The Pervasive IS Organisation

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Abstract

The fundamental premise of the discourse presented in this paper is that the inability of organisations to generate value from their investments in IT is primarily due to legacy thinking and practices. In particular, it argues that positioning the IS organisation as a separate organisational unit, while valid when computers first entered organisations, is a flawed practice today. In challenging the dominant orthodoxy, the paper proposes the concept of the Pervasive IS Organisation as a more appropriate construct in meeting the new role of IT. This concept is built on the premise that generating value from IT is not about managing technical artefacts but in harnessing knowledge that is distributed across the organisation and increasingly in vendors and other third parties, including customers, suppliers and other third parties. The elements of the pervasive IS organisation are presented and its implications developed.

Draft Paper Version 1.0 1st September 2009; V 3.0 26th March 2010. For comment only.
In envisioning the future we are too often constrained by the past. This is reasonable as the past often symbolises a place of comfort and familiarity, characterising what has proven to work. It also represents that which is known and predictable. It does mean, however, that progress from there will inevitably be slow and incremental. More crucially, the past can restrict our thinking about the future and limits the sphere of possibility.¹ Henry Ford captured this sentiment well when he is reportedly to have said that if he had asked his customers what they wanted they would have replied “a faster horse”!

Today, how organisations manage their IT resources, both knowledge and the technology itself, is strongly rooted in the past. And the implications of this are everywhere to be seen. Quite simply, it is severely constraining the generation of business value from investment that organisations make in information technology. Just look at the evidence: even the more modest estimates suggest that at least 40% of investments in IT are failing.² The real figure is probably much higher.

The reality is that IT is managed in much the same way as it was when computers were first introduced into organisations. Yet the contribution of IT to both organisational performance and competitiveness has changed drastically. What organisation can survive today without its IT systems? Increasingly business models are being defined by IT. Compliance is an information driven endeavour. Companies, such as Tesco, drive their marketing activity from data. What my research is highlighting is that the core of the problem with IT is the IT function itself. Or rather, how it is viewed and designed. The bottom line is that neither organisational structures nor resource configuration have shifted to reflect the changing role of IT for organisations today. In fact, both are now a distinct barrier to the generation of business value from IT.

What my data suggests is that most organisations are organising and mobilising their resources, both people and technology, in ways that almost guarantee that they will experience severe problems with their IT investments. In short, IT is being managed based on legacy thinking. And practices emanating from this thinking are grounded in a

¹ In a 1992 Editorial in MIS Quarterly, Blake Ives noted the limitations of drawing on the past for guidance about the future. He wrote: “Industry understands that they must now re-engineer rather than just automate outdated methods. But within the information systems research community we continue to value an extensive trail of references that often reflect outdated assumptions and yesterday’s economics. We are not necessarily paving the cow path, but rather extending it. It is a rare article that explores the implications of changing economics on the central research question or that challenges the dated assumptions upon which past works might have been based. If we are to re-engineer information systems research we must spend less time pouring over the archives and more time soaking in innovative organizations. It is there, rather than in the rear view mirror, that the realities of the transformation of information management will become apparent.”

paradigm that focuses on deploying technology rather than generating value; that emphasise managing technical artefacts rather than harnessing knowledge.

In this paper a new way of looking at the IS organisation is presented that challenges the dominant orthodoxy. It questions conventional conceptualisations of IT in organisations and the role and function of the IS organisation. The paper argues that we cannot see the IS organisation as a separate organisational unit; rather, it must be conceptualised as a pervasive construct. The implications of this are profound.

A short history of the IS organisation

What is today generally referred to as the IS organization or IS function represents a concept that has evolved over the last 50 years, not just in name, but in role, function and position in an organization. Words such as “information”, “services”, “systems”, “processing”, “management”, “data”, “technology”, and “computer” have been combined in many permutations to refer to this organizational sub-unit. Monikers such as Computer Department, eDP Department, DP Department, MIS Department, Computer Services, Information Technology Department, Information Systems Department, Information Systems and Technology Department, Information Services, Information Management Department, and Digital Business Department are just some that have appeared over the years.

Labels have also changed over time with any modification in name usually reflecting a new role and focus for information systems and technology in the organization. Early eDP Departments, for example, concentrated on just that, the processing of corporate data. The key role of such departments was essentially to keep the organization’s computer system up and running. Data was brought to the computer room to be processed, using punched cards, in batch mode. At that time, technology investments were primarily made to automate clerical tasks, where cost reduction and improvements in efficiency were the key investment objectives. The subsequent focus on the provision of information from data processing systems for management decision making saw many organizations rename this unit the Management Information Systems (MIS) or Information Services Department. More recently, in some organizations, Digital Business Departments have appeared, replacing what may once have been called IS Departments, reflecting the emergence of the Internet and e-commerce and the increasing prevalence of IT in the conduct of business.

While giving the appearance of change, re-labelling merely represented a change in name. All it does is move the deckchairs on the proverbial Titanic. Compare the structure of any IT function of the 1960’s or 70’s and it will reveal little difference from today’s blueprints. And most IS organisations tend to look much alike. The basic assumption behind this dominant design is that IT, or more correctly, the generation of business value through IT, can be managed from within a separate unit in the organisation: just look at any organisation chart. This is a fatally flawed premise.

McDonald has suggested that IS organizations look much alike because they have been rapidly standardizing to the point of reaching a dominant design. See M.P. McDonald, “The enterprise capability organization: A future for IT”, MIS Quarterly Executive, Vol. 6, No. 3, 2007, pp. 179-192.
Yet there was a time when the notion of a separate organisational unit dedicated to keeping the computer running was an appropriate response. Back then, IT had a peripheral role to play in business success. The Head of IT prioritised IT spend, decided how much was needed for computing resources, decided what the business could and could not have and put together the annual IT spending plan. He – and it typically was a male – even prioritised processing jobs. This was the ‘priesthood’ of IT based on technology worship. However, and this is the crucial point, the knowledge and resources necessary for success – defined as keeping the computers running – were located in this organisational unit under his/her direct control. The IS organisation was, by-in-large, self-sufficient. Today, this knowledge is distributed; and not just across the organisation but often into suppliers, vendors, business partners and customers. The challenge is no longer to keep the computer systems running – this can in fact be outsourced – but to coordinate and integrate this knowledge to generate business value. This requirement demands a fundamentally new paradigm and a new response. Not only have the rules of the game changed, but we are now playing a different game.

Memo to CxOs: Pssst, IT is Different!

Of course, most CEOs and other C-level executives today remark that, yes, they do see IT as being strategic for their business. They readily acknowledge that it is now fundamental for operations and competitiveness. They then, rightly, proceed to manage it like any other so-called strategic resource. This response is, however, based on a view that IT is like other resources and can be “managed” in a similar fashion. This is a misconception and lies at the heart of the problem. IT is different; fundamentally different. Until CEOs and other C-level executives recognise this, any expected value to be delivered through IT investment will remain as elusive as ever.\(^4\)

To a large extent, the other functional areas, with the possible exception of HR and Finance (which we shall come to shortly), can essentially operate within broad silos as long as there is some level of lateral coordination and communication. Take for example, the Manufacturing Department, typically responsible for producing products. Once it is determined what has to be made, in what quantities and by what date, the Head of Manufacturing can essentially get on with the task of managing production, assuming procurement and on-time delivery of raw materials (if there is a separate procurement function). Once produced, the product can then be shipped to the customer by staff from the Logistics area. “Value”, from the manufacturing perspective, is created by converting raw materials input into a finished product – of course we could argue that value is ultimately not created until paid for by the customer, but let’s not enter into this debate.

Of course, the Head of Manufacturing has no control over sales and would never be held accountable for product sitting in inventory or lying on shelves. That is the responsibility of Sales and Marketing staff. If input materials fail to arrive at the factory on time, this is clearly an issue for the Head of Procurement. The manufacturing supremo is, however, responsible for any quality issues that may arise

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\(^4\) For a study highlighting the poor IT savvy of most CEOs and CxO and the implication this has for IT see J. Peppard, ‘Unlocking the performance of the Chief Information Officer (CIO)’, *California Management Review*, forthcoming.
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during production, although this concern might be possibly traced back to the original design of the product or the raw material input used. Improving production processes through continuous improvement initiatives also fall under his remit; essentially producing more with less. For a global organisation, distributed manufacturing sites add an additional layer of complexity and risk. However, this does not distract from what the Head of Manufacturing can and cannot be held accountable for. Their job can be precisely specified and appropriate performance metrics assigned.

Of course, the big problem with this “functional” approach to organisation design is the lack of focus on the end customer. The thrust of the business process reengineering movement of the early 1990s was on addressing this lack of end-to-end accountability for the customer. Without technology, providing this level of customer focus can be impractical or even impossible to achieve. In addition, IT enables work to be performed in new ways; ways not possible without technology. Processes transcend traditional organisational functional boundaries and are typically assigned “owners” who are accountable for the outcomes of the total process. For organisations structured this way, these processes become the focus of attention. Control over resources resides with process owners, at least in theory; execution can pose more of a challenge.5

Thus, for each functional area of a business, managers can essentially get on with their assigned tasks, as long as there is a certain level of coordination across these business areas. Whether it is Marketing or Production or Sales or Logistics. Indeed, to achieve this level of coordination, executives manage around the boundaries of their unit, particularly at the interface with other functional areas. For example, if demand for products exceeds production capacity, the Head of Manufacturing will look to other areas of the business to prioritise. Factory capacity is finite, and this can be easily demonstrated: it is impossible to produce more than capacity can accommodate. The time and cost to bring new or additional facilities on stream can be calculated with some precision.

The myth of the IT factory

In the majority of organizations today IT is treated in a similar fashion – as a factory – and managed in a similar way. The CIOs and his executive team manage around the boundary of their unit. For example, they establish liaison roles to work with business units and translate business requirements into technical functionalities. They appoint service delivery managers to ensure the business receives services at agreed service levels. However, this practice is based on a perspective that the role of the IT function is to build systems and infrastructure as well as operate, maintain and deliver services. This does not guarantee that value will be delivered. All it does do is guarantee that systems are built, services are delivered and infrastructure maintained.

A key question is what can and cannot be controlled by the relevant functional head. Unless he has a larger remit, the Head of Manufacturing only controls resources associated with plant, machinery and manufacturing staff. But this is all he requires to

5 For a recent take on organizational processes, see J.M. Hall and M.E. Johnson, ‘When should a process be art, not science?’ Harvard Business Review, March, 2009, pp. 58-65.
undertake the role effectively. For the CIO, all the resources required to deliver business value through IT are not under his direct control. Generating business value is highly dependent on others in the organisation. Implementing a new process configuration and changing work practices as a result of a new information system, for example, are not something that the CIO can mandate (unless, of course, they have a larger remit, such as run business operations). All the CIO can do is deploy the technology that will enable and support the new process and any changes to work practices. Relevant business managers need to ensure that necessary changes actually occur and that information and IT are used. The conundrum that CIOs face today is to generate business value through IT without having access to the necessary knowledge or resources.6

Human resources and how they are managed provide an interesting comparison. CxOs and other executives readily acknowledge that employees must be deployed effectively. They actively manage them – not leaving this task to the HR organization. HR can provide certain competencies for recruitment, selection and establishing general employee policies. They can also work with the business areas to ensure that the “right” candidates for particular roles are hired, often using the services of recruitment agencies and head hunters to identify potential employees. What is a crucial point is that functional management recognise that they have a central role to play if staff are to make a value-added contribution. What CxO would not wish to be involved in hiring direct reports or members of his team? They also manage their staff directly; the HR organisation is not expected to do that. They also set their objectives. Why then do they not exhibit the same behaviour in respect of IT?

From managing technical artefacts to harnessing distributed knowledge

The trouble is that most executive teams see IT as a technical artefact: the desktop and other devices, servers, cables, routers and, of course, software. Implicitly, they designate the role of the IS organisation, and the IT specialists it employs, to specify, design and maintain this equipment. The design of contemporary IS organisations mirrors this objective. Indeed, the distinction that is often made between “demand” and “supply” in the context of IT management reflects the requirement for the business to specify requirements – demand – and the IS organisation to supply technology to meet these requirements. This is far too simplistic a distinction and reflects a complete lack of understanding as to exactly how IT generates value for a business.

How IT is managed in most organisations is based on the premise that the objective is to get the technology deployed and to keep it functioning. Thus, the focus of efforts is on maintaining the legacy infrastructure, running data centres, and on building new applications. This was all very fine when the requirement of the CIO (or EDP or Computer Manager, as the incumbent was typically called in the early days) was primarily to keep the technology systems running. Today, IT has significant strategic impact and consequently, it cannot be managed in the same way.

The evolving role of the CIO provides a glimpse as to the nature of an emerging new paradigm governing how IT is leveraged. This role has evolved from the CIO being a Function Head to a Strategic Partner to a Business Innovator. In this latter role, today’s CIO is expected to be visionary, a technology opportunist and to drive and shape strategy through IT. Yet even with this new role, the CIO cannot overcome many of the constraints that are inherent with the legacy thinking. They cannot be expected to deliver on this new agenda while operating within traditional structures and processes.

This evolving role can additionally be seen as a surrogate for the changing requirements for IT, reflecting the shifting focus and emphasis of IT investments. These changing requirements reflects the fact that managing the IT resource is getting more complex as technology becomes more ubiquitous, applications become more sophisticated, IT deployment more pervasive, connectivity much easier, and the role of IT in the business becomes ever more strategic. Business expectations have also changed. No longer is the expectation that the systems work. Now CEOs expect that IT will also transform the business and that the CIO will lead this charge.

To overcome legacy structures, organisations employ a variety of tactics rather than change the structures themselves. We are seeing more and more decisions that were traditionally made within the IT organisation are being devolved out of the remit of the CIO and IT function altogether and into the realm of business executives; although we also witness resistance of business executives to assume these new responsibilities. Expertise in technologies is also migrating away from IT professionals and becoming more embedded in the business; for example, social media in the Marketing organisations and analytics and business intelligence (BI) in Finance departments. Many applications can now be delivered directly from “the cloud,” bypassing corporate infrastructures. IT governance mechanisms, such as IT steering committees and other cross function forums are being established to coordinate the consequence of devolution as well as encourage the involvement of relevant parties in decision making processes. These forums are operating outside of formal structures – within the so called informal organisation – and are central to creating an environment for knowledge access and integration. This is giving tacit recognition that IT decisions are essentially business decisions and require coordinated action.

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Figure 1 captures the evolution that we are witnessing in how IT is managed in organisations. It illustrates that the dominant organizing mode has shifted from hierarchy to network. With this network mode, the IS organization becomes a pervasive construct. The early functional perspective focused on managing within the boundaries of the IT unit, where the emphasis was on keeping the technology running. In this situation, the CIO is an operational manager. The partnership model still accepts the existence of a separate IT unit, with the IT leadership team managing around its boundary, focusing on building relationships with the business and other stakeholders. The Pervasive IS Organisation acknowledges that generating value through IT is a shared responsibility. It is built on the premise that the requirement is to generate value through IT and not to manage IT as an artefact, a subtle but profound distinction. It also acknowledges that this quest requires the harnessing of organizational knowledge. Thus, the Pervasive IS organisation refers to the sum total of all resources, activities and decisions regardless of where they are located, inside the enterprise or outside it, that are concerned with optimising value through IT.

**Figure 1** Towards the Pervasive IS organisation.

**The Pervasive IS Organisation**

The fundamental implication from this analysis is that we cannot put neat boundaries around an organisational unit and label it the IS organisation and expect it to deliver business value from IT investments. All such a unit can do is manage the technology and deliver IT-enabled services into the organisations. And if building systems and maintaining the infrastructure was all that was required for IT to generate value,
outsourcing IT would not have such a high failure rate. Payoffs from IT are ultimately the responsibility of the entire organisation.  

The Pervasive IS Organisation\(^{11}\) is built on the premise that the challenge in generating business value through IT is to coordinate and integrate knowledge that is distributed across the organisation. Thus, it proposes that delivering value through IT is a knowledge-based practice and must thus be centred on the marshalling, harnessing and exploitation of knowledge. That is, the activities and tasks associated with delivering business value from IT are all knowledge oriented. For example, developing an IT strategy is a knowledge-based task. Prioritising IT spend is also a knowledge-oriented task. So too is building systems. In fact, the technical infrastructure is the embodiment of knowledge: knowledge that has been deployed by systems architects, developers, communications experts, etc. in its design and construction. Maintaining this legacy also requires knowledge. Using information effectively is critically dependent on the application of knowledge. Outsourcing arrangements can be similarly viewed as knowledge based; indeed, many organizations argue that they have outsourced their IT to an ESP or vendor as it will provide them with access to knowledge that they do not currently possess.

Yet, managing IT has never really been about technology anyway. It has always been a knowledge oriented undertaking. Keeping complex mainframe computer systems running required lots of specialised knowledge, most of it of a technical nature. And, when this was the only requirement, this knowledge was best housed within a separate organisational unit. Importantly, it was all under the jurisdiction and control of the head of IT.

What we are claiming is that the necessary knowledge to deliver business value through IT is not located solely in a separate organisational unit and under the jurisdiction of the CIO. In fact, much of this knowledge is under the control of other C-level executives. This is why it has been stressed as being of crucial importance for the CIO to build relationships with these executives: to ease access to knowledge resources under their stewardship. If not, access to this knowledge will be difficult if not impossible. Even with access, the organization must have the capability to coordinate and integrate this knowledge.\(^{12}\) This requires not just having connections but also demands that trust, shared understanding and cooperation exist between parties for collective action to happen.\(^{13}\) If all the required knowledge cannot be harnessed then it is then unlikely that business value from IT will be delivered.


\(^{11}\) This notion of the pervasive IS organisation is not the same as pervasive computing, but does have a similar genesis. The idea behind pervasive computing is that technology is moving beyond the personal computer to everyday devices, from clothing to tools to appliances to cars to homes to the human body to your coffee mug, with embedded technology and connectivity as computing devices become progressively smaller and more powerful. Also called ubiquitous computing pervasive computing is the result of computer technology advancing at exponential speeds – a trend toward all man-made and some natural products having hardware and software.


\(^{13}\) This is the basic premise of social capital. Social capital can be seen as networks of strong, personal relationships developed over time that provide the basis for trust, cooperation and collective action. See
By establishing a separate IT unit, no matter what it is called, the assumption can only be that all the knowledge necessary to deliver business value through IT can be located within the boundaries of this unit. Yet evidence clearly concedes that knowledge from other areas of the organization outside of the IT function is required if this value is ultimately to be delivered. For example, prescriptions around the IS strategy process demand the involvement of executive management if it is to be effective. Why? Because there is incomplete knowledge in the IT function to successfully develop this strategy. IT project teams are typically composed of both IS specialists and managers and users from the business. Why? Because the all knowledge and skills to successfully implement the new IT system is not solely resident within the IT function. Indeed, a project team, set up to design and implement a large-scope IT system, is essentially tasked with integrating distributed knowledge.\footnote{See S. Newell, C. Tansley and J. Huang, ‘Social capital and knowledge integration in an ERP project team: the importance of bridging AND bonding’, \textit{British Journal of Management}, Vol. 15, 2004, pp. S43-S57; and V.L. Mitchell, ‘Knowledge integration and information technology project performance’, \textit{MIS Quarterly}, Vol. 30, No. 4, 2006, pp. 919-939.}

CIOs do attempt to facilitate the coordination and integration of knowledge, although they may not always recognize this as either the objective or outcome of the initiatives they promote. For example, many have appointed relationship managers as a link between the IT function and rest of business. However, while such initiatives seek to provide access to knowledge they may not directly impact knowledge integration. In reality, they usually act as translators of requirements or reporters of problems. Establishing governance structures, such as committees and other cross organizational forums, bring individuals with relevant knowledge together to debate particular issues, make specific decisions and have oversight on decisions and outcomes.

Some CIOs have introduced educational programmes to improve IT staffs’ knowledge of the business. This overcomes the fact that it can be difficult to get business engagement, i.e. access to their knowledge, so the CIO attempts to build this knowledge inside the IT function. However, this does not overcome the requirement for business and IT people to cooperate, i.e. integrate and coordinate their knowledge. To this end, education programmes for non-IT staff are also instigated to create awareness of IT issues and highlight their role in delivery of the expected benefits of IT investments.\footnote{For a illustration of such initiatives see B.C. Wheeler, G.M. Marakas and P. Brickley, ‘From back office to board room: repositioning global IT by educating the line to lead at British American Tobacco’, \textit{MIS Quarterly Executive}, Vol. 1, No. 1, 2002, pp. 47-62.} Initiatives like chargeback, where users are ‘charged’ based on the IT resources and services they consume, can be used to foster communications between IT and the business units.\footnote{J. Ross, M. Vitale, M. and C. Beath, ‘The untapped potential of IT chargeback’, \textit{MIS Quarterly}, Vol. 23, No. 2, 1999, pp. 215-237.} This communication can generate a rich shared understanding for both parties of the cost and benefits of alternative IT investments and service offerings. Indeed, research shows that high level of communication

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between IT and business executives is a direct predictor of alignment of business and IT strategies.\textsuperscript{17}

\section*{A framework for the Pervasive IS organisation}

In our work with senior executives and board members a recurring question that we encounter relates to what their role and responsibilities are in relation to information technology.\textsuperscript{18} Many recognise the contribution that IT is making to their business and in both the achievement and shaping of its strategy but struggle carving out a defined position for themselves.\textsuperscript{19} What decisions should they be responsible for? Do they need to get involved in IT projects? What should they leave to the CIO (or what can they expect their CIO to do)? The Pervasive IS organisation acknowledges that generating value is an enterprise-wide responsibility and makes roles and responsibilities transparent.

Our research has led us to identify what we refer to as the triumvirate of the Pervasive IS organisation (see Figure 2). As its name suggests, this structure has three interrelated components: thinking, doing and using.

- Thinking addresses questions as to the why, what and the how of IT.
- Doing represents the execution of the what through the deployment of the how.
- Using refers to the application of the why through working with information.

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\includegraphics[width=0.5\textwidth]{triumvirate.png}
\caption{The triumvirate of the pervasive IS organisation.}
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In most organisations, the primary focus around IT has tended to be on the *doing* dimension: building systems, running IT operations, delivering services, maintaining legacy, making systems secure, etc. However, what the Pervasive IS Organisation demands is that it is also imperative to *think* about the *doing* (the ‘why’, ‘what’ and ‘how’) as well as recognise that *using* information and IT is how value is ultimately generated. Thus, *thinking*, *doing* and *using* are not the sole preserve of the traditional IS organisation or the CIO. Senior executives must be particularly involved in the *thinking* and developing the overall framework for the *doing*, including establishing effective governance structures, mechanisms and processes. The link between *thinking* and *doing* is thus the actual deployment of IT; the link between *thinking* and *using* is the exploitation of information and IT; while the link between *doing* and *using* is organization change (from IT-enabled change projects) and service delivery.

In early IS organisations, the *thinking*, *doing* and *using* were all essentially undertaken by the DP Department, or whatever label referred to the group of computer professionals. It decided what systems were required, built them and then used them. This was the era when the business came to the IT department with requests to process data. Gradually, over time, tasks and decisions moved out of the IS organisation. *Using* went first, when terminals landed on employees’ desks. New, easy-to-use tools harboured the arrival of end-user computing and ultimately saw some of the *doing* devolve out of the IS organisation altogether; this trend continues today with “the cloud.” The *thinking* has been perhaps the slowest to follow, with executives at all levels seemingly reluctant to actually make decisions about IT; they still see the context as concerned with the technology artefact. However, even this shift has gathered momentum over the last number of years and has heralded the importance of establishing IT governance to emphasise that IT decisions require business governance, and that structures are required to ensure coherence in decisions made, particularly when decision-making is both devolved and distributed.20

**Thinking**

In the early days of IT in organisations, much of the *thinking* around IT was done in the IT Department by IT specialists. In this function, decisions were made as to the computer systems to buy and the applications to be built and how they would be used. As the primary role of the IT function was to develop computer systems and keep them up and running, the *thinking* about IT was primarily limited to technical matters.

As the role of IT has become more strategic and embedded in organisational processes and practices it is now not appropriate for all this *thinking* to be undertaken within the confines of the IT Department by the CIO and his staff, not least if investments in IT are to be aligned to the business strategy as well as provide innovative opportunities. Much of it needs to be undertaken by CxOs and executive management. *Thinking* demands that a number of key questions that should be addressed:

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Why are we using IT in our business? Is it to support and/or shape strategy? Does it underpin our business model?

What are we going to do to address the why (the using and the doing)? What information and systems does the business require? What technologies are we going to deploy? What processes will IT support? What are our priorities for IT? What levels of risk are we prepared to accept? What will our level of IT spend be? What criteria will be used to evaluate value and success? What projects will we undertake? What will be outsourced to third-parties?

How will the doing be organised, executed and managed? How will IT projects be managed? How will IT services be delivered? How will information and systems be used? How will resources be allocated and marshalled? This is essentially enterprise governance of IT.

Addressing the how also requires identifying and assigning responsibilities and accountabilities to specific individuals, defining processes and audit mechanisms. Much of the focus of recent work around IT governance centres on addressing these requirements. Additional, how information is going to be used and protected also requires attention, an area that has received scant attention.

Doing

The IT function is usually seen as being concerned with doing “stuff”, essentially building new IT based systems, maintaining legacy infrastructures and delivering IT services. While most of this has traditionally been done in-house, the last 20 years has seen more of the doing is being outsourced to third parties. Yet the doing must be driven by thinking, both of the ‘what’ and the ‘how’ in order to address the ‘why’. Outsourcing does not mean that the thinking and using are now not necessary. The ‘what’ defines the requirement that the business has for information and systems, given its strategy: systems to build and services required. The ‘how’ defines how day-to-day activities are performed and managed, including coordinated and controlled. From our research we have identified that the ‘doing’ activities fall into three areas: (IT) projects, IT operations and service delivery.

(IT) projects: Projects are the fundamental building blocks for the implementation of envisioned opportunities that have been given the go-ahead by executive management through the prioritisation process. Activities here are concerned with the implementation of these projects including the planning and management of the associated change – thinking activities. IT projects will have two interdependent outcomes: change and creation of IT services for ongoing execution and realisation of processes. The exception is pure infrastructure projects. When considering outsourcing, it is the doing that may be contracted to third parties (with appropriate governance); the thinking or using are never outsourced.

All projects require control and coordination. Management should additionally look for synergies across these projects, for example, in procurement or resource utilisation. It is also important to ensure conformance to any standards and policies, for example use of development methodologies. Organisations typically have many IT
projects running at the same time; sometimes these are logically grouped together in programmes.

**IT operations:** These are the activities involved in the maintenance of the IT platform services and ensuring that the applications continue to run and are secure. The cost of performing these activities contribute to total running costs of IT services.

**Service delivery:** This is concerned with the ongoing provision of information handling services into the organisation. It also includes user support, maintenance of help desk, and performance measurement and reporting (i.e. against any agreed service level agreement).

### Using

Using information and IT systems is a much neglected aspect of IT in organisations; value is only realised through usage. While organizations are increasingly able to gather and process information from a variety of new sources, competitive advantage will still belong to those who know how to use it. Without the ability to work with information, any benefits from deploying technology are unlikely to be forthcoming.

Despite all the advances that have occurred in technology, executives must recognise that IT is deployed in organisations for its ability to handle information. That is, IT facilitates the provisioning of a range of information handling services. These include those that enable communication and collaboration (i.e. email, desktop videoconferencing, inter-organizational systems, instant messaging, social media), data capture (i.e. point of sale [POS] systems, Internet-based data entry systems, customer portals, sensors), data processing (i.e. order processing, invoicing, customer query management, account management, resource management), storage (i.e. data centres and databases with information about customers, inventories, assets, etc.), access (i.e. ad hoc queries, report writing), and analysis (i.e. analytics, modelling and decision support tools). One way of considering this perspective is that, if the technology fails, it is not the loss of the technology per se that would result in problems for the organization, but the loss of the organization’s ability to avail itself of these information handling services enabled by the technology.

While thinking about the information that is required to run the business is a key part of the strategy execution process, organisations must also have the capacity to work with this information. We studied two banks that had deployed CRM software from the same vendor, implemented by the same team of consultants from the vendor. Yet, one of the banks had managed to leverage significant value from this investment while the other is still struggling to achieve any of the benefits established in the investment proposal. While some of the difference can be accounted for by the implementation process and the ability of the organisation to absorb the change necessary change, a large proportion can be attributed to the fact that it had not

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developed the capability to work with the new information that was at its disposal. Using data-mining tools, building propensity models, and gleaning customer insight from the mass of customer data and then executing on this insight proved elusive for them.

**Integrating Thinking, Doing and Using**

*Thinking* demands thinking about the *using* and thinking about *doing*. How is the organisation going to use information? What information is necessary to drive and execute strategy? How is the organisation going to build and operate the required technical infrastructure? At a meta-level, there must also be *thinking* about the *thinking*. Who is going to engage in this thinking, what domains require thinking and how will this thinking be undertaken? What processes, if any, will be followed? How often will this thinking be undertaken? The outcome of this meta-level thinking defines a governance structure.

While *thinking, doing and using* are highly inter-woven in the fabric of an organisation – they are knowledge-oriented – Figure 2 also illustrates the link between this triumvirate. The link between *thinking and doing* is characterised by the *deployment* of IT. The connection between *thinking and using* is defined by *exploitation* of the information. This requires a deep understanding as to how information and resultant systems will be used by the organisation. The link between *doing and using* is delivering both *change* and *services*. IT projects, the organising mechanism through which technology is initially deployed, are really about introducing organisational change; change that is enabled and shaped by IT. When a project ends and the resultant IT systems have been built and the organisational changes made, there is an ongoing requirement for IT services to be delivered into the business to help in sustaining the change.

Linking *thinking, using and doing* essentially requires having proper governance in place. Unfortunately, governance is a much misunderstood concept today, particularly in the context of IT. Quite simply, governance is about behaviour. In establishing a governance structure, an organisation is attempting to influence appropriate behaviours with respect of information and technology. A governance structure clearly defines roles, accountabilities and responsibilities. Governance mechanisms include committees and other forums; policies; decision making processes; and initiatives and practices such as charge-back and rotating employees in and out of IT. These are the levers that the organisation has at its disposal to influence behaviour. Governance is also required around information use and protection.

**Conclusion**

Nearly a quarter of a century ago, Dearden\(^\text{23}\) predicted the demise of the IS organisation. The basic premise of his arguments were that users would soon completely control individual systems and that systems development would be done

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almost entirely by outside software specialists. However, he did not foresee the tremendous advances in IT and the key role it would play in business and global commerce. Yet while he was right that the IS organisation would wither away he erred by suggesting its demise based largely on arguments focused on technology deployment. Focusing on value generation through IT presents a different conclusion.

This paper argues that executives should no longer see their IS organisation as a separate organisational unit but rather as a pervasive construction. The rationale for this is based on the premise that the focus in generating value from IT should not be on managing technical artefacts but on harnessing knowledge. This knowledge is not only distributed across the organisation but can also be found in vendors and other third parties. The challenge is therefore to integrate and coordinate this knowledge. This latter objective should define the configuration of resources. To this end, the concept of the Pervasive IS Organisation was introduced and described. Generating value through IT is increasingly concerned with thinking and using and much less about the doing, although the doing requires no less thinking if it is to be a success.