Spring 4-11-2011

A Manager's Guide to Joining up Business and IT: Achieving Business-IT Alignment

James Bacon
University of Bath, cjamesbacon@gmail.com

A MANAGER'S GUIDE TO JOINING UP BUSINESS AND IT: ACHIEVING BUSINESS-IT ALIGNMENT

C. James Bacon

Formerly School of Management, University of Bath,
and University of Canterbury, New Zealand

cjamesbacon@gmail.com

Abstract

This paper summarises a book-in-progress, and aims to air the book's findings thus far as part of the research process.

It is - and is not - about Business-IT Alignment. It is not, in that "alignment" has been found to suffer from 'underconceptualisation', and it is in this sense that the paper is not about what is considered to be a narrowly focused alignment paradigm. The term "Joined Up" is used to signal a broad-based, systemic approach to this fundamental issue for the field of Information Systems.

The paper is based, firstly, on a 12-part JUMP (joined-up means payback) Model, which describes IT in Organisations, with the central theme of Information Value for Business Value.

At the same time, the Model serves as a systemic framework for joining up Business and IT. It is based on a comprehensive review of the literature using the Constant Comparative Method of Grounded Theory, and a global, Delphic survey.

Secondly, the paper is based on the development of Business-IT Synergy Theory, and its use in a seven-themed JUMP Process. The Process utilises Model and Theory in the development of actions to achieve joined-up in the organisational setting.

Thirdly, the paper and its JUMP approach are based on Systems Thinking, which is seen as the 'X-Factor' in and for a joined-up organisation's culture. Ten Principles of Systems Thinking are therefore summarised and enunciated.

There is not the space to include the Action Learning approach to business change & implementation, the assessment of information value, or the use of the JUMP Model for teaching IT-in-Organisations, but questions and comments are welcomed.

Keywords:
Alignment, Education, Management, Systems Thinking, IS Model, Business Change.

A Socio-Economic Issue

A significant socio-economic issue today, deeper and wider in its impact than we might realise, is the general failure in harnessing the power & potential of Information Technology (IT) in organisations - as compared with needs and expectations.

It's not all bad. For example: the mobility and global reach we have through a laptop, smartphone or tablet; the vast amount of information easily available through the Web; the satisfaction, collaboration and 'instant news' we get through social networking; the apps and music we can download to our smartphone; the photos we can upload for our family and friends; the convenience and savings we get by shopping through the Internet; the number of transistors that can fit on a microchip so bringing down cost; the volume and speed of bit signals with Broadband that make communication so much easier and faster, and videos so richer; the fun we have with computer games and avatars . . .

Social scientists and others may be concerned about such things as impoverishing authentic human connectedness, the assumption that technological progress equals human & societal progress, and how technology may be degrading our brains and our being (Carr 2010, Lanier 2010, Maushart 2011, and Turkle, 2011). But for many of us, and especially "digital natives", such general advances in IT continue to fascinate, amaze, and delight.

However, the situation for organisational IT appears to be not quite as delightful:

> Computer-based information systems *in organisations* too often fail or fall far short in meeting needs and expectations. According to research and regular surveys, it appears that it may be only a *minority* of the investments in IT in Organisations that are successful. (Krigsman 2007, Ackerman et al 2007, IT Governance Institute, 2008, and Roberts and Sikes 2008).

We learn about big systems failures on a regular basis, with billions of dollars, euros and pounds sterling wasted annually (McManus & Wood-Harper 2008, Power 2008, Manwani 2008, Mostrous and Elliot 2009, and Foundation for Information Policy Research 2009). It may be that the ones we learn about are not isolated incidents but the tip of the iceberg, and so the big picture of IT in Organisations could be telling us that:

> When all the loss of productivity, wasted effort, wasted time, and poor use of human and physical resources are considered, IT failure as a whole adds up to a macroeconomic mountain of waste; we are failing in serving human aspiration, economic fulfilment, and society at large.

That which organisations (corporate, government, and non-profit) do or fail to do as a whole has a significant impact on society as a whole. Consequently, general IT failure in organisations can be said to have a *sociological* impact in such areas as: (a) physical and mental health, (b) quality of work-life, (c) the use of information, (d) customer service & value, (e) the use of limited resources, and (f) the quality and cost of public services, such as health care, taxation, public transport, national security, crime prevention, and social services (Powner 2008, Anderson 2008, Mostrous and Elliot 2009, and Foundation for Information Policy Research 2009).

In some cases IT failure has lead to loss of lives as in failed health-care systems, or blighted lives as in social services. Significantly, it is reported that only about one-third of government IT projects succeed (Collins, 2007).

It therefore appears that, to no small degree, *IT in Organisations is not working*, and the issue is not just a top *business* issue or *government* issue. Given its impact it is a *societal* issue, and may be appropriate to ask:

> If the issue is this serious, why isn't something being done about it?

Causes of the problem have been well researched, and it is evident that there are people, management process, leadership, organisation, governance, and technology causes. (Chan and Reich, 2007).

For many, however, it may be that the extent and nature of the problem remains unseen, unknown, and unimportant; it's outside our radar. It may even be that we have come to expect that there is little we can do about it – particularly given the increasing complexity (Garbani, 2010). Indeed, there is some evidence that failure has come to be accepted as the norm (Krigsman 2007, and Hinssen 2009)

No wonder that Business-IT alignment is said to lie at the heart of the issues preventing maturity and growth in IT (Stenzel, 2007). No wonder that alignment is seen as the "Holy Grail" in the field of Information Systems (Huff, 2008).

Vision and Solution

All of this is *not* to say that IT in organisations provides little benefit; far from it. There are many successful systems. The issue is that IT in corporate, government, and non-profit organisations could bring *so much more* benefit if the power & potential of IT were effectively harnessed and optimised. Going a step further, and presenting what might be a Vision:

> If, instead of *failure* being the expected norm, Business and IT were effectively *joined up* as the norm, then up there might be a significant increase in performance and prosperity, not only for business organisations, but also for people working in and for organisations, and for stakeholders across society.

What would happen if, for example, there were a 71 per cent jump in an organisation's performance as a result of Business and IT being joined-up? What would happen if this kind of improvement in performance were replicated across private sector and government organisations as a whole?

This is what happened with one organisation (Swabey, 2007), and there are similar cases (Gibson 2006, Codd 2007, and Aryanpur 2008), and some studies (Marchand et al 2001, Avison et al 2004, Weill and Ross 2004, Weill and Aral 2006, and Chan and Reich 2007), all indicating the positive correlation between joined-up Business-IT and business performance

While taking nothing away from the organisation that experienced a 71 per cent jump in performance and others like it that are doing better at Joined-Up, this kind of performance might be nothing to the greater and wider payback that *could* happen - if Business and IT were *fully and systemically* joined-up. The implication is that:

> If there were joined-up Business-IT across the economy and society it might significantly impact capability and effective working, not to mention citizen satisfaction, and quality of life.

In local and national government, for example, what would happen if the billions of dollars spent annually on IT were spent successfully - instead of much of it being wasted, with some of it in ways injurious to taxpayer citizens (U.S. General Accounting Office 2008, and Foundation for Information Policy Research 2009).

So what is the underlying issue, and what's the solution?

> The issue is not about new, cutting-edge technology. Nor is it about more or better point-and-click training. And it's not about better project management, master data management, service oriented architecture, or even alignment of Business and IT strategy & structure. It's not about any one thing.

Joining up Business and IT is a holistic and systemic issue – and it therefore requires a *systemic* solution.

Describing Joined-Up

What does *Joined-Up Business-IT* actually mean? What's involved? Here's where we put a stake in the ground in describing joined-up Business-IT. However, rather than employ a prolix narrative a graphical model is used, as shown in Figure 1: *Mapping the Meaning of Joined-Up Business-IT.*

Thus, joined-Up Business-IT is or needs to be a *continuous* process and culture; one that needs to adapt to *continuous* change within the organisation and in the external environment (Sabherwal et al 2001, and Luftman 2003). Joined-up is not a one-off. A joined-up organisation is always pro-actively changing and adapting.

The Alignment Paradigm

There have been various solutions offered under the Alignment Paradigm:

- *Vendor Legacy Offerings*, for example, view the Alignment Paradigm in terms of infrastructure or software solutions such as customer relationship management (CRM), enterprise performance management (EPM), service oriented architecture (SOA), and enterprise content management (ECM). One vendor promises *85 per cent of your IT problems solved with our product!*

  Much of the vendor offerings are aimed at making *legacy systems* flexible and responsive to change (e.g. Service Oriented Architecture: SOA), or getting consistent data across the organisation (e.g. Customer Relationship Management: CRM), or cutting the cost of maintenance and support (Virtualisation and Desk-Top Management), since as much as 90 per cent of IT budgets are said to be devoted to keeping legacy systems up and running, or "keeping the lights on" (Sucharov and Rice, 2005).

  Such legacy solutions may have their value, but they are *technology* solutions for an issue which is much more systemic in its nature.

- *Business Process Management* (BPM), similarly, embraces a number of technology solutions aimed at alignment, such as Service Oriented Architecture (SOA), and Business Intelligence (BI).

In fact BPM has been heralded as *redefining competitive advantage for the next fifty years* (Smith and Fingar, 2007). Again, it is only part of the solution.

- *Master Data Management* represents a significant software solution in aligning data domains, information systems and business processes in organisations by centralizing the most critical master data (such as customer name & address or product description) into a single source.

  The fundamental aim is alignment through *data consistency* - meaning that the definition, structure, format, and content at any point in time, of any particular datum, are the same anywhere in the organisation; a single version of the truth. Data consistency is reported to be the biggest data quality issue facing business organisations (Hall, 2010).

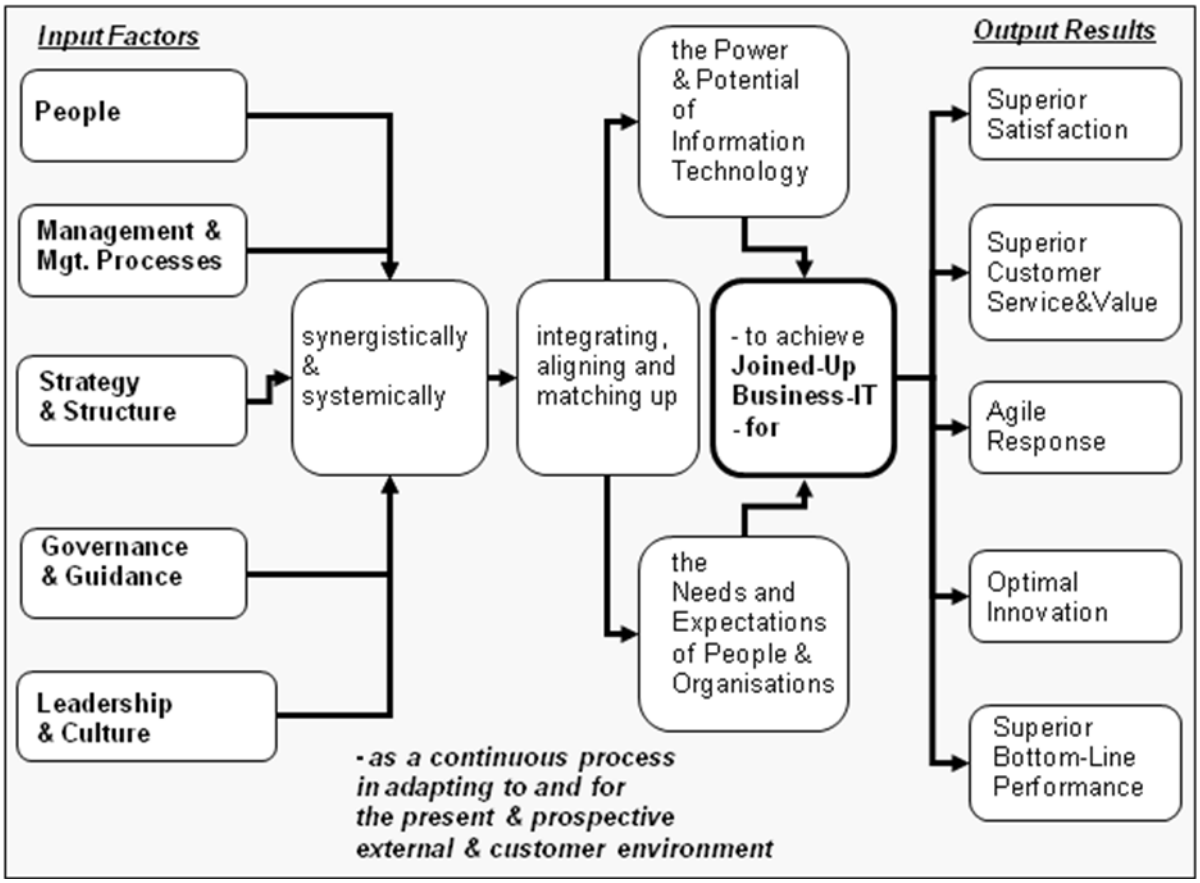


Figure 1: Mapping the Meaning of Joined-Up Business-IT

- *IT Service Management* is about how to achieve alignment by providing effective IT support through service strategy (largely in the form of day-to-day operational support), in alignment with business strategy (Compuware, 2008). Version III of the five-volume ITIL bookshelf (Information Technology Infrastructure Library), is an industry standard for achieving service integration and alignment.

  ITIL provides a comprehensive set of guidelines on how to achieve *Best Practice* in IT Service Management (itil-officialsite.com). It comes under the UK government's Office of Government Commerce (OGC).

However, apart from being only part of the answer to Business-IT alignment, the IT Service Management perspective may restrict IT in Organisations to reactive *service paradigm*, thus stifling IT as a strategic enabler of people and organisations.

- *Communications Convergence* seeks to integrate and align all forms of communication; data, voice and video, on to a single, Internet Protocol (IP) network. It particularly addresses cost reduction, access flexibility and alignment with people & organisational needs for an increasingly mobile workforce (Suby, 2009).

- *Project Management* has a large literature in all its aspects. When made effective it may be seen as the solution to failed systems projects and the answer in aligning IT development with business goals; even more so with up-dated versions of the PRINCE project management standard.

  But the literature on agile development says otherwise.

  In addition, project management in itself can be counter-productive to joined-up Business-IT (whether agile or not), unless it has a systemic/holistic view of the needs & expectations of the organisation as a whole (as for example in other stakeholder needs, data consistency, and enterprise architecture).

- *IT Governance* takes a strategic, top-level view, and it has been shown to have demonstrable value when undertaken effectively: get the overall guidance and direction right and the risks and resources managed appropriately, and the resulting alignment will generally produce a greater level of business performance (Luftman 2003, and Weill and Ross 2004).

- *External-Internal Alignment* seeks alignment by comparing (a) the external environment and industry of the subject organisation, with (b) its internal (IT) core competencies (Manwani, 2008). The aim then is to leverage these core competencies in achieving competitive advantage.

- *Strategy & Structure* has figured large in the academic literature. Like IT Governance, there appears to be a greater level of organisational performance when (a) Business Strategy & Structure and (b) IT Strategy & Structure are in alignment (Chan et al 1997, Papp, 2001, Luftman 2003, Bergeron et al 2004, Chan et al 2006, Chan and Reich 2007, Manwani 2008, and Powell and Yetton, 2008). This is represented in Figure 2: *Strategy & Structure: the Alignment Link*.

  And yet, strategy & structure alignment in itself may be limited to the extent it omits the consideration of two, fundamental considerations: (a) people –hearts and minds, and (2) actual execution – getting alignment things *done*.

  Moreover, the Alignment Paradigm in the Information Systems literature has been described as being too theoretical to be of practical use, and needs to become more relevant to real-life application (Ciborra 1997, Powell and Yetton, 2008, and Glass 2009).

  Since the field of Information Systems is a practise-based field, this issue of *relevance* may not be a minor issue.

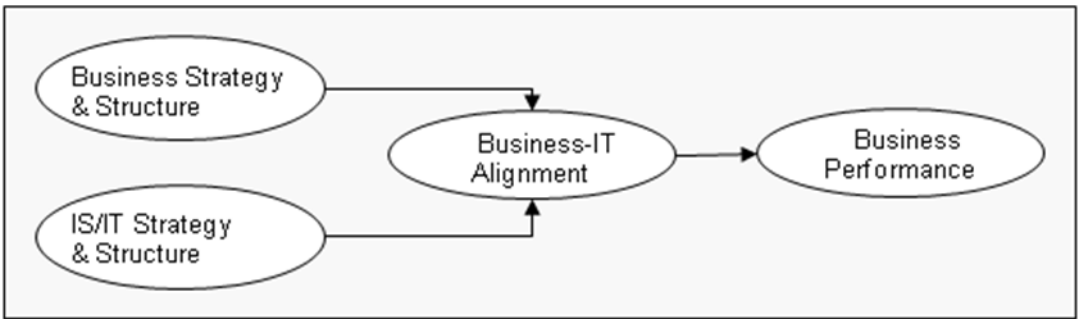


Figure 2: Strategy & Structure: the Alignment Link

More fundamentally, there is a problem in a narrow Alignment Paradigm, as might be seen in the following definition:

> *Business and IT alignment is the process of ensuring that investments in IT are matched to the strategic goals of the business*. (Manwani, 2008).

The issue here is that this kind of alignment is (1) top-heavy, and (2) a one-way street. That IT investments are matched to the strategic goals of the Business is, *prima facie*, a sound basis, but actually getting Business and IT joined up requires a more systemic view of IT in Organisations.

Firstly, Business and IT need to be in sync both strategically top-down *and* from the bottom up, as for example in the need for pro-active collaboration on the ground between IT Customers and IT Professionals, and the need for Business-IT Savvy on the ground – as well as at the top.

Secondly, the direction in matching Business and IT strategic goals needs to operate in *both* directions. It is would seem simplistic to say or imply that management should formulate their business strategies and then throw them over the wall, as it were, to IT professionals, expecting them to be smart enough to deliver whatever is necessary in supporting Business strategies (Hughes, 2008).

IT Itself is or should be a business driver if properly exploited, and innovation with and through IT means (a) pro-actively scanning for *new* technology developments that show promise for business exploitation, as well as (b) entrepreneurial innovation for exploiting *existing* technology. There are therefore opportunities in the technology landscape that demand a response in and from Business strategy. Joined-up goes both ways.

For all of these reasons, from Vendor Legacy Offerings to Strategy & Structure, it is argued that the Alignment Paradigm suffers from *underconceptualisation* (a concept borrowed from Gasparski, 1993). In sum:

> The issue with the Alignment Paradigm is that each perspective, solution and offering may promise "alignment", and might be seen as a *silver bullet* in one form or another. But the need is for a *systemic* solution - since this is a systemic issue.

In other words, alignment is a *many-to-many* proposition.

Consequently, whereas the Alignment Paradigm has been very useful and has got us this far, it now becomes needful to 'stand on its shoulders' and take a broader view in joining up Business and IT. A paradigm shift is needed (Kuhn, 1962). The term "joined-up" is employed in signalling and symbolising the shift to a broader, many-to-many paradigm.

The Cod Fish View

But the need for a broader view than the alignment paradigm is only a beginning in achieving joined-up Business-IT. To enable joined-up there is the need for an integrated and systemic understanding of IT in Organisations which is evidently lacking at the present time, as represented in Figure 3: A *Memo to the CFO from the CIO*.

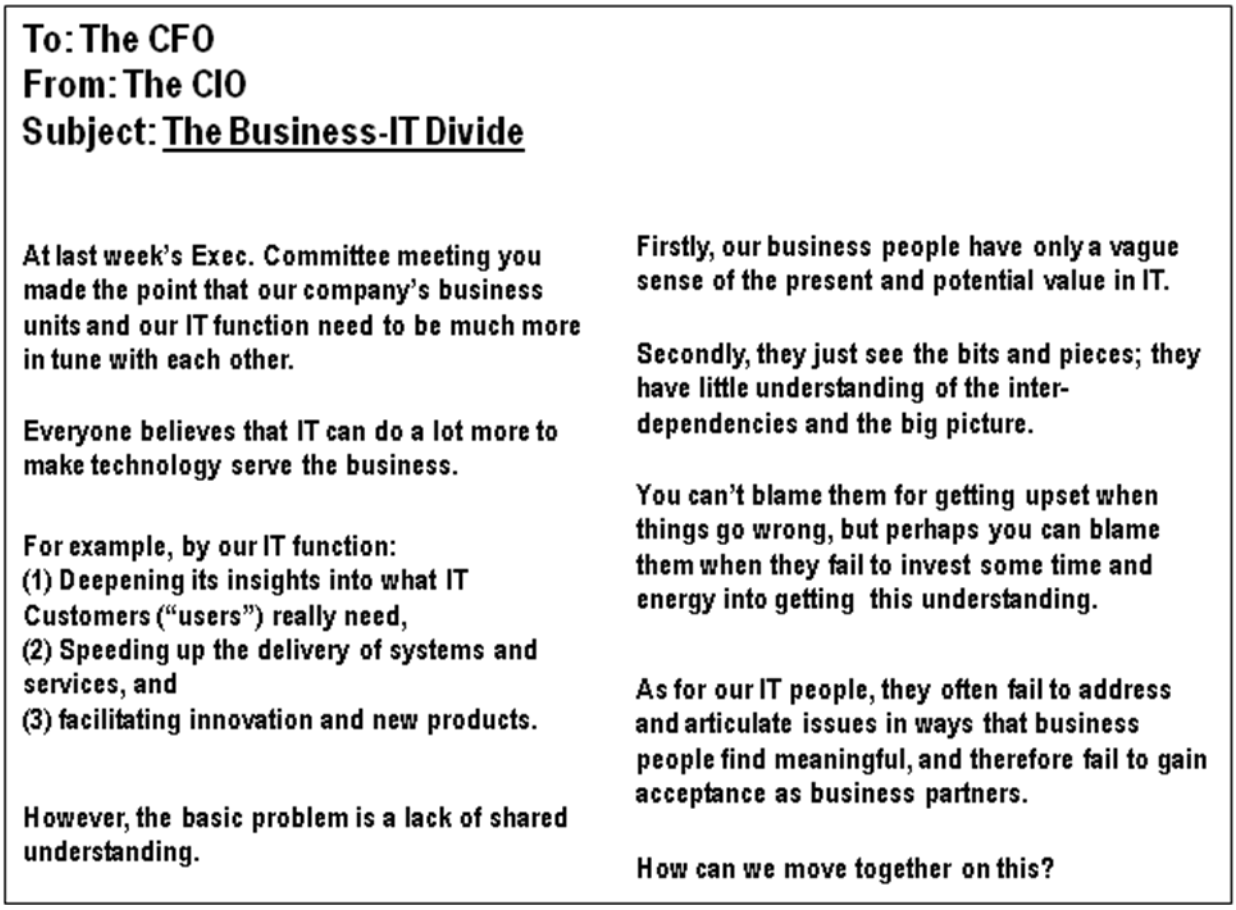
The need for an integrated understanding was the impetus for the origins to this present paper, in *A Systemic Framework for the Field of Information Sysems* (Bacon and Fitzgerald, 2001). Undergraduate students in Information Systems, Computer Science, Accounting, and Management Studies were seen to be 'not getting' IT as a whole; not having a *systemic* understanding of the world of IT in Organisations, and not appreciating that IT is more than just "a tool", and more than a service.

It was seen especially that MBA students, many of whom are experienced managers, were in need of a framework for understanding IT that they could take away and apply in the real world of actual practise.

That students are 'not getting' IT as a whole has been complemented by research indicating that line-of-business managers typically have difficulty in obtaining an integrated and systemic view of IT in Organisations and that, consequently, there is a need for some kind of framework that might enable such a view, as might be seen in *Memo from the CIO to the CEO*, and as called for on previous occasions (Keen 1987, Burnes 1991, Dooley 1991, Keen 1991, and Silver et al 1995).

There have therefore been more than a few frameworks and models for understanding IT in Organisations (Kroenke & Dolan 1987, Earl 1989, Ahituv & Newman 1990,

Morton 1991, DeLone & McLean 1992, Henderson & Venkatraman 1992 and 1999, Ein-Dor & Segev 1993, Robson 1994, Silver et al 1995, Hirschheim et al 1996, Reich & Benbasat 1996 and 2000, Zachman 1987, 1992, and 1997, Iivari et al 1998, Barron et al 1999, Bacon & Fitzgerald 2001, Papp 2001, Sabhewal et al 2001, SFIA Foundation 2005, Alter 2006, Chan et al 2006, and Luftman 2007).



To: The CFO
From: The CIO
Subject: The Business-IT Divide

At last week's Exec. Committee meeting you made the point that our company's business units and our IT function need to be much more in tune with each other.

Everyone believes that IT can do a lot more to make technology serve the business.

For example, by our IT function:
(1) Deepening its insights into what IT Customers ("users") really need,
(2) Speeding up the delivery of systems and services, and
(3) facilitating innovation and new products.

However, the basic problem is a lack of shared understanding.

Firstly, our business people have only a vague sense of the present and potential value in IT.

Secondly, they just see the bits and pieces; they have little understanding of the inter-dependencies and the big picture.

You can't blame them for getting upset when things go wrong, but perhaps you can blame them when they fail to invest some time and energy into getting this understanding.

As for our IT people, they often fail to address and articulate issues in ways that business people find meaningful, and therefore fail to gain acceptance as business partners.

How can we move together on this?

Figure 3: Memo to the CFO from the CIO
Source: The McKinsey Quarterly, May, 2009

And yet, notwithstanding the valuable contributions of these frameworks and models, it would appear that there has been little that could actually be used *in practise*, to join up Business and IT (Powell and Yetton, 2008). Instead, the way in which IT is typically viewed in organisations is represented in Figure 4: *The Cod Fish View of IT in Organisations*.

The metaphor has turned out to have resonance with IT and line-of-business managers to whom it has been shown as part of the research process. The responses are

consistent; the Cod Fish View represents the "messy" way that IT is typically viewed in organisations.

The concern with the Cod Fish View is that (a) it represents a muddled mess that defeats an integrated understanding of IT in Organisations, (b) it is a view that misses the systemic big picture, and (c) it may be a block in joining up Business and IT.

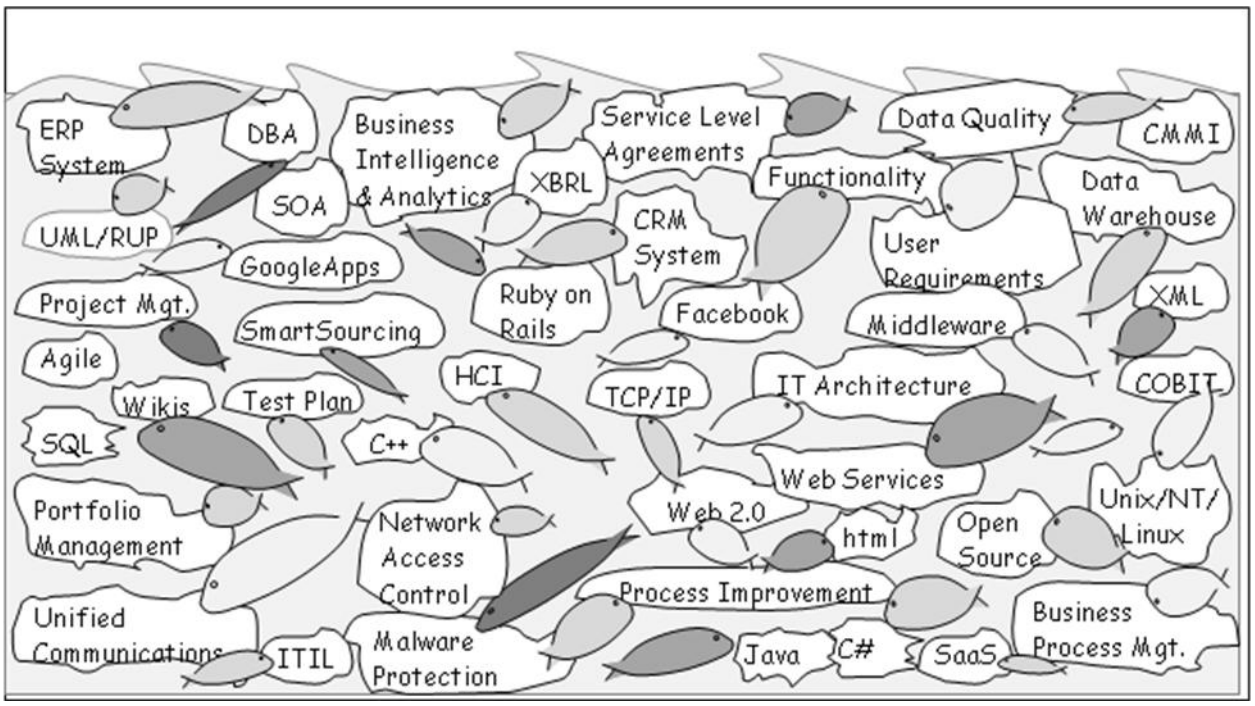


Figure 4: The Cod Fish View of IT in Organisations

There must, therefore, be a better way; something is needed that will serve in providing an integrated and systemic/holistic understanding of IT in Organisations.

The JUMP Model and Systems Thinking

The need is for a robust, big-picture framework of IT in organisations that would (a) give a broad and integrated understanding for application in the real world of actual practise, and (b) provide a basis for what it is that needs to be aligned and joined up.

> This is a key consideration in this research; a framework or model such as that being sought not only needs to facilitate an integrated understanding. It also needs to provide a basis for joining up the key areas or parts of IT in Organisations.

> Systems Thinking, which has its roots in General Systems Theory and Management Cybernetics, and which aims to see the big picture, seeing things in terms of their systemic wholeness and connectedness, is seen as serving both these needs.

It is therefore at this point that we briefly take up the subject of *Systems Thinking*, or what might be called systemic, holistic, big-picture, joined-up thinking – as it applies to IT in Organisations. Ten Principles of Systems Thinking are discussed later, but suffice it to say at this point that:

> Systems Thinking means (1) viewing almost everything as (potentially) a form of holistic *system,* with (2) *intra-dependent parts* within the system, and with (3) the holistic system having some kind of *purpose,* and which (4) must continuously *adapt* to its contextual environment in order to survive, prosper, and fulfil its purpose, and that (5) every system is a system *within a system with systems within itself* that is also connected with *other* systems.

Thus, the business organisation (government, corporate or non-profit) is a form of system, and *IT in Organisations* is a form of system *within* the business organisation, which in turn operates within its external environmental system. This system of IT in Organisations is represented in Figure 5: *The JUMP Model* of *IT in Organisations*.

The original version of the JUMP Model ("JUMP" being explained below), was developed through the Constant Comparative Method of Grounded Theory (Glaser and Strauss, 1967). Grounded theory is a research methodology in the social sciences for generating theory through data collected 'from the ground up', from a sufficient and usually large number of different cases or instances, as opposed to the 'top-down' approach of scientific method that begins with theory and *then* collects data in attempts to disprove the theory (the null hypothesis). Thus, a fundamental difference between Grounded Theory and the more traditional (physical sciences) approach to theory development is that it does not start out with any theory.

In the Constant Comparative Method the key instances - or in this case the key headings, topics and themes found in what was a comprehensive search of the literature for the field of Information Systems - are marked with a series of codes so as to sort into related areas, sub-areas, and sub-sub-areas – each needing to reconcile consistently and thematically up and down and across the coded groupings. Such codification then forms a basis for the creation of theory – or in this case the original

version of the JUMP Model with its intra-dependent areas of *IT in Organisations*, and with its central theme and purpose as shown – Information Value for Business Value.

The literature search and Constant Comparative Method was complemented by a Delphic survey of about 70 leading academics in 21 countries and hundreds of managers. The result was the *original* version of the JUMP Model in "A Framework for the Field of Information" (Bacon and Fitzgerald, 2001).

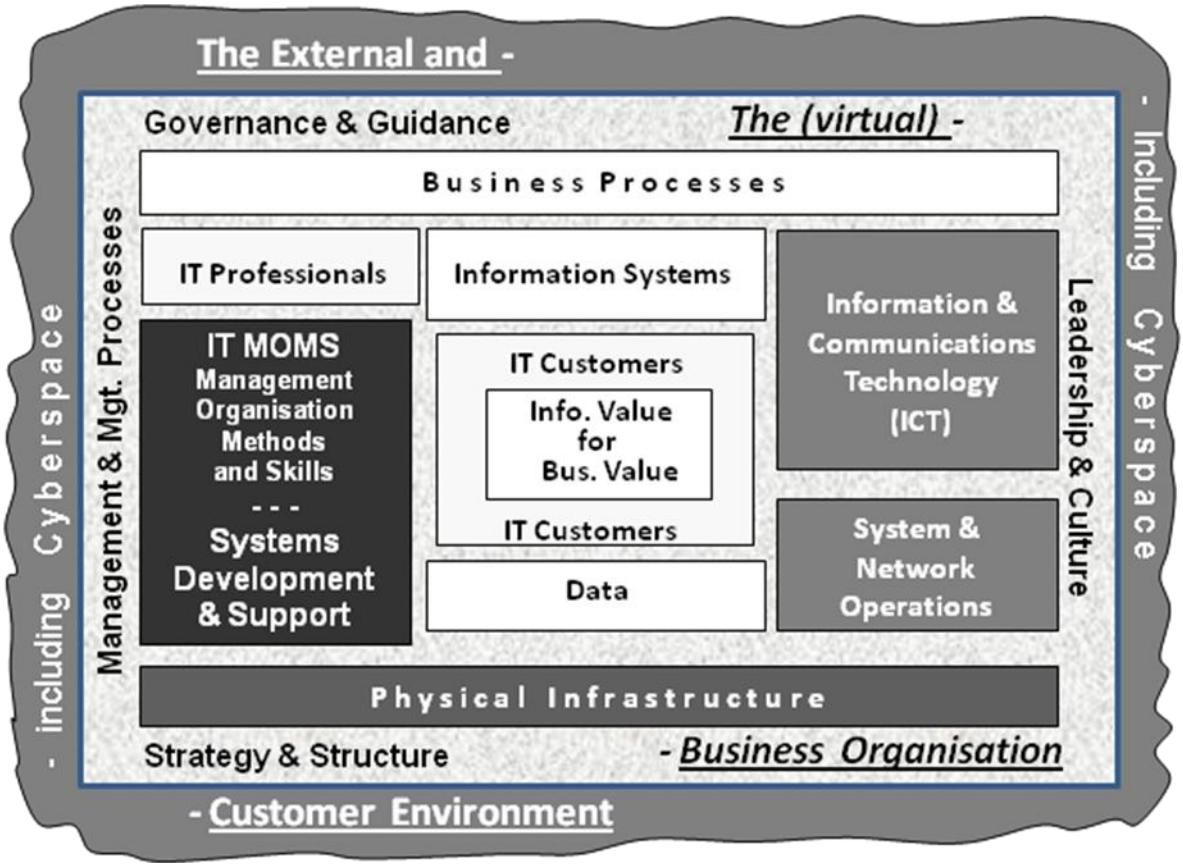


Figure 5: The JUMP Model of IT in Organisations

The version now shown in the form of the JUMP Model, and representing IT in Organisations, is the result of *continuing* consultation with senior academics (of which this paper is a part), business managers, and IT professionals; and *continuing* search of both the academic and trade literature. Therefore:

> Representing as it does IT in Organisations, within the contextual environment, the Model may contribute to a framework for the field of Information Systems.

The field has always been about IT in Organisations; the development, management and use of computer systems in organisations, beginning with its roots in systems

analysis. It is very much an eclectic field drawing on a number of disciplines, and it has never been about "Information Systems" alone and as such. People and society, for example, are also very much a concern.

It has been said (and it would seem a useful metaphor in distinguishing the field), that the field "looks *out* from the computer" at people, the organisation, and society, and how the computer (or IT) is (descriptively) and might be (prescriptively) used, developed, and managed (Galliers, 2007).

This is in comparison with *Computer Science*, which looks *into* the computer with its technology and data; and as compared with *Information Science*, which looks at information largely in terms of organising, accessing and retrieving information in and for the library environment. It might therefore be said that:

> The field of Information Systems is *the pre-eminent field* concerned with *IT in Organisations*.

This has important *societal* implications for the field, since organisations (corporate, government, and non-profit), and that which organisations do (or fail to do) in the context of IT as a whole, can have a significant impact upon society as a whole.

This, therefore, is where the field of Information Systens might be said to add value to society; it would seem to be the only field of study that is effectively equipped (especially given the eclectic and disparate backgrounds of its members), for the study of IT in Organisations. It might be said that Computer Science builds our knowledge of technology – and that Information Systems tells us how to make this technology effective.

As for *"JUMP"* this has two different strands. First, it is an acronym representing *Joined-Up Means Payback* – payback from joined-up Business-IT - with payback seen in broad terms, i.e. not just in bottom-line business performance, but also in IT Customer satisfaction, external customer service & value, innovation, and Business-IT agility.

Secondly, payback in the JUMP approach is also seen in terms of socio-economic payback for customers, investors, taxpayer citizens, and for stakeholders in the

broader society. Joined-up Business-IT is seen in the light of socio-economic payback directly and indirectly to and for society as a whole.

The second strand of "JUMP" symbolises the potential "jump" in satisfaction and performance when Business and IT are joined up.

As for the systemic purpose of IT in Organisations, this is represented in Figure 6: *The Purpose of Information Technology (IT) in Organisations*.

Information Value and the Field of Information Systems

At the centre of the JUMP Model is *Information Value for Business Value*, and this is seen as the central theme and purpose of and for IT in Organisations.

In developing the Model through the Constant Comparative Method as described, "Information" pervaded the instances repeatedly, albeit not always directly. For example, subjects and topic headings addressing Information Systems were taken to be dealing with (1) Information, (2) Systems, and (3) Information Systems (Checkland and Holwell, 1998). Apart from this, the word "information" was and is used again and again in the academic and trade literature.

Therefore, through direct and indirect mention, *Information Itself* repeatedly surfaces as the essential, intrinsic and underlying area and theme characterising IT in Organisations. It pervades and underlies almost everything to do with IT in Organisations.

However, in order to make Information Itself more specific and applicable to IT in Organisations the first version of the Model referred to *Information for Knowledge Work, Customer Value and Business Performance*. The word "Information" by itself was thought to be too general a purpose - and any system in Systems Thinking must have a purpose (even if it is unknown or not articulated), as the root of its purposeful activity (Checkland, 1981).

IT in Organisations, therefore, is not just about "Information". It needs to be about Information for some kind of *purpose*. Decision-making is not the purpose in itself, since this traditional paradigm has been shown to be too narrow (Bacon, 1997). It is a case of underconceptualisation. Rather, Information is more generally for knowledge

work in organisations; it is ultimately for customer value; it must be for people and business performance.

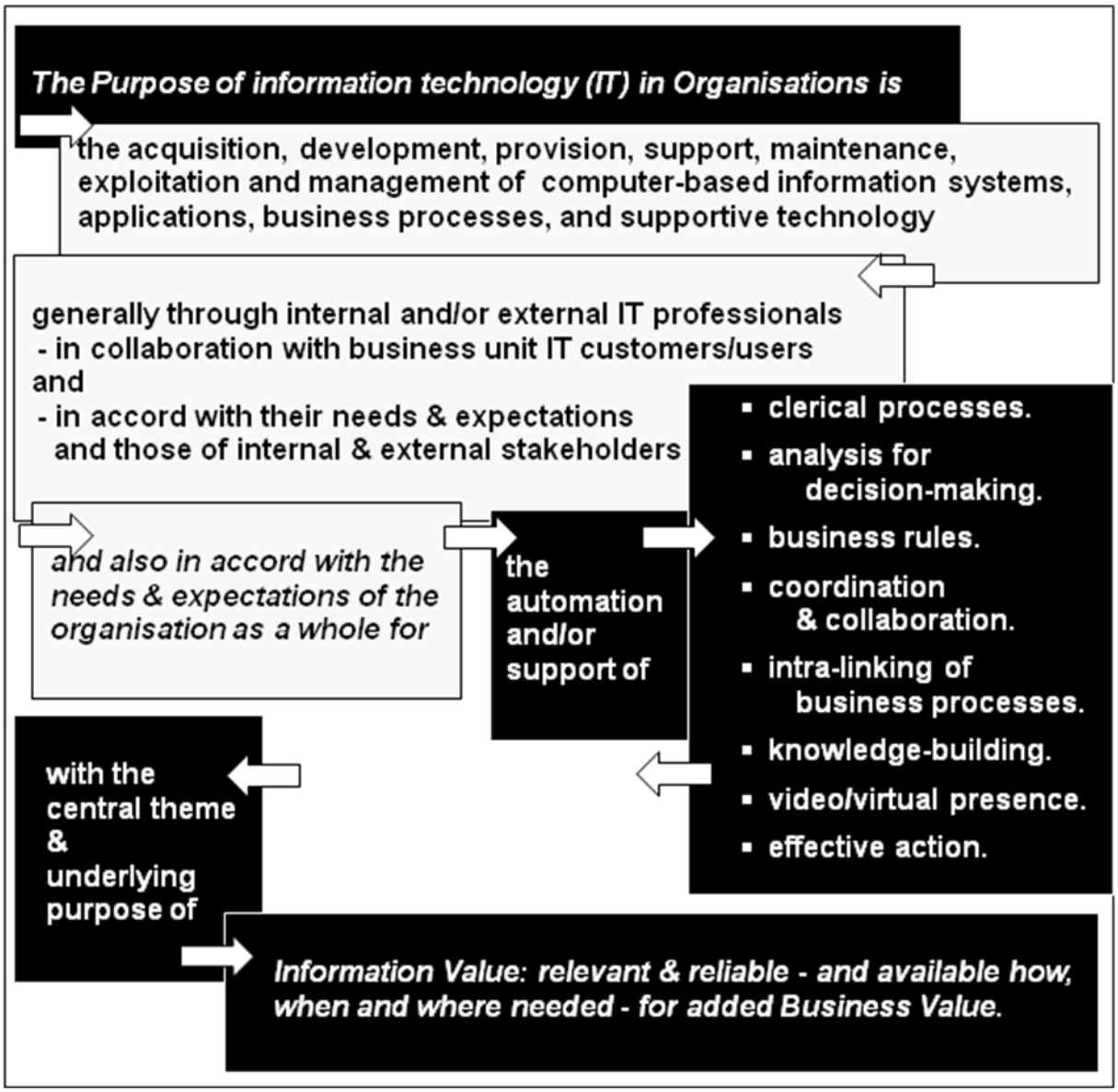


Figure 6: The Purpose of Information Technology (IT) in Organisations

But information has an all-important role in information for action, since purposeful activity or *action* is what any kind of system inherently and fundamentally *does* (Checkland and Holwell, 1998). Information for action is also the greater, real-world purpose (Bacon, 1997).

> In sum, the finding is that Information in Organisations, and for IT in Organisations, serves a *multiplicity* of purpose.
>
> The question then becomes: how to represent this multiplicity of purpose for Information, at the centre of IT in Organisations?

And yet, more fundamentally, what is Information Itself – in organisations? There have been more than a few definitions offered, many of which confuse and conflate information with data and/or knowledge, and many of which are based on a particular paradigm (such as *Information Theory*), or a personal view based on individual experience (Bacon, 1997). The aim has been to take all of this into account in describing information and related concepts in Figure 7: *The Information-Centric Pyramid.*

From the frequent instances of "Information" recorded as part of the Constant Comparative Method, and in order to represent the multiplicity of purpose for information in organisations and IT in Organisations, a simple yet broad concept is needed which might represent the central theme and purpose of and for IT in Organisations, and this is seen to be:

Information Value for Business Value

It may be unlikely that *Information Value for Business Value* is the first thing that comes to mind for the practitioner as the central theme and purpose of and for IT in Organisations. It may be more likely Technology Itself is the driving purpose.

But it is also the case that information is often confused with data and/or knowledge. This can often be traced back to so-called Information Theory (Shannon & Weaver, 1948), which even the Oxford Dictionary refers to in defining information. But Information Theory is not about information at all. Rather, Information Theory is about the statistical implications of telegraphic signal transmission (Bacon, 1997). As shown in *The Information-Centric Pyramid,* signals are quite different from information.

Thus, information as a concept remains woolly, nebulous and unknown, and this can lead to mistaken or ineffective action, since words drive concepts, concepts drive thinking, and thinking drives action.

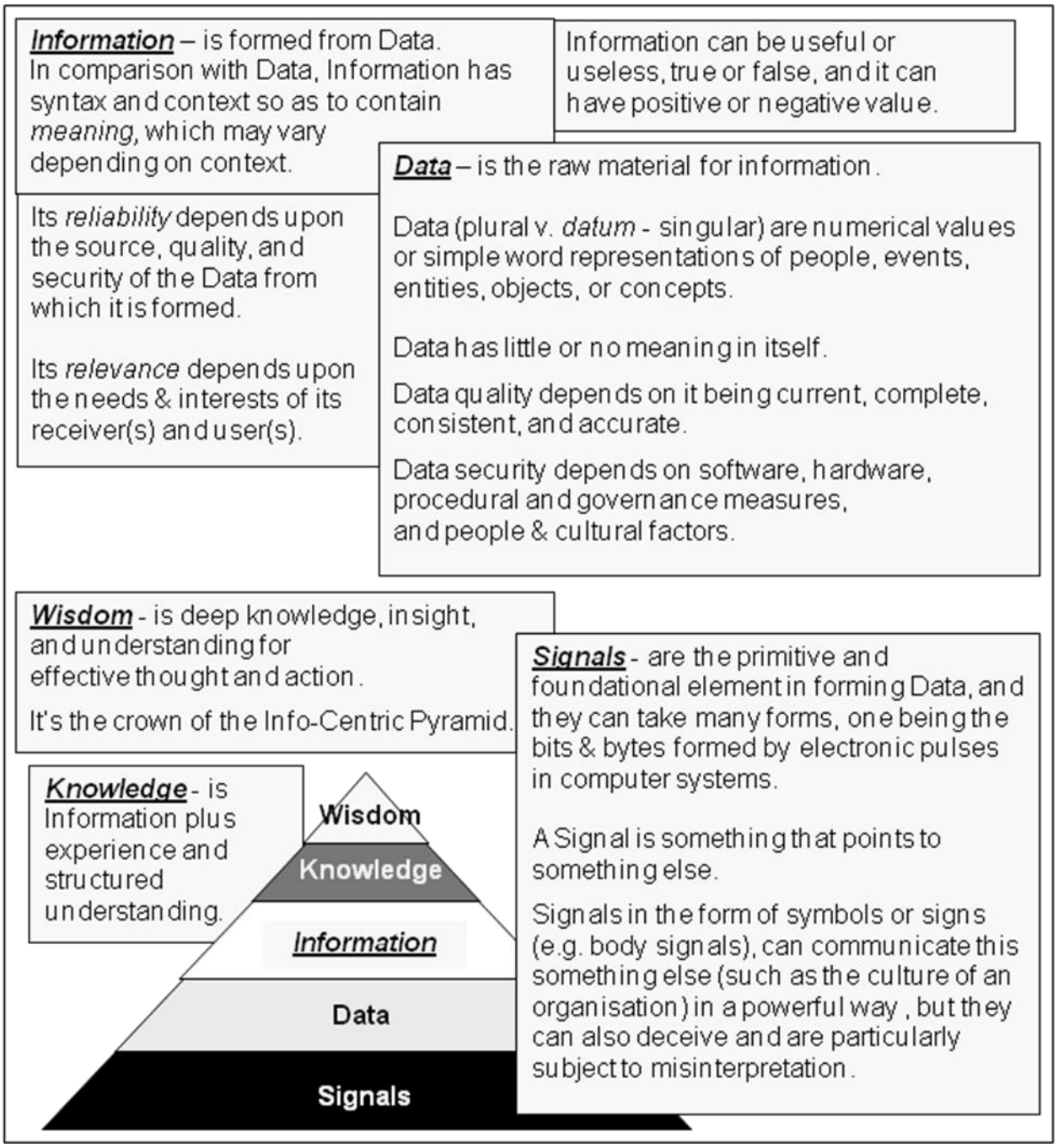


Figure 7: The Information-Centric Pyramid

The remedy might be a satisfactory definition and understanding of information, as opposed to data and knowledge, such definitions having been suggested as above.

For the field of Information Systems the implication may be that:

> If *Information Itself* is a fundamental concept and *Information Value for Business Value* is the central theme and purpose for IT in Organisations, and if

> there is a need for a deeper and broader understanding of Information (what it is and what it isn't), and its multiplicity of uses in business organisations, then the field of Information Systems (being the pre-eminent field concerned with IT in Organisations), might give greater research focus to Information Itself, and how it is actually used in organisations.

If it is the case that Information Value for Business Value is not the first thing that comes to mind for the practitioner as the central theme and purpose of and for IT in Organisations, then it may be that Information Value for Business Value is not so much a *descriptive* as a *prescriptive* indication of what IT in Organisations is ultimately all about; it is or needs to be the "Big Idea" (Checkland and Holwell, 1998).

Otherwise, it may be that Technology Itself is the default theme and purpose.

Describing the 12 Areas of the JUMP Model

Each part or area of the JUMP Model is described in Figure 8: *The 12 Areas of the JUMP Model: IT in Organisations.* It assumes the *virtual* organisation, wherein some parts or areas of IT in Organisations may not be sourced with the organisation proper.

At a later point it will be shown how these 12 areas form the basis for Business-IT Synergy Theory.

The JUMP Process and its Themes

The *JUMP Model* is used by a complementary *JUMP Process* to achieve Joined-Up Business-IT. The Process does this by taking the Model apart and putting it back together in a *search for synergy* between the intra-dependent areas or parts of the JUMP Model. The seven themes are as shown on a subsequent page.

The Process incorporates Business-IT Synergy Theory which, based on Systems Thinking, provides the rationale for systemically joining up Business-IT, as described in the following section.

The seven themes of the JUMP Process are based on a search of the academic and trade literature; these appear to be the enduring themes or aspirations for IT in

Organisations. Each theme in itself aims to lead to broad payback outcomes from joined-up Business-IT, as described earlier.

There is not the space to describe the seven themes in detail here, but their headings may at least be self-explanatory and sufficient in indicating content.

Figure 8: The 12 Areas of the JUMP Model: IT in Organisations

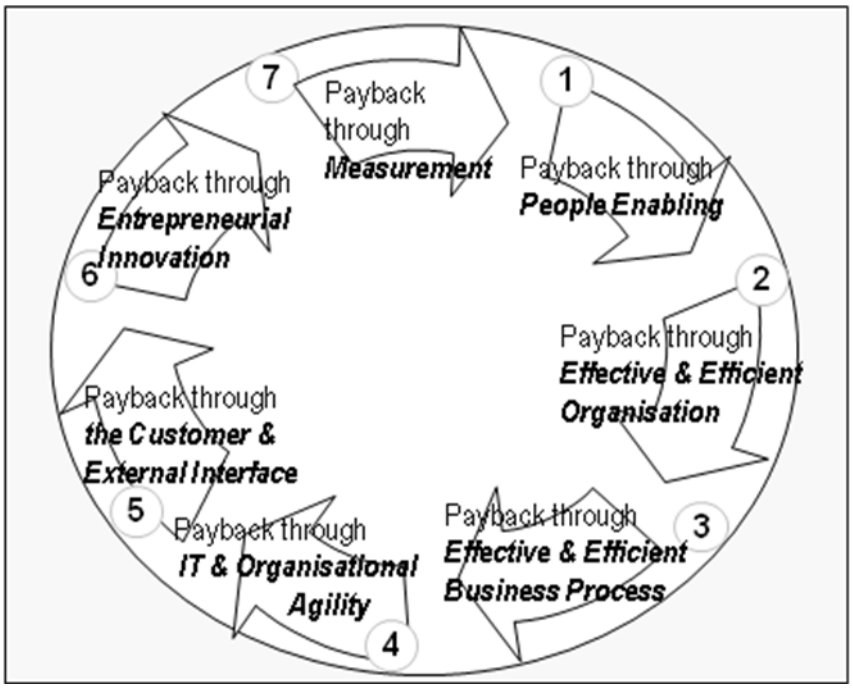


Figure 9: The JUMP Process

Business-IT Synergy Theory

Joined up Business-IT is achieved in the JUMP Process and its use of the JUMP Model through *Business-IT Synergy Theory*, as shown in Figure 10..

To begin with:

- Stages 1 to 5 of Business-IT Synergy Theory, up to and including a *Systemic Whole of IT in Organisations*, encompasses the development of the JUMP Model.
- Stages 6 to 9 are the subject of the JUMP Process. These stages lead up to and include generalised *Possible Actions* for bringing about joined-up Business-IT. It is in these stages that each of the seven themes in the JUMP Process are addressed, for each of the significant intra-relationships in the JUMP Model. This is considered in the form of two matrices or spreadsheets.
- The first spreadsheet is for the *Purposes* and the *Idealised or Synergistic Expressions* for significant intra-relationships. Along the top and repeated down the side of the spreadsheet are all 12 areas of IT in Organisations as represented in the JUMP Model. The boxes in this first spreadsheet are populated with (a) the Purposes, and (b) the Expressions. It is only the *significant* intra-relationships that need to be populated.
- The second spreadsheet has the seven themes of the JUMP Process down the left side, and all intra-relationships along the top (many to many), as for example between Information Systems and Business Processes, between IT Professionals and IT Customers, between Data and Business Processes, etc.

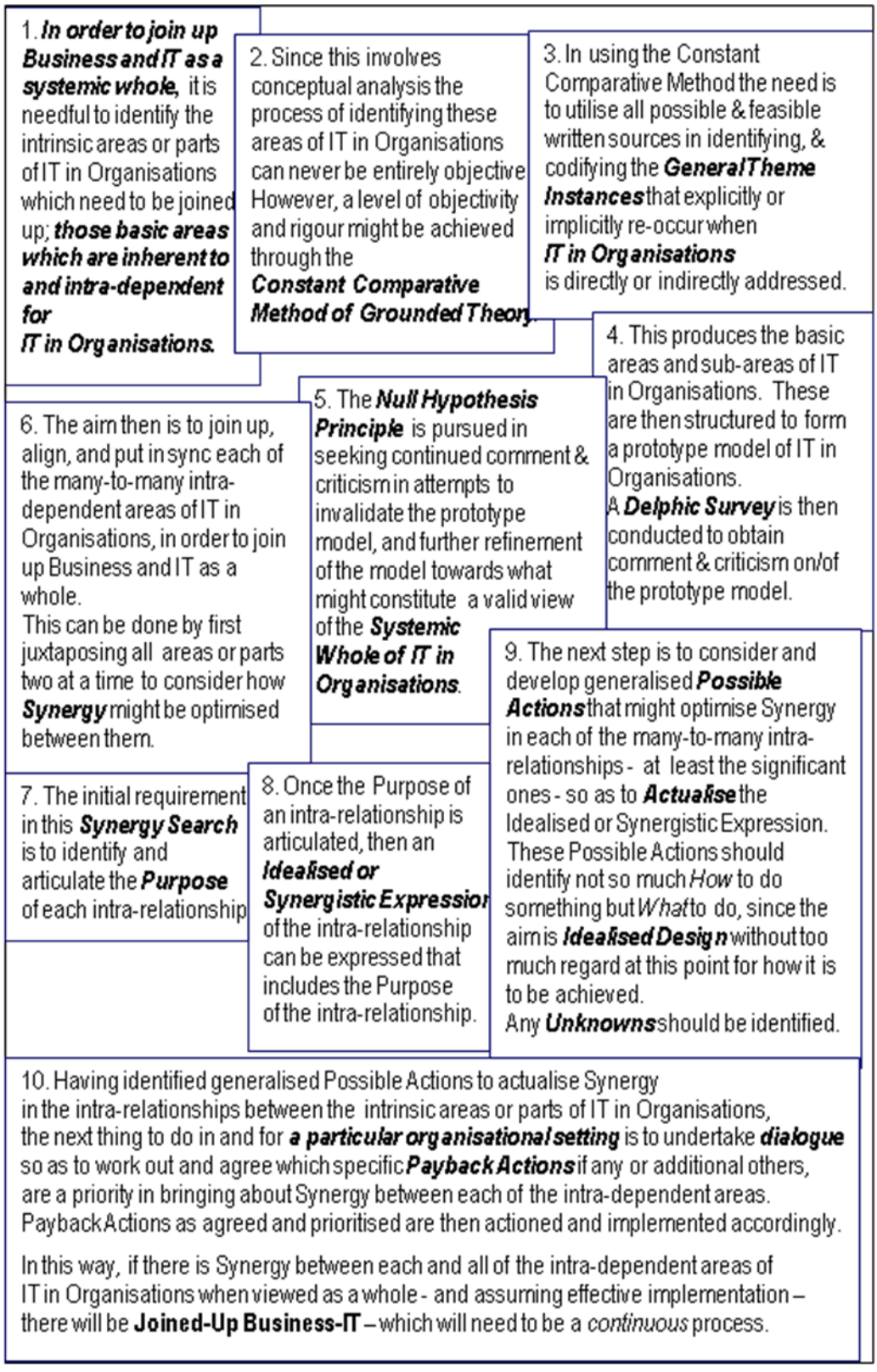


Figure 10: Business-IT Synergy Theory

- The boxes in this second spreadsheet are populated by Possible Actions to bring about joined-up Business-IT in each intra-relationship – but again, only for the significant intra-relationships.

- Stage 10 is the action and implementation stage, where specific Payback Actions are developed in and for a particular organisational setting.

Based on Purpose, what is the *idealised or Synergistic Expression* of a given intra-relationship? An example showing Purpose and Expression is shown in Figure 11: *Example Purpose & Idealised/Synergistic Expression.*

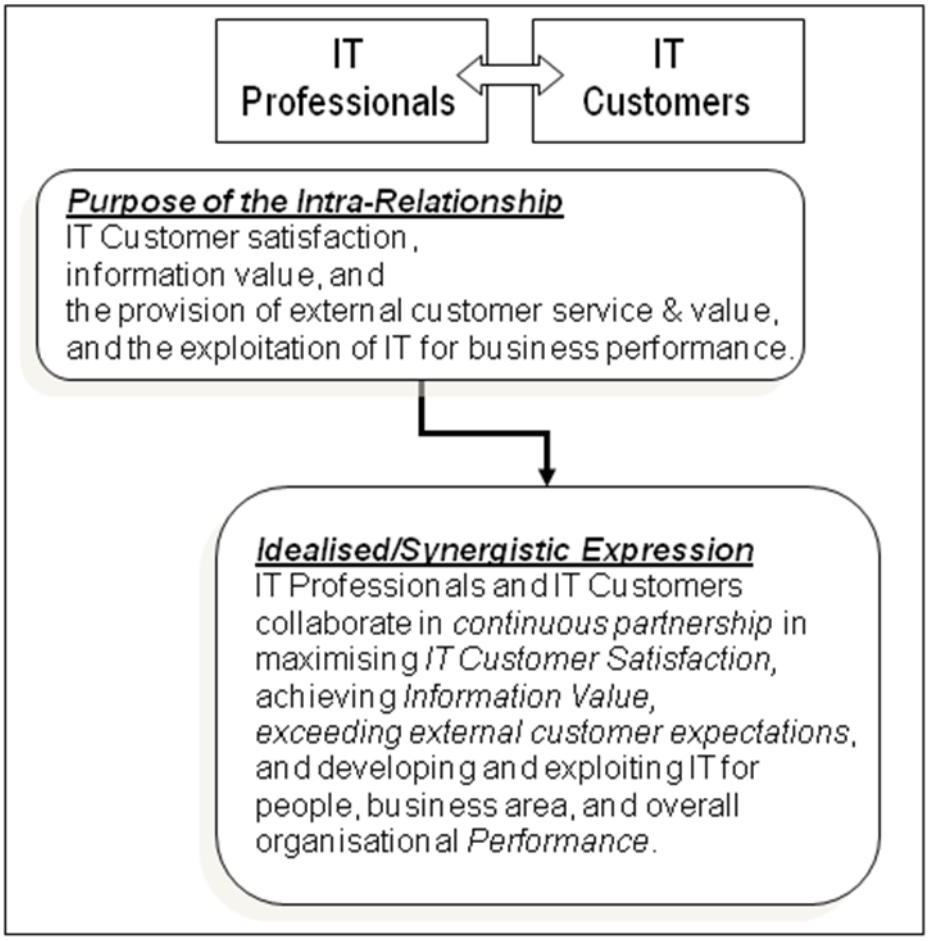


Figure 11: Example Purpose & Idealised/Synergistic Expression

In identifying generalised *Possible Actions* to actualise the Synergistic Expression it is important not to become too focused on the *How* detail in these actions. This will come later, once all the Possible Actions are considered and prioritised together – as a whole. For now, *what* needs to be done is sufficient, according to the *Idealised Design* principle of Systems Thinking (see later discussion).

There may be Possible Actions that are found to be less than useful or inapplicable for a particular context or environment. It doesn't matter. What does matter is that

Possible Actions spark and facilitate *dialogue* for the discovery of specific *Payback Actions* in and for a particular organisational setting which *are* useful. This is the aim of generalised Possible Actions.

Generalised Possible Actions might be seen as textbook outcomes, and this is because - they are!:

> Apart from its Foundation Module, the book-in-progress on which this paper is based is largely concerned with Possible Actions to bring about (greater) synergy in and for each *significant* intra-relationship in the JUMP Model, under each theme of the JUMP Process; each Possible Action being preceded by discussion and rationale for the Possible Action.
>
> This is the current status of the book-in-progress – the development of Possible Actions with iteration back to the Foundation Module as occasioned by continued discussion, presentation (as in this paper), and research.

Actual business change and implementation in a particular setting only begins to occur when *Possible Actions* are:

1. Considered as Possible Actions in workshop dialogue by joint Business-IT groups (wherein initially only the *what* not the *how* is considered).
2. Accepted, rejected, modified or added to by such groups.
3. Associated and identified with any Unknowns.
4. Prioritised
5. Converted into specific *Payback Actions* wherein the Implementation *How* is worked out by task-force groups*.
6. Accepted by and assigned to empowered, cross-functional task groups for business change.

> * In fact GE, which uses *Action Learning* (not to be confused with Action Research), of empowered, cross-functional, self-managing, mutual-coaching groups, and which is the means of business change used to implement Payback Actions, calls these groups *Work-Out Groups*. Action Learning is the business change approach used in the book – for which there is not the discussion space in this paper.

An example of generalised Possible Actions is shown in Figure 12: *Example of Generalised Possible Actions (abbreviated) Intra-Relationship ()ab: IT Professionals – IT Customers; Theme: People Empowerment.* These are *abbreviated* Possible Actions, given that there is not the space to go into greater detail in this paper.

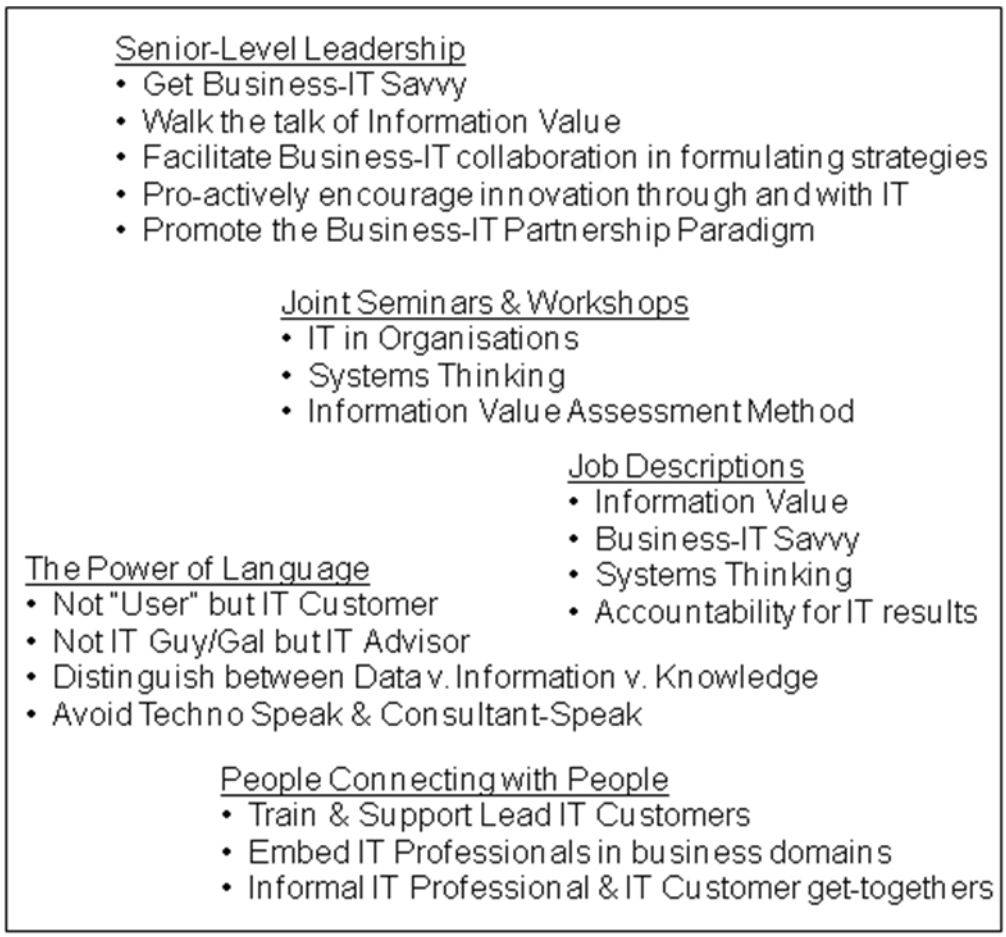


Figure 12: Example of Generalised Possible Actions (abbreviated) Intra-Relationship: IT Professionals – IT Customers; JUMP Process Theme: People Empowerment

Ten Principles of Systems Thinking: A Summary

Systems Thinking is seen as the glue in the mix, the X Factor in joined-up Business-IT. A summary version of Systems Thinking principles is shown in *Ten Systems Thinking Principles: A Summary*.

Systems Thinking is the third leg or basis for "JUMP" (joined-up means payback). As a systemic whole representing IT in Organisations, the JUMP *Model* is used by the JUMP *Process* through the rationale of *Business-IT Synergy Theory* for synergy search; a continuous search for ways of achieving greater synergy between the intrinsic, intra-dependent areas of IT in Organisations, so continuously enhancing joined-up Business-IT.

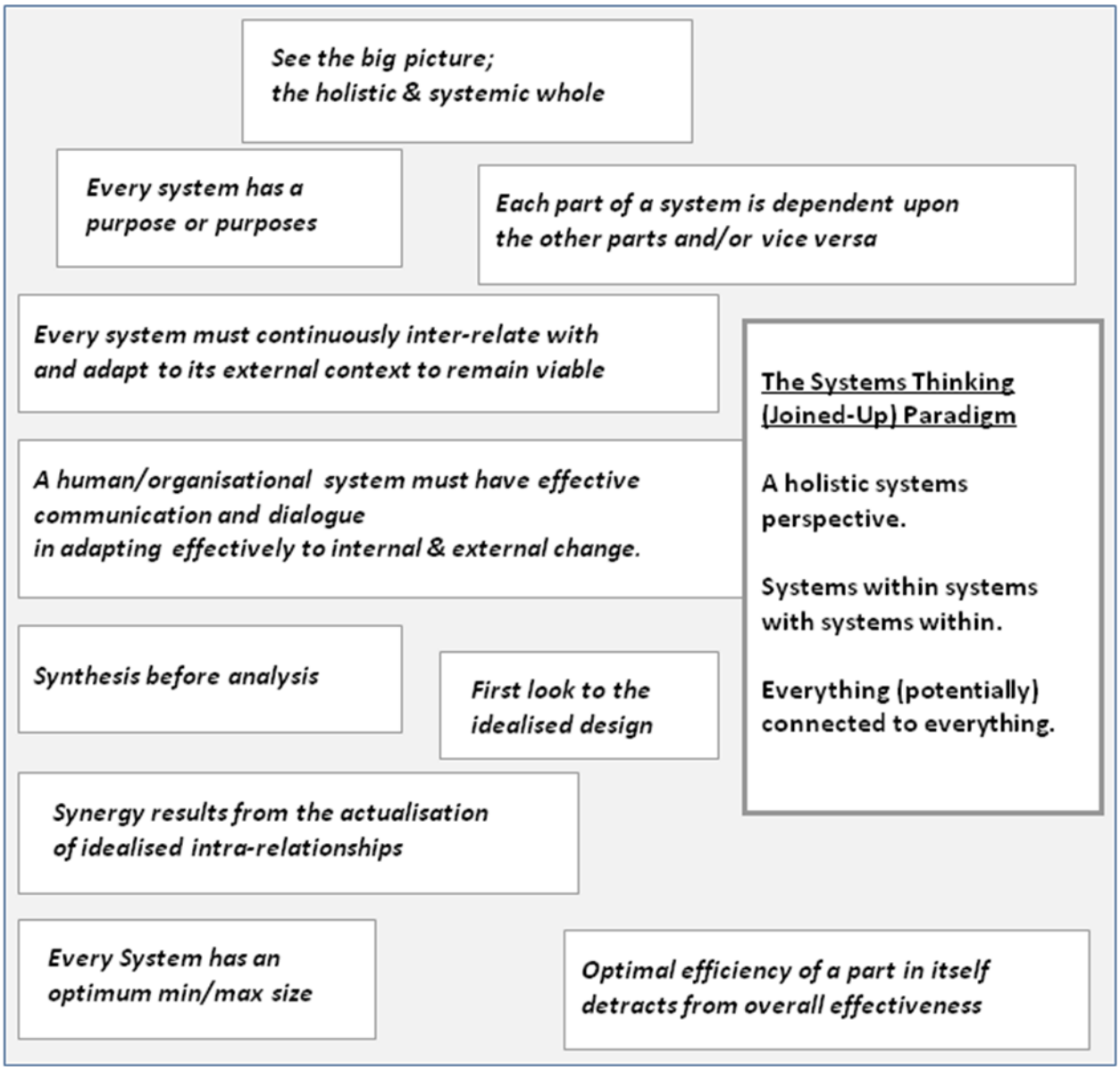


Figure 13: Ten Systems Thinking Principles: A Summary

Systems Thinking is the glue in the mix. In addition to underpinning Business-IT Synergy Theory, it is also the underlying culture and way of thinking needed to drive the continuous search for synergy in joining up Business and IT. Systems Thinking might also be called *systemic* thinking, *joined-up* thinking, *holistic* thinking, *big-picture* thinking, *connected* thinking, and even *synthetic* thinking – the latter given that it aims to synthesise parts into a whole (Ackoff, 2003).

Quite apart from IT in Organisations and joining up Business and IT, Systems Thinking is a worthy subject in itself, for it has been proven to be a powerful enabler of satisfaction, performance, and authentic customer service when it becomes part of

the organisation culture ((Checkland 1981 and 1990, Espejo 1989, Flood 1995, Sugarman 2001, and Ackoff 2003).

However, it is not apparent that Systems Thinking is generally understood or used in organisations; it seems to be quite the reverse. What might be called *Parochial Thinking* seems to be more the norm, or in the context of IT in Organisations, *Silo* thinking. It is often a silo or *Stovepipe* view of the particular technology, application, process, hardware platform, software solution or "user" need, that's the concern.

It seems that the reason for this absence of use and awareness of Systems Thinking is its accessibility; it seems to be little understood. This may be due to a lack of education in Systems Thinking, and/or a lack of Systems Thinking principles being enunciated so as to facilitate education and understanding.

Although, if it is to be part of a joined-up culture it critical that Systems Thinking have senior management pro-active support, as amply demonstrated in one particular case study (Sugarman, 2001). Even so, the issue generally appears to be a lack of education and understanding for Systems Thinking.

Ten Principles of Systems Thinking: Discussion

So what is Systems Thinking? The brief and general description provided earlier referred to (1) viewing almost everything (potentially) as a form of holistic *system,* (2) *intra-dependent parts* within the system, (3) the holistic system having some kind of *purpose,* (4) continuous, systemic *adaptation* to the contextual environment, and (5) every system being a system *within a system with systems within itself* and connected with *other* systems.

The following discussion of Ten Principles of Systems Thinking is oriented, especially in its examples, to the organisational environment

- *See the big picture; the systemic whole:*
  everything is a system within a system, with systems within it.

  This is the foundational principle of Systems Thinking.
  It initiates Systems Thinking as a *theory*, and a theory is "a net that we cast to catch the world as we see it, so as to rationalise, explain and master it" (Popper, 1968).

Seeing things in general as (potentially) systemic wholes, informs and explains much in our complex, globally-connected, ever-changing world, and helps us to understand and operate effectively in it.

It enables us to master the systems we are part of and connected with, and the systems (including Information Systems), that we ourselves create.

Therefore, what is the *subject* system?

In terms of where we are and what we are doing, what is the subject system we're looking at, or operating in and part of, or interfacing with, or creating, or improving?

What are its boundaries?

Then, what is the *contextual* system of which the subject system is but one part?

Beyond the contextual system, what is the *supra* system?

What are the subject system's *sub*-systems?

At the social level, for example, when watching a football or rugby game, and given that all teams are a form of system, how does the team operate as a system? And what is the team as a whole? Does it include the manager, coach, trainer, physiotherapist and other parts as inter-dependent parts of the whole; where are its boundary lines?

At the national level and our system of government as the subject system; how is it operating as a system? The economy, with its mix of government and free enterprise activity; how is it operating as a system? Where are or should be its boundary lines? What is the *contextual* and the *supra* system?

Our own job or function: (a) what is the whole job or function as a system, and (b) what is the contextual system of which it is a part, and how does this contextual system operate?

- *Every system has a purpose or purposes, whether known or unknown, with such purpose being effective to the extent it responds to the external context.*

  Why does the subject system exist; what is its purpose; its *raison d'etre*? Almost everything is (potentially) a system (within a system and with systems within it), and every system has a purpose or purposes, whether known or unknown, and whether articulated or not.

  The Purpose of any system as a whole is the basic benchmark against which all of its activities are measured, its effectiveness determined, and its reason for being justified. It is therefore critical to know, if not articulate, the Purpose in plain and simple terms – so that *all* will know.

  If the Purpose has been articulated and the Purpose known, and if there is buy-in to it, then this will facilitate *unity* of purpose.

  But Purpose must have relevance within a *subject* system's *contextual* system – otherwise it has no *valid* relevance.

Therefore, is the Purpose of the subject systemic whole articulated and agreed, and is this being fulfilled and satisfied as against the needs and requirements of the contextual system and supra system?

- *First look to the idealized design based on the Purpose of the system, regardless of practical constraints.*

  The design, upgrade and maintenance of any system must first look at the whole as a whole, in consideration and fulfillment of its Purpose, and not in the first instance be distracted by detailed (albeit practical) constraints that may or may not have relevance when the overall design is complete.

  It must focus on *what*, to begin with, more than *how*.

  If this is not done then the design may be undertaken not so much in consideration of the whole and its Purpose, but rather the constraints and transitory elements. Design needs to be in accord, first and foremost, with the Purpose of the whole, and *only* after this should constraints and transitory elements be considered.

- *Synthesis before analysis: first determine & define the subject system as a whole, in terms of its boundaries and its external context.*

  Synthesis brings together the parts into a whole. It is the opposite of yet complementary to scientific analysis and reductionism, which aims to break down and reduce things to their basic parts.

  In comparison, synthesis is all about considering and pulling the parts together; seeing them and considering them as a whole. This needs to come first, before analysis, otherwise the error is that of not seeing the wood for the trees; that is, first focusing on the detail and missing the whole itself.

  What is the whole; what are its boundaries, wherein it interfaces with its external context and other systems? Which parts are intra-dependent parts of the whole, and which are not - and thus not part of the subject system?

- *Every system has an optimum min/max size given its purpose.*
  (1) Beyond the max. size a system ceases to be viable due to
  (a) intra-relationship complexity, and/or difficulty of sustaining itself within its external context,
  and
  (b) for organisations and projects in organisations, loss of human identity with the system as a whole, and its purpose.

  (2) Below the min. size it ceases to be viable due to insufficient capability and/or capacity for its purpose, within the external context.

  Depending upon its context and external environment, a system may be potentially too big or too small to be viable or fit for purpose beyond the short term.

  The dinosaur, the complex conglomerate, the over-staffed project team, the sprawling government department, the multi-language & multi-cultural political union, and the vastly complex legacy computer information system are examples of systems that may be too big.

The common factor in these examples is that the entity is too large to act as a *coordinated whole*, and/or adapt *quickly* enough to its changing, external context; the parts cannot be managed, maintained or coordinated cost-or-time-effectively, with all of the many different parts with which there are inter-dependencies, and with the external environment.

As for optimum min. size, an example of a system being too small is a project team that may be too small to get the job done given the level of external co-ordination and multiplicity of tasks required.

Other examples are a one-man Safety Officer function in an organisation, a sports team without a key player, or a CIO without sufficient staff to manage an organisation-wide responsibility.

The Gulf of Mexico Oil Spill provides a further, albeit horrific example. The report of a Presidential Commission said that the U.S. Department of the Interior was understaffed given the activities, decisions, and inspections that it was expected to carry out in assuring health & safety (Graham, 2011). It was below min. size.

The common factor in these examples is that the entity does not have the critical mass and/or the parts required; it is too small as a systemic entity to effectively fulfill or serve the Purpose of the whole.

- *Every system must inter-relate effectively with and continuously adapt to its external context to remain viable.*

  If a system is a living, intelligent organism, as for example a human being or human organisation, it must continuously change and adapt itself, if it is to survive, prosper, and remain viable within its ever-changing external context or environment.

  This principle goes back to the very core of Systems Theory, wherein any living being, organism or organisation is seen as a systemic whole, interacting with and adapting to its environment in a continuous feedback loop, in order to survive and remain viable.

- *Each part of a system:*

  (1) is dependent upon the other parts for the parts to comprise a true system,

  and/or

  (2) is depended upon by the other parts for the way the system works as a whole, and for the system to be viable in its external context.

  If a part, such as a gift shop in a hospital, a badge or decorative design on a car, a cafeteria restaurant in a company, or a retail store for an on-line bookshop, is not essentially dependent on the other parts or vice-versa then it may not, really, be part of the system. Accordingly, it might be removed, with positive cost v. benefit impact.

  But a contrary implication is that a part *added* to a systemic whole may not be synergistic, but rather anti-synergistic. For example, analyses of mergers & acquisitions (M&As) appear to indicate that, in most cases, M&As do not add value to the new systemic whole.

A further example is in information systems, where a patch to a legacy system could reduce the value of the system as a whole. It is anti-synergistic.

On the other hand (in the organisational environment), an activity or function which is outsourced, such as customer deliveries, help-desk support, information systems development, or an enterprise cloud computing application, may well be considered part of the systemic whole, and therefore an essential part of the *virtual* organisation, if the intra-dependence is intrinsic.

- *If each part of a system operates as efficiently as possible in itself, then the system as a whole will be sub-optimal and ineffective.*

  This Systems Thinking principle has particular application in the organisational environment. It may be that, to be optimally efficient, the business unit or function should operate without particular reference to the other parts of the organisation. It may well be able to operate more efficiently this way.

  Examples might be in the areas of data quality, health & safety, or needs & requirements in information systems.

  In *Data Quality*, a department may appear to operate more cost effectively if it does not scrutinize or spend time updating customer or product detail, or if it has its own, convenient way of defining its data, or if its only concern is its own data needs, or it has its own spread sheet system that may not integrate with the data needs of the rest of the organisation, but which suits its own needs very well.

  These things could have detrimental implications for the rest of the organisation, where much re-work, correction, poor decisions, and added cost might be the consequence.

  As to *Health & Safety*, a horrendous example of what can happen without Systems Thinking was the Macondo well Gulf of Mexico oil spill in 2010. It was apparent that different areas, although they may have been cost-effective in themselves, and even doing their own jobs well and according to management expectations, were not linking effectively nor thinking of the big picture. This would have added or be seen to have added to time and cost. The outcome was a loss of eleven lives and a very big cost to the organisation, to the ecological landscape and its wildlife, and to the Gulf of Mexico region as a whole. The report of the Presidential Commission on the disaster said that "the root causes were systemic . . . and likely to re-occur . . ." (Graham, 2011).

  Needs & Requirements in Information Systems are often considered in terms of "requirements" as opposed to needs, and the requirements of a particular department, business area, business process, information system or manager. Front-end and continuing analysis and learning may not take into account the big picture context; the needs of the organisation as a whole. The outcome can be hard-to-maintain legacy systems, poor data quality, shackled knowledge, and poor customer service (Hall, 2010).

- *Synergy is where the whole is greater than the sum of the parts: it results from the actualisation of ideal intra-relationships between the parts, for the respective purpose of each intra-relationship, within the purpose of the overall system.*

  There may be attributes emerging from the whole as a result of the intra-relationships within the whole, but which have limited meaning in the individual parts themselves. When these are *positive* attributes (because intra-relationships could have a negative effect), then there is synergy. The whole, as a whole, benefits..

  The key or the aim is for ideal intra-relationships in a system to be optimised; an ideal intra-relationship in the sense that the respective parts work well together in terms of purposeful achievement.

  In the organisational situation therefore, the aim is to consider and define the ideal in relationships between different parts of the organisation. It is essentially the descriptive v. the prescriptive; how might the descriptive be improved to achieve the prescriptive, given the purpose of the relationship, and impact on the overall organisation and its purpose?

- *(1) The parts of a living system need to intra-relate and intra-adapt as a whole to:*
  (a) accommodate internal change,
  and
  (b) inter-relate and adapt (with suitable rapidity) to change in its external context,
  and
  (2) a human organisation needs effective dialogue and adaptation as a whole to:
  (a) address internal change,
  and
  (b) inter-relate with and continuously adapt (with suitable rapidity) to change in the external context.

  If the system is a living, intelligent organism, as for example a human being or human organisation, it must continuously change and adapt itself, if it is to survive, prosper and remain viable within its ever-changing external context or environment.

  However, while the emphasis is adaptation to the *external* environment, there is also a need to adapt to and accommodate *internal* change. For example, people leave, retire, or reach their potential in a job. Therefore, succession and promotion planning is a necessity.

  Information Systems and Business Processes also become continuously out-dated, so they need to be modular and flexible enough so that they can change and adapt (with suitable rapidity), for internal and external change.

  The most important consideration here is that the human organisation must have effective dialogue and networking, in order to adapt effectively, and this means effective leadership, effective governance and guidance, optimal use of IT tools such as Web 2.0 collaboration, and a culture that encourages open dialogue and networking.

> Such open dialogue and networking is a deep and significant need between IT Professionals and IT Customers, in joined-up Business-IT.

It might be seen from these principles how and why Systems Thinking is seen as the X Factor in joining up Business and IT. If instead of the Parochial or Silo Thinking that so pervades IT in Organisations there might be Systems Thinking embedded in the culture then, *ceteris paribus,* joined-up becomes greatly facilitated.

Conclusion

JUMP Model, JUMP Process, Business-IT Synergy Theory, and the glue in the mix: Systems Thinking; IT in Organisations and as its central theme and purpose Information Value for Business Value.

This is what this paper is about, for the greater purpose of aligning, or better *joining up* Business and IT (which represents a departure from and stands on the shoulders of the alignment paradigm), in all kinds of business organisation (corporate, government or non-profit), in order to achieve payback in broad terms for people, for organisations, for the economy, and for society as a whole.

It also aims to assist teaching with a big-picture, systemic view of IT in Organisations (especially as IT in Organisations increases in its complexity), and to assist a systemic and holistic understanding of IT in Organisations. Indeed, if a student – or a manager – can describe a particular aspect of IT or a particular technology in the context of the Model, then it might be said that they have a systemic/holistic understanding of IT in Organisations.

Such an understanding in the organisational setting – if it were to become a common understanding – might be a factor in helping to promote joined-up Business-IT, addressing as it does The Divide (and implicitly disparate mind-sets), between IT Professionals and line of business managers.

This is research on a significant issue, and one that is fundamental for the field of Information Systems, with alignment having been an intractable top issue since at least the mid-1980s and since its resolution, if achieved in the large, could have significant satisfaction and performance payback.

It is therefore ambitious as a research project and is of a divergent nature, rather than convergent; it is broad in its compass, and there is a multiplicity of research implications.

Consequently, the author is conscious of small knowledge and capability and presents this paper with the aim of inviting questions and comments if not dialogue, with others who may have an interest.

References

Ackerman, J., Yeung, M. A. and von Bommel, E. (2007).
Better IT Management for Banks, in McKinsey Quarterly, July.

Ackoff, R. (2003).
A Systemic Approach to Innovation, in Strategy & Leadership, Vol. 31, No. 3.

Ahituv N. and Neumann, S. (1990).
Principles of Information Systems for Management.

Alter, S. L. (2006).
The Work System Method: Connecting People, Processes, and IT for Business Results. Lightning Source.

Anderson, R. (2008).
Patient Confidentiality and Central Databases, British Journal of General Practice, Vol. 58, No. 547, Feb.

Aryanpur, S. (2008).
Taking Comet to New Heights, in CIO Magazine (UK), June.

Avison, D., Jones, J., Powell, P., and Wilson, D. (2004).
Using and Validating the Strategic Alignment Model, Journal of Strategic Information Systems, Vol. 13.

Bacon, C. J. (1997).
Information for Action: A Study of Information & Knowledge in the Organisational Environment within the Context of Information Systems & Technology
Doctorate awarded by the University of Victoria, Wellington, New Zealand.
University of Victoria Library.

Bacon, C. J. and Fitzgerald, B. (2001).
A Systemic Framework for the Field of Information Systems,
Data Base for Advances in Information Systems, Volume 32, No. 2.

Barron, T.M., Chiang, R.H.L., and Storey, V.C. (1999).
A Semiotic Framework for Information Systems Classification & Development
in Decision Support, Vol. 25, No.1.

Bassellier, G., Benbasat, I., and Reich, B. H. (2003).
The Influence of Business Manager's IT Competence on Championing IT,
Information Systems Research, Vol. 14, No. 4, December.

Bergeron, F., Raymond, L., and Rivard, S. (2004).
Ideal Patterns of Strategic Alignment and Business Performance
Information and Management, Vol. 41, Issue 8, November.

Burnes, B. (1991).

Managerial Competence and New Technology: Don't Shoot the Piano Player – He's Only Doing His Best, Behaviour and Information Technology, Vol. 10, No. 2, March-April.

Carr, N. G. (2010).
The Shallows: How the Internet is Changing the Way We Think, Read, and Remember. W.W. Norton & Co.

Chan, Y. E., Sabherwal, R., and Thatcher, J. B. (2006).
Antecedents and Outcomes of Strategic IS Alignment: An Empirical Investigation
IEEE Transactions on Engineering Management, Vol. 53, No. 1, Feb.

Chan, Y., Huff, S. L., Barclay, D. W., and Copeland, D. G. (1997).
Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment, Information Systems Research, Vol. 8, No. 2, June.

Chan, Y., and Reich, B. H. (2007).
IT Alignment: What Have We Learned, Journal of Information Technology, Vol. 22, Dec.

Checkland, P. B. (1981).
Systems Thinking, Systems Practice, John Wiley and Sons.

Checkland, P. B. and Scholes J. (1990).
Soft Systems Methodology in Action, John Wiley and Sons.

Checkland, P., and Holwell, S. (1990).
Information, Systems, and Information Systems, John Wiley and Sons.

Ciborra, C.U. (1997).
De Profundis? Deconstructing the Concept of Strategic Alignment
Scandinavian Journal of Information Systems, Vol. 9, No. 1.

Codd, G. (2007).
The Drowning Director, Penn Press Publishers Ltd.

Collins, J., Macehiter, N, Vile, D., and Ward-Dutton, N. (2007).
The Technology Garden: Cultivating Sustainable IT-Business Alignment,
John Wiley and Sons.

Collins, T. (2007).
Only a Third of Government IT Projects Succeed, says CIO, Computer Weekly (UK), 21 May.

Compuware (2008).
Enabling Business and IT Integration, White Paper, Compuware Corporation, compuware.com, 2008.

DeLone, W.H. and McLean, E.R. (1992).
Information System Success: the Quest for the Dependent Variable.

Information Systems Research, Vol. 3, pp 60-95.

Dooley, R.E. (1991).
Critical Issues in Information Systems Management, I/S Analyser, Vol. 29, No. 1.

Earl, M. J. (1989).
Management Strategies for Information Technology, Prentice Hall, 1989.

Ein-Dor, P. and Segev, E. (1993).
A Classification of Information Systems: Analysis and Interpretation.
Information Systems Research, Vol. 4, No. 2.

Espejo, R, edited with Harnden, R. (1989).
The Viable Systems Model: Interpretations and Applications of Stafford Beer's VSM.
Wiley.

Espejo, R. (1994).
What is Systemic Thinking?, System Dynamics Review., June.

Financial Executives Research Association/Foundation. (2008)
Technology Issues for the Financial Executive:
Ninth Annual Joint Publication of the Committee on Finance and Information Technology, Florham Park, NJ, 2007.

Foundation for Information Policy Research (2009).
Anderson, R., Brown, I., Dowty, T., Heath, W., Inglesant, P., and Sasse, A.
Database State, a report commissioned by the Joseph Rowntree Reform Trust Ltd.
The Garden House, Water End, York. YO30 6WQ. United Kingdom, March.

Flood, R.L., (1995).
Solving Problem Solving, John Wiley & Sons, Chichester.

Galliers, R. D., and Whiteley, E. A. (2007).
An Alternative Perspective on Citation Classics: Evidence from the First Ten Years of the European Conference on Information Systems, Information and Management.

Gasparski, W.W. (1993).
The Whys and Wherefores of Social Systems Failures, SystemIST, pp. 180-189, Vol., 15, No. 4, Nov.

Garbani, Jean-Pierre (2010).
The Writing on IT's Complexity Wall.
Forrester Research, Cambridge, US.A., June.

Gibson, C. F. (2006).
Turnaround at Aetna: the IT Factor, MIT Sloan School of Management, Centre for Information Systems Research, Peter Weill, Director, Case Study.

Glaser, B. G. & Strauss, A. L. (1967).

The Discovery of Grounded Theory: Strategies for Qualitative Research, Chicago, Aldine Publishing Company.

Glass, Robert L. (2009).
Making Research More Relevant While Not Diminishing Its Rigour
IEEE Software, Vol. 26, No. 2, March/April, 2009.

Graham, R.. Co-Chair. (2011).
Presidential Commission BP Deepwater Horizon Oil Spill & Offshore Drilling
Report Publication date: 05 January.

Hall, M. E. (2010)
Managing Information in the Enterprise: Perspectives for Business Leaders.
The results of a global survey of 219 C-level executives, Forbes Insights, in association with SAP, Forbes Magazine.

Henderson, J.C. and Venkatramen, N. (1992).
Strategic Alignment: A Model for Organisational Transformation through Information Technology, in Transforming Organisations, Eds. Kocham, T.A. and Useem, M., Oxford University Press.

Henderson, J.C. and Venkatraman, N. (1999).
Strategic Alignment: Leveraging Information Technology for Transforming Organisations, IBM Systems Journal, Vol. 38, No. 1.

Hinssen, Peter. (2009).
Business-IT Fusion: How to Move Beyond Alignment and Transform IT in Your Organisation, Mach Media NV.

Holland, J.H. (1995).
Hidden Order, Addison-Wesley.

Hirschheim, R., Klein, H., and Lyytinen, H. (1996).
Exploring the Intellectual Structures of Information Systems Development: A Social Action Theoretic Analysis, Accounting, Management and Information Technology, Vol. 6, No. ½.

Huff, S. (2008).
Information Systems Strategic Alignment
Presentation to the Australian National University, Victoria University of Wellington, New Zealand, May.

Hughes, Bob. (2008).
Exploiting IT for Business Benefit, The British Computer Society.

IT Governance Institute.(2008).
IT Governance Global Status Report, Price Waterhouse Coopers, Rolling Meadows, Illinois, 60008.

Iivari, J., Hirschheim, R., and Klein, H. (1998).

A Paradigmatic Analysis Contrasting IS Development Approaches & Methodologies, Information Systems Research, Vol. 9, No. 2.

Keen, P.G.W. (1987)
MIS Research: Current Status, Trends and Needs, in *Information Systems Education: Recommendations and Implementation*, Buckingham, R.A. (ed.)
Cambridge University Press.

Krigsman, M. (2007).
Tata Consultancy: New IT failure Stats and COO Interview, 12 December, 2007.

Kroenke, D.M. and Dolan, K.A. (1987).
Business Computer Systems: An Introduction.

Kuhn, T. (1962)
The Structure of Scientific Revolutions
University of Chicago Press (1996 reprint).

Lanier, J. (2010).
You Are Not a Gadget: A Manifesto. Alfred A. Knopf.

Luftman, J. N. (2003).
Competing in the Information Age: Align in the Sand, Oxford University Press.

Luftman, J. N. and Kempaiah, R. (2007).
An Update on Business-IT Alignment: A Line Has Been Drawn, MIS Quarterly Executive, Vol. 6, No. 3, 2007.

Manwani, S. (2008)
IT-Enabled Business Change, The British Computer Society.

Marchand, Donald A., Kettinger, William J. and Rollins, John D. (2001)
Making the Invisible Visible: How Companies Win with the Right Information, People and IT, John Wiley and Sons.

Maushart, S. (2011)
The Winter of Our Disconnect, Profile Books.

McManus, J, and Wood-Harper, T. (2008).
A Study in Project Failure (a study of 214 projects in 10 industries across the European Union), British Computer Society web site:
http://www.bcs.org/content/ConWebDoc/19584

Morton, M.S. (1991).
The Corporation of the 1990s, Oxford University Press.

Mostrous, A. and Elliot, F. (2009)
£18 Billion Scandal as Whitehall's IT Plans Spin Out of Control
http/business.timesonline.co.uk/business/industry_sectors/technology/article5636437.ece, The Times (London), 02 February.

Powell, Philip and Yetton, Philip. (2003)
*Contingent Dynamics of IS Strategic Alignment in SMEs, o*riginally *IS Alignment in Small Firms: New Paths through the Maze*, Levy, M., Powell, P., and Yetton, P., Proceedings of the 11th European Conference on Information Systems, Naples.

Powner, D.A. Director, Information Technology Management Issues. (2008).
OMP and Agencies Need to Improve Planning, Management, and Oversight of Projects Totalling Billions of Dollars.
United States Government Accounting Office,
Testimony before the Sub Committee on Federal Financial Management, Government Information, Federal Services, and International Security, Committee on Homeland Security and Government Affairs, U.S. Senate..
GAO-08-105IT. 31 July.

Reich, B.H. and Benbasat, I. (1996).
Measuring the Linkage Between Business and Information Technology Objectives
MIS Quarterly, March.

Reich, B.H. and Benbasat, I. (2000).
Factors that Influence the Social Dimensions of Alignment Between Business & Information Technology Objectives
MIS Quarterly, March.

Roberts, R., and Sikes, J. (2008).
IT's Unmet Potential: McKinsey Global Survey Results
The McKinsey Quarterly, December.

Robson, W. (1994).
Strategic Management and Information Systems: An Integrated Approach.

Sabherwal, R., Hirschheim, R., and Goles, T. (2001).
The Dynamics of Alignment: Insights from a Punctuated Equilibrium Model
Organization Science, Vol. 12, No. 2, March-April.

SFIA. (2005).
Skills Framework for the Information Age
Version 3.
www.sfia.org.uk

Shannon, C.E. and Weaver, W. (1948 - 1959)
The Mathematical Theory of Communication
(First published in the Bell System Technical Journal, July/October, 1948).
University of Illinois Press, Urbana

Silver, M. S., Markus, M. L., and Beath, C. M. (1995)
The Information Technology Interaction Model: A Foundation for the MBA Core Course, Management Information Systems Quarterly, Vol. 19, No. 3, September.

Smith, H. and Fingar, P. (2007)

Business Process Management: the Third Wave
Meghan-Kiffer Press.

Stenzel, J. (Editor). (2007)
CIO Best Practices: Enabling Strategic Value with Information Technology
John Wiley and Sons.

Suby, M. (2009).
Frost and Sullivan, Division of Statecast.
True Convergence Demands a Communication Service Provider that Embraces a Customer-Centric Approach.
White Paper, frost.com

Sucharov, T., and Rice, P. (2005).
The Burden of Legacy
Erudine White Paper, web site.

Sugarman, B. (2001).
Twenty Years of Organisational Learning at Hanover Insurance: Interviews with Bill O'Brien.
Reflections: the Journal of the Society for Organisational Learning, Fall.

Swabey, P. (2007).
Agility Applied at Standard Life,
Information Age, October.

Thilthorpe, A. (2008).
A Professional IT Industry
The British Computer Society, 2008.

Turkle, S. (2011)
Alone Together: Why We Expect More from Technology and less from Each Other,
Basic Books.

Weiland, G.W. (1981).
Improving Health Care Management
Health Administration Press, Univ. Michigan, Ann Arbor.

Weill, P. and Aral, S. (2006).
IT Assets, Organisational Capabilities and Firm Performances: Do Resource Allocations and Organisational Differences Explain Performance Variation? MIT Sloan School of Management, Centre for Information Systems Research, Working Paper.

Weill, P. and Ross, J. W. (2004)
IT Governance: How Top Performers Manage IT Decision Rights for Superior Results, Harvard Business School Press, 2004.

Zachman, J. A. (1987).
A Framework for Information Systems Architecture

IBM Systems Journal, Vol. 27, No. 3.

Zachman, J. A, and Sowa, J.F. (1992).
Extending and Formalizing the Framework for Information Systems Architecture
IBM Systems Journal, Vol. 31, No. 3.

Zachman, J. A. (1997).
Concepts of the Framework for Enterprise Architecture
Zachman International.