capabilities, configuration, co-ordination, control and culture.

Capabilities

Through articulating the vision and business objectives the required business capabilities underlying the business strategy can be defined. The focus is on capabilities to deploy resources, usually in combination, in order to effect a desired end (Amit & Schoemaker, 1993). Capabilities are firm specific (Rumelt, 1991) and develop over

time (Prahalad *et al.*, 1990; Grant, 1991) and unlike resources, are not tradable over time. They often contain tacit aspects making them difficult to imitate (Spender, 1993).

Configuration

Refers to decisions concerning the deployment of value chain activities around the globe, specifically the geographical location of resources (people, plant, finance, expertise, etc) (Porter, 1986b) to deliver the required capabilities. Configuration decisions are essentially business decisions and have many influences:

- often governed by regulatory requirements;
- strongly influenced by financial implications, for example transfer pricing, tax implications and wage rates;
- customer preferences with customers often preferring locally produced products/services;
- strength of trade unions and industrial relations situation can effect location decisions;
- communication and infrastructure systems;
- proximity to markets;
- governmental inducements (Kogut, 1991), for example 10% manufacturing tax in Ireland can be a major attraction in making investment decisions;
- arbitrage cost differences in factors of production (Kogut, 1991) providing a cost advantage to the producer (Rugman & Hodgetts, 1995, p 225);
- economic and political stability are key influences on location decisions.

While resources are tangible, capabilities are intangible and difficult to imitate (Dierickx & Cool, 1989; Collis & Montgomery, 1995). A company can gain a 'comparative advantage' through locating activities in certain areas. Such advantage may be due to differences in factor costs across country locations (Porter, 1980; Kogut, 1985; Ghoshal, 1987). Competitive advantage influences the decisions of what activities and technologies along the value added chain an organization should concentrate its investment and management resources (Kogut, 1985).

Co-ordination

Concerned with managing the interdependencies (Roth *et al.*, 1991) of a complex network of operations brought about through selecting specific configurations. The increased uncertainty and complexity resulting from international competition makes co-ordination a critical success factor (Pfeffer & Salancik, 1978).

The firm selects a coordination structure by jointly determining its decision authority structure ('who decides what') and its information structure ('who knows what') (Anand & Mendelson, 1997). In essence,

co-ordination entails defining what it is that must be managed:

- understanding the value system and the value-added contributions of activities;
- defining the extent of coupling of global value chain activities (i.e. the interdependencies among activities in business processes), particularly in exploiting synergies;
- relatedness at corporate strategy, i.e., the extent to which a firm expects to achieve synergies across its business units (Gupta & Govindarajan, 1984; Porter, 1985; Hoskisson *et al.*, 1993);
- understanding the 'information intensity' of business processes;
- identifying local business practices, perhaps due to cultural factors, and their impact on global processes.

Control

Process by which management influence other members of an organization to implement the organization's strategy. The management control system should enable management to control the essential strategy of the company. Formalisation is the degree to which organizational norms are defined explicitly. Control includes:

- formal structural mechanisms, such as parenting style defining the nature of the relationship between the centre and subsidiaries and the roles and responsibilities of each (Gould & Campbell, 1986);
- defining the nature of the relationship between subsidiaries (or business units) due to global processes and the requirement for lateral co-ordination;
- informal (based on personal relationships) or trust (Ouchi, 1980). Control can also be exercised through informal networks, for example it may be the outcome of moving managers around (Edstrom & Galbraith, 1977);
- integrating mechanisms such as taskforces and committees, used to develop collaborative efforts among organizational sub-units, are seen as critical to managing international operations (Barlett, 1983; Egelhoff, 1984; Turner & Henry, 1994). They are also instrumental in creating a single managerial philosophy within the organization (Roth *et al.*, 1991);
- market governance structures (Williamson, 1985) or internal economy (Benson, 1975);
- allocating responsibility to senior executives for business units and geographical areas of functional responsibilities (Turner & Henry, 1994);
- transferring organizational culture overseas (Jaeger, 1983) or socialisation through in-house training (Turner & Henry, 1994).

Culture

Cultural differences due to operating in different countries and different marketplaces, different business press-

ures and different influences (Hailey, 1994). What are the basic business practices in operation which differ from the 'home' country and what is their impact (Myers *et al.*, 1995)? There are also company-specific cultural issues, which often overflow into power and politics.

These five decision dimensions are interdependent (see Figure 4) and successful implementation of any global business strategy would require these dimensions to be aligned. For example, the location of R&D facilities can have implications for the transfer of knowledge (von Krogh *et al.*, 1996). Cultural factors can also affect the attitudes of people in relation to sharing knowledge and best practice (Szulanski, 1996). In practice, configuration decisions strongly influence co-ordination and control decisions and define the cultural context.

IS/IT both supports and drives the global business model. It enables new organization designs to overcome the spacial and temporal dispersion that accompanies increased global reach (Boudreau *et al.*, 1998). Building on the pioneering work of Lawrence & Lorsch (1967), we find that as an organization expands overseas its information processing capacity must increase. IS/IT is needed for co-ordination (Emery, 1990) as the essence of co-ordination is the communication and processing of information (Malone *et al.*, 1987). IT reduces communication and transaction costs while at the same time it also makes different types of configurations possible through its co-ordination capabilities (Chismar, 1994; Malone & Crowston, 1994). Capitalising on this phenomena, organizations can depend less on hierarchy and more on markets as co-ordinating mechanisms (Malone *et al.*, 1987; Gurbaxani & Whang, 1991; Evans and Wurster, 1997). However, culture might have an impact on co-ordination dictating that IS/IT knowledge based in one jurisdiction may not be applicable in other countries (Tricker, 1988; Raman & Watson, 1994) or

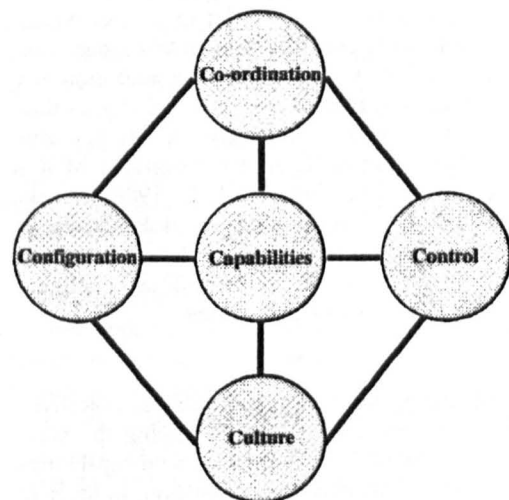


Figure 4 Interdependencies among dimensions in developing the global business model.

that an IT application developed in one national culture for use in another may present its own set of unique problems (Shore & Venkatachalam, 1996).

Global information strategy

Thus far we have been primarily concerned with an organization's global business strategy and how it organises for the implementation of that strategy. We have seen how this strategy is influenced by global business drivers which define the framework within which this strategy is formulated and implemented. The duality of IT is that it not only supports the strategy of a business but can also create strategies through the opportunities which it provides. For example, technologies like the Internet now permit transactions to be conducted in a computer mediated environment which has profound implications for the very nature of business itself (Rayport & Sviokla, 1995) enabling the redesign of business networks or the redefinition of business scope (Venkatraman, 1991). We have also seen that IT can influence global organization design choices, enabling innovative configuration opportunities which are not possible without significant use of information technology.

The concern of the global IS/IT strategy domain is how information, information systems and information technology support the GBM, facilitate the GBD and consequently help in achieving the overall global business strategy of the organization. While the terms information systems (IS) and information technology (IT) are often used interchangeably, this paper uses these two terms precisely (c.f. Earl, 1987, 1989; Checkland & Holwell, 1998; Ward & Griffiths, 1996). Without wishing to enter into a philosophic debate (see, for example, Backhouse *et al.*, 1991) information and information systems predate computer, communications and networking technologies (the IT) and have always existed in organizations. Indeed, information is often portrayed as the lifeblood of an organization and, following this analogy, the systems are its veins directing the flow of blood. It is the organization's global business model and global business drivers which give focus to this flow and define the purpose and function of this information in the global enterprise. Borrowing a concept from economics, IS is demand oriented, i.e. it defines the organization's demand for information and systems to support and enable the strategy of the business and for core competency leverage. Anand and Mendelson (1997) present an appealing use of the term IS to refer to the organization information structure, with the information system implementing its information structure.

On the supply side there is IT, which is concerned with how that demand is to be met. It addresses not just the technologies but also includes corporate data, IT competencies and skills and knowledge to specify, develop and maintain the technology (Earl & Sampler,

1998; Feeny & Willcocks, 1998). The choice of supply side options is increasing with organizations no longer compelled to source all IT resources in-house. Options range from sub-contracting software development to the wholesale outsourcing of all technical requirements. However, even with 'total outsourcing' there are aspects of IT management which should remain in-house (Dutta, 1996; Lacity *et al.*, 1996) and which place new responsibilities on the IT organization, such as managing relationships with the outsourcing vendors (Venkatraman & Loh, 1994) and identifying appropriate ways to use the market (Cross, 1995; Lacity *et al.*, 1996). Research highlights that many firms outsource their IT without giving sufficient attention to requisite information and systems decisions (Lacity & Hirschheim, 1995; Dutta, 1996; Earl, 1996b).

Yet, even recognising the distinction between IS and IT there must also be a governance structure put in place in order to manage the different aspects of information and system requirements between the centre and the business units and laterally across all the business units. Similarly, the global organization must insure that 'islands of automation' do not sprout up, severely limiting the flow of information and potentially damaging the competitive elements of the global business strategy. While IS provides the context for IT (Checkland & Holwell, 1998), the organization must put in place structures and processes which define responsibilities across all operating units as well as drafting the mechanisms for dealing with disputes.

From this discussion, three components of the global information strategy can be defined. Illustrated in Figure 5, these are

- the global business infostructure model;
- the global IT infrastructure model;
- the global IS/IT suprastructure model.

The global business infostructure model

The definition of the global business model will demand specific information and systems requirements depending on the decision choices made in relation to the global business drivers and the global business strategy. Information systems must be harmonised with the structure of the organization they support (Karimi & Konsynski, 1991; Chismar, 1994; Anand & Mendelson, 1997) and are the mechanism for managing organizational interdependencies (Rockart & Short, 1989).

The global infostructure is business driven defining how information and systems support the organization in its pursuit of competitive strategies. It involves identifying for global and local business processes their associated information and system requirements. Some business processes will be truly global while others will be less so in order to incorporate the requirement for local

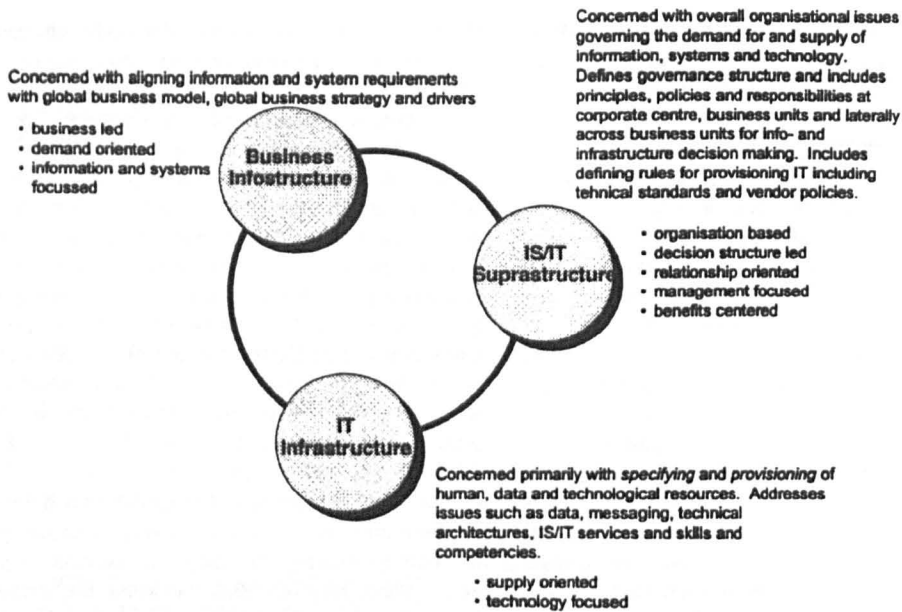


Figure 5 The global information strategy.

flexibility. Traditional IS planning approaches can be useful here in determining the applications to support both current and future business strategies, however sight should not be lost of how resources are organised (Lambert & Peppard, 1993).

The critical aspect of the business infostructure is the business management understanding of how information and information systems support the choices made for the dimensions of the global business model, for example, to support both co-ordination and control decisions or balancing configuration and co-ordination aspects. Reference has already been made to the fact that new information and communication technologies can provide new possibilities for organising global operations and these should also be considered in defining the infostructure model.

The global IT infrastructure model

The global IT infrastructure model is concerned with the technical and human resources necessary to develop, maintain and support the required applications and technologies to enable and support the global infostructure model. Activities addressed by this model include IT development and maintenance, local and wide area networks as well as the provision of IT services such as the help desk and IT training.

From a conceptual perspective, the IT infrastructure provides the shared foundation of IT capability for building business applications (Weill & Broadbent, 1998). Yet, a central problem with IT infrastructure is that it is usually not adequately planned for. The IT organization has generally been "obliged to grow its IT infrastructure clandestinely, by small increments hung on the shirt-tails

of particular applications for which a direct benefit can be demonstrated" (Index Foundation, 1993, p 22).

Although the concept of IT infrastructure is not well defined in the literature, the following distinguishing features can be discerned (Brophy & Monger, 1989; Turnbull, 1991; Weill, 1993; Ross *et al*, 1996; Weill & Broadbent, 1998):

- It is shared across either multiple applications, processes, departments or business units, depending on how the organization is structured (the GBM).
- Provides the capability for a range of business opportunities.
- It provides a capability which may not be used.
- In its own right IT infrastructure does not deliver any direct benefits, *per se*. This is one reason why traditional investment appraisal approaches may be inappropriate (Brophy & Monger, 1989; Parker & Benson, 1989; Turnbull, 1991; Powell, 1992; Weill, 1993) and that such investments should include an evaluation of their 'embedded options' (Sharp, 1991).

The additional complexity when considering IT infrastructure, particularly in the global content, is the debate between 'fit' and 'flexibility' (Jarvenpaa & Ives, 1994). The logic of 'fit', which is a cornerstone of strategic alignment (Henderson & Venkatraman, 1993), demands that investments in IT are aligned to business requirements. However, the nature of IT (its legacy aspect coupled with rapidly changing business requirements) means that 'flexibility' is also an imperative. Jarvenpaa and Ives (1994) have examined the 'fit versus flexibility'

debate concluding that flexibility of IT is a necessary requirement for the successful exploitation of IT in a global context. This puts a tremendous strain on the part of IT infrastructure planning as it requires particular foresight in IT strategy formulation.

The concept of IT infrastructure is further blurred by the lack of precision in the usage of the term. A variety of terms can be found in the literature, such as architecture (Brophy & Monger, 1989) and platform (Madnick, 1991), and these are often used interchangeably with their meanings undefined. From the literature, however, key elements of the IT infrastructure can be identified. These are data, transaction messaging, technical architecture, IS/IT services and skills and competencies (Madnick, 1991; Keen, 1993; Weill, 1993; Ross *et al.*, 1996; Feeny & Willcocks, 1998).

Data: the basic elements of information; the 'factual raw material which becomes information' (Checkland & Holwell, 1998).

Transaction messaging: the traffic generated by the applications through the processing of data.

Technical architecture: the technical frameworks for operating systems and hardware—ensuring that intercommunication is technically possible.

IS/IT services: the service aspect of the IT organization which includes applications development, applications maintenance, security, help desk and IT training.

Skills and competencies: the requisite skills and competencies required by IS professionals to maintain the infrastructure.

In summary, the IT infrastructure defines the infrastructural requirements to support the global infostructure model. Yet it must also address the need for flexibility to deal with changing business priorities. One of the reasons why organizations often choose outsourcing is the belief that the vendor will provide them with this flexibility; this may not always be the case (Clark *et al.*, 1998).

Global IS/IT suprastructure model

The management of 'demand' and 'supply' in the global context is complex. The debate is traditionally portrayed as swinging between centralisation and decentralisation although the 'middle ground' has become an appealing alternative (Buchanan & Linowes, 1980; Von Simson, 1990; George & King, 1991; Hodgkinson, 1996). Von Simson (1990), for example, subscribes to an IT organization design with IS/IT roles played by both a central IT organization and the business units and prescribes a 'centrally decentralised' IT organization with strong dotted line reporting relationships. In a similar vein the federal structure is often seen as capturing the benefits of both centralisation and decentralisation. With such a structure, business units receive a responsive service from decentralised IT functions, whilst at the same time

a corporate IT function provides group-wide IT services and exerts some degree of central leadership and control of IT activities (Hodgkinson, 1996). Table 2 summarises the dominant structural types which can be identified from the literature, highlights the advantages of each type for the global enterprise and identifies the critical management issues.

From this stream of literature examining the role, function and position of the IT organization a number of observations can be made. First, business infostructure and IT infrastructure, as defined in this paper, are generally treated in a similar fashion; no distinction is made between different decision types. For example, there is an implicit assumption that if IT infrastructure decisions are centralised then IS planning is similarly centralised. It is feasible for significant aspects of the IT infrastructure to be centralised while IS planning may be predominantly decentralised.

Second, the archetypes identified in Table 2 are based around a premise of control of resources. For example, independent global IT operations is seen as advantageous for individual business units as the available IT resources is under the control of business unit management rather than the corporate centre. While implementing customised designs for business units leads to higher co-ordination costs (Porter, 1985; Ghoshal & Nohria, 1993), a growing body of evidence suggests that global firms with custom managed business units outperform firms which force an 'indiscriminate fit' (Gupta, 1987; Bartlett & Ghoshal, 1990). However, little empirical studies have been undertaken investigating the most appropriate structure for the IT organization and the positioning of decision rights. There has been some recent work on capabilities for the IT organization (Feeny & Willcocks, 1998) and general imperatives for the IT organization (Rockart *et al.*, 1996). While insightful, these are framed within a single business unit rather than specifically within the content of a global company.

Third, a further problem with the archetypes identified in Table 2 is that these are structural arrangements, saying nothing about which aspects of the infostructure or infrastructure are managed centrally, which are devolved, and the rules which govern such decisions. Positioning the IT organization and defining its role, at both corporate and business unit level as well as structures, processes and responsibilities, raises a number of questions which make it unique among organizational resources. Managing IS/IT raises certain questions concerning scale, infrastructure planning and risk (Earl *et al.*, 1996). It is likely that there are distinct advantages to be gained through standardisation (Butler Cox, 1991). Therefore, it seems logical to suggest that there are aspects of infostructure and infrastructure management which should be managed centrally and others which individual business units are permitted to have more

Table 2 Summary of global IS/IT structural arrangements

<i>Structural arrangements for the IT organization</i>	<i>Strategies for managing global IS/IT</i>	<i>Advantages</i>	<i>Critical management issues</i>
Independent global IS/IT operations	Subsidiaries pursue independent system initiatives	Business units have ownership Users control IS/IT priorities Responsive to BU's needs	Integration Variable standards of IS/IT competence 'Reinvention of wheels' and duplication of effort Little synergy and integration Cost
Headquarters-driven global IS/IT	Corporate-wide IS/IT solutions imposed on subsidiaries	Scale economies Control of standards Critical mass of skill	Politics Unresponsive Does not meet every business unit's needs Effect on customer
Informal co-operation in global IS/IT	Informal social networking between the head office and foreign subsidiaries Usually brought about by movement of key IS/IT personnel	Awareness of IS/IT issues in the global enterprise	Co-ordination and direction setting Leaving too much to chance
'Federalism' (integrated global IS/IT)	Balancing central control and local autonomy without losing the advantage of world-wide co-ordination and integration	Group-wide IS/IT strategy and architecture with devolution where appropriate	Complexity Execution Timing Defining 'where appropriate'

discretion over (Cross *et al.*, 1997; Brown & Magill, 1998). For example, telecommunications and other infrastructure which are shared across the global company may require centralised control, given global co-ordination requirements, while IT help desk support may be more effective if localised. Even with the latter decision the issue of scale economies must be factored into any choice.

The challenge is to determine the appropriate balance between responsibilities and activities that can be devolved and those which should be retained centrally. Consequently, applying the principles of federalism means that there must be a mechanism for deciding how to divide the activities and responsibilities between the centre and the business units, for devising rules setting the parameters for both info- and infrastructure decisions, and for the satisfactory resolution of any conflicts which may emerge.

Developing this requirement, the suprastructure recognises the need to treat the management of the corporate business infostructure and the IT infrastructure differently. It is conceivable for the IT infrastructure to be centralised but for much of the decisions concerning the infostructure to be devolved to the business units. The infostructure defines the support that information and information systems will provide to the business. While it is generally recommended that IS planning be conducted at business unit level (Earl, 1989; Ward & Griffiths,

1996), it is probably more appropriate to have some aspects of the IS strategy defined centrally in a multiple business unit organization (Butler Cox, 1991).

As the IT infrastructure is concerned with defining systems and services to meet current and future infostructure requirements, decision rights may need to be more centralised (Butler Cox, 1991, p 23) and responsibility assigned at a higher level in the corporation (Earl, 1989). It has been recommended to position IT strategy at the level at which business plans are co-ordinated (Butler Cox, 1991). Two aspects of the IT infrastructure should be distinguished: specifying and provision. Specifying is concerned with the development of the IT infrastructure strategy; literally, the technologies and resources which will be used to support and provide the infostructure. It is a decision with long-term implications, and probably revisited once a year or when major strategic changes take place. The provisioning of IT is ongoing and represents the actual operationalisation of the strategy.

While Earl and Sampler (1998) have used the term 'market management' to refer to the management of both supply and demand, the conceptualisation of suprastructure is much broader. Suprastructure encapsulates defining the framework for operating and decision-making within the global company; in short defining governance. It defines reporting relationships, budgeting process, cost recovery mechanisms, defines the IS planning process,

identifies who is involved, defines a benefits management process for delivering benefits from IT, and signals how relationships are managed. It determines local and global responsibilities and the relationship between headquarters and business units and between the business unit themselves. It also addresses how IS requirements are prioritised, defines approaches to investment appraisal, determines appropriate project management methodologies, specifies policies regarding hardware and software, and allocates roles and responsibilities.

For example, in addressing the IT infrastructure dimensions, the following aspects will be considered:

Data management: the extent to which data supplied by applications can be used by corporate-wide applications and across the extended enterprise.

Transaction messaging: the extent to which that traffic generated by the applications can be handled correctly by the rest of the global computing systems.

Technical architecture: specifying the technical frameworks for operating systems and hardware—to ensure that applications built in one location can be successfully reused in other places without the need for major changes to the technical infrastructure and that intercommunication is technically possible.

IS/IT services: defining those services which are best provided on a global scale and those more appropriate to provide locally.

Skills and competencies: the requisite skills and competencies which will be required by IS professionals to maintain the infrastructure.

Figure 6 presents a schematic illustration of the IS/IT suprastructure. It requires determining the principles, policies and responsibilities for both the infostructure and infrastructure at the corporate, business unit, and laterally across business units.

Principles are 'simple, direct statements of an organization's basic beliefs about how the company wants to use IS/IT in the long term' (Davenport *et al.*, 1989). These are akin to the concept of 'IT Maxim' as espoused by Weill & Broadbent (1998). Policies are rules or laws specifying what 'not to do' as well as 'enablers' (Earl

et al., 1996; Weill & Broadbent, 1998) which provide the parameters for operating within.

Defining responsibilities requires delineating where responsibility for decision-making lies within the global enterprise. It entails defining the aspects of infostructure and infrastructure which the centre and business units have authority over.

Global information management does not take place in a static environment but within a world which is constantly changing both in business and technology terms. Not only has this consequences for both the business infostructure and the IT infrastructure but also for the design of the suprastructure. For example, new technologies and new technological standards emerge and these will be evaluated for the applicability to the organization. Business strategies change requiring changes in the global business model. The economics of production might shift requiring a new configuration of business activities. All this suggests that it will be necessary to have an organizational body which will oversee changes and additions to the suprastructure as well as addressing any disputes which may emerge: a meta decision-making forum. The evidence suggests that this will be a central function with a group composed of both senior business and IT staff from the centre and business units (Butler Cox, 1991; Starre & de Jong, 1998). With input for business and IT as to the most appropriate actions to take, suprastructure decisions are made within this forum.

Concluding remarks

The purpose of this paper has been to develop an organising framework for information management in the global enterprise. Drawing on a diverse and comprehensive literature base, the conceptual framework presented in the paper extends the traditional prescription of aligning the information management strategy with business strategy suggesting that, particularly in the global context, both the drivers of the globalisation process as well as how the business organises itself in the international arena exert a major influence.

The framework recognises the central role which

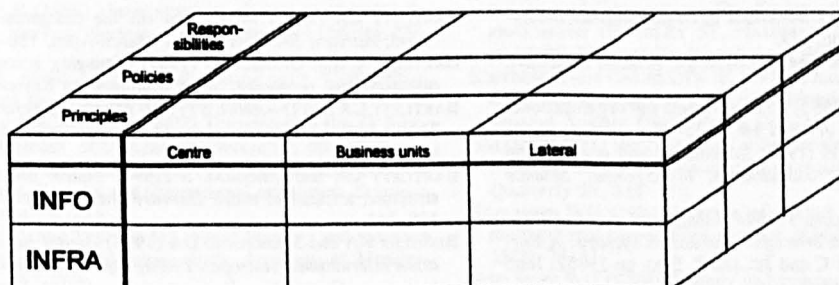


Figure 6 Schematic illustration of the IS/IT suprastructure.

IS/IT can play in global operations. IS/IT can both support and enable new strategies, new structures and offer new trade-off possibilities. At the same time, IT provides opportunities in organising for global operations enabling new configuration and control strategies and provides novel ways to leverage capabilities. The global business drivers are themselves strongly influenced by developments in technology, affecting the globalisation process itself.

The interdependent nature of the four domains suggests that changes to any one dimension will probably require corresponding changes in the others. For example, a new global strategy may require a novel organizational model; increasing the requirement for local responsiveness is likely to place a high co-ordination overhead on the organization. However, this framework is not an alignment mechanism but further development could potentially lead to such an outcome. Such a mechanism would enable an assessment to be made of the fit between each of the four domains of the framework. While each of the four domains may be examined in isolation they do not function in isolation.

The global information strategy is portrayed as having three interdependent components: the business infostructure model, the IT infrastructure model and the suprastructure. It is perhaps issues surrounding the suprastructure which are least addressed in the research literature. Guidance in the design of the global IT organization, defining specific decision-making responsibilities and establishing parameters for both infostructure and infrastructure decisions is an area requiring more research. This paper has suggested a concept centred around defining principles, policies and responsibilities for both infostructure and infrastructure decisions at both the centre and business units and laterally across the organization.

One research question which would greatly improve our understanding of the global information strategy domain is the extent to which host organization characteristics influence IT organizational arrangements. How

do elements of the global business model influence the global information strategy? Do particular configurations or patterns of control for the GBM have a dominant global information strategy? Addressing these questions would be useful in regard to establishing best practice.

Much of the research in global information management is based on the assumption of a homogeneous global IT base. This is unlikely to be the case. It is more probable that there will be different stages of IS/IT maturity in business units, markets, customers, and among business partners. What are the implications of this? Trade-offs are likely to be required but what governs the making of these decisions? What guidance can be provided to organizations in such situations?

A related issue which is not adequately addressed in the research literature is dealing with the management of information after mergers and acquisitions. There is the problem of how best to assimilate the newly acquired or merged organization with a different business infostructure and IT infrastructure. What strategies are possible and under what circumstances is one selected?

This paper does not attempt to present a blueprint for formulating a global information strategy. What it has done is present the elements which are important to consider in developing this strategy. It does highlight that the global information strategy cannot be developed outside of an understanding of the other domains. More frameworks and models are needed in order to help in addressing questions relating to these elements.

IT directors/CIOs in global companies face a complex set of issues to deal with in regard to the management of their function. In this paper an attempt has been made to provide an organising framework which imposes some structure to the issues which require consideration. Yet, as the paper has highlighted, considerable research is urgently needed if IS/IT is to contribute to corporate success. By presenting an organization framework it is hoped that we have taken a step forward in this direction.

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Whose job is it anyway?: organizational information competencies for value creation

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Abstract. *Research highlights that most business managers continue to be dissatisfied with the value they perceive they are deriving from their organization's information systems investments. On examining the literature, the dominant perspective is that creating value through information systems is primarily the responsibility of the IS function. Accordingly, to address this chronic malaise, attention generally focuses on the IS function with proposed prescriptions ranging from re-skilling the IS professional through re-engineering the IS function to the ultimate sanction of outsourcing. This paper examines the problem of value creation from IS investments from an organizational as opposed to an IS functional perspective. Drawing on resource-based theory, the paper argues that the effective deployment and exploitation of information should be viewed as a 'strategic asset'. To leverage value from IS, the paper proposes that organizations must recognize and develop information competencies and that the elements of these competencies are distributed throughout the organization and not solely resident in the IS function. Through a multimethodological approach these information competencies are identified and described. The resultant competencies are then studied in an organizational context. The paper ends by drawing conclusions and articulating further research directions and opportunities*

Keywords: Competitive advantage, information competencies, IS function, resource-based theory, value creation

INTRODUCTION

A recent case study in *Harvard Business Review* eloquently captured the dilemma which many organizations face with regard to their information systems investments (Reimus, 1997). This fictitious case concerns an insurance company that had invested millions of dollars in a new system which had yet to be implemented and used by front-line staff. Indeed the application development, which began 3 years previously, months ahead of any of their competitors, was now significantly behind schedule and any advantage which the organization may have derived

had now been lost. While the dialogue in the case centres around a discussion between the Chief Executive Officer (CEO), Finance Director and Chief Information Officer (CIO) concerning the status of the project, the case opens up a whole range of issues regarding the management of information and the development of the appropriate competencies within the organization. A critical item in the debate is 'whose job is IT anyway?': where does responsibility for information systems and technology (IS/IT) lie and in particular who is responsible for delivering value from IS/IT investments?

The simple argument is to say that IS/IT is the responsibility of the CIO and the IS function and, by association, that the delivery of value from information investments is also the responsibility of the incumbents of this function. While appealing, practice and research has suggested that this may not be the case (Rockart, 1988; Boynton *et al.*, 1992; Anonymous, 1995; Dutta, 1996). Technology is merely part of the value creation process, it needs to be combined with organizational change and then the resultant processes applied in the organization (Soh & Markus, 1995).

The history of IS investment in organizations is littered with disappointment. It is not that the technological systems have not been built, but that in many organizations they have consistently failed to deliver business value (Strassman, 1990; Willcocks, 1994; Ward *et al.*, 1996). Reasons promoted for this failure include:

- lack of strategic direction given by the business to IS investment decisions (Earl, 1989; Ward & Griffiths, 1996), often reflected in a misalignment between IT strategy and processes, and business strategy and processes (Henderson & Venkatraman, 1993; Earl, 1996a);
- inappropriate management of IS-related change (Benjamin & Levinson, 1993; Benjamin & Markus, 1997; Ward & Elvin, 1998);
- lack of a formal 'benefits management' approach (Farbey *et al.*, 1993; Ward *et al.*, 1996; Remenyi *et al.*, 1997);
- inability to leverage existing IT infrastructures (Weill, 1993; Broadbent & Weill, 1997);
- 'paving the cow paths' rather than capitalizing on innovative ways to organize work that technology provides (Hammer, 1990; Davenport, 1993);
- the relationship 'gap' between the IS function and rest of the business (Schein, 1992; Grindley, 1993; Ward & Peppard, 1996; Peppard & Ward, 1999);
- not availing of the marketplace to provide IS/IT applications and services through a strategy of selective sourcing (Quinn & Hilmer, 1994; Cross, 1995; Lacity *et al.*, 1995, 1996; Earl, 1996). Indeed, we would argue that the disappointing results which many organizations have achieved through outsourcing is due to the treatment of IT as something which can be abdicated to third-party vendors to manage, without explicitly considering the wider organizational role in leveraging value from IT. See also Strassman (1995) for a more disparaging argument.

Recognizing the imperative to generate value from IS, organizations often engage in an examination of their IS function and many have looked towards the re-engineering of IS processes (Clark *et al.*, 1997; Boar, 1998; Brown & Magill, 1998). However, such re-engineering

effort generally only addresses the supply of technology into the business: the IS function becomes better at building and operating applications. Yet, these applications may only be contributing marginally to the achievement of organizational goals and objectives as the focus is on building and operating applications and technology rather than delivering significant business benefit.

Although information technology provides a powerful vehicle for processing information, the focus on technology has often shifted the emphasis away from the real issue of exploiting information for value creation to the delivery of technology. In general, information technology has no inherent value in itself; For example, just having PCs on employees' desks does not confer any value to the organization. This value must be unlocked and it is only business managers and users who can ensure that this occurs. In short, the 'T' of IT has become the focus of attention rather than the 'I'. Unfortunately, information is a Cinderella with few champions while the 'T' has lots of mercenaries (the technology supply industry, IS functions and outsourcing vendors, to name but a few). Yet the irony is that information is a factor of production (Bell, 1981) while technology is a cost of doing business. Organizations must redress the balance in favour of the 'I' if value is to be created.

The objective of this paper is to identify and describe those information competencies that are necessary to create value. We use the words *information competence* to capture all aspects of the management of information in an organization, including assessing the role of information in an industry, the exploration of the potential impact of technology, the identification of competitive opportunities through to the design of systems, the deployment of information technologies and the realization of business benefits from these systems. The paper concludes that creating value from information is an organizational wide issue and not a responsibility that can be assigned solely to the IS function. Information competencies span across the organization.

The paper begins by examining the concept of competence as portrayed in the general management literature. The IS literature is then surveyed for specific guidance in relation to information competencies and a framework synthesising the prior research is developed and presented. Following this, the research design and process is outlined and a set of information competencies are identified and defined. These competencies are then studied in the context of an organizational setting. The paper finishes with conclusions and identifies future research opportunities.

LITERATURE REVIEW

As the central objective of this research is to identify and describe those competencies necessary to create value from information investments, in this section the concept of competence as it is addressed in the general management literature is first explored. Then, focusing specifically on value creation through IS and information competencies, there is an examination of the IS literature, critiquing empirical and conceptual studies in this area. Finally, a frame-

work, which provides an initial basis for positioning and understanding information competencies is developed and presented.

The concept of 'competence' in the management literature

There has been a burgeoning literature in economics, industrial organization, marketing and strategic management providing theoretical and empirical research to understand the concept of competence. This literature falls broadly into two camps. First are those researchers who have considered the concept of competence at the level of individual skills and knowledge (cf. Klemp, 1980; Boyatzis, 1982; Woodruffe, 1991). Second are the researchers who focus on competence at an organizational level and have explored the concept of competence as a basis for organizational competitive advantage (cf. Wernerfelt, 1984; Winter, 1987; Prahalad & Hamel, 1990; Barney, 1991; Amit & Schoemaker, 1993; Peteraf, 1993; Andreu, 1994; Ciborra, 1994; Hamel & Heene, 1994; Collis & Montgomery, 1995; McGrath *et al.*, 1995). This second view is the one to which this paper subscribes.

Captured in a theoretical perspective known as *resource-based theory*, the central tenet is that is that unique organizational resources of both tangible and intangible nature are the real source of competitive advantage. With resource-based theory, organizations are viewed as a collection of resources that are heterogeneously distributed within and across industries. Accordingly, what makes the performance of an organization distinctive is the unique blend of the resources it possesses (Barney, 1991; Rumelt, 1991; Collis & Montgomery, 1995). A firm's resources include not only its physical assets such as plant and location but also its competencies. Much of this research suggests that the ability to leverage distinctive internal competencies relative to environmental situations ultimately effects the performance of the business (Barney, 1991; Ginsberg & Venkatraman, 1995).

There has been some debate in the strategy literature as to the distinction between 'competence' and 'capability'. Prahalad & Hamel (1990; Hamel & Prahalad, 1994) who popularized the concept of 'core competence' see the two as one and the same. Stalk *et al.* (1992), however, make a clear distinction between the two, portraying capability as a higher level construct. This paper views organizational capability at this highest organizing level and as being directed towards the strategic purpose of the organization. Specific capabilities are achieved through the unique combination of organizational competencies. From this perspective, organizational competencies are a subset of capabilities and are concerned with acquiring, developing, managing and deploying resources of all types. Such competencies therefore comprise a blend of personal skills, knowledge and experience, roles and organizational processes (McGrath *et al.*, 1995).

Information competencies in the literature

Exploring competencies in the context of the management of information is a relatively recent development in the evolution of the IS discipline. Culnan (1986; 1987; Culnan & Swanson, 1986) in her co-citation analysis of IS makes no reference to the concept of competencies as

a subfield which constitutes MIS research. Swanson & Ramiller (1993) reviewed the nature of manuscripts submitted to *Information Systems Research* and none fall within the thematic area of 'competence'. Indeed, the *MIS Quarterly* keyword classification scheme (Barki *et al.*, 1993) does not explicitly refer to competence although it would probably fall under category D. Organizational Environment.

Throughout the 1980s there was a steady stream of articles and papers on the theme of IT and competitive advantage (McFarlan, 1984; Rockart & Scott Morton, 1984; Cash & Konsynski, 1985; Porter & Miller, 1985; Earl, 1987). In general, these articles were predominately descriptive and illustrated how companies were applying technology in ways that gave them a competitive advantage in the market place. Recently, the sustainability of IT as a source of competitive advantage has been examined by a number of authors (Lemons, 1986; Floyd & Woolridge, 1990; Feeny & Ives, 1990; Keen, 1993; Kettinger *et al.*, 1994; Mata *et al.*, 1995; Dvorak *et al.*, 1997; Powel & Dent-Micallef, 1997) with the overall conclusion that technical wizardry does not generate sustainable competitive advantage. In fact, today information technology is a commodity product that is available to all. Consequently, the general conclusion and recommendation from this body of research is that organizations should focus less on technology *per se* and more on the management of information. In the language of resource-based theory, there are currently few 'structural impediments' to purchasing technology; but organizations require competencies to leverage value from their information investments.

Within the context of resource-based theory, the management of information (and consequently IS) is a 'strategic asset' (Dierickx & Cool, 1989) which demands development and cultivation. The importance of developing competencies that allow organizations to successfully take advantage of information in their specific context has been noted even if these competencies have not yet been articulated (Sauer & Yetton, 1997).

The concept of competence in the IS literature is predominantly focused upon *individual* competence in the form of IS skill sets rather than treated as an organizational construct. The focus has been on the technology supply side and individuals' skills, emphasising the requirement for IS professionals to have not just 'technical' skills but also 'business' and 'interpersonal' skills (Palmer & Ottley, 1990; Skyrme, 1992; Lee *et al.*, 1995; Todd *et al.*, 1995; Cross *et al.*, 1997). More recently, 'change agency' as a skill for IS professionals has been proposed (Markus & Benjamin, 1996). The implication of this literature stream is that the solution to the 'problem' with IT can be solved by equipping IS specialists with additional skills. The inference is that the inability to deliver value from information arises from shortcomings in the IS function and among IS professionals.

Sambamurthy & Zmud (1994, 1997) were the first researchers who explicitly looked at information competencies (they use the term 'IT management competencies') from an organizational perspective. In their research they identified seven categories of IT management competencies: business deployment, external networks, line technology leadership, process adaptiveness, IT planning, IT infrastructure, and data centre utility. Each of these categories contained a number of competencies, giving 29 in total. While providing an innovative perspective, three main criticisms can be levelled at this research. First, the definitions of their competencies lack rigour. For example, one competence they cite is labelled 'existence of elec-

tronic links with the organization's customers'; we would argue that this is not a competence but is the outcome of having a particular competence. Second, the interrelatedness of these competencies has not been illustrated; how do they 'fit together' and what is their relationship? Third, their list of competencies makes no explicit reference to the exploitation of information; this is how value is created (McGrath *et al.*, 1995; Soh & Markus, 1995).

Ross *et al.* (1996) contend that to apply IT to enhance competitiveness lies in the development of an effective IT capability. Their research suggests that this capability derives from careful management of three key IT assets: a highly competent IT human resource, a reusable technology base, and a strong partnering relationship between IT and business management. This research does not explicitly address the detail of the IT capability, rather it provides glimpses of possible effectiveness.

Feeny & Willcocks (1998) have addressed the issue of IS competencies specifically from an IS functional perspective. They have identified nine 'core IT capabilities': IS/IT leadership, business system thinking, relationship building, architecture planning, making technology work, informed buying, contract facilitation, contract monitoring and vendor development. However, no explicit reference is made to those competencies required within the business as a whole in order to create value through the exploitation of information.

These studies have proved to be useful platforms to ground our research and we have built upon them. However, there are two aspects in particular which we sought to address in the research reported in this paper. First, to focus not just on the technology supply side competencies but to explicitly describe a set of organizational wide information competencies which would also incorporate this technology supply side view. Second, to develop a framework depicting the relationship between these competencies illustrating how they relate to each other.

An initial competence positioning framework

To construct an initial framework for positioning information competencies, three domains of research were discerned from the literature. The early IS literature tended to focus upon ways to improve the management of the 'IT department' to ensure the effective supply of information systems to the business (cf. Nolan, 1973). Issues such as structured systems analysis and information elicitation techniques were exhaustively discussed. These issues of information supply have continued to be researched right up to the present day; for example outsourcing of information technology has been a topical issue throughout the 1990s (Cross, 1995; Lacity & Hirschheim, 1995; McFarlan & Nolan, 1995; Earl, 1996b).

Practitioners and researchers soon recognized that the efficient supply of technology was not sufficient; the requirement for alignment of the organization's IS/IT strategy with the business's underlying goals and objectives was apparent (Porter & Miller, 1985; Earl, 1989; 1993; Henderson & Venkatraman, 1993; Peppard, 1993; Ward & Griffiths, 1996). Approaches were developed which sought to identify opportunities for competitive advantage in the marketplace from IT developments (Wiseman, 1985; Earl, 1989) as well as others that provide mecha-

nisms for classifying and prioritising IS investments (Ward & Griffiths, 1996). The subject area now known as 'IS strategy' dominated the IS literature of the late 1980s. Yet, even organizations that developed IS strategies often failed to derive significant value from their investments; and it was recognized that while an IS/IT strategy may be a necessary condition it was clearly not sufficient.

There was a significant body of research during the 1990s that investigated why organizations with an IS strategy and efficient technology supply still did not create value. The research area of information exploitation was beginning to emerge, concerned with issues such as productivity (Brynjolfsson, 1993); process inefficiencies and ineffectiveness (Hammer, 1990; Davenport, 1993); and 'value for money' and benefits (Farbey *et al.*, 1993; Willcocks, 1994). It is only through exploitation that value is created (McGrath *et al.*, 1995), corresponding to 'the IT use process' as defined by Soh & Markus (1995).

Building on this literature, an initial framework is proposed which suggests that organizational information competencies fall into three broad domains (see Figure 1):

- Information strategy competencies: evaluating strategic information and technology based opportunities as part of business strategy formulation and translation of these into resource supply requirements.
- IS/IT supply competencies: sourcing IS/IT supply resources, developing and implementing information systems and technology.
- Information exploitation competencies: defining the required information and information systems and the ongoing exploitation of information to realise business benefits.

This categorization, which was shortened to *strategy*, *supply* and *exploit* within the research project, extends the traditional business strategy-IT strategy linkage to explicitly incorporate the exploitation of information. The framework was used to guide the conduct of the early phases of the research (see below).

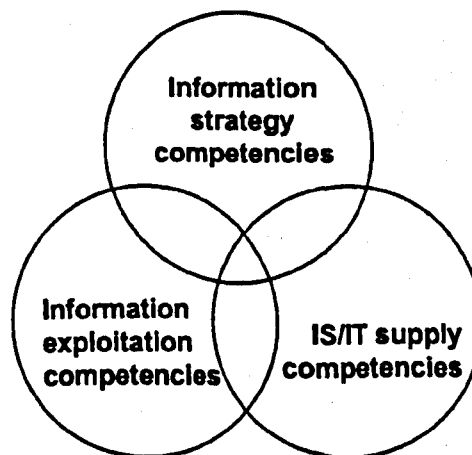


Figure 1. The initial organizational information competence framework.

RESEARCH DESIGN

While the research objective was clear, the novelty of the topic under study for the IS discipline meant that many of the questions were unknown and would evolve over the duration of the research project. While this presented many challenges for the research design it also ensured that the research process would have to be ground in the 'real world'. The organizations participating in the research were large and complex and were committed to the project agreeing full access and participation; a number provided funding. They recognized the opportunities provided by the concept of competencies and sought to explore further the application of the concept to the creation of value through information, systems and technology.

The research design was divided into two stages. The first stage was to identify, describe and validate the set of information competencies for value creation in an organization. The second stage involved an in-depth investigation of these competencies within a single organization setting. The research project was undertaken over an 18-month period.

Within stage 1 there were three phases. Phase 1 was the conduct of a literature review of the research area and the construction of an initial research framework (already described above). Phase 2 involved further exploration and analysis of this framework in 'communities of inquiry' both within each participating organization and also across participating organizations. This was to ensure a wide debate and understanding of the issues with regard to information competencies and the identification and definition of a complete set of competencies. Two case studies were also undertaken to provide input into this process.

For ease of elaboration a third phase is shown as part of the overall design. In reality, this was an extension of phase 2 as the research highlighted that further refinement and analysis was going to be required if the competencies defined were going to be 'useful'. We did not expect at the outset of the research process that there would be a distinction between 'macro' and 'micro' competencies. This was one of the benefits of using communities of inquiry as a research method (see below).

Research methods

Given the focus of the first stage of the research, a single research approach was deemed inappropriate. Despite the available advice for selecting an appropriate research methodology (cf. Antill, 1985; Franz & Robey, 1987; Galliers, 1991) the nature of the problem suggested that it would be more appropriately addressed by adopting a multimethodological approach. Driving this view was a recognition that the often conceptual and intangible nature of competencies could possibly make their identification and definition difficult. It was postulated that by using a number of research methods a more coherent and complete set of competencies would be identified. Two methods were selected as appropriate: communities of inquiry (Heron, 1996) or focus groups (Greenbaum, 1998) and case studies (Lee, 1989; Smith, 1990; Yin, 1994; Myers, 1997). Figure 2 illustrates the structure of the stage 1 research process.

The communities of inquiry were used as a mechanism for a *co-operative inquiry* (Heron, 1971) process between the researchers and practitioners. Co-operative inquiry is a collabo-

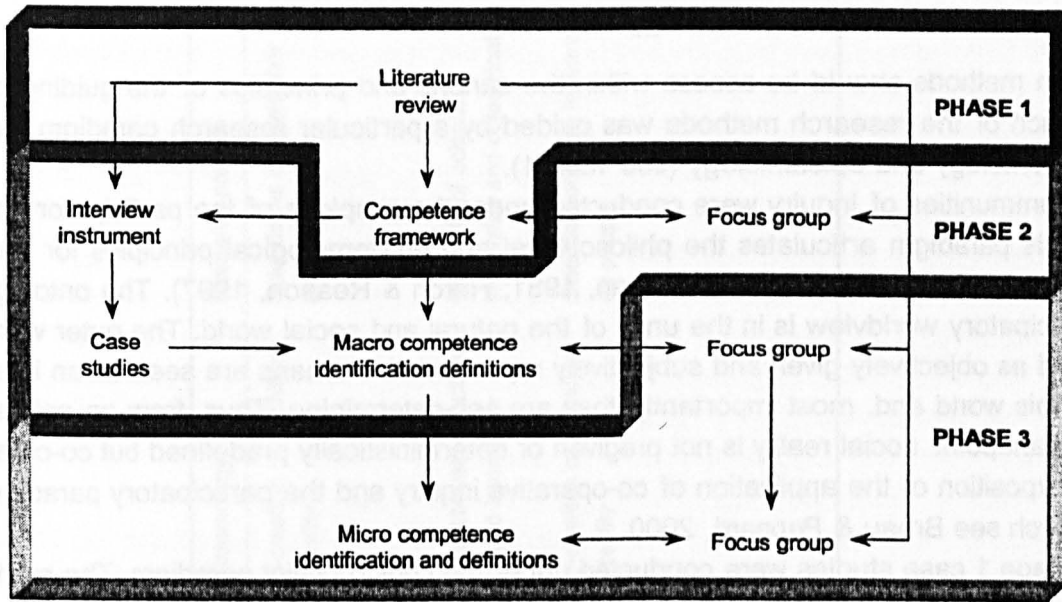


Figure 2. Overview of stage 1 of the research design.

rative, experiential, reflexive and action-oriented process (Park, 1999) with the researchers and the research subjects forming a 'community of inquiry' and engage as equal partners in the inquiry process. This process cycles between creating four types of knowledge: experiential, practical, presentational and propositional knowledge (Heron, 1996).

The researchers and participants acted as both co-researchers and co-subjects (Heron, 1971). Subjects within each of the focus groups were drawn from the participating organizations, with each focus group lasting from half-a-day to 2 days. All participants contributed to all aspects of the research process in generating ideas, collecting, analysing and interpreting the data and concluding from the findings (Reason, 1994). Co-operative inquiry is committed to the exploration of concerns and interests by a group of people who are part of the activity being researched. The fundamental aim of this method is the development of improved propositional knowledge (Heron, 1988; Reason, 1999).

The two case studies, which were undertaken by the researchers, functioned as an input into the deliberations of the communities of inquiry. In-depth interviews were held with key informants in the two case companies. The semi-structured interviews were guided by the initial research framework with questions keyed to this framework.

Action research was employed for the conduct of the stage 2 case study. This method represents an interventionist approach to the acquisition of scientific knowledge with foundations in the postpositivist tradition. The researchers were in a 'helping role' within the organization being studied (cf. Schein, 1987; p. 11). To achieve scientific rigor, the five-phase cyclical process, as articulated by Susman & Evered (1978) and elaborated upon in relation to IS research by Baskerville & Wood-Harper (1996; 1998), was adhered to.

Guiding paradigms and epistemology foundations

Research methods should be assessed within the canons and principles of the guiding paradigm. Each of the research methods was guided by a particular research paradigm, had a different ontology and epistemology (see Table 1).

The communities of inquiry were conducted under the auspices of the participatory paradigm. This paradigm articulates the philosophical and epistemological principles for participatory forms of inquiry (Reason & Rowan, 1981; Heron & Reason, 1997). The ontology of the participatory worldview is in the unity of the natural and social world. The outer world is portrayed as objectively given and subjectively represented. Humans are seen as an integral part of this world and, most importantly, they are self-determining. Thus, from an epistemological standpoint, social reality is not pre-given or deterministically predefined but co-created. For an exposition of the application of co-operative inquiry and the participatory paradigm to IS research see Breau & Peppard, 2000.

The stage 1 case studies were conducted under the constructivist paradigm. The relativist view of reality in constructivism proposes that realities, as multiple mental constructions are local and specific because they are grounded in humans' social and experiential contexts (Guba & Lincoln, 1994). The relativist concept of reality leads to a transactional and subjectivist view of epistemology. Knowledge is created, not discovered by the mind, because the scientist and the subject of investigation actively interact in the research process (Schwandt, 1994).

In contrast to the stage 1 case studies, the stage 2 case study was conducted using an action research approach (Checkland, 1991; Wood-Harper, 1985, 1992; Baskerville & Wood-Harper, 1996; 1998). Action research aims to contribute both to practical problem solutions and the advancement of social science theory. Action research is not fully participatory because it is still largely the researcher who defines the topic, issues and problems from the perceptions of the practitioners in their particular context (Reason, 1994). It aims to build descriptions and explanations within the practice context itself. The inquiry structure of theoretical framing, data collection, and evaluation constitutes a cycle of continuous interaction between theory and practice that ensures that action research is both rigorous and relevant (Checkland, 1991; Baskerville & Wood-Harper, 1996).

Validity of the research process

The guiding paradigm for each of the methods has been discussed in the previous section and it is these paradigms which provide a commensurate theory of validation (Kuhn, 1962). This validity aspect of the research process addresses the plausibility and credibility of the evidence produced within its scientific paradigm. In the context of this research, in particular stage 1, it sought to ensure that the competencies identified accurately represented a comprehensive and complete set.

The nature of co-operative inquiry is the open, direct and collaborative conduct of the research process with the social actors in the field (Reason, 1988). Co-operative inquiry strategies share the fundamental idea that reliability of the research outcomes is ensured through

Table 1. Research methods and guiding paradigm, ontology, epistemology, and research practice

Method	Guiding paradigm	Ontology	Epistemology	Research practice
Focus groups (Co-operative inquiry)	Participatory	Unity of natural and social world Outer world as objectively given and subjectively represented Humans are integral part of this world and self-determining.	Co-creation of definitions of reality	Scientist as coresearcher and cosubject
Case studies (Stage 1, phase 2)	Constructivist	Relativism Local and specific constructed realities	Transactional/subjectivist Created knowledge	Dual role of scientist: immersion and objectification
Action research (case study) (Stage 2)	Participatory [Reason (1994) notes that action research is not fully participatory as it is still largely the researcher who defines the topic, issues and problems from the perceptions of the practitioners in their particular context]	Unity of natural and social world Outer world as objectively given and subjectively represented Humans are integral part of this world and self-determining.	Co-creation of definitions of reality	Scientist conducts research on people

the grounding of the data in real action and in contexts that are relevant to the real world participants (Pettigrew, 1990; Eden & Huxham, 1996).

Participatory research cycles between action and reflection, exploring experiences from diverse perspectives, developing diverse ideas and interpretations, and testing different forms of action. The participants, in actively creating, modifying and testing these knowledge types in an iterative research process, not only own but validate the outcomes of the research. This cyclical research model is indeed the strongest validity check of knowledge claims in participatory research. Validity is enhanced in creating and enacting the findings through those participating in the inquiry. The quality of participatory research is improved further through the commitment to critical subjectivity, which means that the research participants critically examine their beliefs and theories in the inquiry process.

The outcomes of discussions within the communities of inquiry were sent to participants to ensure that they accurately reflected discussions and outcomes thus increasing validity (Silverman, 1997). Respondent validation of data (Reason & Rowan, 1981), referring back to the subjects with tentative outcomes, also increased the validity of the data generated throughout the research process. These outcomes were then refined in the light of their reactions. In essence, those involved in the research process were asked to ensure that the competencies corroborated to their experiences. The competencies were also linked back to the research literature, again providing validity at a theoretical level (see Table 2).

The tactics for the validity of the case studies as recommended by Yin (1994) and Eisenhardt (1989) such as using multiple sources of evidence, were adhered to during the conduct of the phase 1 case studies. A data collection protocol, keyed to the initial competence framework, was developed. The semi-structured interviews, used for the development of these cases, were grounded in the literature. The case descriptions were reviewed by the case organizations to ensure that they accurately represented the situation that existed in their organization.

Table 2. Macro competence definitions

Macro competence	The ability to
Formulate Strategy	evaluate strategic information and technology based opportunities as part of the business strategy formulation process and define the decision-making environment
Design processes and Information	translate the business strategy into business processes and information based needs
Define supply resources	translate the business strategic vision into long-term information supply resource requirements
Develop supply resources	create and maintain the information supply resource
Exploit and monitor	develop and apply exploitation plan and monitor value creation
Develop, implement and operate solutions	deploy resources to develop, operate and information solutions

To ensure the reliability of the stage 2 research study, in which the competencies identified in stage 1 were used as a lens to view an organization, the evaluation was conducted with two large groups of managers on two separate occasions using the same instructions, documentation and questions. The participants presented back their own data to their peers for comment. The combined outcomes were then presented back to a plenary session that comprised all the participants together with the top management team.

The interpretation and analysis of the data was undertaken in collaboration between the researcher and the case study organization. To improve validity, one of the research team acted as a disassociated 'watcher'; the role of this monitor was to discover inadvertently misguided research assumptions caused by the close personal involvement of the primary researcher (Baskerville & Wood-Harper, 1996). Additional information regarding the application of the action research method is presented later in the paper.

RESEARCH PROCESS

Table 3 summarizes the research process, as outlined in Figure 2, illustrating the research stages, methods employed, who was involved, key findings and outputs and implications for following phase of the research. This is described in the paragraphs that follow (phase 1 has already been described).

Phase 2

In order to explore the 3 competence domains as illustrated in Figure 2 and to understand the issues faced by participating organizations more clearly, case study research was undertaken in John Brown Engineering and the UK's National Health Service (NHS) while communities of inquiry were established with subjects from the CCTA, GlaxoWellcome, Scottish Equitable, National Westminster Bank, and Zeneca. These subjects were a mixture of business and IS professionals.

While this phase confirmed the possibility of categorizing competencies using the three domains, it also stressed the significance of the *interplay* between these three categories – and highlighted that competencies were also required to address this interplay. This led to the construction of an enhanced framework for mapping competencies, explicitly showing the linkages between strategy, supply and exploitation. This is illustrated in Figure 3.

The linkage between the *strategy* and *supply* competencies highlights the need to identify and justify the development of future IT supply resources, i.e. the development of future IT infrastructure including people, hardware and technologies. Historically, such developments have been piecemeal, often limited by a yearly budgeting cycle or only making investments when applications are developed. The longer term nature of IT infrastructure development can only be justified when linked to future strategic business vision (Broadbent & Weill, 1997).

Table 3. Summary of the research process

Stage	Methods	Who involved	Key findings/output	Implications for next phase
1	Phase 1 Literature review	Authors with some input from participants	<ul style="list-style-type: none"> • IS literature focus on individual skills • Concept of organizational information competencies not well developed • Initial competence positioning framework developed synthesising previous research 	<ul style="list-style-type: none"> • Defining competencies • Operationalizing framework
	Phase 2 Case studies	John Brown Engineering NHS	<ul style="list-style-type: none"> • Links between strategy, supply and exploit are important and must be considered 	<ul style="list-style-type: none"> • Macro competencies defined at too high a level to be meaningful for application
	Focus group 'Community of Inquiry' – inside each organization – across participating organizations	CCTA GlaxoWellcome Scottish Equitable National Westminster Bank Zeneca	<ul style="list-style-type: none"> • Identified macro competencies 	<ul style="list-style-type: none"> • Requirement to understand components of macro competencies
2	Phase 3 Focus group 'Community of Inquiry'	Microsoft Motorola GlaxoWellcome Scottish Equitable Shell	<ul style="list-style-type: none"> • Identified 25 micro competencies within the set of macro competencies • Many of the competencies not in direct control of IS function 	<ul style="list-style-type: none"> • Is this a useful categorization? • Operationalising each of the micro competencies • Would an organization recognize these competencies?
	Case study – Interviews – workshops	Multi-national organization	<ul style="list-style-type: none"> • IS and business managers recognized the need to better manage for value creation • Responsibility for competencies distributed across the organization • Elements of competence distributed across the organization 	<p><i>Further research</i></p> <ul style="list-style-type: none"> • Identifying elements of each micro competence • Identifying where each competence element located • Defining roles and responsibilities within each competence

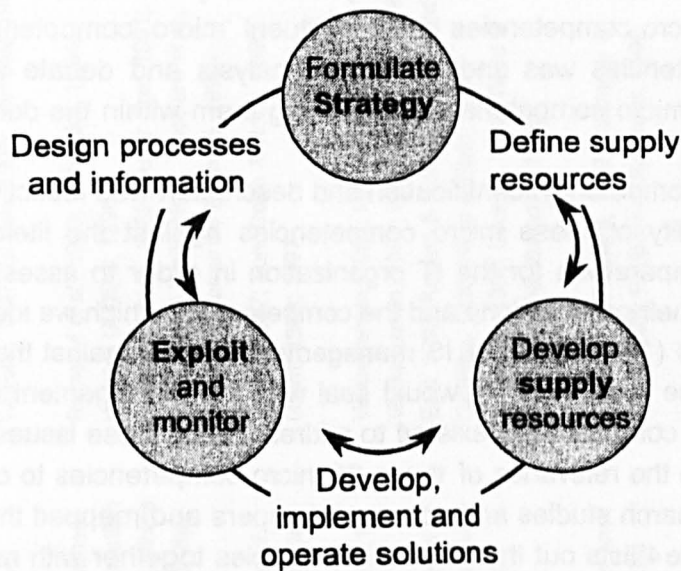


Figure 3. A framework for mapping macro competencies.

The linkage between the *strategy* and *exploit* competencies describes the need to translate and communicate the strategic business vision into business processes, information requirements and strategic performance measures. These provide the basis upon which IT applications are identified and scoped.

The linkage between the *exploit* and *supply* competencies refers to the need to effectively communicate and deliver information systems solutions into the business and includes systems development, change management and operational support.

The identification and descriptions of these competencies took place within the community of inquiry comprising both IS and business managers from the participating organizations. These descriptions were fed back to participants for comment and clarification. In describing these competencies, we sought to ensure that the meaning they conveyed was clear and precise to both IS and business communities. The resultant competence descriptions are listed and described in Table 2.

Phase 3

As the community of inquiry discussions progressed, they revealed that the descriptions developed above were useful in understanding the broad competencies required in an organization, but that they were at 'too high a level of abstraction' to be useful in both evaluation and assessment. While these six 'macro' competencies do provide a mechanism for reporting an overall competence profile for an organization, for assessment purposes the community of inquiry concluded that these macro competencies would require further refinement by decomposing them into constituent 'micro competencies'.

In the same co-operative environment, the inquiry community identified, developed and subsequently refined the macro competencies into constituent 'micro' competencies. The identification of micro competencies was undertaken by analysis and debate within the focus groups. Table 4 lists the micro competencies, positioning them within the domains of the six macro competencies.

While the process of competency identification and description was inductive we wished to test the theoretical validity of these micro competencies against the literature. We used Rockart *et al.*'s (1996) imperatives for the IT organization in order to assess whether there might be gaps between their prescriptions and the competencies which we identified. We also plotted Brancheau *et al.*'s (1996) study of IS management issues against the macro competencies to ensure that the competencies would deal with the management issues raised in their study. Reassuringly competencies existed to address all of these issues.

Finally, to demonstrate the relevance of these 25 micro competencies to contemporary IS issues, we reviewed research studies and conceptual papers and mapped these onto the 25 microcompetencies. Table 4 lists out the micro competencies together with relevant literature sources.

A STUDY ASSESSING INFORMATION COMPETENCIES IN AN ORGANIZATION

The research project to date had identified six macro competencies and their interrelationships, which was subsequently divided into 25 micro competencies. This section of the paper describes the application of the micro competencies in order to assess an organization's information competence. A multinational organization agreed to participate in this stage of the research process. The specific name and details of this organization are irrelevant for the purposes of this paper; indeed the sensitive nature of both the discussions and findings also preclude its publication. The objective of stage 2 of the research process was to assess the robustness of the competencies as defined. From the perspective of the case study organization, the research sought to:

- raise awareness of information competencies and expose relevant issues;
- determine the existence or otherwise of each of the micro competencies;
- assess current performance in each of the micro competence areas as perceived by organizational actors;
- define those competencies which need to be either improved or developed by the organization;
- gain commitment for change from key managers.

Operationalizing the micro competencies

Two instruments were developed in relation to each micro competence, based upon the literature identified in Table 4, in order to help in determining the existence of micro competen-

Table 4. IS/IT micro competencies and associated literature references

Macro competence	Micro-competence	The ability to ...	Literature sources
1. Formulate strategy	1.1 Business strategy	... influence business strategy and its formulation to make the best use of information	Earl, 1989; Bowman & Kakabadse, 1997; Enns & Huff, 1997; Evans & Wurster, 2000; Sampler, 1998
	1.2 Technology innovation	... incorporate the potential of technological innovations in the business strategic vision	Earl, 1989; Ward & Griffiths, 1996; Evans & Wurster, 1997; Ghosh, 1998; Sampler, 1998
	1.3 Investment criteria	... establish appropriate investment criteria for investments in information	Remenyi <i>et al.</i> , 1993; Willcocks, 1994; Ward & Griffiths, 1996
	1.4 Information management policies	... define IS/IT management policies that enable effective delivery of the IS, IT and business strategies	Davenport <i>et al.</i> , 1989; Butler Cox, 1991; Broadbent & Weill, 1997; Peppard <i>et al.</i> , 1999; Sambamurthy & Zmud, 1999
2. Design processes and information	2.1 Prioritization	... understand which elements of organizational knowledge are critical to delivering the strategy	Winter, 1987; Von Krogh & Roos, 1995; Grant, 1996; 1997
	2.2 Information alignment	... align the information required to the business strategy	Venkatraman, 1991; Henderson & Venkatraman, 1993; Ward & Griffiths, 1996
	2.3 Business process performance improvement	... develop and support business strategy performance improvement	Earl, 1993; Kaplan & Norton, 1996; Ward & Griffiths, 1996; Ward & Elvin, 1998
	2.4 Information innovation	... incorporate the potential of information innovations in the business strategic vision	Wiseman, 1985; Lockett, 1996; Ward & Griffiths, 1996; Sampler, 1998
	2.5 Business process design	... design business operations and processes required to deliver the business strategy	Edwards & Peppard, 1997; Kettinger & Teng, 1998; Peppard & Rowland, 1995
3. Exploit and monitor	3.1 Exploitation planning	... explicitly identify and plan exploitation of information	Farbey <i>et al.</i> , 1993; Remenyi <i>et al.</i> , 1993; Ward <i>et al.</i> , 1996
	3.2 Benefit evaluation	... monitor and evaluate the costs and benefits on an ongoing basis	Remenyi <i>et al.</i> , 1993; Ward & Elvin, 1998
4. Define supply resources	4.1 Infrastructure design	... design long-term supply capabilities to meet future demands	Broadbent & Weill, 1997; Cross <i>et al.</i> , 1997; Feeny & Willcocks, 1998
	4.2 Technology analysis	... monitor and understand	Venkatraman & Loh, 1994; Cross, 1995;

Table 4. Continued

Macro competence	Micro-competence	The ability to . . .	Literature sources
		technological advances to select appropriate infrastructure directions	Lacity & Hirschheim, 1995
5. Develop supply resource	5.1 Sourcing	. . . determine and evaluate supply sourcing options	Cross, 1995; Lacity <i>et al.</i> , 1996; Cross <i>et al.</i> , 1997; DiRomualdo & Gurbaxani, 1998; Earl & Sampler, 1998;
	5.2 Supplier relationships	. . . manage and develop relationships with suppliers	Weill, 1993; Cross, 1995; McFarlan & Nolan, 1995; Lacity <i>et al.</i> , 1996; Powel &
	5.3 Technology standards	. . . determine and maintain appropriate standards, controls and methods for application development	Dent-Micalleff, 1997; Butler Cox, 1991
	5.4 Technical architectures	. . . develop and maintain technical architectures	Cross, 1995; Weill, 1993; Broadbent & Weill, 1997
	5.5 IS/IT staff development	. . . develop IT technical skills	Boynton <i>et al.</i> , 1992; Lee <i>et al.</i> , 1995; Feeny & Willcocks, 1998
6. Develop, implement, and operate solutions	6.1 Service level definition	. . . define service level requirements to support the achievement of business benefits	Cross, 1995; Lacity & Hirschheim, 1995; Van Dyke <i>et al.</i> , 1997; Whyte <i>et al.</i> , 1997; British Standards Institute, 1998
	6.2 Applications development	. . . develop and deliver IS/IT solutions to the business	Rockart & Hoffman, 1992; Clark <i>et al.</i> , 1997; Feeny & Willcocks, 1998
	6.3 Defining Information requirements	. . . identify and exploit the value of Information and information systems	Parker & Benson, 1988; Sampler, 1998
	6.4 Apply technology	. . . deploy technological solutions to deliver business benefits	Farbey <i>et al.</i> , 1993; Soh & Markus, 1995; Ward <i>et al.</i> , 1997
	6.5 Systems implementation	. . . implement information systems, including the associated new ways of working	Davenport, 1993; Markus & Benjamin, 1997; Powel & Dent-Micalleff, 1997
	6.6 Continuity/security planning	. . . plan continuity and security procedures	Hutt <i>et al.</i> , 1988; Rainer <i>et al.</i> , 1991; Loch <i>et al.</i> , 1992; Dhillon, 1997
	6.7 Change management	. . . manage business change issues for implementation	Benjamin & Levinson, 1993; Boddy, 1996; Markus & Benjamin, 1996; Benjamin & Markus, 1997

cies, to debate the relative importance of each micro competence in relation to overall strategic goals, and to assess current performance.

The first instrument facilitated a review of each micro competence in order to determine the *required* level of performance to support the business objectives. The outcome of this debate was a shared vision for each micro competence of the required performance and its criticality to the delivery of business strategy. Appendix A illustrates sample questions for the micro competencies within a macro competence.

A second instrument was developed to help assess the *actual* performance in relation to each micro competence, as perceived by the organizational actors. These questions were developed initially from the literature and then refined through a combination of an expert panel and by discussions with participating organizations. In total, over 300 questions were determined. Appendix B illustrates a sample of questions used to assess one of the micro competencies.

Both instruments were used in workshops facilitating discussion and debate between participants. This allowed them to develop a shared vision for each micro competence and its criticality in achieving business objectives. Additionally, participants were able to discuss their views on current performance and also reasons for any shortfall to the required level of performance. By encouraging any differences in opinion to be explored and resolved enhanced understanding and commitment to the assessment was secured. The participants themselves presented and discussed the results of their analysis with their peers.

In summary, the micro competencies were used by the organization as a lens to assess performance. The workshops also allowed the research team to assess the reaction to and understanding of the micro competencies and supporting instruments by the participants.

To improve the communication of the results for each competence 'radar charts' were developed permitting a visual representation of current performance in relation to the shared vision of the required level of performance. Figure 4 depicts an example used to illustrate overall performance at the micro competence level. The outer line is the consensus view of the required performance level. The shaded area represents the evaluation of current level of performance for each of the micro competencies. These charts proved to be a powerful communication mechanism and the participants repeatedly returned to them to anchor their discussions.

Conduct of the workshops

Four workshops together with a feedback meeting were held to review the organization's performance. These were conducted away from the organization's premises to ensure full commitment of the participants and to minimize interruptions. The CIO, IT Strategy Planning Manager and Head of the Business Division agreed to involve as many business and IS/IT people as possible.

The first workshop was attended by 30 business managers and six IS/IT managers from across the division. The second workshop was attended by 20 IS/IT managers and four business managers. The third workshop involved the Head of the Division together with his direct

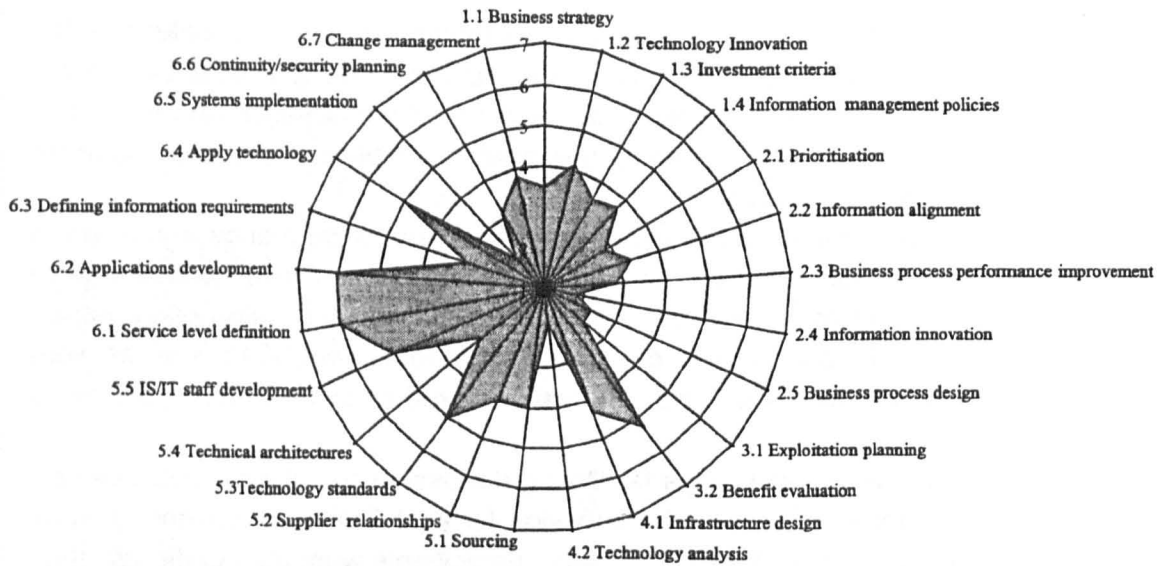


Figure 4. Summary of micro competence assessment within the study organization.

reports. The fourth workshop was a feedback session to the participants at the first two workshops. Finally, there was a presentation of the findings and discussion of the conclusions at a meeting attended by 70 people, including board members, most of whom had participated in one or another of the previous sessions.

Each of the workshops was led by one of the researchers who facilitated the discussion. Detailed notes were taken by a second researcher and were subsequently fed back to participants to ensure they conveyed an accurate account of the proceedings. At the first two workshops, the approach was explained and six syndicate groups, each containing a mix of IS/IT and business managers with facilitators, debated each of the macro competencies, together with their component micro competencies. Subsequently each syndicate group presented, for discussion, their assessment of the ability of the organization to perform these micro competencies. This discussion developed a common view of how well each micro competence was being performed at present and a shared vision of how well it ought to be performed.

While it is not possible to discuss in this paper every point in detail of the deliberations within these syndicate groups and plenary sessions, a great number of issues were raised, and many deficiencies in the organization's information competencies were uncovered. Interestingly, the conclusions of the first two workshops were very similar despite the different backgrounds of the participants.

The third session was successful in engaging senior management in the review; the pictorial representation, using radar charts, forcefully brought home weaknesses within particular information competencies. Senior management recognized the results and gave their commitment to address areas of weakness.

Figure 4 illustrates the situation with regard to micro competencies within this organization. The overall consensus among both business and IS/IT management was that the organization had an ability to manage the sourcing and supply of systems and technology, but the IT organization was getting little guidance from business management and exploitation was poor.

Critical issues were discussed concerning each of the micro competencies and the output enabled the participating managers to make a persuasive presentation dealing with required improvements based on an agreed assessment of the current situation. Table 5 describes key insights for each micro competence and these are summarized below:

Formulate strategy: The business strategy addressed product oriented issues but not the information systems that support new product development and marketing. Indeed, IT priorities were not driven by business needs.

Design processes and information: The analysis highlighted the need to focus upon broad based performance measures as against the existing fixation with financial justifications. There was an inadequate understanding of business processes and how information provided support.

Exploit and monitor: Limitations in achieving successful exploitation of information investments were revealed. Performance measures focussed upon IT performance rather than success of the system in a broader content of delivering business benefits.

Define supply resources: Despite the time horizons in IT planning being at variance with business planning horizons, the IT infrastructure was successfully developed, however, this was at a high cost due to piecemeal planning.

Develop supply resources: Much effort was being made to minimize costs and develop IT resources but critical supplier management issues were being given inadequate attention. In general, supply resources were being developed effectively, however, multiple uncoordinated supply units were being created.

Develop, implement and operate solutions: It was found that business people were uncertain – even unable – to specify their requirements. Much development effort was based upon inadequate analysis.

The final workshop involved a review of the findings and conclusions, and left the organization in no doubt that it was below the required level of competence needed in almost all the six macro competencies analysed. The workshops created a high level of support for action based upon a common desire to improve the organization competencies. For the study organization, the major benefit was the achievement of a common vision of the role of the organizational information competencies required to create value from information investments. A series of agreed competence development projects was initiated with the following aims:

- aligning business objectives with information priorities;
- reviewing their business processes;
- introducing a clear business benefits management and exploitation framework;

Table 5. Summary of key points to emerge from discussions at the case study organization

Marco competence	Summary of key points to emerge from workshops
Formulate business strategy	<p>The business strategy is a product based strategy which gives little guidance for IT based priorities</p> <p>The 1 years budgetary cycle precludes significant scale applications</p> <p>The company aims to be a world class player in its industry</p> <ul style="list-style-type: none"> – it is unclear about the role of information and IT in this objective <p>Information is seen as a cost not a resource, exploiting information is primarily reactive</p> <p>There is no consistency in the use of investment criteria for information</p> <ul style="list-style-type: none"> – 'hard nosed' not 'visionary' – mainly financial criteria applied – not aimed at long-term business benefits <p>Technology innovation – this is counter to the business culture</p> <ul style="list-style-type: none"> – rewards are based on 'getting it right' no points for failure <p>Mis-alignment between IT management and business management on the strategic intent of IT organization</p> <ul style="list-style-type: none"> – business looking for highly flexible arrangements with shared risks and rewards, with a timed road map – IT management looking for some flexibility, based on medium to long-term relationship with the business
Design processes and information	<p>IT priorities are not set corporately or driven by business strategy</p> <ul style="list-style-type: none"> – priorities are IT driven not business driven – priorities are frequently overridden by the business <p>Performance measures – need to measure the 'right' things</p> <p>There is poor understanding by the business of current business processes</p> <ul style="list-style-type: none"> – business processes are a poor fit to current needs <p>There is little emphasis on knowledge management</p> <ul style="list-style-type: none"> – minimal leveraging of expertise from corporate knowledge <p>Room for improving effectiveness of new processes including use of IT systems and new ways of working</p> <p>There is a communication/understanding gulf between the IT organization and the business in that the business believes that IT management do not understand business operations</p>
Exploit and monitor	<p>IT success criteria is focused mainly on cost reduction</p> <p>Exploitation of information rather weak, but is improving</p> <ul style="list-style-type: none"> – internal key information not readily accessible – external information is available but tools for analysing/disseminating are not good <p>IT investments are mainly monitored and evaluated on the basis of IT costs only, associated business costs are only partially captured</p> <p>Service Level Agreements (SLAs) focus on IT delivery, not achieving business benefits</p> <ul style="list-style-type: none"> – business and IT need to focus more on delivering business benefits in defining SLAs – business managers need training in specifying service definition

Design supply resources

Long-term Infrastructure decisions weak

- unclear approach to justifying/defining future needs

Medium term needs are not well identified. 'We'll succeed, but at what cost?'

In the short term the strategy-supply processes are effective because the head of IT and the Division head work closely together

- but it is IT driven

External scanning of IT environment to identify Infrastructure improvements is informal but effective for technical standards

Develop supply resource

Current focus of sourcing decisions is mainly to minimize costs

- room to improve sourcing decisions as a means of expanding expertise through use of external suppliers

Supplier management both by and on behalf of business managers 'miles off' at present

- based on 'carrot and stick without the carrot'

Not all business areas aware of criteria and policies regarding contract management

Hardware architecture effective, but there is plenty of room to exploit information and systems architecture more fully

- partial support only of IS strategy and business benefits

More training is needed in change management and benefits management for IT specialists

Develop, implement and operate solutions

Approach for delivering IT solutions is IT driven

- business people are poor at specifying requirements
- they possibly do not understand where they fit in
- project management usually defaults to IT

Time is a big issue

- it drives projects rather than benefits

Much more training is needed in:

- defining and delivering systems
- project management
- benefits management
- creativity and change management

Recovery/back-up procedures are mainly IT driven

- not driven proactively through business risk

IT enabled change is far from being an integral part of culture

- culture is of 'warring tribes'
- internal politics are a barrier, which are talked about rather than being addressed

When implementing new systems, training is poorly managed

- unclear responsibility for user training

The current culture is to hijack IT resources and if not then extra outposts unofficially developed

- improving the approaches to applications development, in particular the requirements definition phase.

CONCLUSIONS, COMMENTS AND IMPLICATIONS FOR FURTHER RESEARCH

In this paper we have developed the notion of competence within the context of the management of information for business value creation. We have grounded our discussions in the perspective of the resource based theory and have taken the stance that the effective management of information is a 'strategic asset.' Using a combination of research methods, 25 micro competencies located within six macro-competence areas have been identified and positioned around a framework ground in the literature but extended through early empirical research.

Adopting a competence perspective in relation to creating value from information investments has provided significant insights that may be summarized as follows:

- An almost exclusive focus on the IS function has been the traditional solution to problems of securing value from information investments. This study indicates that a broader organization-wide perspective is required.
- The research indicates that to create value from information investments it is important to understand and then develop information competencies.
- Information competencies are organization wide, potentially having elements in both the business as well as in the IS function.
- Research in the stage 2 study organization suggests that poor information competencies can result from inadequate recognition and unclear management responsibility.
- An informed discussion between business and IT managers, based around the competence framework can provide a shared understanding and insights into the development of an organization's information competencies.
- The evidence from the stage 2 study organization suggests that organizations can develop action plans to improve their information competence profile.

We concur with Feeny & Willcocks (1997) who note, in relation to information competence, that 'in this emerging field there is as yet little general agreement on the labelling or definition of the building blocks, or even on the level at which a competence is most appropriately identified' (p. 467). We have attempted to advance the contribution of those scholars who have been exploring these issues.

Over the past decade, there have been a number of articles strongly recommending that business managers take more responsibility for IT management (Palmer & Ottley, 1990; Boynton *et al.*, 1992; Anonymous, 1995; Dutta, 1996; Rockart, 1988). Such prescriptions have recommended that 'the line takes leadership' (Rockart, 1988) and more recently pleas from a number of scholars and practitioners for the 'end of delegation' of information decisions to IS specialists (Anonymous, 1995). Yet these exhortations have largely fallen on stony ground,

possibly because they lack specificity. In this paper we have contributed to this discussion through an examination of information competencies.

The title of this paper proposes a provocative but crucial question (the title is also a play on words and could also be 'Whose job is IT anyway?'). While responsibility for IS management is a 'grey area of management' (Griffiths, 1994) we conclude that it is important to view information competencies from an organizational rather than an IS functional perspective, and that the competencies necessary to deliver value are likely to transcend functional boundaries. Some component elements of each competence may reside in the business while others may reside in the IS function. Yet all elements must exist in a holistic context if a particular competence is to exist. From this organization-wide perspective, the folly therefore of assigning responsibility to the IS function for information value creation becomes obvious.

The important contribution which *business* managers make to each of the individual information competencies should be recognized. The stage 2 study highlighted that situations where the micro competencies resided primarily in the IS function performance was assessed more positively and often highly regarded within the organization. This is probably because the CIO (or equivalent) had direct responsibility for this competence, including its structuring and resourcing. Where the micro competencies resided primarily in the business, such as those competencies necessary for the exploitation of information, performance was rated low as individual in the business did not see their role as encompassing the exploitation of information. This would suggest that clarification of roles and responsibilities would assist in maximising value creation and represents an interesting research opportunity.

Significantly, the research has highlighted that the IS function's ability to build relationships with the business is not a competence, in itself, which is in contrast to the assertions of a number of scholars (cf. Ross *et al.*, 1996). Dialogue within the focus groups suggests that building and fostering relationships with business managers and users is an element present in many of the competencies. However, as the study indicates, the ability to build relationships with suppliers and vendors is a competence. The research also supports Feeny & Willcocks (1998) findings that project management is not a competence, but pervades a number of the competencies.

The micro competencies developed in this paper require further study in order to identify their component elements. There are also likely to be tacit aspects to be dealt with, for example, the close relationship between business and IT management that may infuse particular competencies. Is a particular cultural climate conducive to the existence of certain competencies? For example, Zmud *et al.* (1986) have described the notion of an 'information economy' within a company while more recently Davenport and Prusak (1997) has used the term 'information ecology' to capture the cultural conditions necessary for effective exploitation of information.

Given our embryonic understanding of micro competencies defining action plans in general could be problematic. McGrath *et al.* (1995) have proposed a model illustrating that organizational competencies not only derive from personal skills and knowledge (what they refer to as components) but also through effective organizational processes (what they refer to as deft-

ness) that allow these individual skills to be deployed. While this paper has identified the information competencies for value creation, the challenge is to address the components and deftness dimensions. A crucial research question is therefore how do organizations translate these information competencies into individual skills, knowledge and behavioural characteristics? How can human resources and organizational development programmes help in the creation and maintenance of these competencies? In the recruitment of staff and in defining employee contracts, how do these competencies translate into job descriptions? All of these questions require further research.

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Biographies

Joe Peppard is Senior Research Fellow at the Information Systems Research Centre, Cranfield School of Management. He has held a number of visiting academic positions and has published widely in the information system field. His current research and consulting focuses on how organizations can leverage value and benefits from information technology. He is a Director of Managed Solutions Corporation, a leading solutions vendor to the financial services industry.

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Chris Edwards is Professor of Management Information Systems at Cranfield School of Management. Prior to joining academia, Chris worked in industry for 12 years developing business systems. During that time he qualified as a Chartered Management Accountant and hence specialized in financial information systems. He joined the

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APPENDIX A

Sample questions for assessing future requirements within macro competence exploit and monitor

EXPLOIT: The ability to develop and apply exploration plan and monitor value creation

What criteria should be used to judge the success of IT in your organization?

Prompts: When projects are delivered on time to budget and specification? When business managers identify and realize benefits? When the organization realises benefits corporate wide and gains strategic advantage?

With regard to business systems implementation, what should be the focus when implementing new systems solutions?

Prompts: Training users in the new application? Training users in the new business process including the IT aspects? Involving users throughout the life cycle of the project enabling them to contribute to the design and development of the business processes?

What should be the primary purpose of information in your organization?

Prompts: To provide reliable, accurate and timely input to support business decisions? To allow the business to understand and maximize the use of business resources? To understand and exploit customer and market trends?

How should IT investment be understood and justified?

Prompts: IT resource should be costed in isolation? Both IT and business resource costed together? Full costs of organizational change included? Benefits to be quantified and measured?

APPENDIX B

Sample questions for assessing the supplier relationship micro competence

SUPPLIERS: the ability to select, evaluate, manage and develop suppliers of IS/IT

Are there clear guidelines for contract management, quality control, evaluation and de-selection of external suppliers?

Who is responsible?

Do you monitor the market for potential suppliers?

Is there a formal tender process?

Is the evaluation criterion clear?

Do you have a clear policy re contract management including monitoring and de-selection of suppliers

What is the standard of service level definitions?

Are there clear responsibilities/roles in the management of suppliers?

How do you integrate suppliers and ensure their commitment

How do you reduce risk?

How do you ensure focus from suppliers?

Is there a willingness to share risks and rewards?

How integrated are your operations with those of your suppliers?

Are you moving towards open-book accounting?

Assessment of current performance

Bridging the Gap Between the IS Organisation and the Rest of the Business: Plotting a Route

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ABSTRACT

Much of the research literature advocates a strong IS-business relationship if the IS organisation, and in particular technology, is to make a value-added contribution to the business. While research also highlights that in many organisations this relationship is poor, little guidance is provided as to how this 'gap' might be bridged. The research reported in this paper is a longitudinal study of three organisations that are actively seeking to bridge the gap, improve the relationship and consequently the value that they are deriving from their IS investments. A process model containing 6 stages, illustrating the route to creating high performance from IS, is constructed from cross-case analysis of the collected data. The paper ends with conclusions and implications.

Keywords: IS organisation, performance improvement, relationship management, IS capability, longitudinal research

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1. INTRODUCTION

It has long been recognised and acknowledged that in the majority of organisations there is a 'gap' between the IS organisation and the rest of the business.¹ This gap has been described as a cultural gap (Grindley, 1993; Schein, 1992) and research has illustrated that culture can be used as an explanatory variable in understanding the basis of the "troubled marriage" between the IS organisation and the rest of the business (Ward and Peppard, 1996). Manifesting itself as a poor relationship between both sides, it can result in severe competitive implications for an organisation, particularly those competing in information intense industries or those heavily dependent on their IT-based systems. However, little guidance has been provided in the literature as to how this gap can be bridged. Grindley (1993), for example, has even suggested that the 'culture gap' has a generation dimension and that over time will be bridged as a new breed of manager and user emerges.

An examination of the IS literature portrays the problem of a poor relationship as one which originates primarily from within the IS organisation, and consequently the focus of prescriptions are directed there. For example, reskilling the IS specialist with 'business' and 'inter-personal' skills (Cross *et al.*, 1997; Lee *et al.*, 1995), the more recent call for 'change agency' as a skill for the IS specialist (Markus and Benjamin, 1996), redesigning the IS organisation (Boar, 1998; Brown and Magill, 1998) or developing specific competencies for the IS organisation (Feeny and Willcocks, 1998). Further, many of the remedies that have been proposed merely address the symptoms of the gap rather than causes or only contend with a limited number of the elements required to deliver value through IS. For example, the 'hybrid manager' (Palmer and Ottley, 1990) initiative was an attempt to develop an individual with broad business knowledge and technical IT skills. The reality is that, in isolation, such individuals can achieve little, particularly where there is a lack of strategic and senior management leadership of IS, inadequate structures and processes, poor service quality and a dominant value and belief system among management which does not view IT as being either strategic or requiring their involvement (Peppard and Ward, 1999).

With the inability of organisations to deal with the troubled relationship and the inevitable disappointment which senior management have with the perceived value from IS expenditure, many have chosen to rid themselves of the 'problem', or part of the problem, by outsourcing some or all of IT requirements to third parties. Indeed, it has been argued that the IS organisation is often 'culturally outsourced' long before a decision is made to contract out the provision of IT to a third party (Ward and Peppard, 1996). This is not to suggest that outsourcing is inappropriate, but only serves to reinforce that it should be driven by a coherent sourcing strategy (DiRomualdo and Gurbaxani, 1998; Lacity *et al.*, 1996) rather than seen as eliminating a problem which is ill-defined and misunderstood but clearly having a negative impact on business performance.

¹ In the context of this paper, the 'IS organisation' refers to that body of individuals providing IT resources and services to the business. Included are IT department, DP department, MIS department, IS Services, Information Services, IS function or any other grouping providing such services, which exists inside the organisation. The phrases 'IS organisation' and 'IS function' will be used interchangeably in this paper.

Yet, the importance of a strong IS-business relationship cannot be underestimated. Emerging research suggests that in the search for IT-based sources of sustainable competitive advantage organisations must focus less on technology, *per se*, but more on the process of organising and managing IT within the organisation (Bharadwaj, 2000; Dvorak *et al.*, 1997; Kettinger *et al.*, 1994; Mata *et al.*, 1995; Powell and Dent-Micaleff, 1997; Sambamurthy and Zmud, 2000).

This paper presents findings from an ongoing research programme that is exploring the IS/business relationship and how the IS organisation adds value. This research has examined in-depth the relationship and explored it from a cultural perspective (Ward and Peppard, 1996), identified the organisational dimensions to be managed in order to increase the value-added contribution of IS to business performance (Peppard and Ward, 1999), and identified and defined the organisational IS competencies necessary to deliver value through IS (Peppard *et al.*, 2000). The research reported in this paper addresses the question: *how* can the 'gap' be bridged, the relationship improved and the value derived through IS increased? A process model that aids in plotting a route to addressing these questions is developed, derived from longitudinal case study data.

The paper begins by examining some previous research that is relevant to the research question. The research methodology is then outlined. Drawing on the empirical data, a process model is presented and described. The paper concludes with some observations, implications and further research opportunities.

2. PREVIOUS RESEARCH

Despite research highlighting the importance of a strong IS/business relationship, research explicitly addressing how organisations can 'plot a route' and manage the migration to a situation where the relationship is strong is lacking. There is, however, a body of literature which touches on some of the issues that are of relevance to the research question and these are reviewed here.

The 'stages of growth model', first articulated by Nolan (1973) and later extended by Gibson and Nolan (1974) and Nolan (1979), is probably the first to attempt to relate the transition of IS management processes to the maturity of IT in the organisation. This model suggested a pattern of practices for the management of 'computing', depending on positioning relative to an S-shaped expenditure curve. Zmud (1984) considered the changing type of activity performed by IS staff, arguing that during the 1980s it changed from a 'manufacturing' based activity set to a 'distributed' set. He proposed a different type of IS organisation structure to reflect the need to provide services rather than develop and deliver products. Others, including LaBelle and Noyce (1987) and Keen (1988) discuss both the merits of different organisational structures and the changing nature of the skills required by IS specialists. However, little is said about the inter-relationship between the IS function and the rest of the business. Hirschheim *et al.* (1988) are more specific and begin to address relationship issues, albeit by describing the need for IS organisation to respond effectively to changing demands from 'the business'.

A more detailed assessment of the evolving relationship is described by Galliers and Sutherland (1991) who synthesised Earl's (1989) planning model with Nolan's (1979) six stage model and the McKinsey '7S' model for analysing the interacting management attributes. Their conclusions, tested in a number of organisations, are essentially that: each of the attributes needs to change as the organisation becomes more dependent on its IT systems and more mature in its planning of them; if any of the attributes is unsatisfactorily addressed in an early stage of the evolution, then the organisation will be less able (even unable) to achieve success in later, more demanding, stages; positive attributes developed in the early stages should not be discarded later since the organisation will have a legacy of products from the earlier stages to support; and for an organisation to succeed, without a major hiatus of disruption of IT supply, it should address all the 7S elements coherently at each stage before moving forward.

More recently, Cross *et al.* (1997) have described the transformation of the IS organisation at British Petroleum (BP). Building on this work, Earl and Sampler (1998) have used the distinction between 'supply', namely the provision of IT operations, systems development and user support and the 'demand' side, namely the identification and prioritisation of applications and of opportunities to exploit emerging technologies, in order to define a prescriptive model. They argue that both supply and demand have to be managed, a process which they refer to as 'market management' and propose a four stage model which helps organisations balance supply and demand in managing IT.

With the exception of Earl and Sampler (1998), the research to date has produced 'stage models' which are static and do not capture the process of change nor do they provide prescriptive guidelines for organisations. The research reported in this paper develops a process model that provides a 'route map' for organisations attempting to bridge the gap, increase the performance of the IS function and consequently the contribution of IS to the business.

3. RESEARCH METHODOLOGY

As already noted, this paper reports on a project that is part of a larger research programme exploring the relationship between the IS organisation and the rest of the business. The aspect of the research programme reported in this paper studied the process of change as organisations seek to increase the value added contribution of IS and, consequently, the performance of their IS organisation. The research sought to construct a generalised model from empirically derived data, and thus adopted a theory building approach. The research design is illustrated in figure 1. This figure highlights the approach followed in developing the model from the data and is elaborated upon in the remainder of this section.

3.1 Research sites

The research data was collected in a longitudinal study of three organisations lasting from 30 months to 40 months. These sites were chosen for theoretical rather than statistical reasons (Glaser and Strauss, 1967; Yin, 1994) and selection was based

upon three criteria: purposeful sampling, availability of multiple sources of information, and a willingness to co-operate (Lincon, 1985; Vail, 1989; Yin, 1994). Two of the organisations had implemented formal programmes to improve the relationship between their IS function and the business, and ultimately the contribution that IS was making to business performance. The third was managing the consequences of a merger and seeking to maintain the contribution that IS had been making pre-merger; previous research by the author had studied this organisation pre-merger (reported in Peppard and Ward, 1999) and this data was also used as it provided a rich source of historical contextual information. A brief overview of the three case organisations is presented in the paragraphs below with a fuller description available at URL <http://www.cranfield.ac.uk/som/isrc/isjpeppard>.

Organisation 1 (to be known as Muff & Jeffrey International or MJi) is a global re-insurance brokerage. The organisation is the result of a merger between Muff Scott and Croke Jeffrey and the focus of the study was to track the merger of both companies from an IS perspective, particularly given that insurance is a highly information intense business with the company critically dependent on its IT systems.

Organisation 2 (to be known as PSD) is an organisation operating in an information intense service area. Although IT is central to its activities, a recent organisation and performance review by external management consultants was highly critical of IS management in the organisation. The study tracked the implementation of the recommendations of this report as well as other initiatives to improve the value-added contribution of the IT Division.

Organisation 3 (to be known as XY Bank) is a large financial institution that was seeking to create a 'World Class' IS organisation by the year 2000. Its Top Class programme, driven by Group Information Service (GIS) represented a transformation strategy based around the European Foundation for Quality Management's Business Excellence Model (BEM). The research study reported in this paper tracked the implementation of this initiative.

3.2 Data collection

In all three cases, data was collected through a mixture of quantitative and qualitative techniques. Central were the semi-structured interviews conducted with key informants at all levels from both the business side and the IS organisation itself. Structure for these interviews was provided by research reported in Peppard and Ward (1999). This paper highlighted the organisational dimensions to be managed in improving the relationship between the IS organisation and the rest of the organisation – a framework was developed based around the dimensions of leadership, structure and processes, organisational roles, service quality and values and beliefs, and questions were keyed to these dimensions. The interviews also had an unstructured element with questions keyed to themes that had emerged from previous interviews or from documents and reports. Interviewees were given considerable latitude over what they wanted to say and how they said it. Further probing of interviewees, often requiring an additional interview, was sometimes necessary in order to seek clarification and elaboration. Several interviewees were interviewed on a number of occasions over the

duration of data collection. Some of these interviews were recorded and subsequently transcribed; for others, detailed notes were taken during the interview.

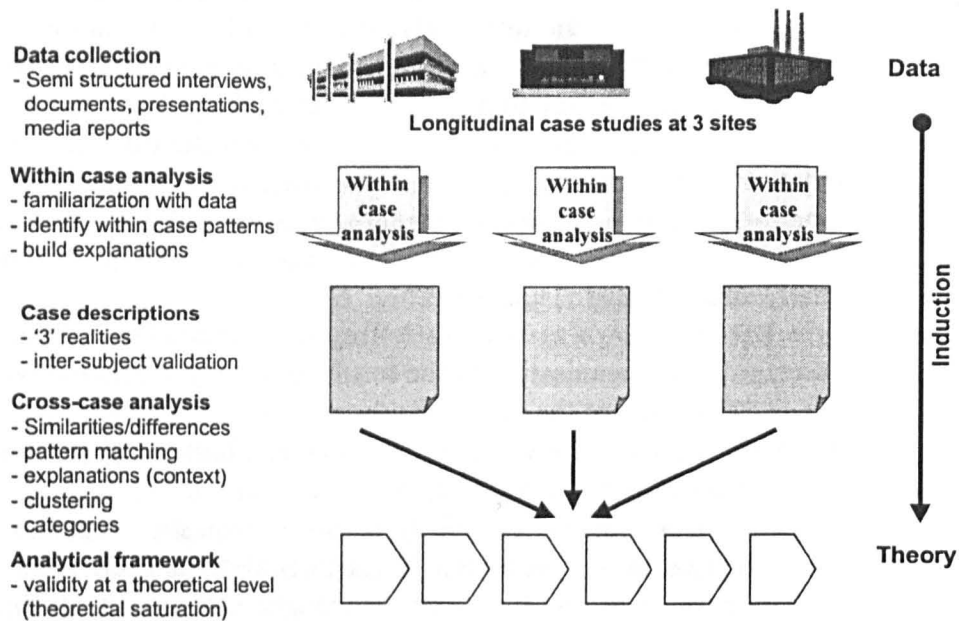


Figure 1 The research design.

Questionnaires were administered in both MJ1 and PSD to provide additional information; the structure and content of these questionnaires is described in Peppard and Ward (1999). XY Bank retained a small consulting company to design, administer and analyse a questionnaire twice-a-year in order to assess progress towards World Class status, as represented by the BEM, and the analysis and responses to these questionnaires were also made available. Documents, internal surveys, minutes of meetings, consultant reports, and presentations were also examined in all three organisations, and copies retained where feasible. All these sources combined to form the empirical case study database.

3.3 Data analysis

The model presented in this paper was developed following a three-stage analysis strategy together with an eclectic use of tools and techniques. During stage one, within case analysis of the data from each study sites was undertaken. The objective was to capture the process of change as it unfolded in each organisation and to discern and describe patterns in the data. The data from each of the cases was analysed by building an explanation about the case using the strategy recommended by Yin (1994). The analysis of this data had the objective of understanding rather than prediction (Burrell and Morgan, 1979; Orlikowski and Baroudi, 1991) and followed a cycle of deduction and induction (Pettigrew, 1997). Essentially, deductive analysis included foresight about the primary purpose, themes and questions. This was gleaned from the research objective and prior research as captured in the literature section of the paper. Validity of

the data was ensured through multiple sources of evidence, review of case interpretations by interviewees and chain of evidence provided by the case data.

The second stage involved cross-case analysis of the data, locating and examining similarities and differences across the three cases using a variety of cross-case searching tactics. General themes and lessons both common and different across the three sites were also identified, giving particular attention to the dissimilar contexts. The analysis strategy was to go beyond “initial impressions” (Eisenhardt, 1989, p. 541), “rising above and beyond mere events” (Pettigrew, 1997, p. 339), and generalise beyond the data (Olaisen, 1991).

During the third stage of the analysis, a framework was developed to organise the data into a generalised model of the transformation process, based on the evidence from the three case sites. It should be highlighted that this data analysis process was not as clear as these sentences might indicate but emerged through much discussion and deliberation. An initial model was developed, supported by evidence from the cases. Unsupporting evidence or patterns not captured by the model were then incorporated in a subsequent version. This cycle continued until full saturation was achieved. To increase the validity of the model it was then presented to each of the three organisations for comment.

3.4 Data presentation

In this paper the data from each of the three cases is presented in the context of the model derived from the empirical evidence (this model is introduced below). Consequently, the presentation of the data may not follow the actual processes encountered within each organisation or reflect the actual process of change during the study period or represent chronologically progress of the various initiatives and projects undertaken in each of the three sites and therefore is not an historical account. Rather, it reflects the experience of each of the three organisations as evidence is extracted which both supports the model and helps in its construction. As will become apparent, often an initiative was implemented by one of the case companies which is positioned at a later stage in the model, but was not deemed successful or faltered, as earlier antecedents (as positioned in the model) had not been addressed. The following section first introduces the model, then describes it drawing on evidence from the case studies. Section 5 discusses the model from theoretical and practical points-of-view, drawing out its wider implications.

4. BRIDGING THE GAP: PLOTTING A ROUTE

Figure 2 below illustrates the process model for transforming the value-added contribution of IS that has been derived from cross-case analysis of the data. This model contains 6 stages and summarises the general areas to be addressed in creating a value-added partnership between the IS organisation and the business. The words ‘value-added contribution of IS’ have been carefully chosen as the focus of the study was *not* on creating the value-added IS organisation.

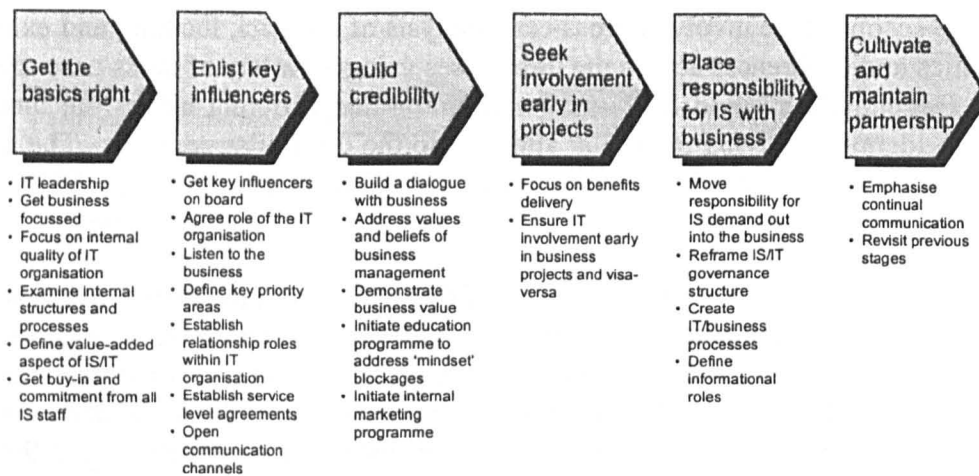


Figure 2 A process model for transforming the value-added contribution of IS.

Stage 1: Get the basics right

“Get your house in order” before attempting to seek any dialogue with the business is a central message to emerge from the data. The evidence was overwhelming in asserting that it is futile attempting to improve the relationship if the ability of the IS organisation to meet basic business expectations is either weak or non-existent. Interviewees pointed to the fact that the initial requirement of any programme to improve the contribution of IS is to address the fundamental, tactical, day-to-day activities and is therefore primarily technologically focused: network up-time, availability and reliability of applications, help-desk response times, etc. Training in the use of desktop applications was conveyed by users during interviews as also being a priority area to address. Many of the problems at PSD, for example, could be traced back to inadequate training in the use of core applications which negatively affected perceptions of the IT Division by business staff. Success during this first stage establishes the foundation for later stages; a senior IT manager from XY Bank noted “[w]e have got to show them that we are serious.”

Among the majority of senior managers interviewed was a feeling of the necessity to “get business focused” early in the transformation process. In addressing the question ‘are we providing what the business requires?’ the data revealed that very often the IS organisation does not know for certain what the business requires and continually ‘second guesses’ business decisions, particularly if the relationship is so poor that dialogue is virtually non-existent. This was clearly evident at PSD, and it points to one of the reasons why their transformation programme floundered despite the rhetoric in an internal document *Aligning IS with the Business*.

The data also suggests an examination of the internal structures and processes of the IS organisation to assess their robustness and ability to deliver basic IS services. The data indicates that the IS organisation should focus on its own internal quality, particularly in the areas of project management and user services. The data also

highlights that the IS organisation should instigate a performance management programme, establishing the metrics against which performance will be judged. It is important that the IS organisation at this stage does not become defensive, even if it is apparent that the 'problem' and hence 'solution' lies predominantly in the business. They, rightly or wrongly, "are in the driving seat" (IT Director, XY Bank).

Communication between senior IT management and IT staff was seen as central to the success of any transformation initiative. At PSD it was widely expressed that "there was poor communication both within IT and between users and IT" (Business Manager). Even many months after the start of the Top Class programme at XY Bank, one senior IT manager noted that "there is still a level of cynicism out on the shop floor, the coal face ... can't yet relate to Top Class and what it means to them". Another commented that "IS people [are] having difficulty with new expectations." IS Staff must also believe the message that the IS organisation is becoming more business focused and "walk the talk", eliminating comments like "wouldn't it be great if we had no users!" The implication is perhaps best expressed by one senior IT manager who wryly commented that "...if the troops are not fighting then we will not win the war!"

The data revealed overwhelmingly that strong IT leadership is central to the successful outcome not only of this stage but the overall initiative. It was clear from the analysis that it is also crucial for the senior IT management team to recognise and accept that there is 'a problem'. Cohesion among the IT management team was also felt to be crucial in order not only to plot a route towards building a strong relationship but to sustain the programme during the difficult times that lie ahead. As indicated by the data from PSD, without strong IS leadership it is unlikely that any initiative will proceed beyond a recognition both of the existence of a serious problem and its manifestation. At MFI, where there has been a strong relationship between the business and IS organisation for many years, one team leader noted "I think [IT Director] is forward thinking enough to be looking at all the new technologies [and] that he is brave enough to take the decision to go with things". The IT director leading the transformation at XY Bank was newly recruited into the organisation and was given the remit by the board to over-haul the IS division. He had the respect of his management team, was seen as someone with the capability to transform IS management and importantly, according to one senior business manager, was not associated with the past. This contrasts with the situation at PSD, where the IT Director was seen as "weak" by both senior business managers and his own IT staff, and as shall be illustrated later, the initiative struggled to proceed beyond this first stage.

Stage 2: Enlist key influencers

Within any organisation there are particular actors who are pivotal to what happens in the organisation, the opinion leaders or key influencers. If the transformation of the IS organisation is to progress, the evidence suggests that it is important to get these influencers on board early before proceeding to the later stages. Identifying and interacting with the right people and winning them over was seen as paramount; the visibility that these individuals bring is not only extremely beneficial but they can often decide the fate of a non-performing IS organisation. More importantly,

once on board they are more likely to support initiatives, particularly when harsh decisions have to be made by business management. A senior IT manager at XY Bank noted that “[i]t is about good relationships with business sponsors so when the inevitable priority clash for funding comes up then the IS related expenditure tends to come out better because it is core to what they want to achieve”. Contrast this with the situation at PSD where key influencers have never really supported the IT Director, although they recognised the central importance of IT to their business – during the period of data collection he never managed to win over their support.

Questioned as to the characteristics of such an IT leader, the general consensus from analysing the data from IT management was an individual with the personal credibility to seek out and engage in dialogue with key influencers: someone who is both a good listener and a good communicator. It was highlighted that in some organisations the leader of the IS organisation may not necessarily be a member of the Board of Directors or the “inner sanctum” of decision making (although this was not the case at the three case sites) and therefore may not be a direct peer of these influencers. All three IT directors saw their ultimate objective as having a leading role in the business strategy formulation process, particularly as organisations are increasing dependent on their IT systems and new technologies were opening up new competitive vistas. Despite this rhetoric, the reality was somewhat different at PSD.

Enlisting these key influencers generally requires that there is some agreement reached as to the role and function of the IS organisation. This ensures, if nothing else, that both the business and IT management are “singing off the same hymn sheet” (senior IT manager, XY Bank) and are aware of each others expectations, setting the parameters for subsequent dialogue and action. This is seen as not only giving clarity to the role and establishing expectations but also identify areas of potential conflict that may have implications at later stages. At MJI, the role of the IT department was implicitly understood by all employees. This role was loosely defined as working closely with the operations of the company and with external customers and encouraging and leading business managers to take advantage of IT. At XY Bank, clarity of role has been agreed at senior management level, but was slower permeating to lower levels of the organisation, particularly outside the IS function. At the conclusion of the data collection period, the IT division at PSD issued a strategy document where a number of practices to help in promoting a “collaborative working relationship” with the rest of the organisation were detailed, including “the definition and publication of the responsibilities of the IT division”.

The relationship between the IT Director and CEO was shown to be paramount in ensuring an effective relationship. As a symbol of the strength of the relationship between the IT Director and CEO at MJI, they regularly attend IT conferences and seminars together. Having put together the blueprint for the Top Class programme, the IT Director at XY bank spends an increasing amount of his time working closely with the CEO and courting the other directors. This situation contrasts with the reality of PSD where senior business managers and IT managers did not feel that the CEO was supportive “beyond words” of either the IT Director or IT initiatives.

The evidence from the cases also suggest that at this stage in the transformation process it is often worthwhile to define some Service Level Agreements (SLAs) to prove that the IS organisation is sincere and wants to deliver: “they define the penalty if

you don't" (IT manager, XY Bank). Two years after the consultants report to the Board of PSD and with little progress being made on its implementation, the IT Division began to implement SLAs with internal customers as part of the strategy referred to above. To reinforce the importance of meeting SLAs with the business, XY Bank has linked them with salary bonuses: "If we don't meet our target, we don't get paid" (middle IT manager). In a later stage, the data from MJI indicates that these SLAs may be dropped as they can in fact impinge upon building the type of relationship where IS is truly adding-value and the intimate relationship that is often required.

Stage 3: Build credibility

A word which came up frequently during interviews with both IS and business staff was 'credibility'; whether the IS organisation had or had not credibility or the importance of having a credible IS organisation. Credibility must be earned by the IS organisation and is derived from achievements and actual results. The evidence from XY Bank and PSD suggests this third stage is possibly the most difficult and time-consuming stage to pass through. If this credibility doesn't exist, the experience from these two sites indicates that the partnership sought will not occur and the objectives of later stages will be difficult if not impossible to achieve.

The data indicates that building trust and establishing mutual respect is a central aspect of the route towards a strong relationship; distrust on both sides can emerge over the years and is a legacy that can be difficult to discard. The distrust that existed between the IT Department and the business at Croke Jeffrey prior to the merger with Muff Scott was very evident during the interviews. Despite the fact that the disastrous CPS project - to build, in-house a claims processing application - had been canned over 3 years earlier, the majority of business managers interviewed referred back to it during interviews. Although there were multiple interpretations of the events surrounding the project it had clearly left a lasting impression. The merger with Muff Scott had resulted in a significant increase in the trust and confidence which the staff of the former Croke Jeffrey had of the "new" IS department, mainly because of the reputation that IS had in Muff Scott, in the industry in general and in particular the reputation of the IT Director.

Cultivating trust was seen as dependent on successfully getting buy-in and involvement from all IT staff (an objective of stage 1). A senior IT manager at XY Bank noted: "[o]ne of the problems we have got, I think, is that basically we are doing all the hard work to try and get the trust and everything else, but somebody from the rest of GIS (Group Information Services) could, in a moment, destroy a lot of that by saying the wrong things: I wouldn't have bought this system, or I wouldn't do that, or why are you doing that..."

The challenge is therefore to build this credibility and the evidence from XY Bank indicates that the IS organisation may need to establish a marketing plan as part of the journey towards gaining this credibility, as they did. However, the focus of this marketing initiative is on communication and understanding customer requirements and "is not about selling" (IT manager, XY Bank). For example, one of the twin objectives of the Top Class initiative at XY Bank was to be seen as the preferred supplier of IT applications and services to the business. There was an explicit recognition that to be

considered as a preferred supplier in the commercial world requires an implicit understanding of the needs and expectations of the customer.

Therein lies a large part of the problem with the relationship. Firstly, there is often the existence of unrealistic expectations by business management and users concerning both the technology itself and what the IS organisation *should* do for them. At both XY Bank and PSD, this was a consistent feature of the responses of informants. Secondly, user and management roles are not clearly defined; this particular point can have its roots in the value and belief system of incumbents and initiatives are required to address this aspect. The interviews at XY Bank and PSD indicated that there can be a gap between the expectations of business managers and what the IS organisation was committing to. The difficulty in challenging a belief system that may have been moulded over many years should not be underestimated. For example, at PSD there is a very strong belief among many of the business management team that IS is the responsibility of the IT Division. Their experience indicates that changing such a position is extremely difficult but if it does not occur little progress will be made.

Initiatives to build credibility include the establishment of liaison roles that seek to cultivate the relationship. XY Bank established the roles of "Relationship Managers" (later changed to "Service Managers") to liaise with business management across the organisation. "The reason for establishing relationship manager was due to IT being seen as a service provider" (Senior IT manager). Their experience strongly suggests that the personal characteristics of these individuals crucial; "[u]se your best people" (Senior IT manager, XY Bank). Further, the evidence suggests that relationship managers must also be assigned responsible for any projects which emerge from their work with business management and not handed over to an IT project manager once the initial specifications and project plan have been agreed.

Education can also assume an important role in changing mindsets. However, one of the big problems is either getting people to attend education events or indeed for managers to release their staff. "Staff must see a clear distinction between education and the traditional training programmes run by GIS" (Business Manager, XY Bank) if they are to be enthused by any education programme. Little or no education took place at PSD; it has already been noted that basic training in utilising core applications was seen by business staff as being inadequate. This is in contrast to the IT Department at MJI who run regular lunchtime presentations for business staff. These presentations cover topics ranging from utilising desktop utilities to demonstrating new software in order to stimulate the identification of opportunities to deploy in business processes. Importantly, they "give visibility to the IT department and IS staff" (IT Director).

Other aspects that would seem to enhance the journey towards achieving credibility include using a language that the business understands and is comfortable with. For example, while XY Bank has adopted the Business Excellence Model of the European Foundation for Quality Management to drive its programme, more significantly, it conveyed a message to the rest of the business that it was serious in what it was attempting to achieve and presented its plans and objectives in a language which they understood. Achieving ISO9000 accreditation can also be a good signal to the business that the IS organisation is serious (Muff Scott had received this a number of years prior to the merger) - what it also provides is external validation of what can be seen as a purely internal initiative.

Stage 4: Seek involvement early in projects

While important, having credibility is not an end in itself; rather it establishes the launch pad for passing through the final three stages. Without a credible IS organisation, business managers are unlikely to risk being involved or will be, at the very least, cautious in getting involved in IS related matters not to mention assuming responsibility for activities and decisions traditionally in the remit of the IS function. Therefore this credibility must be harnessed and built upon if the value-added contribution of IS is to be enhanced. The evidence from the cases suggest that this is a two-way process. On the one hand, it is important to request business involvement early in IT projects but equally, IS staff must also seek early involvement in projects which have implications for systems and technology. The latter can often be difficult, as business management may not recognise the contribution which IS specialists can make, particularly at the outset of projects or discussions. The duality of IT is that it is both an enable and creator of strategic opportunities. This is why it is important that the IT director "has a seat at the table where the real decisions are taken" (IT director, XY Bank).

The 'values and beliefs' changes achieved during the previous stage should help both sides in recognising that each has a role to play. At PSD, one senior IT manager captured this sentiment: "IT is seen as secondary to [...] production process and as such is not usually consulted early enough on new business initiatives". From the evidence of XY Bank enacting these changes can be a lengthy process. Three years into the Top Class programme, the behaviours of business managers in respect of IS matters were still slow to change.

Despite this, the relationship management role at XY Bank was seen as very successful in getting business participation in determining IS requirements, but there was still a tendency for business management to consider this as being the end of their involvement until the project (i.e. technology) is eventually delivered. To ensure continuous business management participation, they have instigated a 'benefits management' initiative that requires their active involvement in the identification, structuring, planning and realisation of business benefits. No project now begins without first exploring the benefits expected and constructing a benefits realisation plan. Regarding this benefits management process at XY Bank, one IT manager noted that he found it "very, very good, because I have a long history of working with marketing and they dream all kinds of things up, and that process ... is a discipline where you can actually go through and get them to say and prove the benefits." The focus moves away from delivering the technology to delivering business benefits. However, at the time of data collection, behavioural change among the business was seen as the biggest inhibitor to the successful conclusion of the Top Class programme.

Stage 5: Place responsibility for IS with business

XY Bank was attempting to move to a position where there would no longer be any more IS projects only business projects; however, these projects may have a significant IS component. This situation represents a new challenge and an added dimension for business managers to take responsibility for, and it is one that they may be reluctant to accept unless previous stages have been successfully passed through. For example, the benefits management approach of XY Bank, implemented during stage 4, had as a central objective to highlight to business managers and users that the successful management of IS requires active business management and user involvement and that it is only through business changes that benefits from IS investments emerge.

There is some evidence to suggest that the SLAs defined in stage 2 and the relationship management roles defined in stage 3 should be revisited after a period of time. The data from XY Bank, who had initially defined and appointed specific individuals as relationship managers, suggests that the relationship aspect becomes embedded in the jobs of most, if not all, IT staff, particularly those who interact with 'internal customers', including helpdesk staff. "Definition of this role is important. Often no continuity from Relationship Manager into delivery through to implementation. Throw it over the wall, catch this one." (Senior IT Manager, XY Bank) Demarcation in the IS organisation itself can contribute to this situation. A senior IT manager at XY Bank recounted a meeting where 20 different areas of IS were represented as the project (which was concerned with PC banking) touched everywhere. "I think one of the problems I had was that there was too much demarcation so, you know, I am the network guy, I do it up to here, and that guy does the equipment and somebody else does the PCs and all this. It was far too fragmented." MJI have no SLAs in place, other than for desktop support, but this is merely to provide "comfort" to end-users.

XY Bank found that relationship management often degenerated to "account management" and indeed reinforced the "us and them syndrome". The top team of GIS now recognise that they can only go so far down the road towards becoming a value-added entity before the business must take a good look at itself and how it manages IS in the widest sense. This was perhaps best captured in a statement by one IT manager at XY Bank: "[w]hat use is a world class IS organisation, if working in a 'scum bag' organisation." He was expressing his frustration at business managers for not taking more of a lead with regard to IT matters. This demands the creation of IT/business processes, an aspect that the Bank continued to grapple with when data collection concluded.

At MJI, the policy is for all the IT staff to be recruited either internally from the business ranks or from other insurance companies: having deep industry knowledge is seen as crucial and more important than a technology background. Consequently, staff can "envision the opportunities that technology provides" (IT Director) to the business fully aware of industry developments and the strategy of the organisation. Large-scale development work is outsourced. Recently, the IS Department developed a prototype Extranet application for the business, something which would have been difficult to define based on purely IT knowledge. But whether or not this application would be further developed and rolled out across the organisation was a decision taken in

consultation with business management. Strong IS leadership coupled with a credible IS organisation ensured that this pilot was taken seriously but more importantly that the business had the faith in the IS organisation to deliver within short time scales.

Although neither XY Bank nor PSD had reached this stage, the dialogue with Muff & Jeffrey International suggests that the issue of IS governance, i.e. defining the framework within which IS decision making takes place, has at sometime to be broached. Policies and principles guiding decision making regarding IS were well established within Muff & Jeff. The role definition that took place at stage 2 would seem to be a precursor to defining and implementing a more rigorous governance structure.

Stage 6: Cultivate and maintain partnership

Like any good relationship it must be continuously worked on. Both technology and the business environment are continually changing requiring appropriate responses to be made. Above all, the relationship should not be taken for granted; “[w]e can never be complacent” (IT Director, MJI). It is probably the IS organisation which has to take the lead, even if the IT budget is held by business management.

At the time of writing, only MJI had reached the situation where the senior IT and business management believed that there was a true partnership between the IS organisation and the rest of the business. A recent of business and IT management saw business management rating the service provided by the IS organisation higher than IT management rated themselves! Indeed, this same survey also asked business management for suggestions as to how the service could be improved and over 60% replied that as far as they were concerned it couldn’t be! They were very satisfied with what they were currently receiving and with the contribution that the IS organisation was making.

Within the industry the company is recognised as the leader in the exploitation of technology for competitive advantage. The IT Director is also Director of Operations managing 80% of the business. The evidence for MJI suggests that some of the SLAs defined at an earlier stage may need to be dismantled as they can impinge upon relationship building. Indeed, at MJI there are few SLAs in existence. The “culture” in the IT department is one of “we help you to help yourself”. Further, there is also no formal contract between the company and the main provider of its core broking package. Staff from the vendor organisation attend internal MJI meetings; they are seen as part of the business

A percentage of the IT budget is set aside every year for ‘high potential’ application development and experimentation. IT staff are encouraged to develop prototypes and seek business assessment of the outcomes. There are regular lunchtime technology briefings to staff from the business to help in identifying possible opportunities. This is also seen as helping in maintaining the visibility of the IS department and its staff. Twice monthly user-group meetings for its core broking application are held with a representation of the vendor always present at these meetings. An update on actions since the previous meetings is provided and any

problems encountered during the previous two weeks are highlighted. Modification and additional requirements are presented by the users themselves and prioritised.

5. DISCUSSION AND IMPLICATIONS

Much research and prescription advocates a strong IS-business relationship if IS is to deliver value to the business. While research also highlights that in many organisations this relationship is poor, little guidance is provided as to how this 'gap' might be bridged. The research that has been reported in this paper is a longitudinal study of three organisations that sought to improve the relationship and consequently the value derived from IS investments. An empirically derived model guiding action, drawn from cross-case analysis of the data, has been developed and described. This model provides a framework to help structure and sequence activities and initiatives in order to improve the overall contribution of IS.

This paper represents one of the few attempts to address the question as to how the so called 'gap' between the IS function and the rest of the business can be bridged. It is unique in that it is based on empirical data collected over a number of years from three organisations. During the conduct of this research Earl and Sampler (1998) published a paper proposing the concept of *market management* to transform the IS function. While based on the experiences of one organisation (BP Exploration), it does resonate with aspects the model developed in this paper. In particular, the first two stages of their model stress the need to recognise that there is a problem, and to "emphasis supply management", seeking radical performance improvement of the IS supply side by setting delivery goals and beginning to rebuild the technology platform. The focus is on releasing and realising value from the inherited IT situation and the prescriptions which they recommend at this stage include setting ambitious performance targets, rebuilding the technical platform, seeking early, visible results and setting application priorities. This is similar to the content of stage 1 of the model developed in this paper.

5.1 Practitioner implications

This research addresses a topic that is relevant for many organisations today, particularly as they are becoming increasingly dependent on their IT-based systems with more and more business being conducted in a computer-mediated environment. In its current form the model provides guidance for the practitioner based on the experiences of three organisations. Despite the research adopting a theory building approach, the model does guide the practitioner through the transformation process, highlighting those areas that require attention as well as indicating the order in which they should be addressed. For example, the model indicates that an organisation should not begin to address the issue of the credibility of the IS function without first 'getting the basics right', as this is a precursor and a necessary stage to successfully complete before attempting later stages, confirming the findings of Earl and Sampler (1998).

The model also reveals that delivering value from IS is an enterprise-wide issue and not a task that can be abdicated to a single functional area, which is generally the IS

function. The initiative at XY Bank illustrates the problems of attempting to create a high performance IS organisation without significant involvement and commitment from 'the business' who have traditionally been reluctant to get involved with 'anything IT'. In isolation, even a fully committed IS organisation can achieve very little without the commitment and buy-in from business managers and users. Consequently, prescriptions calling for the "line to take leadership" (c.f. Rockart, 1988) or for an "end to [the] delegation" (Anonymous, 1995) of IS decisions to the IS function, are unlikely to occur in an organisation where the relationship is poor to begin with unless the foundations of a successful partnership are established. The early stages of the model put in place the foundations for positive business involvement. Hence the crucial importance of passing through stages 1, 2 and 3 and building trust and credibility with business managers and engaging key decision makers and influencers before moving to later stages where greater engagement of business managers and users is demanded. At PSD, one business manager wryly noted "PSD does not emphasise the responsibilities of users. Its very easy to be critical of a service provider [i.e. the IT Division]."

The central role of people in the transformation process cannot be over emphasised. Even in stage 1, addressing people issues is crucial, particularly in getting the necessary buy-in and commitment of IS staff. Progress of the Top Class programme at XY Bank was slower than expected because of underestimation of the time and effort required to win over the "hearts and minds" of IS staff and in gaining acceptance of the new expectations. In addition, the IS management team at XY Bank recognise that further progress would require changes "on the business side", particularly at the interface with the IS function and getting business managers to take responsibility for defining IS requirements. And these changes are not insignificant; structural and organisational change is relatively easy to make compared to the "mindset" changes required of many of the business managers and front-line staff. Even at MJI there is the danger of complacency seeping in, with business managers reducing their involvement in IS related activity, as they fail to recognising either the value or necessity of their own contribution in the success of IS.

The evidence from the 3 cases suggests that the sequence of initiatives is important. Despite the recommendations of the consultants report presented to the Board of PSD, the IT Director set about implementing a new IT governance structure (which was not one of the recommendations) without addressing some of the more fundamental problems inherent in the IS function such as poor service quality, lack of user focus, and the low credibility of the IT Division. After 22 months of having made little progress, he then begun to address some of the more fundamental aspects, highlighted in stages 1 and 2. This episode illustrates that an attempt was made to short circuit the transformation process, as represented by the model, by skipping directly to stage 5, without meeting the objectives of the earlier stages. One senior business manager commented that the "IT director is weak. He and IT senior staff should be replaced". The consultants report noted that "[d]iscounting the "no comments" the current level of service from the IT Division received a score ... equivalent to poor to satisfactory." It was only two years after the completion of the review that the IT Division begun to address this issue of service quality by establishing Customer Service Level Agreements. Furthermore, the relationship between the CEO and IT Director is described as strained and the CEO is seen as supportive of IT "in general terms ...

because it is fashionable at his level” (senior business manager). More worrying was that senior business managers have lost confidence in the IT Director and his team. Compounding matters further is the perceived reluctance of IT management to devolve some responsibility for IT to business management (Stage 4). According to one business manager, the IT Division “wishes to remain a separate IT empire”. Communication within the department is also poor: “[n]o one seems to know what is going on except for the IT Director thus IT staff cannot answer questions or address business issues ... poor communication within and between users” (business manager). In fairness to PSD, the consultants report was weak regarding the implementation strategy; they surfaced the problems but failed to steer a clear route towards a situation where the IT Division would be seen to be making a contribution. In essence, the organisation had little guidance in relation to reaching the destination as outlined in the consultants report.

The cross-case evidence from the three case studies strongly suggests that there is a significant element of *path dependency* in creating high performance from IS; that is, the process is contingent upon preceding levels of learning, investment, resource and knowledge accumulation and development activity. This concept of path dependency highlights that reaching an end goal can be dependent on following a particular path or route, i.e. a number of stages or events must be passed through before the final outcome is achieved. The implications of this is very profound for organisations where the relationship between IS function and the rest of the business is poor and IS is severely impinging on the success of the organisation: high performance is not something that is achieved over a short period of time. XY Bank, for example, set themselves a time scale of 48 months; PSD made slow progress towards improving the relationship during the 40 months of data collection. A key aspect is that historical organisational legacy impinges on progress. Two points are worth making.

First, the evidence would suggest that the process cannot be abdicated to third parties, for example external consultants. “Unless you do it to yourself, you don’t actually get a sense of ownership” (Senior IT manager, XY Bank). Second, neither can it be bought in; for example hiring a new IS director does not automatically resolve relationship problems (as seen at XY Bank). Furthermore, elevating the IT director to a Board position also does not solve problems (the IT Director at PSD is on the Board). Even having an IS strategy does not address problems with value delivery through IS (as seen at PSD). These may all be necessary conditions on the route but in themselves are not sufficient.

5.2 Limitations and future research directions

The research has a number of limitations, although these do not negate the implications for practice developed above. Despite the richness of the data collected, it was only acquired from three organisations. Further, the research approach represented a process of theory building, and while theoretical saturation was achieved, the next logical stage is large scale testing of this model for empirical validity.

Whilst it does not undermine the research, the fact that neither PSD nor XY Bank had reached the last stage of the model as developed in the paper must be highlighted.

Although the study period lasted 40 months at PSD, the organisation was struggling to move beyond stage 2. XY Bank was in the transition between stages 4 and 5, yet engaging the business to make the necessary changes and assume responsibility for aspects of IS was proving both slow and in certain situations problematic. Surveys of internal customers revealed that overall satisfaction levels with Group Information Services were improving, but senior IS management acknowledged that a "step up" in action was now required.

It should also be recognised that each of the studies took place in a different context with different drivers for the change. The changes at PSD were driven by an evaluation by external consultants, although it was well recognised internally that there were problems with IT in general and with the IT Division in particular. The Top Class programme at XY Bank originated out of a remit given to a new IT Director by the board. The study at Muff Scott took place prior to and during the time it merged with Croke Jeffrey to form the new enlarged entity Muff Jeffrey International. The three case organisations were also of different size.

Yet despite these different contexts, the model would seem to be context independent, although such an assertion would require further study. It may be that the basic model still holds but the speed at which an organisation can progress through it may be different, supporting comments made earlier in this section regarding the impact of historical legacy.

A further observation worth exploring is the impact of the organisational remit of the IS Director. At MJJ, the IT Director was also the Operations Director and consequently had responsibility for 80% of business activity. The disputes and conflicts that often emerged at a management level in the other 2 organisations did not manifest themselves in this organisation.

A pertinent question that emerged during the conduct of this research (and one that had not been articulated at the outset) was 'why do organisations seek a strong IS/business relationship?' Reviewing the case histories from the three study sites it is reasonable to assert that they are not seeking a strong relationship *per se*, but rather the consequence of a strong relationship. The assumption is that a strong relationship creates the conditions for IS to make a value-added contribution to the business. In essence, each organisation is attempting to create or maintain an *IS capability*. To date, the IS literature has not defined organisational IS capability beyond an expression of its core objective of enabling an organisation to continually derive value through IS. Nor has it conceptualised the fundamental components or characteristics of organisational IS capability. Indeed, the IT Director at XY Bank was clear that '[s]uperior information systems capability is central to the achievement of XY Bank's business objectives and will be critical to survival in an increasingly competitive environment'.

This IS capability cannot be purchased; it is organisation specific and path dependent. Further, it is very possible that the IS capability exists in a complex web of social interactions and may even depend critically on particular individuals. When questioned as to the reasons why his IS Department had a good relationship with the rest of the business, the IT Director at MJJ was at a loss to explain. An interesting question is 'what would happen if he was to leave the organisation?' Would a strong relationship still exist? How much of the capability is built into the very fabric of the organisation?

As the three case studies illustrate, managing an IS function, and in particular managing to deliver value from IS, is complex and multi-dimensional. Unfortunately IS research tends to focus on discrete areas within the discipline, reflecting the practice in most management disciplines where research delves deeper and deeper into a topic, and while this increases our knowledge of the particular area it does not provide the holistic perspective of all that is necessary for success. Such a holistic perspective is required in order to illustrating how all the "parts" fit together.

6. CONCLUSION

It is widely acknowledged that as organisations become increasingly dependent on IS, they must strive to achieve a closer relationship between the IS function and the business. Despite this, there is little guidance provided in the research literature as to how gaps in the relationship can be bridged. From a longitudinal study in three organisations, this theory building research has induced a model to address situations where a poor relationship exists and consequently the contribution from IS is affected. This model exhibits significant elements of path dependency. 'Bridging the gap' in an organisation is likely to take time and is primarily a people issue governed by the organisational legacy regarding IS experiences.

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