PhD thesis

Maximising the business impact of IT: importance of managing the total business experience

Miller, D.

___

Full bibliographic citation: Miller, D. 2013. Maximising the business impact of IT: importance of managing the total business experience. PhD thesis Middlesex University

Year: 2013

Publisher: Middlesex University Research Repository

Available online: https://repository.mdx.ac.uk/item/84350

___

Maximising the Business Impact of IT:
Importance of Managing the
Total Business Experience

A thesis submitted to Middlesex University
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

David Miller

School of Science and Technology, Middlesex University,
and Managing Director of ITDYNAMICS Ltd

June, 2013

ABSTRACT

Information technology (IT) plays a crucial role in the running of most businesses and yet the success rates associated with IT investment are unsatisfactory. This is borne out by personal experience, regular surveys and in the literature suggesting that the current IT delivery model is incomplete or inadequate in some way. Given the nature of the current IT delivery model it is likely to be even less successful in the future as emerging and future technologies place new demands upon businesses and IT service providers. The research question asks what constitutes a new IT delivery model that can make successful business outcomes more likely both now and in the future.

The research design was required to develop insight into what is known to be a complex, persistently problematic, and non-obvious phenomenon in a business-critical practitioner area that has been yielding very low rates of success for many years. The qualitative research was a large scale project using cross case primary data comprised of field notes from conversations with senior managers in some very large global enterprises where IT support to the business had to be improved. Grounded theory was used and a theoretical model, the business and IT relationship model, emerged where the total business experience was of central importance. The model has been found to have heuristic, deterministic, and controlling characteristics, but further research revealed that although a logically correct frame of reference for describing the relationship it doesn't reflect behaviour in all cases. The research has shown that this can give rise to significant business and IT management problems.

The proposed future delivery model, *active management*, is an over-arching management framework based upon the observed relationship and a managed business experience. It is explained how this can provide an improved basis for the assessment, alignment, management and governance of IT. Active management is technology agnostic and is shown to be valid in the context of current practice, emerging technologies and future scenarios.

ACKNOWLEDGEMENTS

Since writing and self-publishing my first modest book (2005) I need to thank The British Computer Society for commissioning a second edition ("Business-Focused IT and Service Excellence") which was published in 2008. I must also thank the many people who have bought the books and the many that have subsequently joined the LinkedIn Group of the same name. Thanks are especially due to the people who encouraged me to take this next step towards further developing my thinking.

The first was Professor Malcolm McDonald, a fellow Chartered Fellow of the Chartered Institute of Marketing, Emeritus Professor at Cranfield University, Honorary Professor at Warwick Business School and something of a legend in the marketing world having written more than 40 books on the subject. Whilst discussing my books over lunch he observed that the content "was probably worth about five PhDs" but significantly he also recommended that I consider developing the theory using a PhD as the vehicle. The second person was Professor Mark Woodman of Middlesex University. I was introduced to Mark via a colleague of a City of London institution and it was Mark who listened to my ideas, recognised the problem I was looking to address and finally made the PhD a realistic possibility. I thank both Malcolm and Mark for encouraging me to re-enter higher education at such a late stage in my career because of what it has enabled me to discover and I thank Mark for his sustained interest and encouragement. The third was Dr Nollaig Frost who is an expert in qualitative methods in Psychology. I thank Nollaig for coaching me in the ways of qualitative research in her discipline where these are mature methods in order that I was able to apply them with confidence to the world of business and IT. Fourthly I wish to thank Prof. Balbir Barn who helped me to build arguments that could be accepted by software engineers. Finally I would like to thank my family for tolerating the inconvenience of my ambition.

Education is a great opportunity that all young persons, if it's within their reach, should grasp as a basis for improving their prospects in adult life. A PhD in particular is an important stage in the development of mature thought. My own experience also tells me that a PhD is also a great way for very experienced and skilled people to further develop their ideas later in life for the benefit of business in ways that the less experienced cannot.

PREFACE

My IT career spans more than forty years having written my first programme in 1969. I have remained within the IT industry and progressed through software engineering, consultancy, management and director level roles. During these forty years I have been involved in many IT investment projects and led many of them. Since 1995 I have held director level positions with a number of commercial IT services organizations and management consultancies working with board members and senior management in large and mid-sized client organizations throughout the world. During this time I have seen a wide variety of business related IT problems and it was often my job to sort them out.

I have personal recollections of early surveys (circa 1970) that reported success rates associated with business related IT investment projects of the order of 30%. These were controversial at the time but typical of the success rates I was seeing amongst my peer group, both inside my company and externally. From my own experience, in discussions with colleagues and by observing the media it seems that there has been little or no improvement over the intervening years. The temptation is to assume that the problem will somehow diminish over time but so far this hasn't been the case. Today IT people are better trained, technology is superior, and methods are more comprehensive than was the case forty or more years ago but the problem has persisted. Emerging and future technologies may not offer a solution either. A desire to understand more about the problem and to address it if necessary has led to this research being undertaken.

The controversy surrounding any estimates of the success rate associated with IT investment projects has not diminished over the years. I have been careful in Chapter 1 of my thesis, where I attempt to define the scale of the problem, to present the analysis such that it draws from a number of sources but it cannot convince those who do not wish to be convinced. This thesis is dedicated to those businesses that I know suffer directly or indirectly from such problems, and to everyone, including IT service providers, who might benefit from understanding how they arise and how such problems can be overcome in the future.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

Problem Description and Thesis Outline

1.1 Introduction

Information technology (IT[1]) has been used by businesses to introduce greater efficiency and create new commercial opportunities. The overall impact on business is evident for all to see; the business landscape today has been transformed from that of the 1960s. Clerks, typists, and comptometer operators have been replaced by computer technology that allows data to be collected, processed, and disseminated using interconnected remote and mobile devices. This has not just yielded business efficiency and effectiveness benefits but also new business models in almost every business sector. This transformation is the result of developments in the sciences to develop the technology (computer science, software engineering, and other engineering disciplines) combined with many millions of man years of investment in analysing business requirements, designing business systems that exploit the technology and re-engineering business processes.

This first chapter will show that this transformation hasn't been without risk. IT presents problems for its managers and its business customers alike and high profile failures are frequently reported in the media. For most of my career[2] I have been aware of these problems because I have often been asked to take responsibility for resolving them. What is immediately apparent to anyone engaged in these remedial activities is the complexity of the problems faced by businesses when investing in IT and the uncertainty of the outcome even though the IT methods used are designed to reduce the risks. In an age where technology is embedded within almost every critical business process and yet

---

[1] "IT" is used here to mean both information technology and information and communications technology. Within the data, business and IT people use "IT" when referring to the technology, to the people or to the organization providing services but within the text IT will normally be qualified unless it is referring to the technology itself.

[2] As an IT practitioner of more than forty years I will from time to time wish to personalize the text by adding my own experience, as here. The first person will only be used to clarify that a view is a personal one or where a personal experience provides insight or helps to generalize an argument.

where failure appears to be statistically more likely than not, business people can be forgiven for thinking that IT management is lagging behind the capability of the technology. This chapter will show that the current IT delivery model, the nature of which is described in Section 1.3, is incorrect or incomplete.

Section 1.2 examines the problems being experienced by IT managers and business managers. Section 1.3 describes the nature of the current IT delivery model, the processes supported and the IT methods typically embraced. Section 1.4 examines the evidence supporting estimates of success and failure relating to IT investment projects and the likely subsequent cost of failure globally. Section 1.5 considers the technological trends and questions the continuing relevance of the current IT delivery model. Section 1.6 sets out the research question, the expected contributions to knowledge, and the structure of the thesis.

1.2 Problems Often Associated with IT Delivery

Delivery problems can arise in IT management and at all levels in business as summarised under the four headings, below.

The Top Ten Challenges for the IT Manager

Popular trade magazines and influential consultancies from time to time publish the top ten IT management challenges. They cannot be considered as academic contributions as they vary depending on why the survey was being conducted, who was approached for a view and when this approach was made. Table 1.1 provides examples of four such lists published in 2011 by Information Week (Preston, 2011), the Enterprise CIO Forum, by Deloitte from a survey of CIOs in Ireland (Goddard *et al.*, 2011), and the Information Technology Association of Canada (ITAC) in conversation with members of the accounting profession (Datardina and Parker, 2011). This last column (ITAC) reflects the wider interests of the accountants interviewed, not all of whom would be primarily concerned with managing IT services.

Over the years, lists such as these have featured the new technologies of the day, examples in Table 1.1 include: "big data", "cloud computing", "social media", "post PC era", "desktop virtualization" etc. Many of the topics are of a more general nature, however, and constantly appear in such lists, examples in Table 1.1 include: alignment, agility, cost/ROI (i.e. value), governance, innovation, legacy/application modernization.

The report accompanying the Deloitte survey says that "just over half of CIOs report alignment as poor or fair. The CIO is fighting a hard battle to be seen as a value adding partner and the results suggest they are not winning. Over a quarter of CIOs responded

that business alignment, and enabling transformation, keeps them awake at night."
(Goddard *et al.*, 2011).

Table 1.1: Examples of top ten IT challenges in 2011

Information Week	Enterprise CIO Forum	Deloitte	ITAC
IT is too slow to respond	Cloud computing	Compliance	Information management and data integrity
Make IT one with the business	IT Maturity	IT cost reduction	Legislation, regulation, and compliance
80% of budget spent on maintenance	"Big data" analytics	Consolidation	New and emerging technologies
Harnessing "big data"	Application modernization	Security	Information skills or resources
Prep for post PC era	Security and GRC management	Information management	IT governance
Finding the right people	IT strategic ROI	Agility	Outsourcing
Leveraging social media	Business process optimization and innovation	Legacy systems replacement	Public trust
Exploiting consumerisation of IT	Green IT and sustainability	IT portfolio management	Management and operation of technology infrastructure
Exploiting cloud computing	IT talent management	Enterprise mobile	Business continuity and pandemic awareness
Improving collaboration	IT culture asset	Desktop virtualization	Impact of the economy on information technology

The problems experienced by businesses are to an extent reflected in the above examples setting out the challenges of the CIO. The focus for business, however, is more likely to be the prospect of the failure of an IT investment, dissatisfaction with what is delivered, or just not understanding what the IT supplier is talking about. These are, of course, also problems for the CIO and the IT service provider.

High Profile Failures

A chief executive officer (CEO) will be concerned that he may be placing the business at risk by investing in IT. High profile failures regularly get reported by the media. IT investments may be classed as failures because projects were abandoned before completion or were deemed to have failed by the business after delivery (Whittaker, 1997), or because the anticipated productivity improvements just didn't materialized (Brynjolfsson, 1993). The recent high profile failure of the UK government's National Programme for IT (NPfIT) for the National Health Service (Lansley and Maude, 2011) is reported to have cost the UK taxpayer £12B or more when it was cancelled in September 2011 (Espiner, 2011) (Martin, 2011) and cancellation costs continue to be incurred

(Walford, 2011). The NPfIT was cancelled in the same month as the report from the Public Accounts Committee of Her Majesty's Government (HMG) was published concerning the cancellation in December 2010 of the FiReControl project with further costs of £500M. This latter scheme involved abolishing 46 local fire and rescue control rooms around the UK and replacing them with nine state-of-the-art regional control centres but it ended in complete failure; the computer system was simply never delivered (Hodge, 2011).

Information on private sector failures associated with IT investment are less readily available (Kemerer and Sosa, 1990) but if operational failures are anything to go by they must presumably happen. In 2010 Computer Weekly reported two such operational failures at Barclays and Tesco (Burrows, 2010). Barclays' online banking services provided to offshore customers through Barclays Wealth was reported to appear to have all but collapsed. Apparently unavailable for several days they eventually returned after nearly a week of downtime. Tesco upgraded their online grocery shopping website and some customers found that the new system was delivering the wrong goods to their homes. In 2012 the Royal Bank of Scotland banking systems (and those of their subsidiaries) were down for a week causing major problems for businesses and private individuals, not to mention the bank itself (Schäfer, 2012).

Because high profile failures such as these are still being reported in the media it can be assumed that there is an underlying problem with the model used for planning and delivering IT products and services. This model is referred to here as the IT delivery model and this will be examined further in the next section (Section 1.3).

The Perception Gap

My own experience is not of out-and-out failure but I see many outcomes from IT investment that just haven't come up to business expectations. Even where IT supply organizations say that they have applied IT industry best practice my experience is that in too many cases business managers are expressing their dissatisfaction with what has been delivered. This includes those organizations that:

- apply proprietary methods or international standards and may submit to audit or external certification
- have delivered according to an IT requirements specification, i.e. defining required functionality and perhaps agreeing cost of development, and are performing operationally according to a contractual service level agreement (including running cost, availability, response times etc.),

In these cases, each party clearly has a different perception of what is being delivered and so where this phenomenon has been identified in the field I have termed this the perception gap (Miller, 2005).

It is known that IT service providers make every effort to deliver to a professional standard. The drive for IT to improve has given rise to an increasing number of organizations offering IT methods, tools and frameworks which promote industry best practice.

ISACA (ISACA, 2012) has 100,000 members worldwide and offers certification in audit, security, governance, risk and information systems and control based on their COBIT method. The UK government developed the ITIL method which *has been adopted by thousands of organizations worldwide, such as NASA, the UK National Health Service (NHS), HSBC bank and Disney. ITIL is also supported by quality services from a wide range of providers including examination institutes, accredited training providers and consultancies, software and tool vendors and well known service providers such as IBM, Telefonica, HP and British telecom (BT)* (ITIL, 2010). CompTIA represents more than 2,000 members and another 1,000+ business partners that span the IT channel worldwide. It offers training and certification in twenty or more specialisms through a number of third party suppliers (CompTIA, 2013). The British Computer Society (BCS, 2013) has 70,000 members worldwide and offers higher education and qualifications as well as professional training and certification in ten subject areas. A wide variety of training is available as can be seen from this sample.

The organizations and their certifications have evolved over many years. Given their growing popularity and the continued existence of a perception gap and the frequency with which it is observed it must be assumed that any underlying problem with the IT delivery model has not been successfully addressed by these methods.

Jargon

Success in business depends on people's ability throughout the organization and between organizations to communicate with one another but IT people have always been accused of using jargon and of being unable to communicate effectively. The elimination of jargon must always be approached by looking at the balance between its necessity for clarifying meaning and the ambiguity it may add to otherwise clear communication (The Reading Teacher, 1991). Certainly for purchase decisions business people must be familiar with computer terminology in order to maintain clarity (Abdul-Gader and Kozar, 1995) but the terminology concerned with associated procurement processes such as the creation of a business requirements specification can create further barriers for business transparency.

The language barrier between business people and IT people is such that few business people are capable of fully defining their own requirements and service levels. It is now common practice for an IT supply organization to specify both the development and operational requirements of a requested IT solution. Note that what is intended by the word *development* here will depend upon its context so a useful working definition is *the design and incorporation of all customised requirements into an IT solution*.

A business will appoint an IT service provider to define its requirements. Based on discussions with the business people the specification and the content of any service level agreement are defined. There is a risk that the IT supplier fails to correctly understand the business requirements. These errors may not be identified and corrected during development and testing. As in the *Chinese Room* (Searle, 1990) the emphasis may be on translating the syntactic requirements with little understanding of the semantics. To eliminate any problems associated with language, business and IT people must have a more effective relationship where understanding is guaranteed.

1.3   The Nature of the Current IT Delivery Model

Although the IT solutions available to business and software engineering methods have evolved with the technology the IT delivery model has remained more or less constant throughout. This is typified by a requirement being expressed by a business and this requirement being specified typically by an IT service provider on behalf of the business and a solution being developed by the IT service provider to satisfy the requirement.

Here the term *IT delivery model* refers to all of those IT activities concerned with determining the requirement, creating the solution and the management of the associated operational IT services. Although it doesn't have a name it is implied by the following activities:

- Business analysis using a range of methods, some of which may be automated, selected for the job in hand and usually designed to arrive at an agreement with the business with regard to what is required tactically and strategically combined with a commitment to invest
- Specification of the IT requirements including the development and operational needs
- Architectural alignment using a framework consisting principally of the business objects of data, process, and organization
- Development, including any acquisition and customisation processes
- Testing the functionality against the IT requirements specification with known data

- Deployment of the solution

- Measurement of operational performance post deployment

- Control of the operational environment post deployment

- Application maintenance

- Overall management process and governance framework.

There has only ever been one IT delivery model though the *modus operandi* may vary. The modus operandi for delivering IT solutions and services that will satisfy the various business requirements of a particular enterprise are based today on processes derived from a cocktail of around 20 to 30 *IT management tools.* By IT management tools I mean frameworks, methodologies and standards for business analysis, solution design, software engineering and information systems development, integration, programme and project management, architecture design, the management of operational services, security, and regulation (legal compliance). Appendix A contains a list of some of the IT management tools that an IT delivery model might currently include. These tools have evolved over the last fifty years. They formalise the process of defining the business problem in terms of its data and processing requirements (the requirements specification) and the processes for delivering the finished, tested and operational solution and resultant service. This is the manner in which IT organizations set about adding business value.

The IT delivery model encompasses the initial idea, the software configuration and the software engineering paradigm (Pressman, 1992) for the construction of the solution. Operationally, the delivery model will define the nature of the service level agreement as well as service quality and service performance criteria encapsulating any aspects of IT best practice applicable to the IT resources consumed and IT processes required to execute the solution. The IT management tools have become the focus of considerable investment in, for example, training and development, demonstrating compliance with or aptitude in methods, best practice, standards, etc. The IT delivery model has remained unchanged in fifty years suggesting that with the exception of changes in technology and the modus operandi there is nothing new to add to what is already known about IT management.

There are many proprietary IT management tools. The most common among these are:

- Control Objectives for Information and Related Technology, COBIT, was developed by the Information Systems Audit and Control Association (ISACA). COBIT 5[3], the first phase of which was launched in 2012, is positioned as "a

---

[3] COBIT 5 consolidates COBIT 4.2 with Risk IT and Val IT (see Appendix G).

business framework for the governance and management of enterprise IT and all other frameworks" (ISACA, 2012). It remains, however, rooted in the IT perspective and aligned with the standard for the corporate governance of information technology (ISO/IEC38500, 2008).

- ITIL (ITIL, 2010) is a service management framework (ITIL 3) and offers programme (MSP) and project management (PRINCE2). Accreditations and certifications are handled by APMG International which has a wide portfolio of certifications including the internationally recognized Best Management Practice schemes and a range of IT and general management certifications based on international standards and best practices.

- The Deming or Shewhart cycle, i.e. Plan–Do–Check/Study–Act (PDCA), was developed by Shewhart and favoured by Deming for continuous quality improvement in the manufacturing industries in the early 20th century (Anderson *et al.*, 1994). It is now the bedrock of Total Quality Management (Knouse *et al.*, 2009) and can be considered to be the basis of the above methods (Bahsani *et al.*, 2011) (Bakry and Alfantookh, 2006) (TSO, 2007). It is also stated to be the basis of the standard for quality management systems (ISO9001, 2008) and influences the other principal international standards in this area, e.g. Service Management (ISO/IEC20000, 2012), Information Security (ISO/IEC27000, 2012), and the Corporate Governance of Information Technology (ISO/IEC38500, 2008).

The functional relationship between business and its IT suppliers or service providers is currently defined by the combined effect of the current IT delivery model and the modus operandi i.e. the relationship is based upon the needs of the IT management tools. The relationship is based on the one hand on the management of the IT resources, processes, and people (as defined by COBIT and ITIL) and on the other on the creation, deployment and operation of working programmes (whatever the methods used) and associated hardware and software (i.e. IT product). IT management arrangements then are based around project management for planning and building IT products and for facilitating their operational availability. Thus value is added by investing in products and product development to create efficiencies in a business. Governance arrangements are centered on the management of a portfolio of planned IT products and collective and individual responsibilities. The functional relationships are enforced through a Responsible, Accountable, Consulted, Informed (RACI) matrix.

This emphasis on product is not surprising – major improvements in IT have been product-led, e.g. mainframe, PC, database technologies, ERP systems, the Web, smart

phones, virtualization and cloud computing, and the earliest alternatives to bespoke development were packages.

Just as the functional relationship is defined by the current delivery model and modus operandi so these have also defined the commercial relationship between business and IT suppliers or service providers. The IT requirements specification, the start point for many IT methods, has become the most likely start point for defining a new application, system or service; commercially the requirements specification is frequently a contractual requirement with variations managed through change control. Similarly, a service level agreement encapsulates what the IT service provider is to deliver operationally. Together they are the preferred expression of a business need by an IT supplier or service provider.

The body of knowledge encapsulated within the IT delivery model and the modus operandi is focused on product development and product quality: product correctness, maintainability/ portability, integrity, and usability (Cavano and McCall, 1978) (Pressman, 1992) (Bourque and Dupuis, 2004). In addition there is an increasing dependence upon compliance or certification/accreditation with a method as a demonstration of the attainment of a suitable quality of what gets delivered to the business. It is easier to demonstrate compliance with method as opposed to achievement in meeting the changing business need (and changing specification) and this is especially so where the IT supply organization is remote from the business, e.g. outsourced or off-shored services. Methods are based upon the formalization of process around what is considered to be IT best practice associated with the creation and operation of IT product. Within this document this is henceforward referred to as the product and production paradigm for IT management.

If this IT delivery paradigm is correct and complete it should be yielding high rates of success. This is not the case and so it should be possible to determine the risk and cost of failure to business globally in order to decide whether the research is necessary.

1.4   The Associated Risk and Cost of Failure

The Standish Group has undertaken an annual survey since 1995 and the results are summarised in the annual CHAOS report. It shows that the success rates associated with IT investment have varied between 16% in 1995, and 32% in 2009 (Standish, 2009) and are rumoured to be even higher in 2011. The survey is used to support the case for value based software engineering (Boehm, 2003) and to illustrate the uncertainty of software development (Little, 2006). The survey has also been criticised as an unjustified and unsubstantiated attack on software engineering (Glass, 2006) and for its statistical inaccuracy and failure to take into consideration forecasting bias within organizations

(Eveleens and Verhoef, 2010). Even so there is much independent evidence in the literature, more latterly in the context of the implementation of enterprise resource planning systems (ERP) central to most businesses, which is consistent with the Standish Chaos claims.

In a Conference Board Survey of 117 companies implementing ERP (Cooke *et al.*, 2001) success rates were put at 34% but there were many reports of cost over-runs and benefits failing to be achieved which could bring this down. Grant Thornton UK LLP sponsored a survey of 1,500 IT project managers for Computer Weekly which showed success rates of 16% and which also confirmed in this sample at least that there is little difference between the public and private sector (Sauer and Cuthbertson, 2003). Less than 30% of responding organizations in another survey are also quoted as having achieved the expected benefits from their ERP implementation (Hughes, 2008), and in another, success rates are noted as being between 30 and 35% (Poba-Nzaou *et al.*, 2008). KPMG Canada (Whittaker, 1997) carried out a survey amongst 1,450 leading public and private institutions where 61% of investments were deemed to have failed but many more exceeded their schedule and budget by unacceptable margins suggesting a similar overall success rate as other surveys. A survey which superficially suggested better success rates than these was a TechRepublic/Gartner joint survey which suggested that 'only' 40% of all IT investments failed to meet business requirements (Smith and Booth, 2000). That survey, however, did not attempt to assess the quality of what was delivered against the investment objectives and abandoned projects were excluded and so failures can be considered to be significantly understated.

Except where projects are cancelled, there are few examples of outright success or total failure. In most cases the expression of the extent to which an investment was successful was determined by estimating the extent to which the business objectives were met including all functional, time, cost, and quality objectives. The literature is suggesting, when the excluded results are added, that the indicative success rate is probably around 30 – 35%. This is very similar to early surveys of IT project success rates that I recollect being reported in the media in 1970s though in those days IT methods and standards were immature and whole systems had to be designed and coded rather than customizing and deploying a ready-made solution as is more typically the case today. As the problem may have persisted for more than forty years it would seem to have little to do with the technology deployed.

An awareness of the perception gap prompted a further attempt to determine success rates prior to the start of this research. Known recent projects (public and private sector) were mapped on two dimensions: y-axis for the percentage score that represents the

business objectives successfully satisfied (as above); x-axis for the percentage that represents the degree of compliance with the major IT management frameworks, methodologies, and standards that help to define the current IT delivery model. In that sample of some thirty known projects there was an even distribution on both axes. This is illustrated in Figure 1.1.

Figure 1.1: Analysis of known IT investment outcomes

The results exhibited a wide variation and so taken in isolation the argument may be unconvincing but the research again suggested a mean success rate in the range of 30–35%. Figure 1.1 also shows that in this sample there was no correlation between a successful business outcome and the use of the frequently applied IT management methods.

Where a successful outcome was achieved there was perhaps another explanation. The sample indicated a correlation between success and "closeness to the business" (Miller, 2008a). There was no attempt to define "closeness to the business" other than to observe that where projects were successful the business and IT people involved frequently remarked on how closely they all worked together. Critics might point out that the survey did not follow a rigorous process, e.g. although methods and standards might be deployed there was no detailed investigation to determine how thoroughly they were implemented (Pressman, 1992). This would be valid criticism but this analysis is frequently and informally repeated with different audiences using their own sample of projects as data with broadly the same result suggesting that either the methods are at fault or in most cases they are implemented badly.

The chief information officer (CIO) at the Department for Work and Pensions (DWP), the largest UK civil government department, speaking at the Government UK IT Summit in London in 2007, was reported as saying that he estimated that only 30% of IT projects and programmes were successful (Collins, 2007). A recent public statement by government indicates that this is unchanged (Bicknell, 2012). As certain standards and

methods are mandated in all UK government work these clearly are not helping to improve success rates.

There is a consistency about these results. Even allowing for some statistical inaccuracy it is probably correct to say that using the criteria defined above the indicative success rate is, and probably has always been, about 30–35%. Whilst producing this estimate is not a part of the research question it does provide evidence to support the problems generally associated with IT investment (Section 1.2) and justification for the research to be undertaken.

An estimate of the worldwide IT spend for 2012 is $3.8 trillion (Gartner, 2012), an increase of 3.7% on 2011. Although Q3 estimates have since been reduced, the growth forecast for 2013 is 3.8%. If success rates are only 35% during 2013[4] as much as $2.5 trillion of the $3.8 trillion could be at risk worldwide. Each percentage point improvement in successful business outcomes could be worth as much as $25 billion per annum globally. Gene Kim founder and former CTO of Tripwire and Mike Orzen author of Lean IT together, using a different approach for calculating the global cost of IT failure, put their estimate of what was at risk annually at $3 trillion, excluding business (non-IT) losses (Krigsman, 2012).

These estimates represent 3.6–4.3% respectively of world Gross Domestic Product (GDP) which is currently estimated at around $70 trillion[5]. It has not been possible to find estimates of IT spend for 1970 but the worldwide IT spend would probably have been a smaller percentage of world GDP which then stood at only $2.9 trillion[6], i.e. even though the success rate is unchanged this is likely to represent a bigger problem in financial terms today than it was in 1970.

Whilst it hasn't been possible to compare success rates associated with IT investment with those in other business disciplines, success rates of 30–35% are clearly unreasonable in business terms. Whether the problem lies in the methods used, their implementation or elsewhere, everything possible should be done to reduce the waste currently associated with the IT delivery model.

1.5 The Changing Nature of the Management Challenge

Addressing the low success rate hasn't been a priority in the past but it should be a priority now. The problem should be addressed now because even though the failure rate

---

[4] Assumes the public and private sectors have similar success rates

[5] Source: World Bank

[6] Source: World Bank

may not have changed over the last forty years, the cost of failure to businesses globally has increased simply because IT is more pervasive. The problem should also be addressed now because although past changes in technology have not created a need to do things differently this may not continue to hold true.

Emerging technologies (and their consequences) are changing the nature of the management challenge. Observable and self-evident trends (grouped under the headings of convergence, commoditisation, the connected world and consumerisation) are described here followed by a discussion of disruptive technology, legacy systems and IT futures. There are many signs that the need to address the problem is already becoming urgent.

Convergence

The convergence of business and IT is facilitated by methods that define business process from which code can be generated. Thus convergent methods can herald a greater involvement of business people in what have hitherto been IT activities (Miller and Woodman, 2011b). Business process management (BPM), service-oriented architecture (SOA) and some middleware (e.g. to provide an integration layer for legacy applications) can be considered to be convergent technologies. Each promise greater participation by business people in the activities associated with building and modifying enterprise IT solutions to meet business needs to the point where organizational computing groups as we know them today effectively disappear (Gray and Hovav, 2007). If these technologies can be developed to the point where business people are able to tailor entire systems to meet their needs then the Chinese Room (Section 1.2), i.e. any lack of cognition caused by problems associated with language and communication, can perhaps be eliminated. Where entire systems are beyond the capability of business people it may still be possible for them to take more control and businesses can avoid the delays associated with involving others.

If this trend continues, an IT delivery model for managing IT resources, IT processes and IT people would need to give way to a model which can orchestrate a larger community to identify needs and deliver new or modified solutions.

Commoditisation

Commoditisation is generally regarded as the movement of a market from being differentiated to being undifferentiated with greater price competition. It is exemplified here by cloud computing which is minimising or in many cases removing the capital constraints associated with satisfying new business needs by utilising managed virtualized resources

over the internet on an as required basis. This is changing not only the types of solutions available to a business but business models, the structure of the IT supply industry and the nature of what has to be managed. Instead of buying hardware and licensing or developing software solutions to run on it, cloud technology may provide instant access to Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), and to Infrastructure-as-a-Service (IaaS) and there are many deployment models to choose from (Karnwal *et al.*, 2011). IT management in a business context may less frequently be about managing software development but more about the discovery (Lahiri and Woodman, 2009), adaptation and orchestration of web services. Web services are becoming the building blocks of business applications. These may perhaps be within a solution framework such as a CRM or ERP or as an element of functional design to support an internal or external value network (Nix *et al.*, 2008). The change is also allowing existing vendors to offer new products and services, and new entrants to appear. Software vendors are becoming service providers selling SaaS (e.g. Google Docs, Salesforce.com), an on-line retailer is selling PaaS (e.g. Amazon), and unused computing capacity can be bought and sold as IaaS (e.g. SpotCloud by Enomaly). The IT supply industry and the products and services that it offers is changing the competitive landscape (Porter, 1980) and the IT industry structure model can be expected to adapt. Management methods will not so much be focused on managing IT resources, processes and people as managing the outcome and maintaining alignment and overall governance.

Commoditisation still requires more standardisation if market-based resource management strategies and global cloud exchanges are to bring about true competition and so create a true utility providing ubiquitous access (Buyya *et al.*, 2008). In the absence of standardisation (and commoditisation) there are proprietary solutions emerging that combine the technologies. A development which combines cloud with SOA that is likely to further drive convergence as well as commoditisation is the expert integrated system such as that offered by IBM (PureSystems, 2012). Software AG is acquiring solutions and integrating them into a family of products aimed at delivering faster solutions (http://www.softwareag.com/uk/). Solutions designed to be easy to deploy, customize and safeguard are allowing business managers to focus on the outcome, alignment and overall governance.

It is already known that a business that transfers its IT to the cloud will receive those services in a very different way, requiring a willingness to focus on the particular needs of their business rather than the routine mechanics of information systems (Burn and Thompson, 2011). It is a radically different computing paradigm that shows all the characteristics of becoming a disruptive technology and it must be looked at from a

business perspective (Marston *et al.*, 2011). Whether cloud will be seen as being driven by the business (Burn and Thompson, 2011) or by IT (Narasimhan and Nichols, 2011) is still unclear but it will become a business reality because the technology is relatively cheap and easy to use (Diaconita, 2011). This increased accessibility and low cost of entry was what made personal computers (PCs) popular with businesses when they became available which explains why businesses can, as was the case with PCs, be seen to be making the purchasing decisions.

Devolved decision making and devolved IT delivery make the central management of IT more difficult and unsuited to the current IT delivery model.

Connected World

The connected world refers to everything from The Internet of Things (Ashton, 2010) to the trend to install processors in plant and equipment in order to monitor or control them remotely via a network within a system. The growth in this technology has changed the economics and the possibilities of retail supply chains, distributed organizations, traffic flow, and plant operation – particularly where this is located in remote or inaccessible places or is inherently dangerous.

Some examples of the increasing sophistication of the connected world are offered. Motorway traffic management and number plate recognition are technologies that assist authorities to centrally manage congestion and also detect vehicles that need to be traced. Intelligent transport systems in urban areas allow the different applications used within modern traffic management systems to communicate and share information with each other such that private vehicle, public transport and commercial fleet operation can be optimised to assist the driver and avoid congestion and pollution (ITS, 2013). Engine health management systems monitor aircraft engines from ground stations whilst in flight to ensure safety and cost-effective maintenance (RR, 2012). Real time communications will soon be more widely available being accelerated by interoperability standards between browsers (Google, 2013).

The management requirement from connected systems is one of immediacy, i.e. to be able to respond in timescales that would apply to fully manned equipment – or better. The current IT delivery model is not so well suited to the operational aspects of this requirement.

Consumerisation

Consumerisation, the not well-defined but observable neologism for the convergence of consumer electronics and business systems, is increasing the opportunities for

businesses. Smartphone technology is creating a personal mobile interface to corporate systems for email and intranet/internet browsing, e.g. Bring Your Own Device (Mansfield-Devine, 2012) (Computer Fraud and Security, 2011). They can also be used for system input and output including alerts.

New devices tend to first appear in the consumer market and then pass into business. Consumerisation is also creating multi-channel business environments, e.g. orders are received by mail, the telephone, the internet, and by text. The literature searches suggest that the integration of consumer devices has so far focused heavily on email and internet browsing.

From an IT management perspective, more pervasive use has the potential to dramatically increase the number of users of a system. When this happens the management methods required may have more in common with those deployed in a business-to-consumer (B2C) context than a business-to-business (B2B) one because there could be many more business needs and opinions to satisfy. This is being termed Business to Individual, B2I (Godfrey, 2012).

Consumerisation has the potential to create a consumer market for new business requirements, i.e. multiple requests with an expectation of an immediate response. In this case the current IT delivery model would require major revision.

Combined Effects of the Trends

Collectively these trends have the potential to enable business people to initiate change, take more responsibility for the process, and to move the decision making closer to the business. These trends, however they may be implemented, are changing how a business and its internal and external stakeholders might interact with technology – i.e. by becoming both a consumer and a configurator (Sharif, 2010).

The attendant new business models are typically able to benefit from enhanced flexibility through scalability and agility of resource requisitioning, device/location independence, and lower cost through shared resources and operational efficiency. Arguably the beneficiaries of the changes will be the consumers of converged and commoditised IT services across all parts of the business ecosystem. The challenge to the combined IT services industry will be whether it can meet the many needs of the business and consumer, which together are, after all, the most important entity and the principle quality driver (Vouk, 2008). For the moment the focus is on the technology but at some point there will be a need to consider how to manage service delivery where the IT resources, processes and people (the basis for many of the methods that comprise the current IT

delivery model) are no longer controlled by IT on behalf of the business (Miller and Woodman, 2011a). This change in the relationship between business and IT is likely to give rise to a degree of disintermediation creating IT job losses estimated at 10 –15% (Burn and Thompson, 2011). With more diverse user demands and greater flexibility available from the technology business management will focus on business need and time to deliver or "time to value". The delivery model will have to change.

The trends are also giving rise to big data. Every day the world generates 2.5 petabytes (15 quadrillion bytes) of data (IBM, 2012). This data comes from everywhere: sensors used to gather climate information, posts to social media sites, digital pictures and videos, purchase transaction records, and cell phone GPS signals to name a few. Big data is mentioned in the top ten problems for CIOs in 2011 (see Table 1.1). In a survey of 550 senior IT managers in the UK in July 2012 by EMC it was found that 60% of respondents said that making better use of internal and external customer insights, trend data, and information is the most important factor in unlocking the next wave of growth for organizations, rather than using traditional methods such as cost cutting, squeezing suppliers on margins, and coming up with the next "big idea" (EMC, 2012). The survey found that 19% of corporate IT budgets was being spent on big data analytics defined here as a set of technologies and techniques that draws together insights from multiple data-sets to provide real-time insight on specific issues, i.e. to answer a business question rather than to improve a business process. The current IT delivery model is less suited to the dynamics of big data analytics than to those of systems building for which it was designed.

The delivery model was designed to manage the definition of the requirements and the construction and operation of the solution. The success of the semiconductor integrated circuit industry (Moore, 1965) has provided increases in performance at less cost year on year for almost 50 years. Although the traditional scaling of feature size in integrated circuits is thought to be reaching its limits (Mack, 2011) the supply of cloud services via multi-tenant large-scale data centres is now becoming common practice and more solutions are becoming cloud enabled e.g. in-memory databases for rapid access such as Terracotta Big Memory (http://terracotta.org/). These facilities simplify the access by businesses to computer processing and memory resources. If the management of this infrastructure and the task of satisfying business needs become partially separated the business will be allowed to focus on meeting its needs knowing that solutions and resources are available. This is likely to put pressure on the IT delivery model to be much more responsive to changes to business needs and a better success rate will be expected. A more flexible and agile approach to IT management is required to enable

business to react quickly to whatever risks or opportunities present themselves (Angell and Smithson, 1990). This may not be an appropriate role for the current IT delivery model.

The successes of the semiconductor industry have probably sheltered the IT community at large from its poor success rate in IT delivery. If there is any slowdown in the traditional price performance improvement it is likely that businesses will be encouraged to look more closely at the waste associated with IT investments. Whilst the IT delivery model has not been the focus of attention in the past, such a slowdown would ensure that it becomes one in the future.

Disruptive Technologies, New Competition, and the IT Credibility Gap

For many businesses over the last fifty years IT has not just been a means of introducing greater efficiency and creating new commercial opportunities. IT has also sometimes been an unwelcome and disruptive influence on their markets or their supply chains, e.g. the effect of internet businesses on some UK high street retailers over recent months such as Comet, HMV, Blockbuster, etc. This has meant that further IT investment was often necessary if they were to remain competitive, e.g. to create their own internet channel to compete with the established players. When a business knows it must invest further in IT and yet its experience is one of uncertainty in terms of the outcome there is inevitably going to be tension between the business and IT people. If the National Health Service in the UK were to be opened up to competition from the private sector it would be unable to compete on an efficiency basis alone. The recent high profile failure of the NHS to invest in IT systems (Section 1.2) would probably discourage it from investing its own money in IT solutions and yet this is exactly what it would have to do.

I have worked with businesses that have experienced multiple and even successive total or partial IT investment failures prior to involving my company. The credibility of the IT supply organizations and the morale of their staff always suffer as a consequence but the real cost is to the businesses themselves. The resulting tension can lead to distrust, reduce expectation, lead to a reassessment of the risks associated with IT investment, limit investment (especially during times of austerity), or prompt discussions about the future of the IT supply organization. This is likely to have a negative impact on the commercial performance of the business.

Assuming there is no such reluctance to invest, what will a future IT landscape look like?

Legacy Systems, Emerging Technologies and IT Futures

The emergence of newer technologies over the years has given rise to legacy systems. Legacy systems might be defined as an aggregate package of software and hardware solutions whose languages, standards, codes, and technologies belong to a prior generation or era of innovation and which need to be managed or displaced (Dedeke, 2012). The useful life of a system can vary but I know from experience that the pace of change, anticipating the direction that technology is taking and deciding at what point to invest have always been problematic for business. I also know that legacy systems can be expensive to maintain, difficult to remove from large businesses, and can inhibit a rapid response to new business requirements and further investment. In considering the acquisition of new technology the business must avoid the worst effects of legacy systems but if new and high priority requirements continue to arise faster than legacy can be replaced, legacy systems are likely to continue to increase in number or at least be a permanent feature of the IT landscape in many businesses for some time to come.

If legacy cannot easily be removed then based on current trends the management of the whole becomes more complex with not just more technologies but more users and more suppliers. Emerging technologies, e.g. cloud, SOA, smart phones, not only offer user advantages but have the potential to reshape the IT industry (Abualkibash and Elleithy, 2012). If there are question marks now concerning the effectiveness of the current IT delivery model, this anticipated mix of technologies could very soon present more challenges. As in the past these technologies will give rise to legacy systems but by changing the relationship with business could also render the current delivery model obsolete – or at least make it a legacy casualty.

Today's autonomic solutions are typically focused on the recovery from operational failure, e.g. server, network, or hardware component failure, rather than on adapting an application to meet some new business requirement. Future self-adaptive or self-managing systems are where the complexity makes defining and testing the requirement difficult if not impossible except at run time (Kephart and Chess, 2003). It is difficult to see how the current delivery model will be relevant to a truly self-adaptive or self-managing world where there may be no requirements specification but where a new business need must be capable of being detected, where the IT resources are neither owned nor managed by the business or the IT service provider, where the business expectation will be such that response must be fast, and where success rates must be very much greater than today.

1.6   Research Question

If the current delivery model is suspected of being costly today, possibly less relevant in the emerging world, and unsuited to these future systems, what should replace it? How does such a future IT delivery model co-exist with the current model if a mixed technology complex environment, i.e. legacy, emerging technology, and future self-adaptive environment, is likely?

Just as marketing has been challenged for perpetuating the marketing management methods of the 1960s long after the emergence of the new economy (Gummesson, 2002), there is now a need for "…inductive and systemic case study research" into the relationship between business and IT organizations "allowing us to confront the complexity, ambiguity and dynamism of the real world…" (p 585).

The question, therefor, to be addressed by the research described in this thesis is:

> *What constitutes a new IT delivery model that can make successful business outcomes more likely both now and in the future?*

This is an open question. It will be necessary to observe and understand the relationship between business and IT organizations. It will ask if this relationship can be supported more effectively during IT delivery. Given the nature of emerging and future technologies, it will ask if the proposed delivery model is more or less likely to be effective into the future.

Whether the results of the research will require some deprogramming or unlearning, as Gummesson suggested is necessary in marketing (Gummesson, 2002), is not certain but to discover how the IT delivery model might be improved the research must be approached with an open mind.

Expected Contributions to Knowledge

The expected contributions to knowledge from the proposed research are an understanding of:

- The relationship between business and IT in terms of what is relevant to stakeholders
- What is involved in this relationship today and why success rates are lower than they might be
- The appropriateness of the current IT delivery model when considered in the context of future scenarios
- A new IT delivery model and the reasons for its current and future relevance.

These contributions also form the objectives of the research.

1.7 Summary and Structure of the Thesis

In this introductory chapter the motivations and rationale for the research have been described. It has discussed the background to the problem, which may have always existed, and identified the likelihood of a successful business outcome over many years and the potential financial impact globally. The scale and the potential financial impact are such that the industry should not continue to ignore the problem. Furthermore, the current IT delivery model would appear to be less suited to the emerging technologies, the disruptive effect of new technologies, and a future complex mixed technology environment. This suggests that the problem requires an urgent solution. After more than forty years of applying the same IT delivery model it is clear that there is a requirement to find a model that is much more effective today, more relevant to emerging and future technologies and capable of managing a complex business and IT landscape. The purpose of the research is to determine what this new IT delivery model might look like.

Chapter 2 is a critique of relevant literature relating to the current IT delivery model, issues raised by the research as it progressed and the work of others in these areas.

Chapter 3 is a methods review which describes the rationale for selecting the grounded theory method (GTM) as the primary research method, the data sources and the research design. It also defines the quality criteria for evaluation purposes.

Chapter 4 describes how the research was undertaken and what was learnt from the data about the business and IT relationship using the qualitative research method.

Chapter 5 examines the theoretical model, the product of the research, from different perspectives and shows how this provides an explanation for the low success rates associated with IT delivery.

Chapter 6 proposes an a*ctive management* framework, based on the theoretical model, as the IT delivery model of the future.

Chapter 7 contains an evaluation and critical assessment of the research and its findings.

Chapter 8 is the concluding chapter which summarises the findings, the contributions to knowledge of the research and describes future work.

CHAPTER TWO

Critique of Relevant Work

2.1   Introduction

The work of others described in this chapter was all reviewed post analysis, i.e. after concepts emerged from the research. Placing the summary of the critique of relevant published work here is useful in that it avoids unnecessary repetition and helps the reader to better understand the later analysis in a way that the researcher could not.

The grounded theory method (GTM) is the chosen process for the research. The rationale for selecting this is described in detail in the next chapter but it is stated here because the choice of method imposes limitations on how the literature can be used. In GTM the literature may be used as a source for making comparisons between the what emerges from the data and the work of others to enhance sensitivity, to stimulate questions for inductive reasoning during analysis, to suggest areas for theoretical sampling, to confirm findings, and to challenge the literature (Corbin and Strauss, 2008) p 36 – 38. The list is not exhaustive and the research design will be justified in the next chapter. It is necessary to stress here that "literature can hinder creativity if it is allowed to stand between the researcher and the data. But, if it is used for comparative purposes it can foster identification of properties and dimensions of relevant concepts." (Corbin and Strauss, 2008) (p 42).

The sequence of the sections and their descriptions were determined by the sequence and the language which emerged from the analysis. As will be described later (Chapter 3) the primary data identified problems amongst business and IT people that were not limited to the core delivery activities, i.e. solution development and its subsequent operation. The analysis also pointed to problems in the associated areas of planning and strategy, alignment and governance, and in value delivery. The work of others is explored in all of these areas.

The literature describing problems associated with IT delivery in the context of the research question is examined in Section 2.2. IT strategy, architecture, alignment and

governance are reviewed in Section 2.3. Value and the related concept of service are discussed and reviewed in Section 2.4. Finally, the literature is reviewed to expose points of importance relevant to IT futures which is summarised in Section 2.5.

Throughout this research, the focus was the IT delivery model in a business context rather than the IT delivery model itself. The observations and arguments that evolve in this critique of the work of others are the results of taking a fresh look from the perspective of the research question which is now known to be different to what has been considered before.

2.2   IT Delivery

The literature was reviewed to discover what was known about IT investment outcomes (see Section 1.4) and it provided consistent evidence of low success rates. The reasons given for these low rates of success were various. These included a lack of involvement of senior business managers (Sauer and Cuthbertson, 2003) (Whittaker, 1997), a weak business case (Whittaker, 1997), a need to better understand the business implications (Hughes, 2008), more competent management of business integration (Cooke *et al.*, 2001), project management generally (Smith and Booth, 2000), project size (Sauer and Cuthbertson, 2003), project planning (Whittaker, 1997), risk management (Poba-Nzaou *et al.*, 2008), and estimating (Boehm, 2008) (Little, 2006).

The problem was first highlighted at a NATO conference in 1968 since when the low success rates have most often been blamed on poor project management (Dalcher and Drevin, 2003). Dalcher and Drevin advocate more qualitative analysis of project failure. Boehm claims that, based on his data from TRW, the estimating uncertainty reduces with each phase of project delivery (Boehm, 2008). This creates a "cone of uncertainty", so named by McConnell (McConnell, 1998). By contrast, Little is strongly of the view that his data from Landmark Graphics over many years suggests that uncertainty is constant over the life of a project and this uncertainty must be managed (Little, 2006). Boehm claims that uncertainty is reduced through prototyping, simulating, modelling, benchmarking, reference checking, COTS evaluation, market trend analysis, and by organizing projects "with enough agility to be able to adapt to the additional emergence of new sources of unpredictable change". Thus Boehm and Little may not be so far apart in their views though neither has solved the problem.

It is acknowledged in the literature that there are many IT methods, much overlap, and a lack of standardisation. Specifically IT Service Management (ITSM) for IT operations management, Business Service Management (BSM) for dynamically linking IT services to the underlying infrastructure (O'Neill *et al.*, 2006), COBIT for control or audit, and IT

Governance give rise to a confusing complexity of terms and practices (Winniford *et al.*, 2009); this is especially unhelpful where methods are applied in combination as is often my experience. Winniford *et al.* conclude that there is conceptual confusion indicating an immaturity of the discipline of ITSM. As an academic discipline, Winniford *et al.* say that ITSM is even less mature and the needs for future research in the area are extensive.

The international standards also reflect the same current delivery model and exhibit a similar lack of standardisation of terms mentioned above. For example ISO/IEC 20000 (ISO/IEC20000, 2012) was once based on ITIL V2 but the international standard has not been updated with the changes introduced for ITIL V3. COBIT overlaps with ITIL but the terminology used again differs to that in the standard. The organizations promoting the major methods themselves recognise and have tried to address the problem, for example by cross referencing their methodologies and where this is approved by HMG for mixed methods it can be placed as a pdf for download on an HMG web site (OTGI, 2008). As an example there is a cross reference for "Aligning CobiT® 4.1, ITIL® V3 and ISO/IEC 27002 for Business Benefit®: A Management Briefing from ITGI and OGC". Examples such as this illustrate the complexity of managing an IT delivery model that is using multiple IT methods such as these. Because of this complexity I have been told by ISACA and itSMF representatives that the cross-referencing may not be updated for COBIT 5 and ISO/IEC 20000 may never be re-aligned with ITIL.

The current delivery model has been said to be problematic in the sense that a development may be a superb technological success but a total failure for the business (Ben-Menachem and Gelbard, 2002). This suggests that the delivery model is IT-focused rather than business-focused; the methods enable practitioners to apply IT best practice and achieve their own success criteria but the outcomes for the business may not be adequate. Ben-Menachem and Gelbard advocate a rationalization of the methods and a system solution to provide visibility to the processes and IT assets/resources such that stakeholders can track progress. The additional control this affords may be helpful but philosophically the delivery model is unchanged. There is a vast array of methods and a generally accepted view that IT delivery is failing to meet business expectations (Velitchkov, 2008).

The concept of quality in the context of software has been addressed from an IT perspective (Cavano and McCall, 1978) devising metrics for reliability, efficiency, integrity, usability, maintainability, testability, flexibility, portability, reusability, and interoperability. These are measures of quality of the output from software engineering and this is consistent with the product and production paradigm for IT management described earlier (Section 1.3).

The problem with IT delivery has existed for more than forty years and is most often regarded as an IT project management or software engineering problem. The many IT methods and standards have introduced additional complexity but are often inconsistent, are predominantly IT-focused and support the current IT delivery model and the product and production paradigm for IT management. Software quality is well developed as a concept. Although there is concern about the poor success rates the IT delivery model is not identified as the possible cause and there is no relevant work that directly addresses the research question.

2.3 IT Planning

From the data it is clear that the problems with the current IT delivery model are not limited to the pure delivery tasks but appear to be connected to concerns in the areas of planning and the associated topics of IT strategy, architecture, alignment and governance, as shown below.

Architecture and IT Alignment

For many, the principle planning framework is an architectural concept that was established in 1978 (Zachman, 1978) for linking projects with the strategic IS plan and with the business processes, organization, systems and data. Zachman later developed his framework providing different views for data, processes and the location (or network) requirements according to the needs of the owner as defined at various levels from overview to detail depending on purpose, e.g. from business management to builder (Zachman, 1987). Many have since recognised the parallels between this basic architectural framework and the need for business and IT alignment (Henderson and Venkatraman, 1989) (Velitchkov, 2008) (Tarafdar and Qrunfleh, 2009).

The work by Henderson and Venkatraman (Henderson and Venkatraman, 1989) further developed the framework using four domains: Business Strategy, Information Technology Strategy, Organizational Infrastructure and Processes, and Information Systems Infrastructure and Processes. Known as the strategic alignment model, this framework considered strategic integration, functional integration, and the cross-domain alignment between business and IT. They note the uncertainty of the process and later there is an acknowledgement that the potential for IT impact is so varied and complex that these perspectives should be considered as alternative conceptual lenses and the practitioner must be prepared to continuously make adaptations (Henderson and Venkatraman, 1993).

The lack of business and IT alignment, problems with IT strategy and inadequate control mechanisms are seen as the root cause of IT investment failure (Velitchkov, 2008). Velitchkov's proposition is that the cohesion between and within business and IT be achieved by using a repository integrating the objects of Enterprise Architecture, IT Strategy (using the Business Scorecard principles) and project management. Velitchkov uses services to add value through units of functionality and his proposal becomes one of essentially creating a new programming environment integrating infrastructure services, application services, and organizational services to create business services. This utilizes alignment principles and top-down techniques common with information engineering (Martin, 1989) extending into software engineering.

Tarafdar and Qrunfleh (Tarafdar and Qrunfleh, 2009) also identified a need for alignment at two levels. At the strategic level there is a need for the alignment of business and IT strategy and at the tactical and operational levels for the dynamic and real-time alignment of projects, people, and processes between IT and business. In this case the tactical alignment calls for greater soft and hard skills. The best results, they conclude, are obtained when there is high strategic and high tactical alignment.

The many branches of research in this area fall into two main groups. This first group sees software engineering based on an EA repository as a solution to alignment similar to the Velitchkov example. Examples of the work of this first group follow.

- Use case diagrams (UML) are aligned with value models developed collaboratively by multiple businesses to achieve a common goal in a value web context (Zarvic *et al.*, 2008). The approach provides a method of checking the extent of the alignment of the value model with the functionality of existing systems and of gap analysis where existing systems lack the required functionality.

- The alignment between IT and the competitive strategy of the business for an e-BPM application (Karagiannis *et al.*, 2007) uses UML notation meta-models with the aim of providing continuous business-oriented IT management. Modelling is carried out at four levels: strategy, design, resources, and execution.

- A method for alignment in the case of a mobile e-service is offered based on positioning the enterprise and e-service in the context of networked value constellations (Pijpers *et al.*, 2008). This requires the alignment of the perspectives of business strategy, value creation, processes and IT/IS both intra-organizationally and inter-organizationally.

- Some advocate that businesses adopt the discipline of EA. For example, the role that the financial markets played in the global economic crisis is used to advocate enhancing corporate governance and, de facto, improving the understanding of

employees' responsibilities by extending the COBIT RACI framework for this purpose into the business (Feltus et al., 2009). Others further develop the architecture by advocating that it become a business as well as IT planning tool (Winter and Schelp, 2008). Having compared the emerging corporate enterprise control requirements with the IT governance reference model defined by COBIT/ISACA Winter and Schelp concluded that in a business context, concepts such as EA and RACI were in their infancy and would need to be extended to meet the corporate needs. They also question how business people can be encouraged to adopt the disciplines of EA.

These are all developments that extend what an enterprise architecture (EA) may have to support. EA has developed into a multifaceted discipline (TOGAF, 2010) though its origins remain faithful to the product and production paradigm for IT management. At the IT/IS level, Pijpers et al. have concerns about UML and TOGAF as approaches because they say they are rather comprehensive and time-consuming to apply during the initial exploration of an e-service. The research raised further questions about the meaning of, and the mechanisms for, alignment. Others share the concerns of Pijpers et al. (Kemp and McManus, 2009) and are already criticizing the manner in which they have experienced EA being implemented. Kemp and McManus are concerned that EA concepts are being pushed beyond what can be justified and that taken too far can adversely affect the IT supply organization's ability to deliver useful business functionality to end users in a timely manner.

The second group acknowledges the architectural or intellectual aspects but also recognises, like Tarafdar and Qrunfleh, the wider implications of alignment. The importance of both the intellectual dimension, i.e. the architectural, planning and procedural aspects, and the abstract, i.e. social and cultural, dimensions of alignment have been identified (Reich and Benbasat, 2000) (Campbell et al., 2005) (Luftman and Kempaiah, 2007) (Leonard, 2005) (Ramakrishna and Lin, 1999).

- Reich and Benbasat studied just four abstract and social aspects of alignment: shared domain knowledge, IT implementation success, communication between business and IT executives, and connections between business and IT planning (Reich and Benbasat, 2000). The research showed that shared domain knowledge is significant in achieving long term alignment but the research was restricted to the abstract and social dimensions that had already been defined by others.

- Campbell et al. conducted a grounded research project involving six IS/IT managers which suggested that the business and IT relationship and alignment are inhibited by organizational culture (Campbell et al., 2005). They conclude that

the intellectual and social dimensions of alignment are inextricably linked in a web of cause and effect and alignment must be considered at all levels of an organization, not just at the executive level. The managers involved admitted that they spend little time developing relationships with business personnel but instead tend to concentrate on the technical aspects of their jobs, attempting to improve their credibility via their successful completion of projects.

- Alignment has been defined more extensively (Luftman and Kempaiah, 2007) in terms of communications maturity, competency and value-measurement maturity, governance maturity, partnership maturity, scope and architecture maturity, and skills maturity. This had developed from an original list of 15 enablers and inhibitors mentioned by attendees at an IBM training establishment (Luftman *et al.*, 1999) which later in the same year advocated a steering group approach and a simple cyclic process for maintaining alignment (Luftman and Brier, 1999). By 2003 the maturity scale had coalesced around the six practices named, underpinning these were some 30 – 40 alignment criteria, and assessment and alignment were being linked (Luftman, 2003). The assessment and alignment process is one of scoring each of the criteria against a maturity scale which represents the IT view of best practice in these areas. By 2007 the number of assessment criteria had reduced to 30 across the six practices. Luftman's alignment framework using a maturity scale has been adopted by others (Khaiata and Zualkernan, 2009) who report a second order misalignment between how the different participants viewed the maturity of the practices. Khaiata and Zualkernan reported a high degree of variance around what people believed was the maturity level of the criteria being assessed. This variance was evident between management and staff and between business management and IT management. There was an acknowledgement that this needed further investigation if the assessment process was to be useful.

- Leonard (Leonard, 2005) says that rather than just focusing on artifacts (e.g. plans and structures) to predict the presence or not of alignment that the beliefs and attitudes of the players should also be considered. Leonard distinguishes between the physical and abstract dimensions of an IT supplier and end user relationship. The conclusions are: 1) the IT manager should be aware of having the right people on the team, 2) the business and IT must be properly aligned, 3) end user maturity must be taken into account and this will influence team composition and the nature of service and support i.e. he treats maturity levels as a business requirement which is determined by the nature of the service and support.

- There is also a proposal for a measure based upon the business users' orientation toward IT as a means of improving the business interaction or relationship with the IT supplier (Ramakrishna and Lin, 1999).

The problem with Luftman's work seems to be one of getting agreement amongst those surveyed on the meaning and usefulness of the maturity scale. The value of a maturity scale was also questioned following another pilot where it was said that the concept of 'maturity', in any field, raises the question: 'Does maturity matter?' (Silvius, 2007).

The suggestion that it is necessary to know about the maturity levels of end user involvement (Leonard, 2005) and an end user's orientation towards IT (Ramakrishna and Lin, 1999) are recognition that one solution/level of service does not necessarily fit all and this can be an important consideration when planning any service but especially B2I (Section 1.5) and end to end (E2E) services, e.g. the flow of event-driven processes across one or more organization and system boundaries (Frye and Gulledge, 2007). Services may be delivering an entire process from one end user to another neither of whom may be employees of the process owner and this may be supported by multiple systems adding further complexity to the task of alignment.

Other methods of achieving alignment have been considered.

- A business-process centered micro-level approach to alignment (Tallon, 2007) excludes all but the business processes in order to establish a standard framework but its value would be limited for the reasons already established.
- The balanced scorecard (Kaplan and Norton, 1996) has been similarly used as a means of introducing a standard framework to describe the business context (Huang and Hu, 2007). Whilst providing a good business focus the balanced scorecard (BSC) approach can be time-consuming and has a tendency to treat information technology as a support activity which may not be such a good choice today where IT is typically at the centre of all value networks. The research of the IT Governance Institute in 2004, in conjunction with Lighthouse Global showed that BSC is evaluated as effective by only 48% of the 200 IT professionals surveyed where BSC has been used whereas methods developed in-house were considered to be the most effective (Velitchkov, 2008).

The alignment of IT with business strategy remains a perennial concern for firms worldwide. Whilst most of the literature focuses on justifying and trying to define business-IT alignment it doesn't actually explain how to do it (Cumps *et al.*, 2006). Similarly, it is said that research has not clearly defined alignment, relying instead on tautological definitions, nor offered guidelines for management practice other than simple rules of

thumb (Maes *et al.*, 2000). Cumps *et al.* offer three guidelines for undertaking alignment: consider the role of IT, use the business case, and measure alignment continuously saying that CIOs should reflect on how they can "infuse the everyday organization with alignment efforts". They add that the use of rich, extensive business cases and value-driven IT metrics and measurement techniques are two examples that seem to work.

A review of research on alignment (Chan and Reich, 2007) observed that alignment is generally considered to be a continuous process, the end state is most often associated with strategy and there is a tendency to use theoretical and artificial constructs for measurement. They concluded that there was still little agreement over what alignment is, where it is most likely to occur or how it should be measured. Chan and Reich observed that alignment remains an important but elusive goal which is under-represented in research to date and suggested that more grounded research in this area was appropriate.

It has been recognised that in practice the real world provides a more complex and fuzzy situation in which alignment is not as straightforward as implied by the methodologies. This is because business strategies are often unclear (Silvius, 2007) and business goals are high level and generic (Grembergen *et al.*, 2005).

If alignment is a key requirement from a delivery model it would probably not be possible to design it from the literature. If business strategies are often unclear and alignment cannot be defined or measured then it is not surprising that just over half of CIOs report alignment as poor or fair (Section 1.2) and that it remains among the top-10 issues for many organizations (Cumps *et al.*, 2006). How also, in the words of Cumps, can an organization be infused with alignment efforts?

IT Governance

Governance is often mentioned simultaneously with alignment (Khaiata and Zualkernan, 2009), (Luftman and Kempaiah, 2007), (OTGI, 2008), (Silva and Chaix, 2008), (Huang and Hu, 2007). There is a gulf between the IT controls at the macro (financial) and micro (operational) levels (Ahituv *et al.*, 1999), and there is a call for the development of an IT corporate governance framework that will allow organizations to deal with a broader spectrum of computing issues, i.e. beyond ROI, (Raghupathi, 2007) though this is not defined nor is the relationship between alignment and governance explored.

Governance is often explained in terms of the mechanisms used which may include a steering group, portfolio management, budgetary controls, IT leadership, IT project steering committee, reporting line of the CIO, and the use of management methodologies

(DeHaes and Grembergen, 2009). More generally, as the authors say, it relates to consistent management, cohesive policies, guidance, processes and decision-rights for a given area of responsibility. In practice IT governance is often seen by the business as a project imposed by the IT organisation (DeHaes and Grembergen, 2005). It is frequently reduced to addressing who pays for what based on which parts of the business benefit most from the investment. COBIT 5, the latest version of the business framework for the governance and management of enterprise IT, says that "governance is about negotiating and deciding amongst different stakeholders' value interests." (ISACA, 2012).

When looking at how organizations are implementing IT governance and the relationship between alignment and governance the product and production paradigm for IT management becomes more evident. Five of the seven practices recommended as the key minimum baseline for IT alignment and governance (DeHaes and Grembergen, 2009) are based on managing product development and delivery. Although the literature demonstrates that there is a need for governance to connect IT and the business more effectively and on more levels (Campbell *et al.*, 2005), (Kang *et al.*, 2010), (Wegmann *et al.*, 2007), (Silva and Chaix, 2008), (Khaiata and Zualkernan, 2009), the IT governance standard (ISO/IEC38500, 2008) illustrates how constructs of the IT delivery model prevent this. The ISO standard for the corporate governance of information technology is focused on outputs of managing "ICT projects" and "ICT operations", i.e. it supports the product and production paradigm for IT management. The standard sets out six principles for the good corporate governance of IT which, the standard claims, are appropriate to all organizations: 1) responsibility 2) strategy 3) acquisition 4) performance 5) conformance 6) human behaviour. The act of governance says the standard, requires an IT governance model using a Deming-like cycle to evaluate, direct and monitor the ICT projects and operations (including the transition of projects to operations).

At the macro level it is thought that there is no one solution for monitoring technology that fits all boards of directors (Nolan and McFarlan, 2005); solutions vary widely. Nolan and McFarlan suggest a framework which classifies a business according to how it uses IT and a calendar for the IT governance committee in which topics are scheduled as quarterly, annually or 'as required'. This is a typical approach but it is prone to failure through management myopia, i.e. management may incorrectly classify their business and may be blind to what is happening, or management can be slow to respond or even unresponsive.

At a time when autonomics is gradually playing a greater role in the management of the infrastructure and systems (Dobson *et al.*, 2006), it is necessary to consider not just how IT governance can be improved for this world, but for a future self-adaptive and self-

managing world where a more immediate response will be necessary. Any future IT delivery model might be expected to improve IT governance and be timely in such future contexts. SOA governance, for example, requires the greater involvement of business management (Schepers et al., 2008) because, argue the authors, the services represent business activities. Schepers *et al.* recommend that SOA governance be an incremental and continuous process with business input and strong communication links with the IT people.

IT governance is at best a boardroom agenda item. Instead the literature suggests that there is a need for governance to involve the business more, to address a broader spectrum of business needs, to connect with business at more levels, and for this to be a continuous and even, where relevant, a more immediate process. The literature does not connect this to the IT delivery model and no solutions are offered.

2.4 Value and Service

The notion of value is raised throughout the data. IT suppliers add value by making business more efficient, more effective, and by transforming business by making new business models possible (Venkatraman, 1994). The transformation of business has been achieved by delivering IT solutions, hardware, software, or a combination, that are justified on the basis of the net value they add to the business. The concept of value is a relatively recent formal addition to the major IT methodologies[7]. By contrast, Value Based Management (Koller, 1994) pre-dates these and as a management concept it has been around for a long while coming from value-add per unit; value-add per employee being a measure of productivity improvement that avoided the pitfalls associated with using revenue per employee.

Service, Value Creation, and Value Realization

The term 'service' if used conventionally is a deed, performance or an act that is essentially intangible and does not necessarily result in the ownership of anything. The characteristics of service that distinguish it from product (Kotler *et al.*, 2002) are:

- Intangibility (cannot be experienced before it is received)
- Inseparability (cannot be separated from those providing it)
- Variability (inseparable from people so deliveries to customers vary)
- Perishability (cannot be stored for later use)

---

[7] For example 'VAL IT' in its current state was introduced to COBIT in 2008, see Appendix G.

- Criterion for satisfaction (prompts difficulties when making purchase decisions and often impossible to know after the event whether alternatives would have produced better outcomes)
- The customer participation in the process (service providers and their customers participate in the co-creation of value).

Service is said to be associated with the co-creation of value (Spohrer and Maglio, 2008), however, from a business perspective, of the ten steps that make up the delivery model (Section 1.3), it is the first, i.e. the provision of business analysis services, that is likely to generate more opportunities for *creating* business value. The remaining 9 are value *realization* services involving the construction or execution of product from an original idea for value creation. Thus in the business and IT context value can be considered to be added through two related phases; the value creation phase where the idea is formed that will create value, e.g. harnessing a particular technology to create a new business model or a more efficient way of working, and the value realization phase where a requirements specification is produced and the solution is built (developed/customised, deployed, and executed). The current IT delivery model (Section 1.3) is predominantly value realization oriented.

This is recognised within the literature. Boehm when describing value-based software engineering acknowledges that value creation requires that the option space within which managers and designers operate must be sufficiently rich (Boehm, 2003). Without such options, and as the development lifecycle proceeds, the focus will increasingly be one of value realization through software engineering. Thus value creation is frequently not the focus of IT services.

Operational Level Services of ITSM

Within the current IT delivery model the dominant use of *service* is in 'IT Service Management' which is synonymous with managing the service level agreement. ITIL (TSO, 2007) describes this as "like turning on the water tap and expecting water to flow from it" (p 4). It is possible to assume that the ITIL literature (Section 1.2) implies much more than this when it describes the service management lifecycle but ITIL is a methodology that has its origins and its focus firmly on the operational aspects of value realization. The expressions of availability and performance used by the IT people form the common basis of the service level agreement. These, like the requirements specification and maturity models are IT terms and constructs that enable IT people and IT service providers to measure performance. A recent survey identified conceptual confusion on exactly what constitutes an IT service given the confounding array of related

terms – even for respondents who have implemented service management (Winniford *et al.*, 2009). Others observe that IT services have existed for 40 plus years with little internal standardisation or process definition and furthermore that there is a need for research that investigates the wider economic and social ramifications of IT service management (Galup *et al.*, 2007). Any future IT delivery model must recognise that there are many kinds of IT services operating at different levels, i.e. not just at the operational level.

Web Services and SOA

Service is now often used to define a unit of functionality that can flexibly be modified or redeployed to support different business contexts (Diaconita, 2011). Web services and SOA provide such applications. Service orientation is said to enhance alignment possibilities enabling a multi-dimensional alignment strategy, i.e. architecture, governance, and communication, (Chen, 2008) and the resource-based view theory perspective (Wernerfelt, 1995), i.e. services become another business resource. Business value is created by integrating these resources dynamically and alignment becomes a continuous process. Chen acknowledges that further work is required to research the harmonization between the technical and social dimensions of the service-based system if this approach is to be truly multi-dimensional and thus not limited in terms of what can be achieved. Service orientation "must be capable of handling change requests that may arrive at any time" and so "SOA governance is not a process but a matter of continuously aligning strategic goals, new tactical opportunities, and to use gained experiences" (Schepers *et al.*, 2008). To achieve control Schepers *et al.* propose a centralist approach with a Deming-like life-cycle framework and assume that the current IT delivery model prevails. From this any future delivery model must combine the resource based view theory perspective with the social dimension and handle change requests on continuous basis.

Service Science Movement

The service science movement is promoting a broad trans-disciplinary approach (Glushko, 2008) combining business and management, science and engineering, social and cognitive sciences, and economics and markets (ERISS, 2010) (SSMED, 2010) through arrangements with more than 70 universities worldwide. This broad agenda is designed to address the challenge of becoming more systematic about innovating in services (Spohrer and Maglio, 2008). Service Science is looking to develop the science of service systems engineering (Tien and Berg, 2003) and theory of value co-creation that will enable business value to be created faster through the recombination of information, capabilities and artifacts (Chesbrough and Spohrer, 2006). The automation of services is

a software engineering programme that is of worldwide interest (Feldman *et al.*, 2006) involving functional attributes, non-functional attributes of control and security, and intentional attributes of goals and purpose. The literature acknowledges that to computer scientists the term services has traditionally had a narrower meaning but that there are common elements across many different types of services that might form a foundation for the field of service science. Amongst these is a call for exchange, as in *value-in-exchange,* to be viewed as processes and experience points (Galup *et al.*, 2007).

Service-Dominant Logic

The product and production paradigm for IT management probably often limits what can be achieved through IT services in a business context (Section 1.3). In considering the logic of services as operating in an end-to-end manner across *value constellations* or *value networks* rather than value *chains,* successful companies were described as conceiving of strategy as systematic social innovation involving the continuous design and redesign of complex business systems (Normann and Ramírez, 1993). It has been suggested that Normann and Ramirez in so doing contributed to defining service-dominant logic. They conceive of the customer as value creator and the offering, i.e. product or service, as an input to a value-creating process. Thus value is primarily defined in terms of *value-in-use*, from which, in virtually all cases in a market-based society, *value-in-exchange* can be derived (Vargo and Lusch, 2004) (Vargo and Lusch, 2007). It is claimed that for these reasons Normann and Ramirez's concepts enrich and expand service-dominant logic by reframing the overall value-creation concept (Michel *et al.*, 2007); using service-dominant logic they re-framed the production or manufacturing logic rather than replacing it. They thus retained the value inherent in the product adding value through the true service element. A future IT delivery model that is service based would frame the product and production culture of IT management.

Mindfulness is the process of drawing novel distinctions. The world of psychology has pioneered this thinking on mindfulness (Langer, 1989) and collective mindfulness (Weick *et al.*, 1999) but it is its relevance to IT in the business context that is of interest in this research. Increases in mindfulness are associated with increases in creativity and, in conjunction with perspective, this has been found to increase performance (Langer and Moldoveanu, 2000). Langer and Moldoveanu have found that mindfulness may be inhibited by an over-prescriptive and excessively procedural approach; rules and routines, perhaps such as those used to ensure compliance with the current IT delivery methods, are more likely to retard this process of mindfulness and so inhibit creativity.

The value of mindfulness in IT has been recognised by others as a means of encouraging innovation (Swanson and Ramiller, 2004) and to explain the success of agile development (Elbanna and Murray, 2009). A future IT delivery model must be sufficiently intuitive to enable mindfulness to be exploited as a means of encouraging innovation at all management levels.

Value Creation and Innovation

Value creation is strongly linked with innovation (Voelpel *et al.*, 2006). Most companies encourage incremental innovation, which they see as desirable, as opposed to discontinuous innovation, which they see as disruptive, risky and threatening (Section 1.5). All businesses must promote discontinuous innovation to maintain competitive advantage but organizational inertia, structured routines, and less absorptive capacity are three among other hindrances to discontinuous innovation (Junarsin, 2009). Given the competitive pressures and the unprecedented pace of change, businesses must be excellent in both incremental, i.e. exploitative, and discontinuous, i.e. explorative, innovation and seek to be "fully dexterous" in order to be sure to be able to secure a prosperous future (Corso and Pellegrini, 2007).

In business, the emerging reality is forcing a re-examination of the traditional system of company-centric value-creation and leaders now need a new frame of reference (Prahalad and Ramaswamy, 2004a). The premise for the new frame of reference is that value is co-created by the customer and the business. For the customer the co-creation experiences are the basis of value, the individual is central to it, and ultimately the co-creation experience is personalized. For the business the customer-firm interaction is the locus of value creation, and the focus becomes the quality of the customer-firm interaction. From both perspectives the focus becomes experience networks. The frame of reference needs a generalizable view of the co-creation process that can accommodate large numbers of consumers of varying interests, skill levels, needs and desires, that allows the business to understand when an experience environment is sufficiently compelling (Prahalad and Ramaswamy, 2004b). Arguably this might apply equally to business, the IT services, and the end user or end customer, e.g. in a B2I context.

Research has demonstrated the complexities of value creation through the exploitation of IT (Melville *et al.*, 2004). Melville *et al.* show that the extent and dimensions are dependent upon internal and external factors, including complementary organizational resources of the business and its trading partners, as well as the competitive and macro environment. These then can be expected to feature in any future IT delivery model.

Overall Service Quality

Expectations and perceptions of service play an important part in the service quality model, or *disconfirmation model*, (Parasuraman *et al.*, 1985): a marketing perspective in a B2C context which considers the gaps between personal needs and the management perceptions of consumer expectation around which a service offering is developed. Improvement comes from a better understanding of the consumer's viewpoint. This work gave rise to the notion of *disconfirmation* where the customer expectation is based upon pre-consumption ideas, i.e. expectation, formed from product advertising and customer reports against which actual satisfaction is measured post consumption. There is recognition that there are a variety of definitions of quality and many reasons for a perception that a service is failing to achieve satisfaction (which appears to be the main tenet). The disconfirmation model does not provide adequate information for decision makers as problems could lie in operations or marketing or even with the market/competitors and any real assessment has to take account of all parts of the business (Rosen *et al.*, 2003). Nevertheless the disconfirmation model has been used as the basis for a generalized SERVQUAL instrument (Parasuraman *et al.*, 1988), (Ziethaml *et al.*, 1988) for measuring service quality based upon the five dimensions of tangibles, reliability, responsiveness, assurance, and empathy (Parasuraman *et al.*, 1988). SERVQUAL uses the Likert scale (Likert, 1932). It has been applied to the assessment of IT services with mixed results (Babakus and Boller, 1992), (Van Dyke *et al.*, 1997), (Pitt *et al.*, 1997). Common problems are the interpretation of the dimensions, the scale, and the method of scoring based on expectation minus perception of service. Additionally, in a longitudinal study (Watson *et al.*, 1998) perceptions of service quality improved briefly but could not be sustained. Watson *et al.* concluded that management's attention to service quality waned after about a year, and IS management needs to recognize that service quality is an ongoing commitment for the CIO at the strategic, tactical, and operational levels, i.e. services operate at different levels.

Additional conclusions might be that SERVQUAL was not ideally suited to the task. Watson *et al.* remind us that quality is judged by the customer (Leitner, 1999) but unless there is a comprehensive understanding of what is being managed (Winniford *et al.*, 2009) it becomes difficult to deliver. There have been many discussions about the competing merits of SERVQUAL, service performance in the form of SERVPERF, and absolute measurement versus expectation minus perception (Cronin. and Taylor, 1992), (Parasuraman *et al.*, 1994), (Cronin and Taylor, 1994), (Brady *et al.*, 2002). To more fully assess the overall quality of delivery of IS services it has been said that the use of both might be more appropriate (Rodrigues *et al.*, 2011) rather than choosing one or the other.

What the research shows is that none of these methods actually measure the gap between business needs and the business experience, the nearest they get to this is where SERVQUAL measures the gap (Gap5) between service expectation and the perception of the service (Ziethaml *et al.*, 1988).

Whereas SERVQUAL is based on business perceptions of service shortfall, the climate concept enables service providers to understand how internal functioning affects its service quality. Although climate has been used in many contexts it has been developed for IT services where IT service climate is defined as "the IT professionals' shared perceptions of the practices and behaviours in their workplace that support the prevision of IT service to business customers" (Jia *et al.*, 2008). The dimensions of climate in the IT context are service leadership, service vision, customer feedback and customer communication the output of which is an expression of service quality. IT service climate is later reduced to ten questions assessed using a Lickert scale (Jia and Reich, 2011). McKinsey and Company seek to combine what they refer to as factory IT, using performance measures, with enabling IT, using value and quality criteria for measurement, and suggest the need for a focus on the business, a more nimble response and more business-credible team members (Roberts *et al.*, 2010).

The European Foundation for Quality Management (EFQM) model was designed in 1988 to assist with business management. It is said to devote too little attention to the link between what is done and the outcome (ten Have *et al.*, 2003). There are few references to the use of this in an IT context and I have never seen this used by business to assess or manage a supplier of IT services.

ISO 9001 Quality Management System (ISO9001, 2008) is a widely adopted international standard for defining quality processes in any organization. Again, this does not specifically deal with the business management of IT services or supply organizations though it may be a stated as a prerequisite for a supplier to qualify to submit a proposal.

There is currently no expression of IT service quality that is satisfactorily in general use by both IT service providers and by businesses. There is, though, recognition that qualitative rather than just quantitative measures are now important. Any future IT delivery model would naturally be expected to provide a suitable measure of service quality to fill this gap.

The Service Experience

The concept of service management is perhaps better developed in the more experience-centric services sectors. In business-to-consumer (B2C) marketing there has long been the notion of the 'moments of truth' when opportunities for value creation arise with

customers (Carlzon, 1987). These moments of truth might arise when a customer has a cause to complain, e.g. when a reservation is lost through overbooking, when a flight is cancelled, when a drink is spilled, etc. More recently it has been recognised that designing B2B services around the major touch-points between the customer and the service provider helps to identify the major opportunities for service improvement and for adding value (Zomerdijk and Voss, 2009). Zomerdijk and Voss explain that, by taking the perspective of the customer journey and working with the touch-points with the business, it becomes important to tightly couple backstage activity with front stage experiences.

The *service experience* is nested within broader managerial issues of organizational structure, philosophy, and culture that can also influence service delivery and service quality (Bitner, 1990). A very detailed study to test seven hypotheses relating to the *service encounter* yielded a model which was tested in part but never subjected to any empirical evaluation. An important conclusion was that the experimental results suggest that when customers perceive the cause of service failure to be within the control of the firm and likely to occur again, they will be more dissatisfied than when opposite conditions hold. Bitner's research, like that of Zomerdijk and Voss (Zomerdijk and Voss, 2009), also showed the clear need for coordination among all functional areas within the service firm involved in service delivery or preparation of materials and facilities that are part of the service. Bitner's model of the *service encounter evaluation* leads to the construct of *perceived service quality* and the consequential behaviours toward the service firm (Oliver, 1980). According to Oliver, the service experience could result in service switching, loyalty or recommendation. *Customer experience management* by contrast has tended to be regarded as a B2C concept (Berry *et al.*, 2002) but where it is also used in a B2B context it has an end-user focus, is associated with customer satisfaction and varies by vertical market (Meyer and Schwager, 2007). When considering the design of the human computer interface the *user experience* became a focus of interest (Pinhanez, 2008) and it was found that measuring the gap, in this case between expectations and perceptions, was not only often more realistic but also more informative than simply measuring satisfaction.

There are frequent mentions within the literature of the importance of the service/customer experience. Even so there has been no attempt to define it in anything other than very broad terms and then only in the context of expectation and satisfaction (Kemp and McManus, 2009), (Galup *et al.*, 2007), (Prahalad and Ramaswamy, 2004a), (Prahalad and Ramaswamy, 2004b), (Zomerdijk and Voss, 2009), (Bitner, 1990), (Oliver, 1980), (Berry *et al.*, 2002), (Meyer and Schwager, 2007), (Pinhanez, 2008).

2.5   IT Futures

There is nothing in the literature about the nature of any future IT delivery model that may be better suited to the manner in which IT will be delivered or must be managed in the future.

Further automation, autonomic computing (McBride, 2002), rational and multi-agent systems are emerging in the business arena. They bring competitive advantage to areas involving complexity, the user interface, and their interaction with the real world. The Belief/Desire/Intention (BDI) architecture (Bratman *et al.*, 1988) and the use of artificial agents offer opportunities for the introduction of practical reasoning into business solutions. These technologies present new challenges for IT management. Many discussions about the future of computing, like Boehm's talk to an audience in Dublin (Lillington, 2005), raise the prospect of autonomic computing, the ability for computers to think for themselves, and bio-computing, the merging of biological processes and computers. The combination of these technologies opens up the prospect of computers that can undertake the fundamental cognitive processes of natural intelligence such as learning, thinking, formal inference, and perception processes, i.e. cognitive informatics or novel information processing systems that think and feel (Wang, 2006).

Boehm describes these technologies as having a great potential for good, but also a great potential for harm. Amongst the potential for harm he includes new failure modes for computing, the loss of human primacy, even the overpowerment of humans (Lillington, 2005). There is no timeline for the commercial availability of this technology, or its likely application, and no suggestion as to how governance must be developed to create the appropriate safeguards. The framework for work evolution in service systems (Spohrer and Maglio, 2008) does show a progression towards service automation based on Engelbart's 1963 notion of augmentation, or human system and tools system co-evolution (Engelbart, 1963) but no notion of how this might be applied to IT Service Management in this context.

More generally the review of the literature revealed four possible scenarios defined in order to consider the possible alternative futures of the IS organization (Gray and Hovav, 2007). The arbitrary date set for these scenarios is 2020. Each of the 4 scenarios considers 31 variables covering information systems, technological innovations, socioeconomic and political factors and a range of possible outcomes that have different implications for how IT is managed. These scenarios are not forecasts, say the authors, but are possible and plausible alternative futures that are internally consistent and which

could arise in the same timeframe. The scenarios and the variables are summarised in Table 2.1.

Table 2.1: Possible 2020 scenarios summarised from Gray and Hovav, 2007

Variable	2020 Scenarios			
	"Return to the Dark Ages"	"Slow Growth"	"Technology Driven"	"Nirvana"
Technology Reliability	Lo	Lo	Hi	Hi
Alignment	Lo	Hi	Lo	Hi
Political Power and Centre of IT Education	Asia-Centric Cybercrime/ terrorism is high	Asia/USA Cybercrime sporadic.	USA/Asia No cybercrime.	US-Centric No cybercrime.
Socio-Economic Factors	Severe recessionary pressures and energy crisis. Globalization stops. Expected IT staff in businesses vs. 2006 = 120%	No economic crisis but still slight energy crisis. Globalization continues. Expected IT staff in businesses vs. 2006 = 80%	Energy crisis is overcome but some unemployment. Globalization stops. Expected IT staff in businesses vs. 2006 = 40%	No crisis. Globalization expands. Expected IT staff in businesses vs. 2006 = 20%
Technology Innovation	Very Slow	Slow	Growth	High Growth
Information Systems	Systems integration culture, centralized, security is low. Mobile and telecoms mostly abandoned for critical and financial transactions. Analytics for reporting only.	Mix of systems types using mainly proprietary software. Slow take-up of mobile and telecoms. Security is moderate. Limited analytics.	SOA-based. Mobile and telecoms ubiquitous to the technology. Coding is automated. Security is high. Analytics adopted by large companies.	Ubiquitous, SOA-based, fully decentralized, and mostly outsourced. Coding is automated or open source. Wireless is universal and security is high. Analytics a competitive tool.

Gray and Hovav acknowledge that no one scenario may be true but that portions of each may be included or additional events and trends that have not yet been thought of may occur and change the outcome. One such technology may be Cloud Computing, not thought of by that name in 2007 but in everyday use today. Whatever the future looks like it is management's job (and perhaps that of the IT delivery model) to ensure that business outcomes from IT investment are successful.

2.6 Summary

This chapter has critiqued the work of others within the guidelines for grounded theory principally to enhance sensitivity, stimulate questions for inductive reasoning during analysis, suggest areas for theoretical sampling, confirm findings, and challenge the literature. Combined with reflexivity this would help to see if a problem identified in the data could be generalized, and to identify the gaps in existing research. The topics were always prompted by the needs of the research. After questions were raised by the data the literature was reviewed. It shows that in a business context there are many possible

interrelated reasons that support the findings from the data and that would give rise to poor success rates.

The problem with IT delivery was first acknowledged in 1968 and is often seen as a project management issue though there are many problems now raised with regard to the many methods and standards. Although there is concern about continued poor success rates (Section 1.4) the IT delivery model has not been identified as the possible cause and there is no relevant work that directly addresses the research question. The scope of the problem from the analysis of the data raises questions about the interrelated areas of development and operations, planning and IT strategy, architecture, alignment, governance, value and service.

Whilst enterprise architecture (EA) is central to the planning, strategy, and alignment activities of many businesses, it is frequently an intellectual approach to software engineering. The wider social implications of alignment are recognised but solutions involve theoretical and artificial constructs. Where the end user has been taken into consideration the suggestion is that one solution or service cannot typically suit all. This is a further complexity when planning E2E and B2I solutions. Business strategies are often unclear and alignment remains an important but elusive goal. There is a plea for more grounded research to find out more about alignment and how it might be measured and managed.

IT governance has become a business agenda item where no one solution fits all businesses. The literature suggests that there is a need for governance to involve the business more, to address a broader spectrum of needs, to connect with business at more levels, and for this to be a continuous and even in some circumstances an immediate process. The literature does not connect this to the IT delivery model and no solutions are offered.

The process of adding value to business is now recognised to be complex and often unlocked through services where value is co-created by the business and IT people working together. There are many different kinds of service and a distinction is emerging between value creation and value realization. The major part of the current value delivery model is about value realization activities and the move is toward the further automation of these. The complexities of value creation must be considered in the context of the macro environment. Value creation and service have perhaps been better developed through the marketing disciplines in experience-centric service industries and some of these ideas need to be taken forward, e.g. reframing product and manufacturing logic within a service framework (service dominant logic), ideas for encouraging innovation through mindfulness

and experience networks, managing the customer journey or the touch points with the business, identifying service gaps. Although quality standards are highly developed for assessing the quality of the software product, quality assessments of IT service are either undertaken from a B2C marketing perspective, from the perspective of managing the internal processes and functioning of the IT service provider, or are general purpose standards. Whilst service performance measures are common place, there is no standard measure of service quality (e.g. SERVQUAL, EFQM) that is in widespread use for managing IT service quality. Although there are frequent mentions within the literature of the importance of the business/customer experience there has been no attempt by others to define it or measure the difference between the business needs and business experience.

The literature review shows that autonomic computing, bio-computing, and cognitive informatics are technologies that feature in discussions about the future of IT though no date is given for their commercial availability. Although there is "potential for harm" from these technologies no alternative to the current IT delivery model is offered in the literature. The scenarios developed to describe the possible alternative situations for 2020 provide a basis for evaluating any alternative future IT delivery model that might be proposed by the research.

CHAPTER THREE

Methods Review and Research Design

3.1   Introduction

The research method must address a large and complex problem that has so far defeated business and the IT industry. Although there has been a problem associated with poor success rates from IT investment for many years and no solution has been found the problem is now known not to have previously been approached from the perspective of the research question.

This chapter will explain why a qualitative research approach is required, the rationale for the selection of the Straussian grounded theory method (GTM), and how the research is to be undertaken.

Section 3.2 considers the research requirements in greater detail, Section 3.3 describes the data sources, participants, and the ethical considerations, Section 3.4 sets out the research method, and Section 3.5 defines the quality and evaluation criteria.

3.2   Research Requirements

The research is not another attempt to improve the efficiency or effectiveness of project management, software engineering or IT operations. Rather it is an attempt to understand how the overall IT delivery model can be improved recognising the problems described, the multi-disciplinary nature of IT and the broader social context in which these activities take place, i.e. within and across the business, its market, and its supply chain.

Reducing the scope of the work would risk things of importance being missed with the high probability that the research would be unlikely to bear any sustainable results that would be of value to business or influence the direction of IT management. The chosen research methodology would have to explore the complexities of the relationship between a business and the service provider, including the associated social phenomena, through the actions and interactions of the stakeholder groups involved.

Recent positivist approaches to researching IS success and IS assessment have all variously involved the sorting and ranking of apparently conflicting evidence from earlier

research that revealed multiple success categories. The IS success model was developed from one of these based on the need to define a taxonomy and find a key dependent variable without which it was thought that much of I/S research is purely speculative (DeLone and McLean, 1992). The dependent variable – in this case *IS success* – proved elusive to define. The different perspectives, e.g. of senior managers and IS executives, was seen as an obstacle to making progress on IS quality measurement (Saunders and Jones, 1992). Saunders and Jones used a Delphi approach to rank the many categories but the authors question the stability of their findings in different or changing situations. The start of the development of a contingency theory for IS assessment was seen as the outcome of another (Myers *et al.*, 1997) where the assessment would depend upon the business circumstances and not just the skill of the IT service provider. A deductive, hypothesis-based, research approach to prove the validity of the DeLone and McLean IS success model had mixed results on a limited sample of data (Wang and Liao, 2007) perhaps suggesting that the choice of the dependent variable or the model has to be challenged. This underlines one of the outcomes of the literature review which is that more grounded research is needed if the problem is to be solved (Section 2.3).

This research must adopt an interpretivist approach in order to explore the meaning of the data and so gain a better understanding of the nature of the full extent of the relationship between business and IT. From the earlier chapters it is clear that the current IT delivery model has shaped the relationship with business to reflect the product and production paradigm for IT management (Section 1.3) and the frameworks, methods, and standards that support it. The IT-focused methods are either an antecedent or precedent to the relationship with a business and it is expected that a qualitative research approach will uncover the true relationship and so help to improve the IT delivery model.

This is not to say that outputs from the research based upon an interpretive paradigm cannot at some future time move to or be supplemented by a positivist paradigm by proposing hypotheses and proving them to be correct by taking quantitative, objective, and scientific measurements. This might happen when there is a sufficient understanding of the phenomena that are suited to operationalization by directly informing the development of larger scale positivist research as is commonly done in mixed method research design.

This research needs to examine the relationship through the actions and interactions of the participants where they are engaged in exploring their IT support and the possible opportunities for improvement. By understanding the problems and opportunities they have with the relationship it will be possible to answer the research question. The demands being placed on the IT delivery model have to be considered not just in the

context of today but in the context of the changes taking place now and more generally in the context of future possible scenarios. As there is no hypothesis the scope of the research is unrestricted in order to understand the full extent of the relationship between business and IT. The scale of the study allows for a fine-grained and detailed analysis allowing the complexity of the relationship to be understood more clearly. The research needs access to high quality data and theoretical sensitivity needs to be high at an early stage in the analysis in order to achieve a useful outcome within a reasonable period of time.

The research requirement was thus classified according to its purpose, process, logic, and outcome (Collis and Hussey, 1997). This is summarised as follows:

- Purpose: the research is analytical or exploratory in the sense that it needs to deconstruct the data in order to interpret the complex relationship between business and IT. If all of the stated objectives were to be met (Section 1.6) the analysis has to observe the interactions between business and IT in order to understand the meaning of the data, uncover characteristics and identify causal relationships. The supplementary purpose of the research is also to derive a predictive model in the sense that the observed characteristics that describe the interaction need to be re-structured in order to explore how control could be introduced allowing the management of IT to be assessed (measured) and improved and to predict when this becomes necessary. This is about discovery not testing.

- Process: There is a need to observe and learn from empirical reality. Any theory will be grounded in the observation of practice. Implicit is the need to understand the language, define concepts and allow any theory that is capable of fully defining the relationship between business and IT to emerge such that it assists with the management of IT. This strongly confirms the necessity for an open research question and qualitative research that is open in its approach in order to understand how the many stakeholders see their role and experience the relationship.

- Logic: The research requires both an inductive and deductive logic in order to first derive theory and then, if suitable, use this to improve IT management.

- Outcome: This can be considered to be applied research to improve a problem associated with the management of IT. The overwhelming reason to undertake this research was to discover new theory that would enable greater control to be exercised over a complex (Section 1.5) long term problem (Section 1.4). Because of the changes taking place within the IT industry (Section 1.5) it is important that

insight was developed with some urgency. Given the preference for a qualitative approach the outcomes may not normally be considered to be generalizable but effort must be made to at least determine where outcomes are transferable. Reflexivity would be an important means of achieving this.

Qualitative research is required in order to address the research question. The strength of the research design, the rigour of the process, the quality of the data, and theoretical sensitivity would be critical to the task.

3.3   Data Sources, Participants and Ethical Considerations

The authenticity, volume and the richness of the content of the data available are considered to be important contributory factors in achieving a high quality and successful outcome to the research. Since the outcome cannot be known in advance there can be no positivist influence brought to bear by the researcher. Instead, a critical realism approach is adopted which recognises that IT is an applied discipline (Mingers, 2004). This combines with reflexivity to enable the researcher stance to influence the data collection as well as the research process to ensure that a reality is found.

The Data

The data must be capable of yielding a full understanding of the problem and this should be apparent to the reader independently of any influence introduced by the researcher. Inadvertent positivist influence during data collection is avoided by using field notes that pre-date this research and which were recorded for other purposes. These could be classed as illustrative case studies involving senior industry figures. They are known to contain rich description and so are considered to be more reliable than commissioning new research material which may prove to lack descriptive content.

The field notes to be used for the research consist of 97 documents recorded during major consultancy assignments with three companies in different sectors by a privately owned consultancy organization. In all three cases the purpose of the assignments was to make recommendations that would improve the IT organizations and their capability in those businesses. The data was made available for the research under a special arrangement and selected for the following reasons:

- The data predates this research and the purpose and objectives of the consultancy assignments are not the same as those for the research problem so the data must be considered to be naturalistic, free of positivist influence and ideal for qualitative research;

- The client businesses are major organizations with global reach which have historically placed few real constraints on IT spend in terms of what the business might expect or demand from IT other than value for money, i.e. any problems that exist have not been caused by a lack of funding;
- Although all pre-eminent businesses within their respective global markets there is a general recognition amongst management in each of them that real IT software and service improvement is necessary if the businesses are to achieve their objectives;
- The participants are drawn from business and IT organizations where something is known about the role, location, and background of the individuals interviewed so that the context can be understood and differences can be analysed;
- The participants talk freely about the situation and what they each believe is needed and so the data provides a rich source of research material which is unconnected with the research itself but which directly reflects the effectiveness of the IT delivery model in those organizations.

I was the consultant leading the assignments and I recorded the field notes, by hand, during the information gathering phase. Interviews were almost totally unstructured and through open questioning participants were encouraged to talk about their role and the IT services they were either partly responsible for delivering or services they were receiving. Interviews were scheduled to last an hour and in practice they varied between 30 and 75 minutes. The interview process allowed the participants free reign over what topics they were able to raise during the discussion, what they saw as important and what they considered had to be done to bring about improvement, i.e. there was no agenda to sell a product or other service to those companies and no methodology or questionnaire used as a basis for gathering information.

Intervention was minimal though the participants were prompted from time to time to ensure that they covered the scope of their responsibility and clarification was sought where there was any lack of understanding. There was slightly more structure in Company 2 because there were topics that had to be addressed as part of the brief: business direction; products, markets and information needs; knowledge management and information needs; business processes and application systems; and IT infrastructure and support services. All notes were made using the words used by the participants so that the notes not only captured the essence of what was said but the language that was used.

Shortly after the interviews took place the hand-written field notes were typed up and sent to the participants who were asked to confirm that the content was an accurate record of the discussion and to answer any queries that arose during the transcription of the notes.

During this process participants were allowed to add, amend, or remove anything on record. Where changes were requested the documents were updated and returned to the participant once more for approval. All notes were processed in this way and the final versions of the transcripts were filed and the confidentiality maintained.

Later in the research process (for the purpose of theoretical sampling – the process of deciding what data to select next) interview notes from a fourth company are used. These notes were also collected whilst undertaking a consultancy assignment which was again driven by client needs. This provided the opportunity to gather more information to enable the analysis to be completed according to the GTM; it can be considered to be an opportunistic and illustrative case study. One discussion in this group was recorded verbatim electronically with the permission of those participating otherwise the remainder of the field notes for this company were recorded by hand using the process described previously. All field notes for this company (consisting of nine documents) were made available from the same private consultancy company as the initial field notes under the same arrangement.

Across all four companies the data represents a period of eleven years. The research is not concerned with the client problems, the assignment objectives, or the original in-case consultancy findings and recommendations but only with discussion content contained within the field notes and the cross-case analysis. Whilst the deployed technologies differ over this period the issues and topics raised have many similarities.

Participants

The 106 people whose conversations are recorded in the field notes were selected for interview by the organizations being studied according to the objectives of the original consultancy assignment. The selection process was one of purposive sampling, i.e. in these instances the populations selected for interview were based on people who held key roles, e.g. perhaps on the basis of seniority or as gatekeepers in some business or technical process, had particular specialisms, or for their experience. These people could conceivably be holding positions at any level within their organizations or represent a key business or IT supplier or business customer. The selection was followed by "snowballing" where a participant would recommend another person for interview, again on the basis of their role, specialist knowledge or experience.

The populations of those interviewed were small compared with the total number of people employed by any given organization and not comparable with, for example, a sample size that might be considered to be representative of the whole population when

using quantitative methods. The data also allows comparison between groups based on five variables describing the participant:

- department, e.g. business, IT, IT supplier, business customer
- seniority using a scale of 0 (most senior) to 4 (least senior)
- region (of the world), e.g. EMEA, Americas, Asia/Australasia
- new to company (i.e. in the first year of service with the company or not)
- length of service in years.

Of the 106 participants, 20 were new to their company, i.e. they had joined within the previous twelve months of the interview taking place. The distribution of the participants according to their seniority (level 0 is the most senior) by department and by region is as illustrated in Table 3.1 and Table 3.2 respectively.

Table 3.1: Distribution of the participants according to their seniority and department

Seniority	Business	IT	External	Group	Total
0	1	0	1	0	2
1	15	8	3	0	26
2	18	18	4	2	42
3	14	15	1	4	34
4	2	0	0	0	2
Total	50	41	9	6	106

Table 3.2: Distribution of the participants according to their seniority and region

Seniority	Europe	USA/Americas	Asia	Total
0	1	1	0	2
1	12	13	1	26
2	27	12	3	42
3	25	7	2	34
4	2	0	0	2
Total	67	33	6	106

Ethical Considerations

As the field notes from the case studies are an output from consultancy assignments they are the property of the privately owned consultancy business that carried out the work. It is not unusual for field notes from previous research or consultancy assignments to be re-used for qualitative research (Adolph *et al.*, 2008) but the consultancy business has a clear duty of confidentiality to its clients. This being the case the field notes have been made available for the research on the basis that none of the client organizations or any of the people participating can be identified either directly or indirectly. As is common practice the entire data set has been anonymised using "blanket anonymisation" techniques (Clark, 2006) as if operationalizing the anonymity of individual contributors in a social context to achieve confidentiality (Wiles *et al.*, 2008).

In preparing the field data for use in the research and when transcribing from the data or from research notes to this text, where a word is missing in the original note and inserted into the note when published or where another word is substituted (to maintain anonymity), the inserted word appears within squared brackets. Where text within a quote is irrelevant to the argument the '…' character is substituted for the omitted words. In extreme situations, i.e. if there is still a risk that the business or the participant can be identified, a reporting style is adopted. Where a reporting style is adopted every effort is made to ensure that this does not detract from the understanding that would have been conveyed by the words actually spoken.

The companies are referred to as Company 1, Company 2, Company 3, and Company 4; no individuals are identified by name. References to third parties are also anonymised. Access to the full anonymised text is restricted and is granted solely at the discretion of the owner of the data but many examples from the data are provided within the thesis such that access to the full data set may be unnecessary.

3.4 Research Method

An interpretivist methodology adopts an inductive process using a range of methods that seek to come to terms with the meaning, not the frequency, of certain more or less naturally occurring social phenomena in a given context (Collis and Hussey, 1997). Interpretivist methodologies include hermeneutics, ethnography, participative enquiry, action research, case studies (though not all case studies are interpretivist), phenomenology, and grounded theory. Hermeneutics was originally concerned with the interpretation of historical texts but is now seen as a more general theory of interpretation, or even a pre-requisite to phenomenology, where the historical context is significant (Nolas, 2011). Although a current business and IT relationship may be influenced by the

past, the research question is about the present and the future and so hermeneutics is not central to this task. Ethnography is derived from anthropology and is used to explore issues of group processes and group interaction. It requires groups to be observed and so is unsuited to this task. Participative enquiry involves the participants as fully as possible in the study where the researchers are co-participants. It has been referred to as research with people rather than research on people (Reason and Bradbury, 2008). Action research, perhaps more commonly used in the past in the context of information systems (Baskerville, 1999), was with participative enquiry briefly considered. The purpose of action research is to introduce change to a situation and to monitor the results. Case studies are methodologies for studying a situation or phenomena using multiple methods for collecting data and developing an in-depth knowledge. Case studies can be of different types, e.g. descriptive, illustrative, experimental, explanatory, or opportunist. Case studies which are illustrative of the problems faced by business and IT people are relevant. Phenomenology is a philosophical approach used to understand how the world appears to people. Grounded theory is a branch of phenomenology consisting of a systematic set of procedures, the grounded theory method (GTM), to develop inductively derived theory from the data generated from the phenomena being studied.

The classification and the paradigm chosen suggested that a methodology is needed that is characterized by GTM. The approach is most suited to understanding actions and interactions and their meaning which has led to it being adopted as a preferred method for understanding practice in various applied settings in the helping professions (Nolas, 2011) and more recently in other disciplines.

Grounded theory is selected as the research methodology because it most closely meets the research requirements (Section 3.2) for an interpretivist, open and qualitative research process to deconstruct the data and, using inductive and deductive reasoning, to build theory, or a substantive model, that will provide greater control over the business and IT relationship.

Grounded theory is a way of thinking about and studying social phenomena developed for the purpose of building theory or theoretical constructs from the qualitative analysis of data. It has well-defined processes for examining and interpreting data to elicit meaning, gain understanding, and develop empirical knowledge that allows others to follow what has been done and so validate the process. Grounded theory was also 'born out of complexity' (Corbin and Strauss, 2008) and so the complexity that has apparently defeated the current methods (Section 1.3) and the complexity apparent from the literature (Section 2.2) makes GTM an ideal candidate:

"Complexity has fascinated and puzzled me much of my life. How to unravel some of that complexity, to order it, not to be dismayed or defeated by it? How not to avoid the complexity nor distort interpretation of it by oversimplifying it out of existence? This is of course, an old problem: Abstraction (theory) inevitably simplifies, yet to comprehend deeply, to order, some degree of abstraction is necessary. How to keep a balance between distortion and conceptualization?" (Strauss, 1993) p12.

Though Strauss may have been referring to the human experience of qualitative research the same reasoning would apply to the complexities of the relationship under study.

The Choice of Grounded Theory Method

Grounded theory first emerged as a methodology aimed primarily at sociologists for building theory through a process of constant comparison with the data (Glaser and Strauss, 1967). GTM has since been developed further such that three broad approaches can be considered to have emerged that are relevant to the research to be undertaken: Glaserian, being based upon the original work by Glaser and Strauss; Straussian, after the schism between Glaser and Strauss and based on the work of Strauss and Corbin (Douglas, 2003); and constructivist which is widely credited to Charmaz (Charmaz, 2000) and acknowledged by Corbin (Corbin and Strauss, 2008) and others. Variations and overlap occur.

Glaser argues that the difference between "particularistic routine normative data" (which is interpreted here as data taken from what might be considered to be data of a normal routine standard) and scientific data is that the latter is produced by a methodology. Glaser lists the essential features of GTM as consisting of: theoretical sensitivity, all is data, use of literature, theoretical coding, open coding, theoretical sampling, constant comparison, core variable, selective coding, delimiting, interchangeability of indicators, pacing, memoing, sorting and writing up (Glaser, 2004). He also stresses the importance of the abstract agency (or *neutral observer*) concept for the role of the researcher for the elimination of bias that might creep in with other approaches. Today, by letting theory emerge, the Glaserian school is considered to be inductive and to offer relative freedom and flexibility in process terms.

It is the Straussian approach, though, which favours a more formalised methodology stressing the need for more process to yield reliable results. The Straussian approach is considered to be an inductive and deductive process for the development of theory that describes and explains the phenomenon that is being researched. Glaser criticizes the Straussian analytical method as *forcing*, rather than allowing the *emergence* of theory.

This can arise if instead of allowing the central theme to emerge inferentially the researcher focuses from the outset on some specific issue or phenomenon or desired outcome. To eliminate this problem the research question must be broadly defined and Glaser stated that the researcher should have no *a priori* knowledge as this could influence the outcome. Equally there is evidence to suggest that when using grounded theory the quality of the final product is more directly dependent upon the quality of the research worker's understanding of the phenomena under observation than is the case with many other approaches to research (Turner, 1983), a point with which Bryant later concurs (Bryant, 2003). There is then a benefit to be obtained from maintaining an open mind thus allowing theory to emerge, without forcing it, and yet achieving early theoretical sensitivity.

Describing the constructivist movement (Bryant, 2003), Charmaz's argument is stated as recognizing that the observer creates the data and ensuing analysis through *interaction* with those interviewed (Charmaz, 2000) rather than viewing an external world as a neutral observer (Glaser and Strauss, 1967). As the grounded theory process deconstructs data and reconstructs concepts and theories it is argued that grounded theory has always been constructivist in nature so *the extent* to which the observer can influence the theory by interacting with those interviewed is what is being questioned (Mills *et al.*, 2006). Epistemologically, where the researcher is seeking to influence the opinion of the participants, as in consultant/client or analyst/patient relationships, the need for interaction would be greater. Where there is a requirement by the researcher to understand the data without influencing the participants the need for interaction would be less. A neutral observer implies zero interaction between the researcher and the participant – or at least zero influence on the participant. Mills *et al.* see grounded theory as a methodological spiral that begins with Glaser and Strauss' original text and continues today. The variety of epistemological positions that grounded theorists adopt are located at various points on this spiral and are reflective of the purpose of the research (Mills *et al.*, 2006).

Because of the many organizational and social aspects to business and IT, grounded theory is eminently suited to the research question of determining what constitutes a new IT delivery model that can make successful business outcomes more likely both now and in the future. There is a concern that it has been infrequently applied in the business and IT context (Douglas, 2003). Originally the method as proposed in 1967 was seen as a tool for professionally trained sociologists but increasingly it is being used by practitioner-researchers as a tool to assist them in better understanding their own fields of discipline (Pianatanida *et al.*, 2002). An analysis of IS research published between 1985 and 2007 (Matavire and Brown, 2008) shows how the popularity of GTM is increasing in this field.

The authors suggest that where IS projects are said to have failure rates approaching 50% that researchers agree that the social context plays a major role; by situating theory development within this social context, improvements can be made but the authors question the claims to the use of grounded theory. Their analysis shows that between 2001 and 2007 in 67% of cases the research merely borrows analysis techniques from grounded theory e.g. coding to undertake content analysis. In 15% of cases the method used is Straussian and in 5% is Glaserian. In 13% of cases mixed methods were used where one is a grounded theory analysis technique. The authors conclude that the full GTM offers an opportunity to IS given its multi-disciplinary nature. Thus it is argued that the use of the full GTM is the most suitable methodology for the research problem. There remains a question though as to what is understood by the full GTM. There is much confusion when it comes to choosing between Glaserian and Straussian approaches.

On the one hand the differences are seen as subtle and yet misunderstandings and myths concerning the nature and underpinnings of GTM are still widespread and there are concerns about judging the soundness of the use of GTM that need to be established (Matavire and Brown, 2008). On the other hand the differences between the approaches are seen as major (Niekerk and Roode, 2009), if sometimes incorrect.

The problem arises because whilst a researcher can learn to use the Straussian approach by reading the prescriptive process as set out by Strauss and Corbin there is no such process set out by Glaser and researchers wishing to learn the Glaserian process are recommended to find a mentor. One researcher suggests that some of the early grounded theory writings often describe grounded theory in "near mystical terms" (Adolph *et al.*, 2008). The risks of "methodological flexibility degenerating into methodological indifference resulting in superficial and ambiguous conclusions" have been described (Bryant, 2002) thus favouring the Straussian school where rigour is necessary. At the same time Bryant acknowledges that the important social dimension, so long ignored in relation to systems in the business and IT context, demands an interpretive orientation such as grounded theory and the advantages of Glaser may outweigh the disadvantages if the alternative is not to use GTM at all.

Because of the requirement for rigour, and because of the lack of detail available for the Glaserian approach, the Straussian approach is preferred in this instance; not because the process warrants the outcome but because process and outcome are both important when validating the work done.

As there is no possibility of interacting with the participants, the GTM to be deployed occupies a position low on the constructivist epistemological spiral; the purpose of the

research in this case is not in fact to interact with those interviewed in order to get some kind of consensus view but to provide an opportunity for the researcher to understand the needs of the participants from what they have said and what is recorded about their actions and interactions. Thus by design there is no requirement to influence the outcome through interaction or persuasion. The researcher has a high theoretical sensitivity for the subject and is motivated to seek a trustworthy interpretation, there is an open research question, a formal method has been selected, and the data set is large. If the richness of the data was to be maintained then it was important that the scope and the scale of the project were not arbitrarily restricted. An appropriate mechanism for the management of a large data set was required.

Data Management

The scale issue is addressed by using a computer assisted qualitative data analysis system (CAQDAS). The tool does not itself conduct qualitative analysis, this is the role of the researcher, but it assists with the organization and retrieval of data. MAXQDA was selected as being the most suitable for this study from about four in the market and it fits well with the latest version of the Straussian approach (Corbin and Strauss, 2008) where it is used to illustrate the case material. "MAXQDA is a high-performance program for professional social science-oriented text analysis, ideal for researchers from social sciences, education, economics, and many others, who work with and analyse text in their professional capacities" (MAXQDA10, 2012). As well as enabling GTM to be applied to a large scale business problem it provides greater visibility of the analysis undertaken. Selective output using MAXQDA tools is used in Chapters 4 and 5 to illustrate how the system was used and how it helped with the analysis.

The Methods Plan

As the research contains a small quantitative aspect and extensive reflexivity both intimately linked to grounded theory the methods plan is strictly speaking a qualitatively-driven approach to mixed methods research or more particularly a grounded theory research programme with pluralistic elements (Mingers, 2001). It is described in detail below.

Straussian Grounded theory includes a number of well-defined methods that involve constant iteration until saturation has been achieved and any theory has been developed that describes and explains the phenomenon that is being researched. In this way, even though the methods are clear, both the process and the outcome are emergent: other than the first and the last no sequence is implied from the list below. In order to confirm

the terminology to be used in this instance the methods are named and described as follows:

- **Open Coding:** line by line open coding of text segments within the raw data to identify substantive concepts and qualifying these concepts by identifying their properties and dimensions from the data. All of the names used for codes are either terms that are in general use or are obvious from their usage; some of the codes are *in-vivo* codes, i.e. they were named from words actually spoken by the participants. These *in-vivo* codes are not distinguished from the rest in any special way but can be observed from the data.

- **Constant Comparison:** the constant assessment during the coding of new data checking for similarities and differences with existing codes and their impact on theory, categories, properties and dimensions etc. Leads to theoretical elaboration, verification of concepts, and saturation.

- **Memoing:** general notes and written articulation of analysis or theory arising during the analysis process about the data and the conceptual connections observed between categories and other concepts, actions and interactions. Memos are of two types: code memos and document memos. A reflexive process that may give rise to further empirical evaluation of some kind during axial coding.

- **Axial Coding:** the process of relating codes, categories and concepts to each other, and identifying any causal relationship which is important for the development of theory. Axial coding is somewhat controversial in that the process forms no part of the Glaserian approach to GTM (Niekerk and Roode, 2009) and the Straussian conditional/consequential matrix may not always be adequate as a solution. Both attract comment in the literature: "When we enter into the coding process, we are not looking for 'sociological constructs' as Glaser suggests or for a conditional matrix as advised by Strauss and Corbin" (Pianatanida *et al.*, 2002).

- **Theoretical Coding:** Conceptual ordering arising from fracturing the data and its codes and grouping these into categories and their properties that become the basis for the theory.

- **Theoretical Sampling:** the process of deciding what data to collect next for generating theory in response to what is emerging from the analysis in order to achieve saturation.

- **Selecting the Central or Core Category and Selective Coding:** Identification of the core category that will emerge as accounting for the most variation around the concern or problem that is the focus of the study. This is followed by selective

coding i.e. focusing on those variables that relate to the core category thus delimiting the coding and ceasing open coding.

- **Sorting and Writing Up:** review, sort, and integrate the numerous memos related to the core category, its properties, and related categories to generate a storyline, theoretical outline or conceptual framework. In practice in large scale research projects such as this it may not entail writing but using the features of any tool, in this case MAXQDA, to martial the data to understand what the analysis has revealed beyond collections of codes and memos. Visualization tools have been found to be particularly helpful as can be seen in Chapters 4 and 5.

- **Saturation:** the point at which it is not possible to learn more about a category, its properties and its relationship to the core category. It could be argued that where the research is addressing a very large scale and complex problem this point may never be reached but may nevertheless be sufficient to satisfy the evaluation criteria.

- **Theory Development:** It is acknowledged that not every researcher is interested in building theory (Corbin and Strauss, 2008) (Pianatanida *et al.*, 2002) but it is built by combining the actions and interactions as observed and recorded in the memos, linking categories around the core category and refining the resulting theoretical construction.

The research design, incorporating these features of the Straussian GTM, is illustrated in Figure 3.1.

Concepts identified by the coding can be used to search the literature to firstly compare with what others are finding and to highlight the extent to which the problems that have been identified are acknowledged and demonstrate how they are already of concern to practitioners and researchers, and secondly to provide a means of directing the search for relevant ideas and work undertaken by others not necessarily within the IT sector. Other than to confirm the existence and extent of the original problem (Section 1.4) the literature is used after the analysis of the data thus avoiding any influence on the pre-conceptualization of the research and so forcing the outcome along a particular path. In fact there are no pre-conceptions in terms of what might emerge from the research and it is to be approached with an open mind.

Reflexivity as used here is a continuous feature of the research design. It will be used to reflect on the meaning of the data as it was discussed with participants and to take an output from the research and consider its significance in other situations. This improves understanding and provides feedback to improve the rigour of the research process to
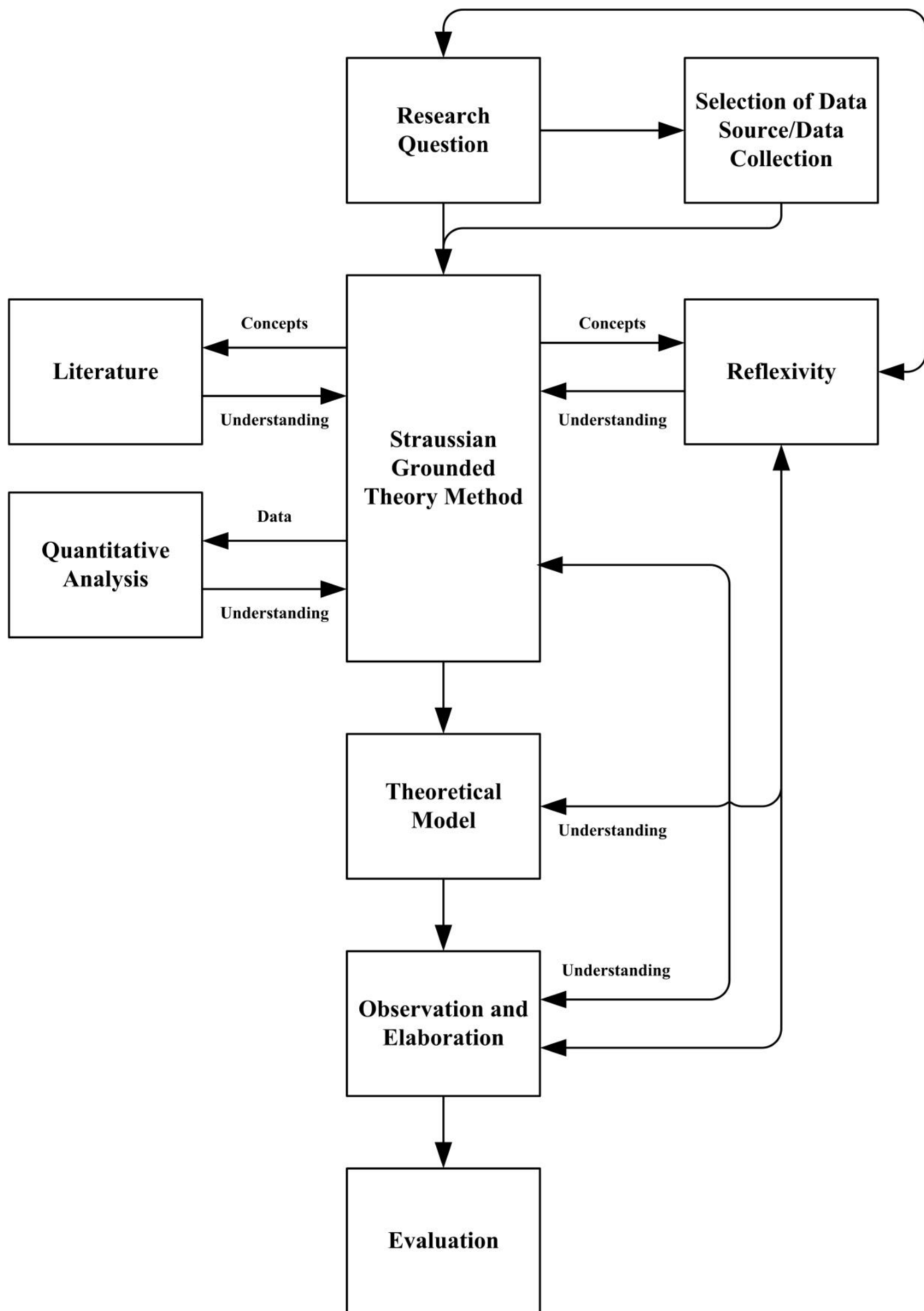
Figure 3.1: The research design

ensure that what emerges is valid according to the researcher's experience and is transferable. It is described in more detail in Section 3.5.

The results will be observed using various alternative lenses in order to understand the significance of the findings. The research will also be evaluated using the quality criteria described in Section 3.5.

3.5 Quality Criteria

It is argued that grounded theory requires self-evaluation both during and after the research process. The earliest work on grounded theory stated that self-evaluation of the research should consider its *credibility* and *applicability* (Glaser and Strauss, 1967). The criteria are still adopted by the Straussian school in the latest edition of the method (Corbin and Strauss, 2008). These are listed below as the bullet points under process and outcome respectively.

Process

According to GTM, the credibility of the process is judged by the following criteria:

- there should be sufficient detail and description so that readers feel they are in the field and able to judge for themselves
- there should be sufficient evidence on how the data was gathered and how the analysis was conducted to be able to understand how conclusions or findings were reached
- theory should be based on multiple comparison groups (multiple cases and known variables)
- the researcher should specify the kinds of data upon which the interpretation rests.

This is further elaborated by others. The process area corresponds to the transactional aspect of evaluation (Cho and Trent, 2006). Key process areas to be addressed by any evaluation of qualitative methods are: sensitivity to context, commitment and rigour, and transparency and coherence (Yardley, 2000). Engagement, processing, interpretation, and (self-) critique is another check list for evaluation in this area of activity (Stige *et al.*, 2009). The credibility and confirmability of the process are emphasized as being important (Lincoln and Guba, 1985).

Outcome

According to the GTM, applicability of emergent theory is judged by the following criteria:

- "fits" the area from which it was derived and in which it will be used

- is readily understood and seen to be reasonable by laymen and professionals (i.e. by the business and the IT people)
- is sufficiently general to be applicable to diverse situations and populations
- provides the user with sufficient control over structure and process to bring about change in situations through time.

This corresponds to the transformational aspect of evaluation (Cho and Trent, 2006) or is referred to as impact and importance (Yardley, 2000). Critique (social), usefulness, relevance, and ethics is another check list for the evaluation of the outcome (Stige *et al.*, 2009). The transferability and dependability are also attributes of the output that are emphasized as being important (Lincoln and Guba, 1985).

Reflexivity

Reflexivity, or the importance of open reflection on how personal experience may have affected either the process or the outcome, is described within the research design and it is further emphasized here. It is mentioned in relation to sensitivity to context, transparency and coherence (Yardley, 2000). Reflexivity has been adopted in combination with grounded theory in the psychology field (Nolas, 2011) and is advocated in business (Bryman and Bell, 2003) for reflecting on the implications of new knowledge using practice-based work. Corbin acknowledges that the meaning a researcher attaches to reflexivity is variable and she herself interprets reflexivity more as a self-reflective process at a personally emotional level but then offers the more standard description of thoughtful, conscious self-awareness and the effect of this awareness on the research process, method and outcomes (Finlay, 2002). This is aimed at sustaining objectivity, or asks how the research question was defined and whether it could it have been investigated differently. Because the data was collected for another purpose any social or experiential relevance concerning the relationship between the researcher and participants that informs the research process (Dowling, 2006) has limited significance. In this instance it is possible to locate the researcher as a peer with the authority of the relevant sponsor (CEO, CIO, etc.) within the data collection process of the consultancy assignments and later as an experienced practitioner with an interest in reviewing the data to find ways of improving the IT delivery model in the research process. These separated roles simplify the relationship between researcher and the participants so avoiding excessive self-analysis at the expense of focusing on the research problem (Finlay, 2002) whilst exploiting the high sensitivity of the researcher in creating an awareness of the possibilities. The approach to reflexivity applied throughout is one of intuitive, dynamic,

and continuous self-awareness as often reflected in the memos and log[8]. Further notes within the thesis are added where appropriate.

Three of the four Glaserian and Straussian tests of acceptability of any outcome (above) are concerned with general acceptability, i.e. outside of the area from which it was derived. The aim of the research, therefore, is to ensure that the outcome was more generally applicable and not limited by the research data. Even though the research approach is grounded in practice and the use of grounded theory especially gives confidence in the emergent results in relation to the data, the researcher has a responsibility to reflexively question what is emerging from the process as concepts and theories to ensure that these have a wider relevance thus improving the rigour of the process.

Fitness for the Future

The research question in part is concerned about the future and so a further evaluation of applicability is necessary. The current delivery model and any outcome from the research is to be assessed against the trends taking place today (Section 1.5), the four alternative future scenarios described by Gray and Hovav (Gray and Hovav, 2007) and summarized in Table 2.1, and the concepts encompassed by self-adaptive, self-managing systems and bio-computing (Section 2.5). The analysis will need to compare and contrast what is done today and its suitability to the future with any emergent theoretical model using the framework in Table 3.3.

Table 3.3: Framework for evaluation of models against future scenarios

Timescale	Future Possibilities	Suitability of Current IT Delivery Model	Suitability of Emergent Theoretical Model
Short Term	Current trends		
Medium	Gray & Hovav Scenarios		
Long Term	Truly Self-adaptive or self-managing systems		
Long Term	Cognitive informatics		

3.6   Summary

The research method is designed to address a large and complex problem that has so far defeated business and the IT industry. The results of recent positivist approaches to

---

[8] Using the Logbook facility of MAXQDA to create a research diary

research into similar areas have been mixed and not helpful for addressing the research question except to point to a need for more grounded research.

The requirements of the research as prompted by the understanding of the problem and the research question are classified as analytical in purpose, qualitative in process, using inductive and deductive logic. This is applied research to improve a fundamental or basic need to identify why, after so many years, the current IT delivery model is incorrect or incomplete and to explore what this might mean in terms of improving IT management. The requirements suggest a need for an interpretive approach using a qualitative methodology that can handle a large scale complex business problem. The GTM was identified as being the most suitable for a practitioner area such as the one under study although there is no evidence that it has been used extensively on any large scale business problems.

The Straussian GTM was selected because it meets the research requirements, provides rigour, and has a documented process. Researcher involvement with participants is to be low on the constructivist epistemological spiral (corresponding to Glaser's neutral observer) though critical realism will ensure that a reality is found through a critical and reflexive approach.

The data is close to naturalistic consisting of field notes from multiple illustrative case studies – the data collection being separated from the research itself by both time and purpose. The data is owned by a consultancy company that has a duty of confidentiality to its clients. Although the consultancy company has given its consent for the data to be used for research it insists that it be anonymised using blanket anonymisation techniques and access be limited. It is a large data set and a CAQDAS has been selected to assist with the organization and retrieval of data (MAXQDA).

The methods plan and research design is based on a grounded theory research programme with pluralistic elements. Other methods (quantitative) are expected to be used in a limited way. Reflexivity will be used throughout to ensure that process and outcomes remain relevant to the research question and that opportunities for generalization of the outcomes are explored. Reflexivity is intuitive, dynamic, and applies continuous self-awareness to process and outcome.

The quality criteria to be applied are defined. These include the criteria to be adopted for checking process and outcome. Special attention has been given to the relevance of the outcome to what is known about possible IT futures in the short, medium, and long term.

CHAPTER FOUR

Execution and Interpretation

4.1 Introduction

This Chapter describes the actual analysis carried out according to the research design, as set out in Chapter 3, and the meaning and understanding of the data that emerged from it.

The chapter will show that the method was executed as planned. It also describes the storyline that emerges from the data, some key findings, and the central importance of the total business experience.

Section 4.2, describes the analysis process itself and the concepts and categories that emerged from the coding. Section 4.3 discusses the observed differences in the language used by identifiable groups within the overall population of those interviewed. Section 4.4 looks at the concept of closeness that has emerged and the spectrum of business requirement identified within the data. Section 4.5 looks at the language of change and the concept of responsiveness. Section 4.6 considers what the data says about the emerging importance of service to the relationship between the business and IT and the different meanings attached to the term in this context.

4.2 The Analysis Process

Planning

In order to ensure an effective coding phase that made good use of the data there was first a preparation phase. This is in contrast to the work of Adolph *et al.* where it was their initial lack of knowledge of the GTM that eventually led them to needing to restart with a method and expertise in qualitative research methods from people within other research disciplines where qualitative research is more common place (Adolph *et al.*, 2008).

Having researched the GTM (and the differences between the methods) as described in Chapter 3 the data usage could be planned within the process. A decision was taken to use only the data from Company 1 in the first instance. This purposive sampling of the

data would minimise the amount of data used during the early coding stages, ensure that coding was thorough and detailed, and keep data in reserve should it be required for theoretical sampling purposes, i.e. the process of deciding what data to select next. This also confined the incidence of change in the naming and sorting of codes through the constant comparison process (Section 3.4), which was greater at the outset than later, to a smaller number of documents. By the time the coding of the data for Company 1 was completed the codes had stabilized enough to extend the open coding to the data from Companies 2 and 3 with relatively little volatility. This proved to be helpful in ensuring that the coding and memoing phase was efficient and economical on data.

Coding and Memoing

During the open coding process, text segments were highlighted which were considered to describe a concept and these were assigned a meaningful code name.

Concepts could sometimes be assigned names *in-vivo* using the actual words of the participants, e.g. *alignment*, *business need*, *business awareness*, and *communications*. As the coding progressed a process of constant comparison with the data enabled the code names to be refined.

Communications is a good example to illustrate how this refinement came about. Communications is used 60 times *in-vivo* in the Company 1 documents but this is a large data set and it has a number of meanings including *stakeholder communications* (coded 53 times and never used *in-vivo*) and *internal communications* (coded 39 times and used *in-vivo* 13 times). Overall, *communications* is deemed by virtue of the theoretical coding to be part of a concept that was named *marketing/communications*. This now refers to a total of 216 coded segments and happens to be a well-known business concept. Other in-vivo codes that were eventually grouped under *marketing/communications* are *IT strategy* and *enterprise architecture* as their principle purpose in the text was in communicating, internally and externally, key aspects of what exists or what is to be developed.

In-vivo coding probably accounts for more than half of the codes used in the code system but, for the reasons stated, names that can be inferred from the text sometimes have to be invented in order to draw important distinctions according to what is explicitly or implicitly stated in the data.

It was noted (Matavire and Brown, 2008) that the full GTM offers an opportunity for IS, given its multi-disciplinary nature, to increase the richness and validity of the results (Section 4.4). The entry I made in the logbook facility of MAXQDA on 23 September, 2010, noted that on day 1 of the open coding for Company 1 845 passages of text were

coded using 46 different codes. From the start these were colour coded[9] as an attempt to identify the subject matter that was emerging. The aim had been to code as much as possible at one sitting in order that as much knowledge as possible was retained in the mind. This intensive approach to open coding speeded the recognition of differences and similarities and improved the efficiency of the constant comparison process (Section 3.4). The constant comparison process enabled the understanding of the data to grow and ensured that the concepts being described remained true to the data. Descriptions grew from the usage as observed in the text eventually creating a rich description for each concept and each grouping of concepts arising from the theoretical coding and conceptual ordering.

The manner in which the chosen data management method helps to maintain the intensity and thoroughness of the analysis is illustrated by a later screen print from MAXQDA, see Figure B.1 (Appendix B).

Visible on the one screen are the document system (containing all available documents and whether they are activated or not), the selected document (showing its content and coding all of which can be scrolled), the code system (all concepts and the structure resulting from the theoretical coding any of which may be selected), and retrieved segments (all of the segments of text from all activated documents corresponding to the selected codes).

The complexity of qualitative analysis using grounded theory becomes apparent very quickly when dealing with large scale data sets and the decision to use a CAQDAS was justified. At this stage the data consisted of 106 documents, 105 codes, 2432 coded text segments, and 406 memos.

There is a view that open coding according to the Straussian approach results in a large number of concepts that get grouped into categories with properties and dimensions whereas the Glaserian approach looks for categories from the outset but then has to develop these to establish properties and dimensions (Niekerk and Roode, 2009). If the Straussian approach is abstraction or 'bottom up' and the Glaserian approach is decomposition or 'top down' then from this experience the bottom-up (Straussian) approach is probably more neutral and more accurate as a coding process. Like all such methods, though, regardless of which is deemed to be correct both occurred within this research project as the theoretical coding developed. There were situations where a text

---

[9] The categories are now colour-coded RED (Business Need), PURPLE (Service Specification), GREEN (Total Business Experience), LIGHT BLUE (Alignment and Governance), BLUE/BLACK (Change)

segment could be linked to what was clearly emerging as a category and yet there was insufficient evidence in the text to create a new concept. For example a senior IT manager in Company 1 said, "*We do not know how to market ourselves, it depends upon individual relationships. In [my region] there is one person to cover 11 offices in 9 centres with language and other differences.*" (Interview 0118, paragraph 8). At the time this segment was simply coded with the concept *marketing/communications* rather than using or creating a more specific code. On the other hand, "*Communications with the business is fragmented. Other than the reviews with the sponsors (every two weeks) it is ad hoc.*" (Interview 0112, paragraph 8), was coded as *stakeholder communications* (because it was communications with the business) and "*Internal communications ranges from the 'overdone' … to 'frantic networking'. Department now too big for meetings*" (also Interview 0112, paragraph 8) was coded *in-vivo* as *internal communications* within the same emerging concept *marketing/communications*. It is this latter text segment that is highlighted for illustration in Figure B.1. In the event, what was coded represented the spectrum of activity exhibited by the sample of data in the area of marketing and communications. As the open coding and the constant comparison proceeded decisions were being taken about the conceptual ordering of the code system and categories were formed.

Memos were created as records of GTM analysis/coding decisions taken or descriptions of what had been observed. There were two types of memo used during the coding. The first was the code memo which here was used to offer a working description of a code (in the code system) which could be derived from the data. These descriptions may not be as comprehensive as the corresponding definitions in the literature but memoing imposed a discipline and meant that there was no attempt to define something which was not grounded in the data. Thus there was no attempt to mould what was observed into what was *a priori* knowledge based on best practice or constructs based on current IT methods unless it was found in the text. For example, there was an expectation that the major methods or the terms used within these would feature strongly in the analysis but this was only partially the case. The constant comparison method (Section 3.4) involved maintaining the integrity of codes and code memos as the understanding of the data developed through the coding processes.

In MAXQDA a code memo is represented by a rectangle that has the bottom right hand corner turned up and it appears to the right of the code to which it refers – examples can be seen in the lower left hand window of the screenshot in Figure B.1 where each of the codes has a code memo to its right hand side. In this text these are always referred to as *code memos*.

The second type of memo is the text memo which provides a repository for notes relating to the content of the text. They were used for noting actions, interactions, any contextual conditions and consequences that may have applied, and other codes that may be relevant to the memo, i.e. they were used to record thoughts and provide a means of capturing relationships referred to as *axial coding* in the Straussian approach. Memos of this second type are appended next to the text to which they refer. In Figure B.1, three such memos can be seen in the upper right hand window represented as small rectangles which can be colour coded for easy recognition. In this text they are referred to as *text memos* or simply *memos*.

Categories, Properties and Dimensions

The discussions with the participants were neither structured nor confined to particular activities. Rather, participants were allowed to approach the task by describing what was important to them. What emerged was descriptive of the many aspects of the relationship between the businesses and the IT services suppliers in the various companies. The concepts assigned to the text segments were ordered to create a code system where those concepts that were logically related were grouped together. The theoretical coding to create categories (and their properties and dimensions) is the so-called constructivist phase of grounded theory where the data is fractured to construct the theory. This constructivist phase in this coding was integral with the constant comparison process involving reflexivity. The categories that emerged from this process are illustrated in Tables 4.1a and 4.1b together with their properties and dimensions.

Table 4.1a: Four of the five categories, their properties and dimensions

Category	Property	Dimensions
BUSINESS NEED	BUSINESS CONTEXT BUSINESS STRATEGY AND OBJECTIVES NEEDS GAP BUSINESS EXPECTATION	(Specific to property)
SERVICE SPECIFICATION	SERVICE MANAGEMENT BUSINESS ENGINEERING BUSINESS PROCESS ENGINEERING BUSINESS PROCESS EXECUTION IT REQUIREMENTS PORTFOLIO ITSM SERVICE QUALITY AND PERFORMANCE	Planning Delivery
ALIGNMENT	GOVERNANCE RESOURCE MANAGEMENT RISK MANAGEMENT	Closeness/Extent of Alignment Agility/Speed of Response
CHANGE	INFINITE AND UNPREDICTABLE	Infinite and Unpredictable

As can be seen from Table 4.1a, the properties and dimensions of CHANGE[10] were deemed to be "Infinite and Unpredictable'. CHANGE is a special case for the reasons given in Section 4.5. CHANGE sometimes gives rise to a new BUSINESS NEED and has been expressed in the data as affecting the BUSINESS CONTEXT, the BUSINESS STRATEGY AND OBJECTIVES, creating a NEEDS GAP, and modifying BUSINESS EXPECTATION. Because CHANGE is infinite and unpredictable the dimensions of the properties of BUSINESS NEED are specific to the CHANGE and would have been noted in the associated code memo but were not used to create generalized dimensions.

Most of the participants described aspects of their experience of receiving the service or of providing the service and this became more significant as the analysis proceeded (See Chapter 6) creating many concepts and the category of the TOTAL BUSINESS EXPERIENCE (TBE). The concepts deemed to make up the TBE were grouped as properties and dimensions of the TBE and this is illustrated in Table 4.1b. Any additional sub-codes, i.e. sub-divisions of the dimension, derived from the data were noted in a code memo e.g. the code memo for key performance indicators (KPIs) notes the dimensions as sales, market share, channel and product/market segmentation, profit margins, or forecasts. Where these further sub-divisions were derived from the data they are likely to be business-specific or they may have been reflexive thoughts that anchor the dimension from the data to other business concepts but all are excluded from further discussion.

The categories are described as follows:

- BUSINESS NEED: An expression of the business need as distinct from the IT requirements specification. It drives investment and knowledge of this is essential for better planning and better service delivery.
- SERVICE SPECIFICATION: Any expression of current or planned services and service levels.
- CHANGE: Any external change or event that affects the BUSINESS NEED. It may affect the trading circumstances, trading environment, the organization or be something new and relevant in terms of IT or technology, or a combination of these.
- ALIGNMENT: The process of ensuring that the functions of the business and supporting services meet the constantly changing BUSINESS NEED.

---

[10] From this point onwards in the text any reference to a concept will follow the style used in Tables 4.1a and 4.1b

Table 4.1b: The TBE category, its properties and dimensions

Category	Property	Dimensions
<u>TOTAL BUSINESS EXPERIENCE (TBE)</u>	BUSINESS AWARENESS	Key Performance Indicators Assumptions/SWOT Budget Leadership
	MARKETING/COMMUNICATIONS	Products and Services Stakeholder Communication IT Strategy Internal Communications Enterprise Architecture Budget Leadership
	SALES/VALUE ADD	Sales Strategy Account Management Pre-Sales Support/Innovation Order Book Budget Leadership
	COMMERCIAL ADMINISTRATION	Contractual Arrangements Financial Management Compliance Admin Management Growth Budget Leadership
	PEOPLE AND ORGANIZATION	Overall Leadership Accountabilities Culture and Motivation Education, Training and Development Individual. and Group Effectiveness Recruitment Budget Leadership
	DESIGN AND DEFINITION OF IT PRODUCTS AND SERVICES	Understanding The Requirement User Interface Product and Service Design Build Versus Buy Decisions Budget Leadership
	DELIVERY OF IT PRODUCTS AND SERVICES	Program and Project Management Data Quality Software Engineering Deployment IT Operations Management Help/Service Desks Upgrades and Change Control Budget Leadership
	BOUGHT-IN PRODUCTS AND SERVICES	Bought-In P&S: Buying Process Bought-In P&S: Marketing/Communications Bought-In P&S: Sales/Value Add Bought-In P&S: Commercial Administration Bought-In P&S: People and Organization Bought-In P&S: Design and Definition Of IT Products and Services Bought-In P&S: Delivery Of IT Products and Services Bought-In P&S: Bought-In Products and Services Bought-In P&S: Security Bought-In P&S: Technical Infrastructure Bought-In P&S: Budget Bought-In P&S: Leadership
	SECURITY	Business/Site Security Information Security Business Continuity/Disaster Recovery Budget Leadership
	TECHNICAL INFRASTRUCTURE	IT Skills Training for the Business Introducing New Technology Technology Deployed Asset Register Budget Leadership

- THE TOTAL BUSINESS EXPERIENCE (TBE): An expression of how the combined effects of the IT services and solutions are viewed by key stakeholders within the business, the IT service provider itself, and other organizations.

All concepts derived from the coding were triangulated, i.e. they are linked to text segments within at least three separate interview documents across more than one company. Most of the concepts that became categories or properties were identified in many more documents, e.g. there were 145 instances of BUSINESS NEED identified; 48 of BUSINESS AWARENESS; and 49 of SALES/VALUE ADD. Decisions taken during the elaboration of the analysis created three exceptions to the triangulation rule described above:

- BOUGHT-IN PRODUCTS AND SERVICES property within the TBE. As the code system matured the decision was taken that the relationship between the business and the IT organization would be no different to the relationship between the business and a sub-contracted supplier of IT services, or even between the IT organization and its sub-contracted supplier of IT services, and that these relationships could be nested. This being the case the TBE could apply at any level but at each level there would be a buying process. Thus all of the properties of the TBE were replicated as dimensions of BOUGHT IN PRODUCTS AND SERVICES with the addition of a buying process. This was a result of reflexivity prompted by the data after the coding phase and the decision taken helps to generalize the outcome of the research but the dimensions cannot all be derived from the data.

- Leadership was initially coded as a property of the TBE. It was decided that leadership was not only an overall requirement but that Leadership could be a dimension of each *property* of the TBE. An IT manager in Company 1 said, "*Poor awareness since Systems has not been on the business floors. Job of [account management and business analysis] is to now rebuild the relationship and understanding. Supports this and expects them to drive the department. Necessary because Systems and business people probably wouldn't even recognise one another as things stand today.*" (Interview 0106, paragraph 6). This new role of account management in Company 1 was seen here to be providing a necessary Leadership role for the IT organization's marketing and communications to the business. Thus Leadership can be considered as an important property of MARKETING/COMMUNICATIONS. The TBE properties define the many areas where leadership may be required. Again, this was a result of reflexivity prompted

by the data but added after the coding stage and does not in every case come from the data.

- Budget was also initially an overall property of the <u>TBE</u>. In just the same way as a degree of Leadership over each property would be required, so it was decided that each property may also require a Budget for the Leadership to be effective. Again this dimension was added to each property after the main coding stage prompted by reflexivity and not all can be derived from the data.

The complete code system in its current state, exported from MAXQDA, can be found in Appendix D.

Code Relations

The conditional/consequential matrix recommended in the Straussian GTM for managing axial coding does not capture the complexity of the many diverse patterns of connectivity (Corbin and Strauss, 2008) and there is an acceptance that some researchers have found it necessary to develop alternative approaches (Dey, 1993). The text memo feature of MAXQDA provided a flexible and useful facility for noting not just observations but also, for each text memo, the codes to which there is a relationship. Each memo was time and date stamped and this in conjunction with any logbook entry provided a further record of progress and changes. Text memos were especially useful later for building theory.

In addition it was possible to explore code co-occurrence, i.e. where multiple codes occur within the same text segment. Figure 4.1 is derived in this way. The categories have been placed at the centre and around the outside are the remaining codes. The lines indicate where there is a direct connection in the same text segment between the codes.

Figure 4.1 was created at an early stage in the open coding process. As more coding is completed these models become less helpful on large scale projects for analysing the relationships; patterns are still recognisable but tables are more precise. Table 4.2 summarises the situation at the completion of the analysis and shows how many text segments any two categories are attached to, e.g. codes that form the <u>TBE</u> and <u>BUSINESS NEED</u> appear together in 184 text segments. Table C.1 (Appendix C1) contains more detail showing the relationship between the categories and the individual concepts that make up the <u>TBE</u> category. Figure 4.1 and Table 4.2 are based on the codes and the code memos resulting from applying the GTM.

Contextual Relationships

Whereas code relations show how many text segments any two categories are attached to, by analysing the text memos it was possible to gain an understanding of the nature of

the relationship. By using *code theory models* (a further mapping feature of MAXQDA) it was also possible to look at the contextual relationships (indicated by a line) recorded in the memo during the open coding. The model in Figure 4.2 visualizes the cumulative effect of these relationships at a mid-point in the open coding process. This view not only helps to further reveal the central significance of the <u>TBE</u> but also the importance of the other categories compared with what seems to be the case when considering code relations. The infill colour of the memo icons was assigned to aid recognition of the subject matter during coding using the same convention as previously described in the footnote of Section 4.2.

Table 4.2: Code relations of text segments by category pair

	Change	Alignment	Business Need	Service Specification	Total Business Experience	TOTAL
Change	0	14	16	4	13	47
Alignment	14	44	42	17	194	311
Business Need	16	42	24	17	184	283
Service Specification	4	17	17	30	104	172
Total Business Experience	13	194	184	104	1084	1579
TOTAL	47	311	283	172	1579	2392

The colour coding also helped to speed up the subsequent analysis. Maps are created quickly and when viewed live in MAXQDA the content of a memo is displayed when the cursor is placed over the icon. Thus it is easy to see how quickly and thoroughly the analysis can proceed even when the data set is large. Thus the technology was used to inform and improve the process of axial coding.

Storyline, the Core Category, Selective Coding

A review of these memos reveals a generalized storyline which runs as follows:

- Services are delivered to the business according to the <u>SERVICE SPECIFICATION</u> to meet an implicit or explicit <u>BUSINESS NEED</u>.
- Business stakeholders have views as to how close the <u>TBE</u> of using the services is to their <u>BUSINESS NEED</u>.
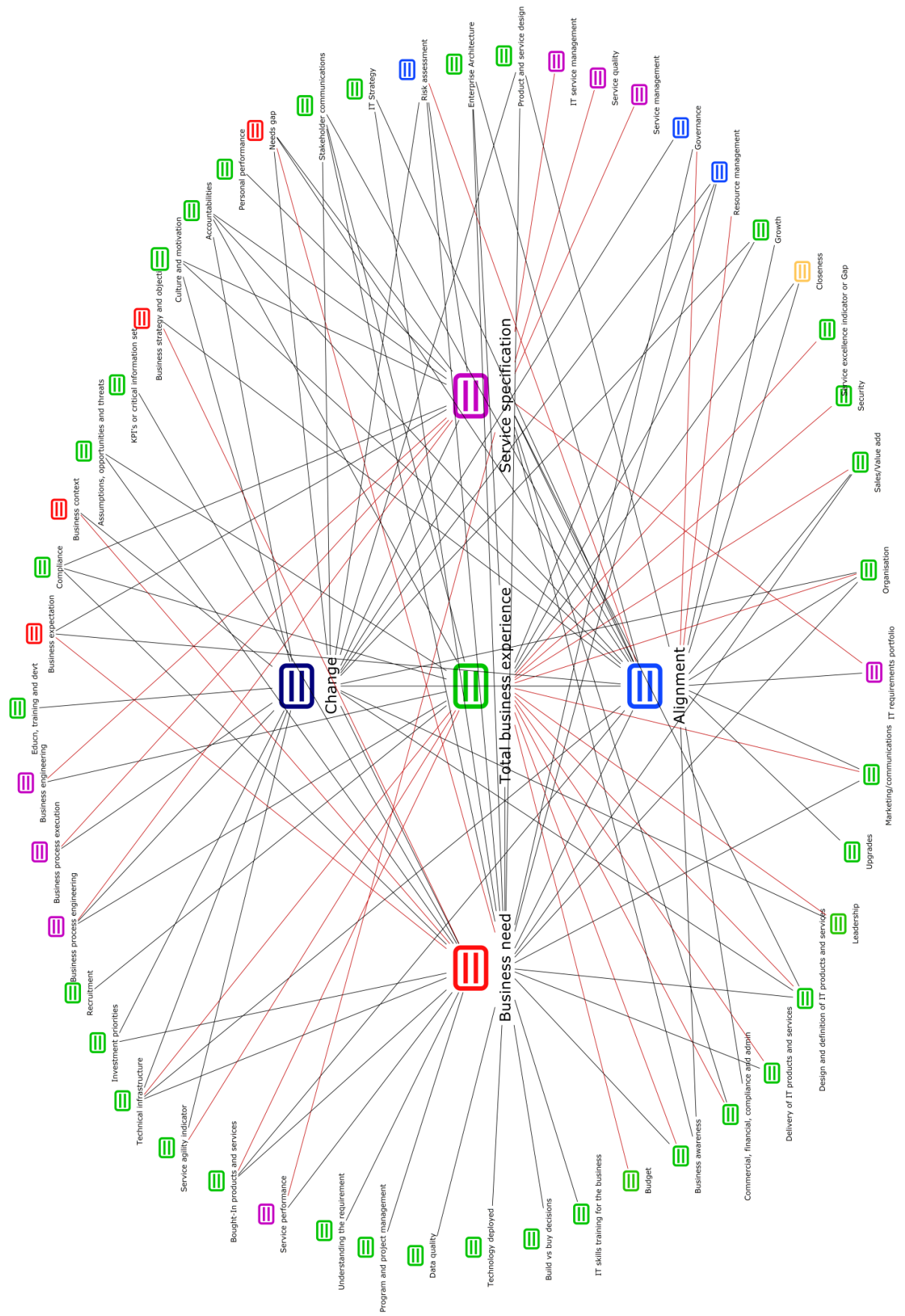
Figure 4.1: The early emergence of categories from an analysis of code co-occurrence

- IT stakeholders also have views about the experience of delivering those services.
- All stakeholders have ideas as to how IT or the business should be re-aligned to better adapt to the technology or market conditions and suggestions need to be prioritised according to the management and governance processes and procedures.
- After ALIGNMENT the business will expect the TBE to have improved but often the process takes too long.
- CHANGE external to the business, e.g. in the market generally and in the world of technology, influences the BUSINESS NEED potentially creating a need for further ALIGNMENT.

There are examples within the data where the need for ALIGNMENT has been identified by detecting a reduced TBE (indicating that external CHANGE has perhaps taken place). Longitudinally, this is also known to happen where the IT infrastructure, applications or services are not kept up to date.

From the storyline, the code relations (Table 4.2), and from the code theory models (e.g. Figure 4.2) the TBE was selected as the central or *core category.* The TBE was selected because it accounted for the most variation around the problem of IT delivery. Although there was a great deal of interdependence amongst the categories identified, the TBE was central to the relationship between business and the IT service providers. From the data it described the consequence of delivering services, provided a means of assessing the extent to which the BUSINESS NEED was being addressed by the delivered services or whether ALIGNMENT had been achieved and indicated when certain CHANGEs had occurred.

At this point open coding ceased and selective coding with a focus on elaborating the properties and dimensions of the TBE category commenced. The data used to this point originated from three very large international "bricks and mortar" services and engineering businesses. Theoretical sampling looked to add additional data that could provide an opportunity to look at the phenomena within a smaller high technology business.

Company 4 is a medium sized UK technology company that was chosen after the selection of the core category and the emergence of the theoretical model. Saturation was judged as having been achieved when the theoretical sampling and the selective coding added little to what was already known and defined within the code system concerning the categories, their properties and their relationships to the core category.
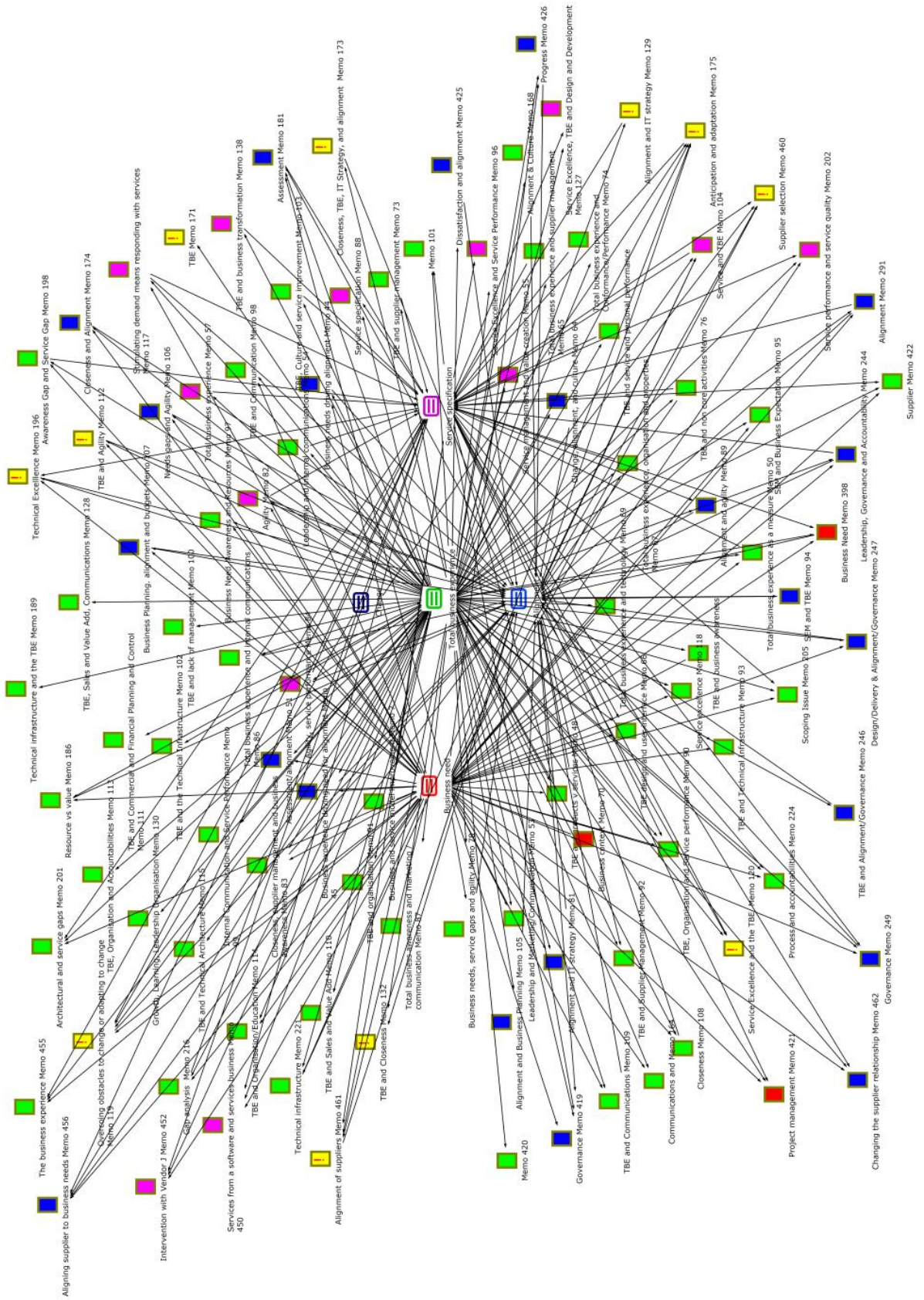
Figure 4.2: Contextual relationships as illustrated by text memos

Table 4.1b reflects the current status of the properties and dimensions of the <u>TBE</u> and Table 4.1a the current status of the properties and dimensions of the other categories. Many of these concepts can be considered to be services aimed at satisfying the <u>BUSINESS NEED</u>, perhaps with IT product at their core. All service concepts are complex in the sense that they contain multiple interrelated properties. The theoretical sampling confirmed that what was defined provided considerable depth and breadth of understanding about the phenomena.

4.3 Different Worlds Separated by Language

Language has long been a problem between business and IT people (Section 1.2). This is visible from the coding and visualized using the document *comparison chart feature* of MAXQDA. The colours indicate which categories are being used to describe the text segments within each document. Colours identify each category and their respective properties and dimensions as noted before (see footnote on page 74) – red (<u>BUSINESS NEED</u>), purple (<u>SERVICE SPECIFICATION</u>), green (<u>TOTAL BUSINESS EXPERIENCE</u>), light blue (<u>ALIGNMENT</u> and GOVERNANCE), blue/black (<u>CHANGE</u>).

This is illustrated in two screenshots which represent two samples of the data set. Each horizontal line in these visualizations represents a different interview document where the unit on the horizontal scale approximates to time. Figure 4.3 illustrates a number of discussions with business people and contains a lot of red indicating that discussion of the <u>BUSINESS NEED</u> occupied most of the time. Figure 4.4 illustrates a number of discussions with IT people and is largely green indicating the dominant topic over time to be aspects of the <u>TBE</u> of the delivered service.

Business people spent four times as long discussing <u>CHANGE</u> (dark blue) whilst IT people spent twice as long discussing the <u>SERVICE SPECIFICATION (purple)</u>. Whilst both groups talked about <u>ALIGNMENT </u>and GOVERNANCE (light blue) they did not necessarily always have the same things in their minds. The data shows that the business people adopt a broad view of alignment whilst IT people tend towards architectural alignment focused on systems. For example a business manager in Company 2 says, "*Application systems are currently supported by application-focused user groups. It was agreed that the future alignment of IT would be improved by deploying process-focused user groups rather than system-focused user groups. In this way application systems will become integral to the business process; this is important if systems are to adequately support a highly developed set of business processes, especially in the context of continuous improvement. Process owners would thus ensure that they were happy with the integrity of both data and applications and ensure that there was an appropriate*
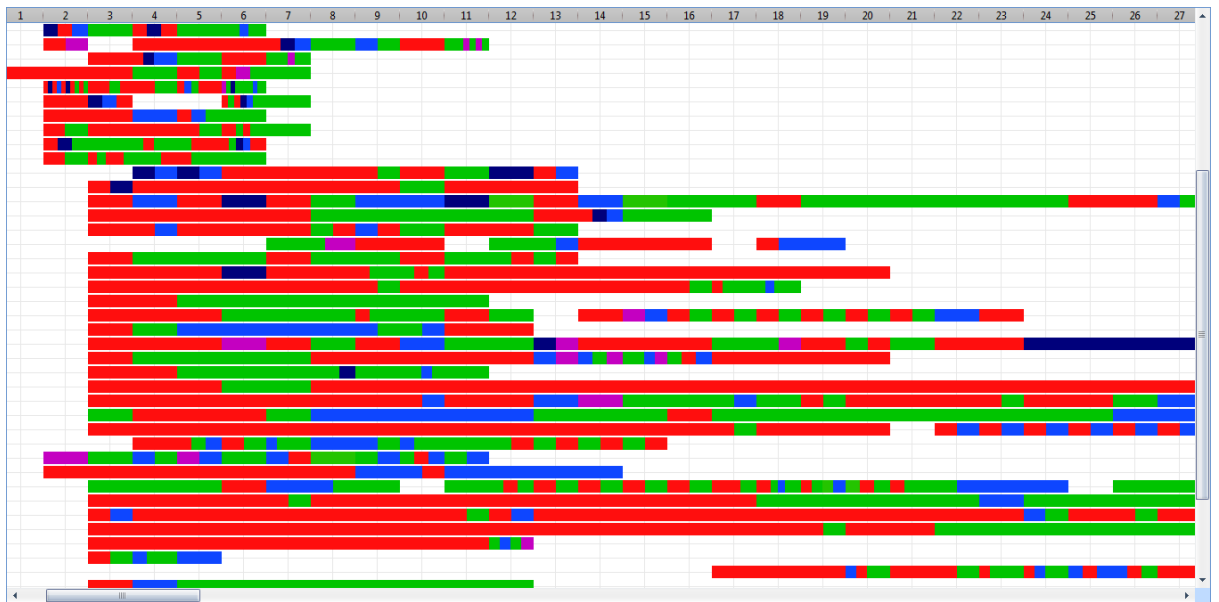
Figure 4.3: Visualization of the coding of discussions with business people
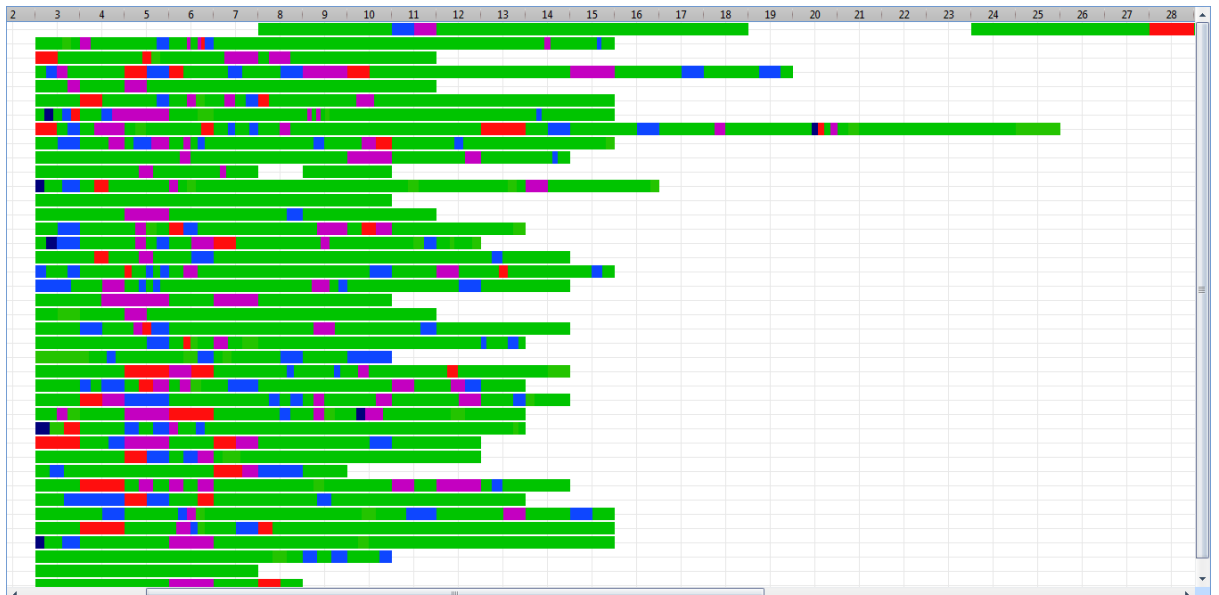
Figure 4.4: Visualization of the coding of discussions with IT people

emphasis on deployment (i.e. not just a focus on development)." (Interview 0206, paragraph 6). A management consultant undertaking some work in Company 3 called for, "*IT organizational realignment*" (Company 3 Field Notes/Summary of report 31, paragraph 24), whilst the Head of IT in that company explained that, "*Now trying to align these new [business] requirements with the [IT] strategy*" (Interview 0303, paragraph 22). In Company 1 a senior IT quality manager said, "*There is an architecture but no strategy.*" (Interview 0106, paragraph 14) and a senior IT applications development manager said, "*Major concern that systems need to be re-aligned with the needs of the business…*" (Interview 0112, paragraph 3), and "*Major concerns are […] project alignment, […].*"

(Interview 0103, paragraph 03). These views of alignment (of systems and projects) are consistent with the conclusions drawn from the review of the literature, i.e. that IT methods are product oriented (Section 2.3).

Further Analysing the Language Variation According to the Variables

The language used in the whole data set was further analysed to determine where the greatest variation in use of language occurred. Table E.1 (Appendix E) was produced by cross tabulating the use of the categories (and their properties and dimensions) by groups defined by five variables (Section 3.3); values were expressed as percentages and summarised using Microsoft Excel. These variables were region (EMEA, Americas, Asia/Australasia), seniority (5 levels), new to company/not, years of service (14 bands from 0 to 20 years), and department (i.e. business/IT/group/external). Table 4.3 summarises the range of values and the median for each category used by each group. This could not interpret the meaning that was being attached to the use of the categories – merely the frequency with which they were used.

Table 4.3: Language usage by variable

	Region		Seniority		New to Company		Years of Service		Department	
Category	Range	Median	Range	Median	Range	Median	Range	Median	Range	Median
Change	1.86	2.14	3.13	1.68	0.70	1.68	3.45	0.65	5.72	2.03
Alignment	1.11	9.93	8.96	11.96	0.26	11.82	13.96	9.74	13.30	9.65
Business Need	12.30	10.70	23.74	16.89	4.63	15.52	8.20	3.45	27.72	23.89
Service Spec	3.89	5.35	6.79	5.51	1.73	6.49	17.24	7.79	5.93	5.88
TBE	12.39	70.91	17.69	62.78	3.87	64.49	18.03	78.75	40.76	58.56

Regional differences can be a significant overhead, e.g. where dual language is a requirement. This variation is most noticeable in the spread of scores for BUSINESS NEED and the TBE. For example, typical of discussions with IT managers in Asia, an IT operations manager said, "*Language requirement in Asia is more demanding and in the regional HQ [we have] to accommodate [a] dual language capability (local language and English). The Chinese characters require a [...particular technical solution and] this combined with the other IT constraints of security and global standardisation etc. can mean long delays and frustration for the user. Too much and there is a risk that they will stop asking for help, [a] risk that they may go elsewhere and source solutions outside of the IT domain.*" (Interview 0105, paragraph 11). Thus IT managers in Asia/Australasia would spend a greater proportion of their time discussing this BUSINESS NEED than

those in other parts of the world though country and regional differences in legislation could also be problematic. The range in the use of <u>BUSINESS NEED</u> for the group defined by the seniority variable is outside the norm set by the other variables with the exception of the departmental differences. This is because two junior managers at the centre of changes taking place to their business had a long list of needs. One of the managers described himself as a deputy manager in Company 2 addressing the project services needs of the project controllers and document controllers in the business operations department. He was also a project manager who was intimately engaged in the SAP ERP implementation. The business direction is one of partnering but the detail of what this means to Company 2 was still unclear to him and he describes his detailed needs in the interview. (Interview 0210, paragraphs 2 and 3). The other was the marketing manager. His role "*is to provide the processes and infrastructure to support the marketing needs of the organization. It is a consolidating market, so the Company 2 and Group business has become international. IT is seen to be the crucial mechanism by which Company 2 will make the market aware of its capability and communicate with its customers, suppliers, and partners. IT is also a means of retaining customers by maintaining relationships to secure repeat business.*" Describing the global roles he goes on to explain that "*data must cover the scope of [those activities], and technology must have the reach and appropriate interfaces to enable data to be shared or exchanged between all parties.*" He explained what was expected from IT in terms of content, look and feel. (Interview 0222, paragraph 3).

The smallest variation in the data was when comparing those who were new to their companies with those who were not. This was unexpected because when someone moves from one company to another they might be expected to recognise gaps when comparing the current operation with what they have been used to in their former company. For example a new director recently appointed to Company 3 complained about the systems that supported project management, document management, materials accounting, the process for IT investment, and the outsourced services provider. More generally he remarked that the systems were slow and he "*Has an impression of an excessive number of old obsolete unsupported systems and questioned whether there was any software or QA control on IT.*" (Interview 0313, paragraph 8). On the other hand there were as many long standing managers with similar views, e.g. the head of IT quality standards that had been with Company 2 for many years. He remarked that there were some key areas where the information available to the business "*was a nightmare*" but that equally "*the needs were not well defined*". He goes on to say that it is "*Impossible to find out what is going on, especially on projects below £2m. It is these lower value*

projects that are often the critical front-end jobs. People-related information is poor. The number of people on the books and where they are located at any one time is unknown." (Interview 0220, paragraph 7). A manager of IT in Company 1 with 7 years' service said, "*Major concern that we must be seen as an organization committed to adding value. Concerned about getting business time, business people are busy and we haven't delivered, so why should we be given any?*" and "*Business people are not getting the information they need from the finance and personnel systems (issues of flexibility, accessibility, view etc.) and Systems has not even scratched the surface of establishing and addressing their requirements.*" (Interview 0125, paragraphs 3 and 5). There was rather more variation when considering years of service but this information was only available for Company 1 and could not be considered to be outside the norm for the data as a whole.

The greatest variation in usage to be seen in Table 4.3 arises from the departmental differences as can be seen by the ranges for BUSINESS NEED and the TBE which reflect the sample visualized in Figures 4.3 and 4.4. Further more detailed analysis is provided in Appendix E (Table E.1 Cross tabulation of language usage by department). From this table it can be seen that the values for departments other than the business and IT, especially those of Group, are frequently more closely aligned with the business. They are fewer in number (representing about 10% of the total population) and do not skew the distribution.

Overall the language is multi-dimensional and borrowed from the business and its environment, and from business and IT disciplines and their constructs.

With reference to Table E.1 the frequency of the language used by each group can be compared. Business people talked predominantly about BUSINESS NEED and any NEEDS GAP, they also talk about CHANGE, their experiences with the service they are receiving, Service Quality, ALIGNMENT and GOVERNANCE. IT people talked mostly about design issues and problems at the business interface, CHANGE, Service Performance, ALIGNMENT and GOVERNANCE. This is consistent with Figures 4.3 and 4.4.

Table E.1 provides more detailed information about the frequency of the use of language amongst the two groups. For example, it is clear that in this research the IT delivery process was raised in discussion one and a half times more often by IT people but design issues were raised four times more often by business people. The subjects raised most frequently by the IT people concerned Software Engineering, Programme and Project Management, IT Operations Management, and Budget whilst those by the business

people were ones of Understanding the Requirement, Product Design, and Data Quality. IT people also raised concerns about the so-called "soft" aspects of BUSINESS AWARENESS, MARKETING/ COMMUNICATIONS, SALES/VALUE ADD, COMMERCIAL ADMINISTRATION, and PEOPLE AND ORGANIZATION a total of almost five times more often than the business people. Whether it was business people or IT people raising a subject it was because they saw these as being important issues that had to be resolved if service was to be improved. The identification of the TBE as the core category would appear to be justified given its central nature in the relationship between business and IT and yet this is typically not what is managed. Because the significance of the TBE has never previously been recognised it has never previously been formally defined.

This analysis of the use of the language indicates that there is a language issue. Business and IT are different worlds separated by their working practices. The research, however, shows that the TBE and its properties and dimensions comprehensively describe what is being received from the service provider and whether it meets the BUSINESS NEED. It provides a means for business and IT people to describe a required or delivered service and contains well-known management terms used by both business and IT people when describing their problems or opportunities for improvement. The distribution of the usage of the concepts across all of the documents in the data set is further illustrated in Appendix F.

4.4 The Concept of Closeness and the Spectrum of Requirement

The earlier coding and memoing process (Section 4.2) had enabled the properties of all categories to be defined through the open coding, sorting and constant comparison process. What emerged from the data was three distinctly different ways of expressing requirements from IT. These were associated with the three categories BUSINESS NEED, SERVICE SPECIFICATION, and the TBE. The properties and dimensions of these categories were shown in Tables 4.1a and 4.1b.

The BUSINESS NEED expresses the business situation, what the business is aiming to achieve, and where it feels it is currently deficient and what it expects. It is usually described by the business people. The HR Director who was new to Company 3 had "*two objectives: to bring clarity to people data and to drive efficiencies within HR*" (Interview 0316, paragraph 5). He had completed a review of all business processes and was engaged in preparing current and future state reports. His conclusion was that the *"The current systems are not fit for purpose and require massive manual intervention"* (Interview 0309, paragraphs 6 – 8). The Technical Director in Company 2 was talking about BUSINESS NEED when he said, "*The business direction is one of a closer working*

relationship with Corporate to both support corporate sites and to provide Corporate with a global engineering capability. Corporate recognises that engineering is core to its business. IT is the mechanism for creating engineering information and for making it available to business processes. The success of the organization depends upon the success or otherwise of IT. The organization must become more effective, more efficient, and produce greater quality. IT must support these drivers by enabling convergence to best practice, providing solutions that work, and by helping to secure the maximum payback from current investments. IT can also enable organizational boundaries to be broken down. This enables development engineering and operational people to engage in a more seamless way as opposed to parceling up and passing on. Overseas government departments will be taking an interest in Company 2 IT; data and systems integrity must be beyond question. Proven packaged solutions are likely to be more credible than home-grown solutions. The Company 2 focus on partnering must not obscure the opportunity to re-engineer the supply chain for commodity items to take advantage of the opportunities afforded by e-business.” (Interview 0206, paragraph 2).

The SERVICE SPECIFICATION sets out the current or planned services and service levels which are implicitly or explicitly aimed at wholly or partially meeting the BUSINESS NEED. These are usually described by the IT people, e.g. a senior IT manager when talking broadly about the service specifications said, “*No contract or SLA, agreement is via the functional spec. which is reviewed with user/sponsor*” (Interview 0118, paragraph 12). However, there were situations in the data where a NEEDS GAP being expressed by a business person could also implicitly or explicitly identify a need for better services, e.g. a senior finance manager in Company 2 said, *“[…] E-business planning has not really progressed beyond EDI for invoices.*” (Interview 0215, paragraph 2). The associated memo noted that the participant was talking about the nature of his role as a result of the changes taking place within the business and how the market is changing but the final sentence implies a need for a service which helps the business to develop more modern mechanisms (e.g. e-business business models and architecture). A general manager in Company 2 responsible for delivering projects to the value of approximately £1.2b said, *“It is important that the IT services match the business drivers. Accessing the workflow system from remote locations is a gross waste of time; it is prone to error and very slow (25 minutes to open the diary). Have to rely on paper-based systems when out of the office. Must have a single e-mail system for the whole company. A voicemail system would avoid the frustration of having to use the workflow system for at least routine messaging and would be less time consuming. Would like to see more telephone conferencing. Basic telephone features are not available throughout the organization, e.g.*

common pick-up. There is always a need for more speed. System availability is improving. Crashes are very disruptive; the workflow system is past its "sell-by" date. [I] no longer trust[s] the system for critical work or weekend work. Instead download[s] data to the hard drive and work[s] locally. Need a better method of disseminating information. User notices about service availability often just flash up on the screen and are lost, company notices have to be searched for on the Intranet etc. Everyone seems to have better systems than Company 2, why?" (Interview 0211, paragraph 6). This manager set out his needs by listing a number of major systems and services deficiencies.

The TBE emerged from the coding as a category because it was a collective term that business and IT people used to describe the nature of what was being experienced when receiving or delivering the service. The categories, properties and dimensions of the TBE are listed in Table 4.1b. A poor experience could be expressed as further needs as illustrated by the statement from an Operations Director in Company 2, "*The current application systems are fine but it is not possible to use them with ease.*" (Interview 0209, paragraph 6). This statement identified an experiential issue associated with product design. The head of information governance for the group of companies embracing Company 3 *said, "The retained IT is considered to be too large. Savings will be achieved by having fewer contracts with the same organization. Lotus notes as an example should only require one contract […] which would attract a larger discount than at present. At the moment there is no cooperation amongst businesses – consider a recent tendering process for payroll services by 9 organizations which resulted in 9 separate contracts with one supplier."* (Interview 0325, paragraph 26). The point being made was that the commercial administration of bought-in products and services was poor; there was a need to reduce the costs of IT and in part this could be achieved by reducing the number of contracts with the same third party supplier without affecting the level of service to the businesses.

During the selective coding stage, where the focus was the TBE as the core category, it became apparent that all of the properties of the TBE as well as describing the actual experience of using a service could also describe a future requirement, i.e. a property could be aspirational. When the Finance Director from Company 4 and the member of staff responsible for the CRM system were discussing the business requirement it was said that *"The information available regarding equipment installed on company sites is not good at the moment. It needs to be much better both from a marketing perspective and from a support perspective."* (Interview 0402, paragraph 7). This was an extract from a long description of data quality and deployment issues relating describing the current state of the TBE which also described additional business requirements that the SERVICE

SPECIFICATION would have to consider. Given the problems expressed in the literature associated with assessing services against maturity scales of various kinds (Section 2.3), the categories of BUSINESS NEED, SERVICE SPECIFICATION, and TBE appear to be the means by which the businesses in the data measure the difference between what is needed, what is expected, the service specification, and what is actually being delivered. This is helpful because there was no evidence in the data of services being assessed by business people or IT people against any kind of maturity scale though there was plenty of evidence of business people being prepared to change supplier if the business experience did not meet their needs or expectations. A few examples will illustrate these points.

The Finance Director of Company 4 in conversation with a software products vendor described his BUSINESS NEED as follows, *"[We] plan to be number one [in our market] after our [product] launch in the spring. Want a fully integrated set of systems to support our business. More divisions are planned. We want the infrastructure and architecture of your products"*. (Interview 0406, paragraph 5). The SERVICE SPECIFICATION then for this Finance Director included what it takes to get these systems up and running in each division. In fact whilst installing these products with the help of a reseller (Supplier N) the business has experienced difficulties. Value creation through pre-sales support/innovation can be considered implicitly to be a part of the TBE it desired even if not an explicit BUSINESS NEED and explicit requirement of the SERVICE SPECIFICATION. The Finance Director in Company 4 goes on to say, *"No added value from Supplier N where for example they suggested alternative ways of doing things."* and again, "*Generally they just give you what you ask for: there is no added value.*" (Interview 0405, paragraphs 11 and 41). In another discussion he said, "*To put a little bit of icing on the cake, what we felt was we were not getting anything back out of Supplier N. They were not adding any sort of value or bringing things to the table, they said they could customise this and that and what have you. But let me just carry on as we were doing here and say that the account management and project management were all about gate-keeping and scheduling of resources - that's why we were not getting any kind of value. It's taken a week to get any kind of tentative commitment to the provision of resource to help complete this latest piece of work on CRM. Twenty four hours after an email there was no confirmation. The account management is very weak.*" (Interview 0406, paragraph 71). This shows an IT services provider whose processes were focused on the requirements specification and project management yet the Finance Director was describing a different kind of requirement that was not being satisfied and a business experience that was not satisfactory.

A senior IT manager in Company 1 asked, "*Opportunity is for Systems to be able to respond in a timescale that enables the business to make an impact on a business*

opportunity. Who spots an opportunity to use a package? In what other ways can we add value?" and later, *"Opportunities to add value are not being exploited.*" (Interview 0101, paragraph 9). The IT manager was describing the service at that time and what he thought was lacking in terms of what the business needed. He was starting to challenge the nature of the SERVICE SPECIFICATION in terms of the level at which it was operating. If it could not explore where business value could be created the question has to be asked is whether this is seen by the business as a true service i.e. there is no co-creation of value.

Where an IT services provider is persistently failing to meet the needs of a business the business intent becomes clear. As a senior business manager in Company 1 said to the IT management, *"We recognised the need to focus on the internal stuff but time is running out. Do it or we will find someone else to do it."* (Company 1 pre-assignment file notes). There is a threat here from the business that it is prepared to switch to another supplier in order to realign its IT services so that they do meet their needs.

A business director in Company 2 said, *"IT must adequately equip Company 2 to work with customers, partners, and suppliers as a virtual team."* (Interview 0209, paragraph 2). This is a statement of need but his need is not that simple and the detail will have to be developed. Past experience has demonstrated to this business manager that he cannot rely on IT to deliver solutions that his people are happy with because he went on the say, *"The culture of the group is such that if IT does not listen or fails to respond to demand, then others will do their own thing. This can happen on different scales from corporate solutions to local Access databases; if the strategy is to address this then the solution must be appropriate to the scale of the problem".* This is not just a reflection on needs that are not being addressed but on inappropriate services and an inadequate business experience. The central importance of the TBE is self-evident in all of the research findings and yet there is no industry definition for the business experience.

IT service providers in contrast will not always encourage a better business experience. A senior IT manager in Company 1 talks about his concerns about working more closely with the business, *"Have more people but it is not apparent that more is being delivered. When the business [account management and business analysis] people stimulate demand from the business, Systems must be able to respond. No cost information and no performance indicators."* (Interview 0125, paragraph 6). It is assumed here that improving the TBE by improving the communication between the business and IT will stimulate demand for IT products and services. Arguably this will only be the case if business needs are not currently being met. There is also a fear that this will create resourcing issues because although there are more IT people than formerly there is no evidence that more

is being delivered and there is no means of measuring performance. The implication is that services are neither specified nor managed and that it is likely that business needs are not currently being met. Maintaining this position would be tantamount to ignoring demand and knowingly underperforming.

Closeness, such as that which is said to exist where IT investments are successful (Section 1.4), is a recurring aspiration throughout the data amongst IT managers, suppliers, and Business people. Quotes from IT managers include, *"Suppliers want to be closer to, in some cases even own, the customer/end user."* Interview 0103, paragraph 8); *"should strive to adopt a culture that is closer to that of the business"* (Interview 0123, paragraph 13); *"Systems must anticipate the needs of the business (or be much closer to them!)."* (Interview 0126, paragraph 4); *"Feels IT needs a closer relationship, should be operating in the problem rather than solution domain…"* (Interview 0131, paragraph 6). A business manager in Company 2 said, *"Improvements will probably come through a more integrated effort and a more integrated team, i.e. business and IT people working together."* (Interview 0208, paragraph 6). At a meeting with Supplier N, the supplier was asked what if anything was needed from Company 4 to help them improve their service. Supplier N replied that it would like to have a closer working relationship with Company 4. (Interview 0407, paragraph 20).

The data shows that business requirements can encompass business needs, aspects of service, and experiential aspects. Functional and requirements specifications by contrast typically only reflect a subset of these requirements. In the context of the data, Closeness is achieved when there is <u>ALIGNMENT</u> between the <u>BUSINESS NEED</u>, the <u>SERVICE SPECIFICATION</u>, and the <u>TBE</u>. Closeness thus becomes an expression or measure of the extent of <u>ALIGNMENT</u>, i.e. a dimension of <u>ALIGNMENT</u>.

4.5   The Concepts of Change and Responsiveness

The term 'change' is heavily used throughout the data and the analysis has determined that in this context two concepts were implied. At an early stage in the coding it was necessary to distinguish between these by analysing what was meant in each case and which change concept was intended.

The data shows that senior business people typically first described the external changes taking place over which there was little or no control and then discussed the new business need that arose as a consequence: new business context, strategy, objectives, and what needs to be done, etc. Business people usually referred to both as changes; the latter being subjected to change management. IT people may have referred to these changes but also talk about the IT changes that they have to manage as a consequence. During

the open coding, in order to differentiate between the causes and the consequences, a decision was taken to class the first as CHANGE and the remainder as a 'response to change'.

In the first case change was external and being imposed on the business or one that was taking place within the business environment, i.e. any of the multitude of external influences capable of affecting the business. Changes of this kind were coded as CHANGE. The business had little or no control over them. It was accepted that there was more variation than could be imagined. It was decided that there was no value in using the data to provide a limited set of properties and dimensions based on events observed in the data and so they were classed simply as "Infinite and Unpredictable".

In the second case the change being described was a *response* by the business (or IT) to a CHANGE which has been imposed or which was happening within its external environment. This follows the condition, action/interaction and consequence logic of axial coding. This interpretation is consistent with a shareholder's view which is that it is the business's job to respond to change by re-aligning the activities and resources of the business. Where IT is at the centre of internal and external value networks the business will need help from the IT service provider to respond to change and the data reflects this. Changes of this kind are coded as ALIGNMENT.

Examples from the data follow including some where an IT response is also identified.

An engineer in Company 2 described the context of his role and then the CHANGE (partnering) that was taking place as follows, "*The department employs about 120 people (50% of whom are agency/hired staff). As partnering develops more of the routine work will be handled by the partners but Process Engineering, because of the nature of the work, will probably retain about 80% of its current workload. Over time the numbers of people employed will probably not change much but the number of hired staff are expected to represent a smaller proportion of the whole.*" (Interview 0213, paragraph 2). Also, "*Changes in legislation have created a need to assemble life-time records for plant.*" (Interview 0213, paragraph 4). In terms of alignment the Process Engineer said that, "*The Partnering concept requires significant interaction between the parties and there is a need to exchange and share data. There is a need for a uniform agreed and flexible means of data transfer when it comes to partner communications.*" (Interview 0213, paragraph 3). When describing the response to change the business people often expressed this in terms of the gaps that needed to be closed. This is consistent with the literature (Section 2.4). The data suggests that gaps are a common way for business people to describe the nature of the re-ALIGNMENT that they believe is necessary when a CHANGE has taken

place and a new <u>BUSINESS NEED</u> arises. Sometimes gaps were described according to some general principles and sometimes they were more specific as in the following examples, "*There is a need to address the need for document storage and retrieval as well as providing knowledge databases*" (Interview 0213, paragraph 4); "*About 60% of all users in Process Engineering currently have access to the Internet and are so encouraged. Knowledge management must be improved in order to facilitate the re-use of information. This will support the trend toward many smaller projects and enable Company 2 to be more responsive and more successful in a more competitive environment*" (Interview 0213, paragraph 4); "*Where partnering arrangements have been agreed by Corporate, IT should be making contact to establish working arrangements and IT opportunities. Partnering is about filling a warehouse of opportunity; this should also apply to* IT" (Interview 0206, paragraph 3).

In Company 3 the <u>CHANGE</u> was artificially imposed. A manager in Group HQ of Company 3 said, "*The former organization was not incentivised to change. The means of bringing about change was to sell the business. The successful consortium is conducting the … change programme*". (Interview 0301, paragraph 5). By selling the business, Group HQ was able to create a management framework that would incentivise the new owners to bring about the improvements it wished to see implemented. Thus Company 3 now has the task of considering how it can adapt the business to the management changes that Group HQ has introduced. A new director in Company 3 had a long list of systems that he considered to be inadequate and details of what needed to be done, or who to speak with to get the detail of what needed to be done, in order to align the business to the <u>CHANGE</u> brought about by the sale (Interview 319, paragraphs 22–32).

By contrast, IT is inevitably going to be involved in some way in many of the responses to <u>CHANGE</u> without necessarily being aware of the <u>CHANGE</u> itself. The data shows that change management and change control in the IT context is often about <u>ALIGNMENT</u> as a response to change but is more often technology-focused rather than business-focused; change of this kind is often regarded as being complex, problematic and likely to provoke resistance. Some examples from the data follow.

An IT quality manager said, "*Major concern is the shortage of good information for forecasting, planning, and prioritisation. Need to overcome the obstacles to change. Imbalance in resources between Infrastructure and Operations.*" (Interview 0106, paragraph 2). This manager is talking about the internal IT organization needing to overcome the obstacles to change. The reference to the imbalance of resources is a part of the remedy as seen from this participant's perspective. An IT administrator in Company 1 is very focused on IT when he said, *"…Change control is weak e.g. Infra may upgrade*

web servers and not communicate it" (Interview 0114, paragraph 9). An IT operations manager was also focused on IT changes but recognised that this was too narrow, "*Major concern that we need a better change control system … Need to identify all of the potential changes that could impact the user and make sure that change control captures them. Scope must include whole of Systems including Infra, the other side of the firm, and suppliers and vendor support.*" (Interview 0120, paragraphs 3 and 8). Another senior IT manager said they, "*Solicit informal feedback after changes implemented, could do better in terms of establishing customer satisfaction. Tend to fix one problem and find another. Change control and change management are problematic.*" (Interview 0139, paragraphs 4 and 5). One senior IT manager acknowledged that as a department they had "*No good handle on business change management.*" (Interview 0107, paragraph 20).

One IT manager went as far as to say, "*Systems must be able to react quickly enough. The threat is that the business may perceive Systems [to] be living off itself i.e. it has become its own client.*" (Interview 0140, paragraph 4). Here the suggestion was that IT was putting itself before the business when it came to new investment; it was not responding to change but defining its own needs within the IT domain and responding to those.

Many business people in the data set (common throughout all of the businesses represented) are frustrated by the IT service provider's apparent inability to respond quickly to CHANGE.

A general manager in Company 2 says*, "IT should ideally be industry standard to enable simple communications to take place quickly and efficiently. This is not yet the case in Company 2 and certainly not so either in [my] previous company where the IT is badly fragmented and management is trying desperately to bring it together."* (Interview 0225, paragraph 2).

Other business managers expressed similar concerns, "*Implementation of Infrastructure Requests must be speeded up (an upgrade to [application] has so far taken 12 months and is still not working properly).*" (Interview 0207, paragraph 6); "*Need to identify actions, priorities, and scope and input to [the change programme] by the end of October which is different to what is emerging from IT. The timescales being quoted by IT are too long and too late for the business plan. Need to find a way of speeding the whole thing up.*" (Interview 0312, paragraph 9); "*little was delivered over a two year period.*" (Interview 0405, paragraph 2).

Many IT people are similarly frustrated by an inability to respond quickly to <u>CHANGE</u>, even when what must be done is wholly within the IT organization's own area of responsibility.

An IT manager says, *"The management team is frustrated at not being able to respond to business requirements more quickly. Need process 'irrespective of personalities' and a rapid deployment force."* (Interview 0103, paragraph 7). A sample of quotes from senior IT people include, "*Would expect users to say that Systems is slow to respond (because it is not very flexible) and lacks some credibility.*" (Interview 0101, paragraph 5); "*We seem to have lost the ability to provide quick solutions.*" (Interview 0101, paragraph 6); "*Customers are becoming more demanding, want more, seek instant gratification, value what is delivered albeit late*" (Interview 0103, paragraph 5); "*The management team is frustrated at not being able to respond to business requirements more quickly.*" (Interview 0103, paragraph 7); "*would like Systems to respond more quickly to providing new or additional capabilities*" (Interview 0105, paragraph 5); "*Delivery against plan has not been good. When planning has taken place, estimates have been too ambitious, hiring has proved to be more problematic, and mobilization has been slow.*" (Interview 0122, paragraph 5); "*Can […] decision-making be speeded up by more empowerment, improved processes?*" (Interview 0135, paragraph 4).

The analysis differentiates between <u>CHANGE</u> and what the business and IT people must do in order to respond to the <u>CHANGE</u> in order to once more achieve <u>ALIGNMENT</u>. The lack of Agility in the response of IT to <u>CHANGE</u> is a recurring theme throughout the data from both business and IT people. The time taken for any <u>ALIGNMENT</u> of the business, or IT upon which the business is dependent, is termed Agility of response. In the context of the data and in business terms, Agility becomes an expression of responsiveness or time taken to respond to <u>CHANGE</u>, i.e. another dimension of <u>ALIGNMENT</u>.

4.6   Importance and Meaning of the Concept of Service

It has been argued that the current IT delivery model and the commercial relationship between business and IT is one based on the creation and operation of IT *product* which has the potential to limit what IT can offer to the business (Section 1.3). Consistent with this product focus the term 'service' in the IT context has increasingly come to mean a web service or a unit of software functionality (Section 3.4). This is a language difficulty that has to be addressed if IT's ability to create value for the business is not to be inhibited yet the coding of the data revealed that both business people and IT people talked about products *and services* when describing what was needed from the IT relationship. In fact the presence of *real service* from people in most IT activities is, according to the data,

what prevents the whole delivery process from failing more often. As senior IT managers in Company 1 said, *"teamwork and common sense prevail; people will do what needs to be done to achieve"* (Interview 0101, paragraph 15); *"People are very responsive, there is a strong work ethic and staff are treated well. The culture is built around success, delivery to the customer, and the ability to help colleagues. It is a meritocracy with a 'can-do' attitude"* (Interview 0104, paragraph 11); *"People are very highly motivated, will work 24hrs a day, all people are smart."* (Interview 0107, paragraph 24).

Real service here is defined as the deeds of people that involve the co-creation of value through the analysis or management of problem areas and the dissemination and adoption/exploitation of know-how.

Many of the concepts in Table 4.1a and 4.1b are service-based. They embrace product where product is present, but essentially are concerned with the deeds of people engaged in value-creation involving the analysis of or management of problem areas and the dissemination and adoption/exploitation of know-how (i.e. value-in-exchange, Section 3.4). Driving this is a need for *"Lower cost and better value from [the] IT supply chain"* (Field Notes Summary of Report 31, paragraph 22) and a need to *"…move to a culture of using knowledge and information to better support the business…"* (Field Notes Summary of Report 31, paragraph 25). Although these two quotes from the data were written as part of a summary of the findings in relation to the situation that existed in Company 3 at that time these are commonly recurring requirements, even in world-class businesses that are less constrained in terms of the budget that can be allocated to IT. Both requirements are simple expressions that could be interpreted as more automation at less cost. In fact they call for a wide ranging study of what is needed and the alternative solutions available. The business experience will reflect not just the deployment of the eventual solutions but also the quality and effectiveness of the study that leads to defining the possible solutions, i.e. not just the value realization but the value creation.

The SERVICE SPECIFICATION encompasses the services and product to be delivered; the research shows that it operates at different conceptual levels and is targeted at different business requirements. From the data, the TBE is a multi-faceted description of the service as it is experienced by the business customer that can be used to assess how services and associated products are being received or to further define a requirement from a service (Section 4.2). The Finance Director of Company 4 said, *"… There was no continuity – something that we ensure exists. I know it is not the same thing but we ensure the project manager undertakes this task. It became clear that the project manager was just a scheduler of resource contributing little else. No matter how many times the requirement has been explained no-one seems to have a grasp of the business, contracts*

admin, what we do or how we do it. Been through the same business requirements with [five people] all of Supplier N - not one of them knows our business. Don't know about Supplier M. But you would expect a working solution. No added value from Supplier N where for example they suggested alternative ways of doing things. Can't stand seeing [the account manager] – no value. I now go direct to [a senior member of Supplier N's management team] as the owner of the resource – can't go any higher without going to the MD." (Interview 0405, paragraph 11). Here the need for service was overwhelming but the IT service provider failed to recognise the need.

There are examples within the data of situations where architectures are developed and product alignment is undertaken but where service alignment is not done. As an example, an IT manager interviewed said, *"We must assume that they [i.e. the business] would pick up the phone more if things were not OK. [We are] Vulnerable because [access to the business is via another department and we] need to spend more time with the business."* (Interview 0104, paragraph 4). There is an acknowledgement here that there is not a good understanding of the <u>BUSINESS NEED</u> or even whether <u>ALIGNMENT</u> exists. The risk is that if it is perceived that the cause of service failure is within the control of the service provider and likely to occur again, they will be more dissatisfied than when this is not the case (Section 2.4); it is in these circumstances that business people may be moved to change their supplier either by outsourcing (as had been the case in Company 2) or when the opportunity arises (as is desired by some in Company 3 and as was the case on two occasions in Company 4).

From this work it must be assumed that <u>ALIGNMENT</u> describes the action required to enable the <u>SERVICE SPECIFICATION</u> and the resultant <u>TBE</u> to be close to the <u>BUSINESS NEED</u> and it is clear now that this applies as much to satisfying the need for service as it does for product. In fact it can be said that without first aligning the need for service there will be no possibility of product alignment. The alignment of services as well as product is referred to here, for clarity, as *total alignment.*

4.7   Summary

The chapter summarises the research process which was executed according to the research design set out in the previous chapter. It describes the process used and the concepts and categories that emerged from the research as well as some preliminary findings with regard to the usage of language reflected by the coding.

The chapter described the application of open coding and memoing, the use of the data in regard to the constant comparison process, the use of theoretical coding and the resulting code system, the use of MAXQDA to manage the data and to provide a practical solution

to axial coding. The analysis of the data enabled the construction of the storyline, and the selection of the TBE as the core category. Selective coding and theoretical sampling enabled saturation to be reached. Many examples from the data were used to illustrate the process and the findings. The categories emerging from the data are BUSINESS NEED, the TOTAL BUSINESS EXPERIENCE (TBE), the SERVICE SPECIFICATION, CHANGE, and ALIGNMENT. The storyline is service based and focused on the business needs and this is set against a theme of ALIGNMENT between BUSINESS NEED, SERVICE SPECIFICATION and the TBE on the one hand and constant CHANGE and response to change on the other. The TBE is central to both themes.

The research output clearly illustrates the differences between business and IT people in terms of the language they each use. The research, however, shows that the TBE and its properties and dimensions comprehensively describe the characteristics of the service being received or given. Big decisions in the data were often based on a reaction to a poor TBE yet there has previously been no industry definition for it.

The coding of the data shows that requirements were expressed in a number of ways, i.e. according to the business need, the services that were perceived to be needed, and the required business experience of using these services. Closeness was a recurring aspiration throughout the data amongst IT managers, suppliers, and business people. From the data, Closeness is an expression or measure of the extent of ALIGNMENT and is achieved when there is ALIGNMENT between the BUSINESS NEEDS, the SERVICE SPECIFICATION, and the TBE.

Change is an over-used term and not all of it can be managed. During the coding, change was considered to be two concepts. The first was external CHANGE over which the business had little or no control. The second was a response by the business and IT people to the CHANGE prompting a need for further ALIGNMENT. Where IT is central to the business (i.e. the business is heavily dependent on IT solutions) most business responses to CHANGE will require ALIGNMENT or re-alignment of IT solutions and services. The lack of Agility by IT service providers in responding to CHANGE in matters involving ALIGNMENT is a recurring theme throughout the data from both business and IT people. From the data, Agility is an expression of responsiveness or time taken to respond to CHANGE.

Whilst from practice and from the literature it is clear that the IT methods are focused on the creation of product, or value realization, and from the literature service can mean many things including a unit of software functionality, the data reveals a need for real service, or value creation, i.e. the deeds of people that involve the co-creation of value

through the analysis or management of problem areas and the dissemination and adoption/exploitation of know-how. From the research it is clear that <u>ALIGNMENT</u> applies to satisfying the need for value realization *and* value creation services.

The <u>TBE</u> can be confirmed as being central to the code co-occurrence model, the code theory model and the storyline and the research achieved good theoretical integration with the <u>TBE</u> as the core category. The assessment and <u>ALIGNMENT</u> of IT using the <u>TBE</u> is central to being able to answer the research question. The <u>TBE</u> is also central to the emerging over-arching theoretical model governing the business and IT relationship.

CHAPTER FIVE

Observing the Business and IT Relationship

5.1   Introduction

This chapter describes and discusses the theoretical model that emerged from the research process described in Chapter 4.

The chapter will show that the model is novel and valuable in its own right but also how further analysis of the data shows how different perspectives can create "blind spots" which become problematic, especially for IT management.

Section 5.2 describes the business and IT relationship model (BITRM). Section 5.3 uses the data to illustrate the manner in which the model is seen to work from a business perspective. Section 5.4 uses the data to illustrate the manner in which the model is seen to work from an IT perspective. Section 5.5 uses the data to illustrate the deterministic nature of the model.

5.2   Theoretical Model Grounded in the Data

The theoretical model is grounded on the research data. It encompasses all of the concepts created during the coding process described in Tables 4.1a and 4.1b, the code relations in Table 4.2 and relevant code theory models which were further used to understand the nature of the relationship in Chapter 4. Table 5.1 contains the same data as Table 4.2 but for easier comparison in the following sections of this chapter each cell is expressed as a percentage of the total.

The BITRM, by virtue of the process used to derive it, is grounded on 'real world' data that has exposed how IT and business people talk and behave differently. It will be shown in this section to exhibit the following characteristics:

- heuristic, i.e. it is capable of fully describing the relationship between business and IT as is apparent in the data and defined in the code system (Appendix D)
- deterministic, i.e. it is seen in the data to be capable of indicating that a <u>CHANGE</u> may have occurred and determining which parts of the business are affected

- control, i.e. it is capable of influencing or changing an outcome through time.

Table 5.1: Code relations for all documents expressed as a percentage of the total

	Change	Alignment	Business Need	Service Specification	Total Business Experience	TOTAL
Change	0.00%	0.59%	0.67%	0.17%	0.54%	1.96%
Alignment	0.59%	1.84%	1.76%	0.71%	0.81%	13.00%
Business Need	0.67%	1.76%	1.00%	0.71%	7.69%	11.83%
Service Specification	0.17%	0.71%	0.71%	1.25%	4.35%	7.19%
Total Business Experience	0.54%	8.11%	7.69%	4.35%	45.32%	66.01%
TOTAL	1.96%	13.00%	11.83%	7.19%	66.01%	100.00%

The BITRM illustrated in Figure 5.1 shows the relationships between the SERVICE SPECIFICATION and the BUSINESS NEED with the TBE at the centre as discussed in Section 4.4. The BUSINESS NEED is an expression of what the business is, its context or circumstances, what it is trying to achieve, what it needs in order to achieve these things (the NEEDS GAP), and its expectations in terms of outcome. The SERVICE SPECIFICATION is an expression of what levels of service are provided, and how these are targeted, managed and measured. The TBE is a detailed expression of the business experience resulting from the services.

During service delivery the flow is from right to left, i.e. a service is delivered to the business and it is the experience (of receiving that service) that is formally or informally assessed by the business by comparing the TBE with its needs. When a new BUSINESS NEED arises the flow will be from left to right, i.e. the ALIGNMENT and GOVERNANCE processes determine whether and how the SERVICE SPECIFICATION might be adapted to meet the new needs. The closer the services are to the needs of the business the closer the IT services organization can consider itself to be to the business. This is measured using the many properties and dimensions that have been defined (Tables 4.1a and 4.1b). This process of assessment uses the theme of Closeness. Closeness is achieved when there is ALIGNMENT between the BUSINESS NEEDS, the SERVICE SPECIFICATION, and the (TBE). Closeness provides a measure of the extent of ALIGNMENT (Section 4.4).
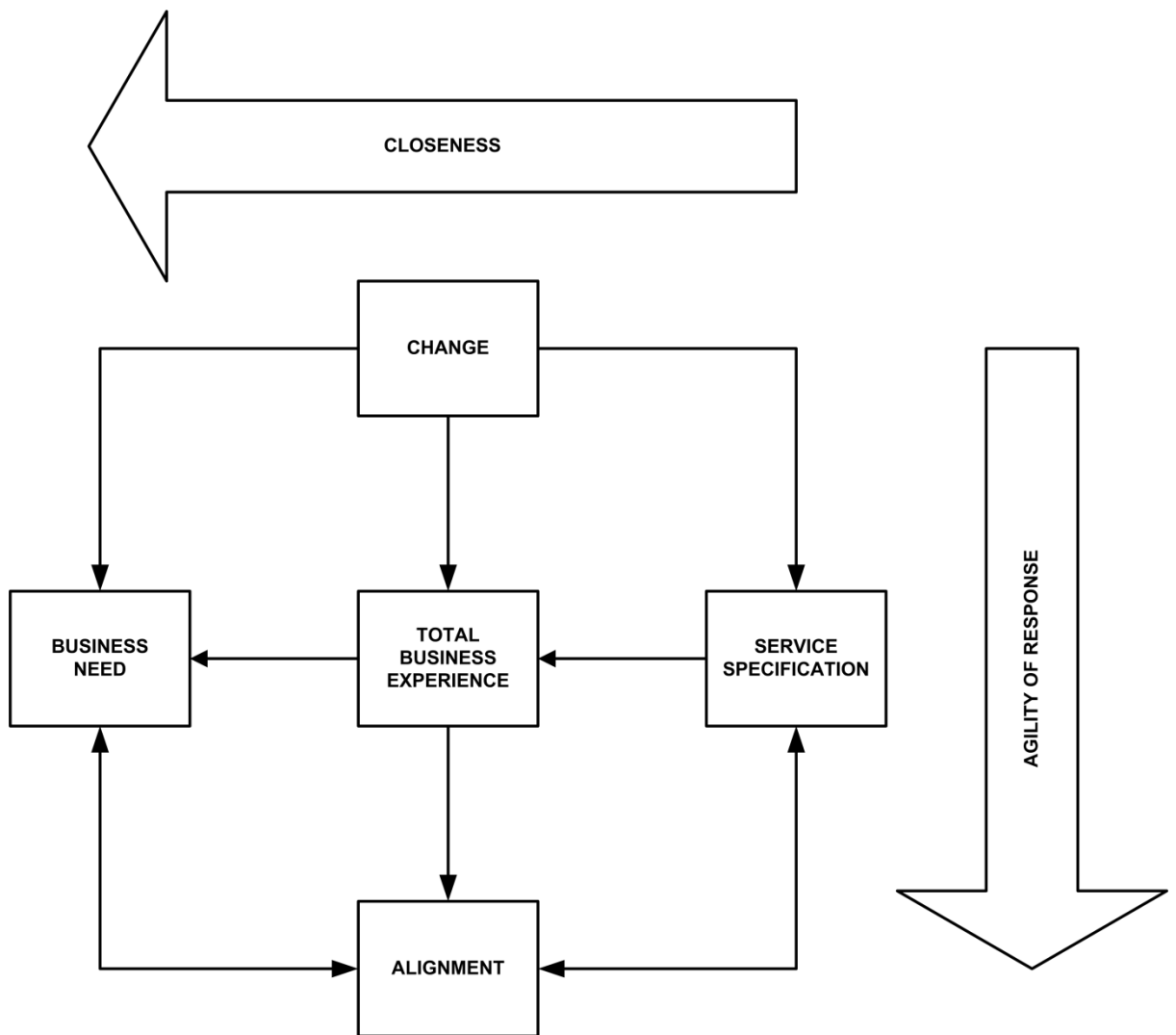
Figure 5.1: The business and IT relationship model

From top to bottom it shows the relationship between external <u>CHANGE</u> and <u>ALIGNMENT</u> as discussed in Sections 4.4 and 4.5. From the data <u>CHANGE</u> can influence:

- <u>BUSINESS NEED</u>, e.g. arising from a <u>CHANGE</u> in market conditions
- <u>SERVICE SPECIFICATION</u>, e.g. a new technology that can create new business opportunity
- <u>TOTAL BUSINESS EXPERIENCE</u>, e.g. stakeholders see <u>CHANGE</u> taking place externally and no timely corporate response such that the user experience is diminished in some way.

Responses to change in the form of investment proposals from the business and/or IT service provider are handled by the <u>ALIGNMENT</u> and GOVERNANCE processes.

Approval in turn demands commitment from both organizations, e.g. for funding or implementation obligations. The sooner ALIGNMENT takes place after a CHANGE the more responsive or agile the IT service provider is seen to be. Both business and IT people in the data understand the desirability of Closeness and Agility of response.

This understanding of the BITRM was based upon the code relations contained within all documents and code theory models for all documents. From the previous chapter it is known that the coding variations are greater between business and IT people than for any other variable so, given the objectives of the research (Section 1.6), it was necessary to establish what could be learnt by observing the business and IT relationship from these different perspectives. This is shown in Sections 5.3 and 5.4, below. Also, in the data, CHANGE has been identified as having occurred by observing behaviour that has resulted from a poor business experience. This is discussed in Section 5.5.

5.3   Model from a Business Perspective

This is an analysis of how the data relating to business people relates to the overall logic of the BITRM. Table 5.2 shows the code relations for the interviews with business people. Each cell has been expressed as a percentage of the total so this can be compared with Table 5.1 (all documents). More detail can be found in Table C.2 (Appendix C).

Table 5.2: Code relations for business documents as a percentage of the total

	Change	Alignment	Business Need	Service Specification	Total Business Experience	TOTAL
Change	0.00%	0.83%	1.19%	0.12%	0.71%	2.85%
Alignment	0.83%	0.48%	2.14%	0.83%	7.13%	11.40%
Business Need	1.19%	2.14%	2.38%	0.59%	15.32%	21.62%
Service Specification	0.12%	0.83%	0.59%	1.19%	3.44%	6.18%
Total Business Experience	0.71%	7.13%	15.32%	3.44%	31.35%	57.96%
TOTAL	2.85%	11.40%	21.62%	6.18%	57.96%	100.00%

Figure 5.2 is the BITRM which has been modified to show weakened relationships (dotted lines) where the percentages in the cells of Table 5.2 are at least 20% less than those in the corresponding cell in Table 5.1. In this case it is the relationships between CHANGE and SERVICE SPECIFICATION and between the SERVICE SPECIFICATION and the

<u>TBE</u>. As if to compensate for this "blind spot" the business people appear to rely upon their experiences of the service to tell them how well the service provider is performing.
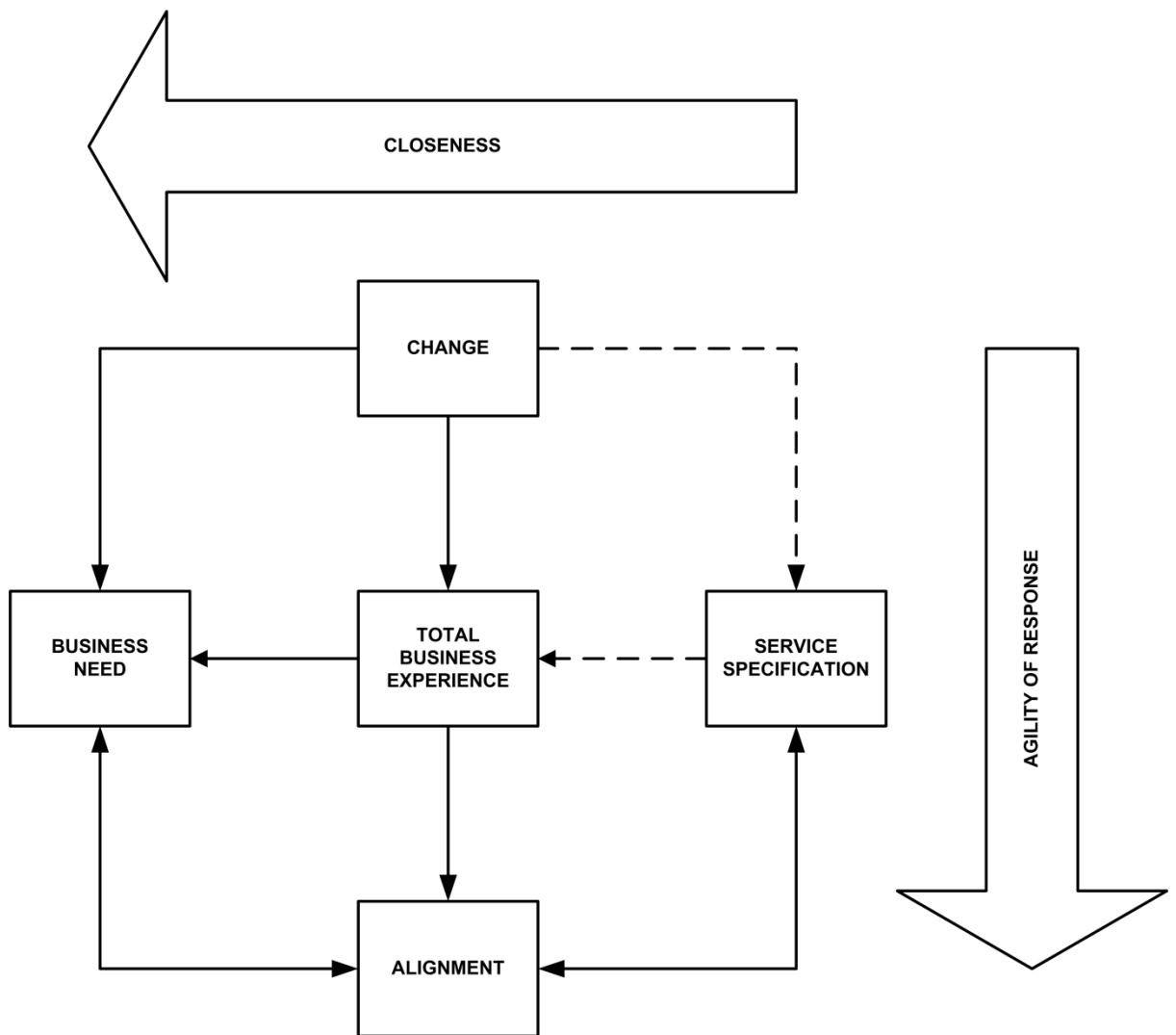
Figure 5.2: Business perspective of the BITRM

Figure 5.3 is a code theory model which visualizes the relationships defined by the codes recorded for the memos created during the analysis of the interviews with business people. This example summarises the conditions, actions and interactions as recorded in a subset of memos concerned with the dynamics associated with <u>CHANGE</u> and <u>ALIGNMENT</u>.

This subset was chosen as an illustration because it is easier to comprehend than some of the other models that have more content. Each relationship is represented by a connecting black line on the diagram between the relevant category and the memo. By examining the memos and the text segments to which they refer, and by repeating this for
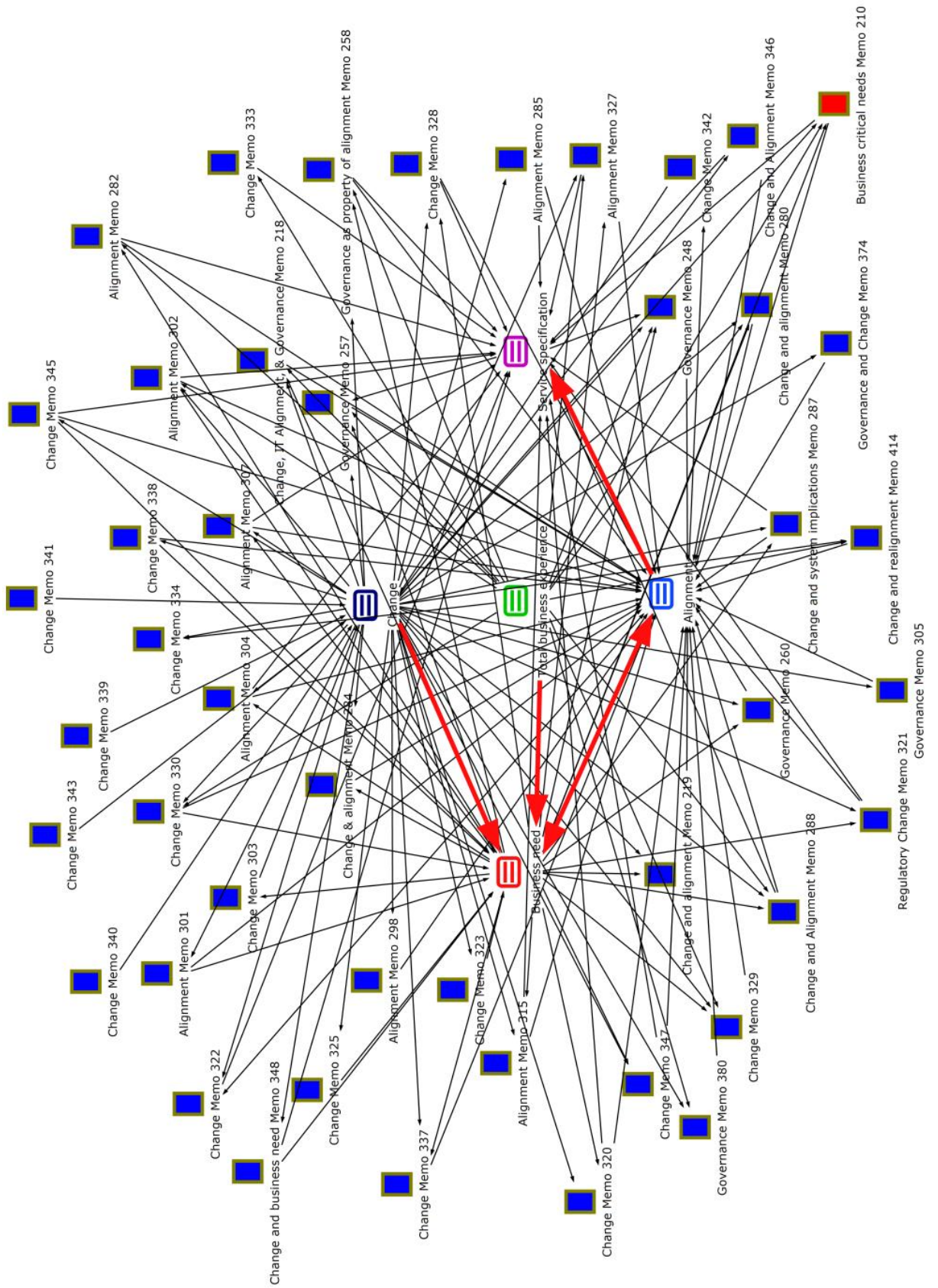
Figure 5.3: Contextual relationships taking a business perspective

all code theory models for the data relating to business people, the nature of the relationship from the business perspective can be determined.

Superimposed on Figure 5.3 and represented by red arrows is a summary of the major interactions between the categories for the data relating to business people. The weaknesses are consistent with those shown in Figure 5.2. These interactions are explained with examples below. When the business experience fails to meet the BUSINESS NEED and this goes on for a long time the business will take the initiative for ALIGNMENT. The most powerful example from the data is where a senior board member in Company 1 said to the IT function, *"We recognised the need to focus on the internal stuff but time is running out. Do it or we will find someone else to do it."* (Company 1 pre-assignment file notes).

This comment followed a period where IT was engaged on essential internal investment projects which meant that the needs of the business had to take second place. This was no hollow threat. The company concerned was more than capable of outsourcing its IT within a very short period of time. The business had decided that the experience had not met its BUSINESS NEED for some time and if things didn't improve it was prepared to exercise its GOVERNANCE rights to force some re-ALIGNMENT. Indeed the threat is the ultimate one of not just modifying the SERVICE SPECIFICATION but of changing the supplier. The problem and intent captured by this statement was enough to prompt IT to critically review how they were managing their services which resulted in over 100 prioritized recommendations.

A business Director in Company 2 said, "*IT must adequately equip Company 2 to work with customers, partners, and suppliers as a virtual team. This should be first made to work at the primary site and then the same model can be deployed elsewhere. The culture of the group is such that if IT does not listen or fails to respond to demand, then others will do their own thing.*" (Interview 0209, paragraph 2). In the next paragraph the same manager says, "*The tools provided by IT are very useful but going forward there needs to be more co-operation with the business.*" (Interview 0209, paragraph 3). The business manager has experienced poor service and is warning the IT service provider that it must from now on align itself with what the business requires. He is making it clear that if the IT service fails to meet the needs of his division others will take responsibility for any necessary (re-) alignment. The coding identifies the many problems with the business experience.

Company 3 is the result of a CHANGE introduced by the former parent company. A senior manager within that parent company said, "*The reorganization took place in 2005 to*

speed up the improvements to the business. The board wanted to see a shift from revenue creation to productivity improvement and a change of culture. Being risk averse it was seen to be maintaining the status quo." (Interview 0301, paragraph 4). "*The former organization was not incentivised to change. The means of bringing about change was to sell the business.*" (Interview 0301, paragraph 5).

In these above examples the <u>TBE</u> is such that the business wanted to change the relationship. The first example was a threat to outsource IT, the second was business changing the relationship with IT, and the third was where the Group HQ was changing the relationship with the business. In each case the intention was to force <u>ALIGNMENT</u> showing that the model has a broader relevance to other service related contexts. Those were drastic proposals arising from frustrations associated with a poor service experience. More routinely, business managers will describe the external <u>CHANGE</u> they see taking place and the gaps in systems support that are emerging as a result.

Group was introducing a partnering strategy (the <u>CHANGE</u>) which is going to impact the whole business, including Company 2. This was described first by a procurement manager as follows, "*Partnering will change the procurement emphasis for Company 2, much of the procurement being undertaken by partners in the future. Company 2 will focus on supplies for their core operation. The change of emphasis will lead to a reduction in the size of the procurement team and a need for new control mechanisms. There are opportunities for procurement process improvement and cost reductions at both corporate and project levels. This will be achieved by specifying standard items on new projects and replacing installed items during plant maintenance; this will reduce suppliers, stock holding and reduce unit price. E-Business is only a 'gleam in the eye' of Corporate at the moment; it will soon have a major impact on supplier relationships and the procurement process.*" (Interview 0224, paragraph 3). The partnering strategy was to have an impact across the whole business. There was no attempt here by the procurement manager to draw conclusions about the implications for IT. It was simply a statement of the business context, the <u>CHANGE</u> taking place and what adjustments in business terms would have to be made though he ends with a strategic view of e-business and acknowledges the impact that this re-alignment would have on the business processes. To get from this gap analysis from the manager to a statement of requirement would require services aimed at business engineering and business process re-engineering but there was no request for these at that stage.

The Head of Strategy for Company 3 expressed the concerns that, "*An information architecture doesn't exist and there is no [IT] governance. We have 200 people collecting data around the business but no structure for it. We need to do this better. Responsibility*

needs to be defined at the executive level." (Interview 0309, paragraph 18). This senior manager was concerned with developing a long term strategy, five year plan, and making change happen but he recognised that information and IT was disconnected from this process. He must influence behaviour, what information is collected, how it is structured, and how it is reported yet there is no governance structure to enable him to make this change. This manager was not concerned with operational tasks but was asking for help in the form of services to improve information availability and to improve the business governance of IT.

A materials technical manager in Company 2 said, "*Market demands mobility. It is essential to support staff working away from the office. The use of mobile computing is growing. Partnering means adopting a more collaborative style of working […].*" (Interview 0221, paragraph 4). The manager quoted one project as an example which was being delivered by a consortium of 5 or 6 companies. This is an example of CHANGE in the market and to technology combining to create a need for a particular style of remote/mobile working.

The examples are representative of the data as a whole. Although the BITRM is a logically correct frame of reference for the data as a whole, the analysis of the interviews with business people shows an incomplete set of relationships with the business and IT management often in a state of conflict. From a business perspective there are weaknesses in the appreciation of CHANGE brought about by new technologies and the detail of links between the SERVICE SPECIFICATION and what is experienced.

From the analysis of the interviews with business people it is clear that:

- The decisions the businesses took with regard to IT were often based upon their experiences of the IT services being received but there was no formal or reliable way for this to be measured that currently meets their needs.
- CHANGEs give rise to NEEDS GAPs that made re-ALIGNMENT necessary.
- Whilst IT ALIGNMENT and GOVERNANCE were critical to the success of these businesses the methods used were failing them.

5.4   Model from an IT Perspective

This is an analysis of how the data relating to IT people in particular relates to the overall logic of the BITRM. Table 5.3 shows the code relations for the interviews with IT people. Each cell has been expressed as a percentage of the total so this can be compared with Table 5.1 where all documents were considered. Further detail behind this can be found in Table C.3 (Appendix C).

Figure 5.4 is BITRM which has been modified to show weakened relationships (dotted lines) where the percentages in the cells of Table 5.3 are at least 20% less than those in the corresponding cell in Table 5.1. In this case it is all relationships except for those between CHANGE and SERVICE SPECIFICATION, between the SERVICE SPECIFICATION and the TBE, and between the TBE and ALIGNMENT and GOVERNANCE. This suggests that in the data the IT people are responding to external stimuli and relying on their own experiences of the service to suggest investment opportunities to the business.

Table 5.3: Code relations for IT documents expressed as a percentage of the total

	Change	Alignment	Business Need	Service Specification	Total Business Experience	TOTAL
Change	0.00%	0.32%	0.24%	0.24%	0.40%	1.20%
Alignment	0.32%	2.72%	1.04%	0.56%	8.87%	13.50%
Business Need	0.24%	1.04%	0.16%	0.72%	2.40%	4.55%
Service Specification	0.24%	0.56%	0.72%	1.60%	4.47%	7.59%
Total Business Experience	0.40%	8.87%	2.40%	4.47%	57.03%	73.16%
TOTAL	1.20%	13.50%	4.55%	7.59%	73.16%	100.00%

Figure 5.5 is a code theory model which visualizes the relationships defined by the codes recorded for the memos created during the analysis of the interviews with IT people. These summarise the conditions, actions and interactions recorded in a subset of memos concerned with the dynamics associated with CHANGE and ALIGNMENT.

This subset was chosen as an illustration because it is easier to comprehend than some of the other models that have more content. Each relationship is represented by a connecting black line on the diagram between the relevant category and the memo.

By examining the memos and the text segments to which they refer, and by repeating this for all code theory models for the data relating to IT people, the relationship from an IT perspective can be better understood. The red arrows in Figure 5.5 summarise the major interactions between the categories. This analysis shows a stronger relationship between the SERVICE SPECIFICATION and ALIGNMENT/GOVERNANCE than does the analysis of code relations in Figure 5.4 which is based on Table 5.3 and a weaker relationship

between the <u>SERVICE SPECIFICATION</u> and the <u>TBE</u>; otherwise the weaknesses are consistent with those in Figure 5.4. Some of these interactions are explained with examples below.

A senior IT operations manager said, "*The only measure is lack of complaints; when this gets to zero [I] will be doing [my] job. Would like some objectives and accountabilities, and some MI so that I know I am delivering otherwise who determines whether I am doing an OK job or not?*" (Interview 0101, paragraph 6).
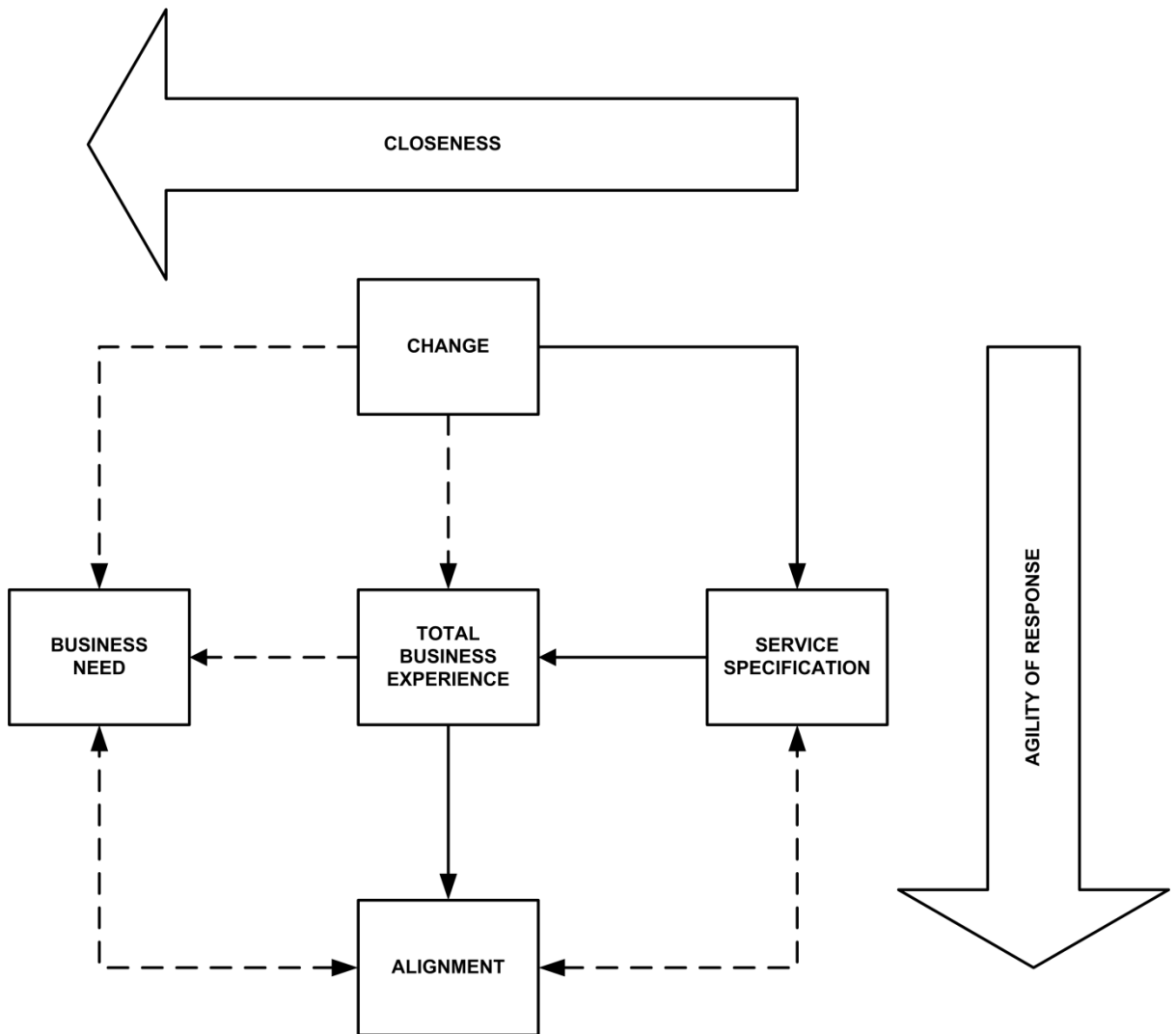
Figure 5.4: IT perspective of the BITRM

A senior applications IT manager in Company 1 said, "*The technology is highly regarded (the best on the street) but Systems is seen to be isolated and so could do better. Systems needs to do more to meet the needs of the business, the back office and admin staff, and users. Systems must demonstrate how the technology can be leveraged by the business.*" (Interview 0118, paragraph 5). An example of how deploying the best
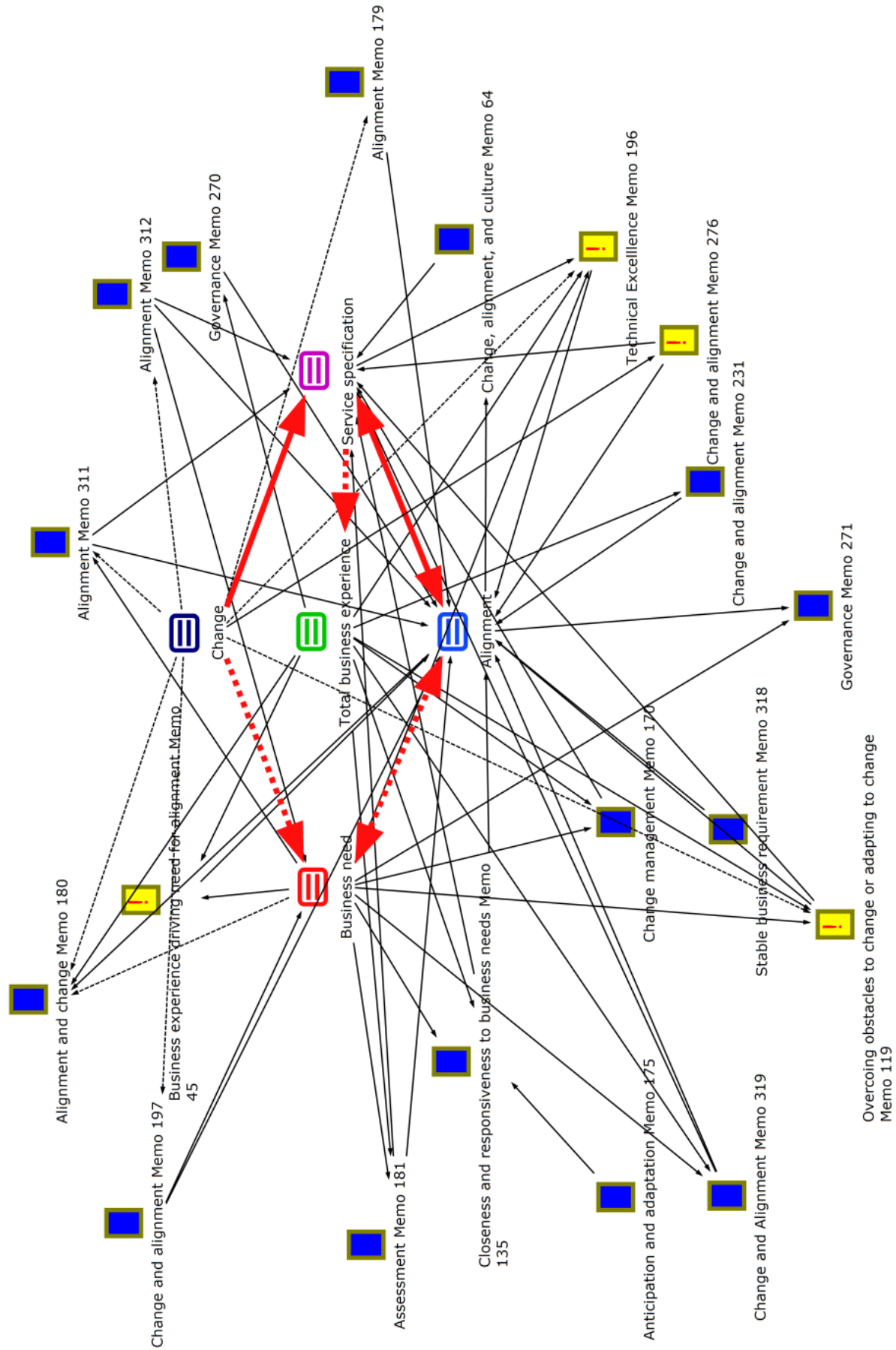
Figure 5.5: Contextual relationships taking an IT perspective

technology does not necessarily lead to delivering the best service. This relative newcomer is aware that the IT people in this organization are too remote from the business to know what is needed.

A senior quality manager with ten years' service in Company 1 said, *"End users consider themselves to be the best and expect the best. Don't know what they think of us but it may not be good."* (Interview 0106, paragraph 4). He knew that there were no suitable quality or performance measures in place and thus he had no understanding of how the IT function was perceived by the business other than through informal feedback or occasional survey.

The senior quality manager goes on to say*, "There is an architecture but no strategy. […] There are some flaws in the system that constrains the deployment of software. There have been a few poor decisions in the past from Infrastructure and Software Engineering."* (Interview 0106, paragraph 14). Perhaps because of its lack of any business focus this IT organization is not great technically either.

Another senior IT manager in Company 1 said, *"[We are] Project delivery-focused rather than business analysis, business change, and benefit delivery [focused]"* (Interview 132, paragraph 7). This is rather like the observation in Section 1.3 which makes the point that IT processes are product and production oriented rather than service oriented. When the manager in Company 1 mentioned in Section 4.5 said, *"[We have] No good handle on business change management."* (Interview 0107, paragraph 20) perhaps there was a suggestion that the IT service provider had not previously considered this to be its role or considered offering this as a service. This is an area to be explored if IT wishes to improve the business experience and the likelihood of a successful business outcome but it will need to develop its skills and awareness and services beyond software engineering and infrastructure support. Logically the driver for business change precedes the IT response: if the former was considered to be (business) <u>CHANGE</u> and the latter to be considered to be (re) <u>ALIGNMENT</u> IT would be able to define its services to meet each need and have a legitimate role to play in both. A long serving IT manager in Company 1 said, *"Needs [are] captured through a specification. Problem is business needs are constantly changing, Systems tries to anticipate the changes but is too remote to pick them up and does not spend enough time prototyping solutions."* (Interview 0135, paragraph 11). The business is constantly changing and by implication the methods used by IT mean that it is not able to respond or adapt to <u>CHANGE</u> quickly enough.

This need for a requirements specification as preferred by the current delivery model is also seen in Company 3 where the IT Director was awaiting a clear statement of the requirement from the business rather than providing any additional capability that would help the business to be reengineered more easily. He did not believe that IT was the enabler to achieve the required savings and business agility but instead saw his problem as one of managing an applications portfolio, long timescales, big investment cases and a process linked to shared systems (Interview 0323, paragraph 49). This is an example of where the enabling technology could have changed the nature of the services to better align with what the business needed. Instead because the IT Director had failed so far to get investment plans approved by Group he saw this as a failure of the IT GOVERNANCE mechanisms (Interview 0323, paragraphs 28–37).

Another IT manager in Company 1 stated, "*Major concern that systems need to be realigned with the needs of the business and this is dependent upon the success of business [account management and business analysis]. Need a prioritisation framework. Resource management is weak across the organization. Internal communications need to be improved. Need to build a more stable set of assumptions about the business to avoid having to react to short-term needs whilst recognising that the business is driven by market opportunities.*" (Interview 0112, paragraphs 3and 4). This starts by acknowledging the need for better ALIGNMENT with the business but then the participant identifies business account management and business analysis as the critical element to achieve this ALIGNMENT. This is resistance to a new role but there is also an acknowledgement that CHANGE is external to IT and it is the IT function's job to realign the systems as a response to the new BUSINESS NEEDs that are arising.

The IT service providers in the data had to compensate for the lack of a relationship with the business which sometimes made decisions difficult to take. What was a failure of the delivery model was often seen as a failure of IT management. Evidence of the failure of IT management can be found in the data. A senior IT manager in Company 1 said, "*Decision-making is through delegation bound together with strong leadership but it doesn't always happen. Organization lacks accepted process, process exists but it is not used.*" (Interview 0103, paragraph 16). An application development manager in Company 1 said, "*[We] must empower senior managers in order to scale the operation.*" (Interview 0107, paragraph 25). Another IT manager in Company 1 said, "*Structure leads to management by committee. Mentoring and teamwork ethics get in the way of leadership and decision making. Decisions take too long, in isolation of good customer input, and are sometimes wrong. Management has had to develop techniques like 'hint and hide' to leak rumours of intent in order to assess reaction.*" (Interview 0125, paragraph 14). Another IT

manager in Company 1 said, *"Major concern is a lack of visible leadership. No apparent concern or drive for improvement."* (Interview 0124, paragraph 3). An IT manager in Company 1 said, *"Major concern is that we are very reactive and so unable to put strategic solutions in place. Do not have the right balance between leadership, delegation, and consensus. Need to shift focus to business delivery."* (Interview 0129, paragraph 3). Poor management can lead to a poor business experience: a manager at Group HQ says of Company 3, *"[IT is] 'the elephant in the room'. Everyone knows what is wrong with IT in the business but no-one talks about it."* (Interview 0325, paragraph 39). Thus a poor business experience is synonymous with poor management. "The Technical Director in Company 2 said, *"There is a real business need for the inspirational leadership of both process change and IT change."* (Interview 0206, paragraph 2). This manager was aware that there was both a business and an IT management problem that had to be addressed.

The management of IT is not necessarily improved by outsourcing it. A management consultant working for Company 3 at the time of its acquisition was recorded as having, *"Questioned the calibre of the management of the outsourced service provider management".* (Summary of 30 findings). A business director of Company 3 was concerned to hear that the contract for outsourced IT services would not be put out to competition for a year and he asked if anyone had given the outsourced services supplier an incentive to improve. He asked, *"What is the cost of tying the business to the current incumbent of that contract? Who will compensate the business?"* (Interview 0313, paragraphs 11 and 12). Yet another business director in Company 3 said, *"[I have] issues with […] the outsourced service providers: they are expensive, scope of work is limited and they charge for anything extra, they don't have the tools to support [our ERP]."* (Interview 0316, paragraph 42)

The examples are representative of the data as a whole. Although the BITRM is a logically correct frame of reference for the data as a whole, the analysis of the interviews with IT people shows an incomplete set of relationships with the business which often reflects badly on IT management.

From the analysis of the interviews with the IT people it is clear from the data that:

- IT people were aware of technological CHANGE that was taking place and the services that they provided
- IT organizations mostly responded to a requirements specification sometimes with little awareness of the BUSINESS NEED or what the business thought about the services they provided

- IT service providers typically followed processes and any measurements that existed were confined to product and production measures of performance
- IT decision making was difficult leading to a perception that IT management was weak
- The IT people interviewed often relied on the GOVERNANCE processes within their organizations for their proposals to be approved and prioritised but the processes were not satisfactory
- The IT service providers' limited view of the needs of the business and their limited awareness of the market suggests that an IT service can only be assessed from a business perspective and certainly not solely from an IT one.

5.5 Model's Deterministic and Controlling Characteristics

This analysis shows how the BITRM can indicate that <u>CHANGE</u> may have occurred and where in the business this is having an impact so helping to establish whether <u>ALIGNMENT</u> may be needed.

Figure 5.6 is a code theory model which visualizes the relationships defined by the codes recorded for the memos which describe where these phenomena have occurred. As in other code theory models it summarises the conditions, actions and interactions, and consequences recorded in this subset of memos. From the data it can be seen that their significance greatly outweighs their number. Each relationship is represented by a connecting black line on the diagram between the relevant category and the memo. Superimposed on Figure 5.6 and represented by red arrows is a summary of the major interactions between the categories for the data relating to these memos.

In Company 2 the Finance and Personnel Director reeled off a list of dislikes with the current systems and then mentioned that "*People are resorting to communicating via [their own devices] which are generally of a higher and standard specification. IT departments are in a similar position to the NHS, more demanding users and step functions in technology. [I] would like to see a plan that everyone can sign up to and which sets out the costs and benefits to enable Company 2 to move forward and to enable IT to rebuild confidence.*" (Interview 0205, paragraph 8). The technical infrastructure is so problematic that people were resorting to use their own devices rather than the corporate facilities. It shows how business people can bring about re-<u>ALIGNMENT</u> when corporate processes or investment fails. The general dissatisfaction with IT here was linked to bad experiences with the IT infrastructure within the company and advancements in technology externally. The current manifestation of this phenomenon is Bring Your Own Device (BYOD).
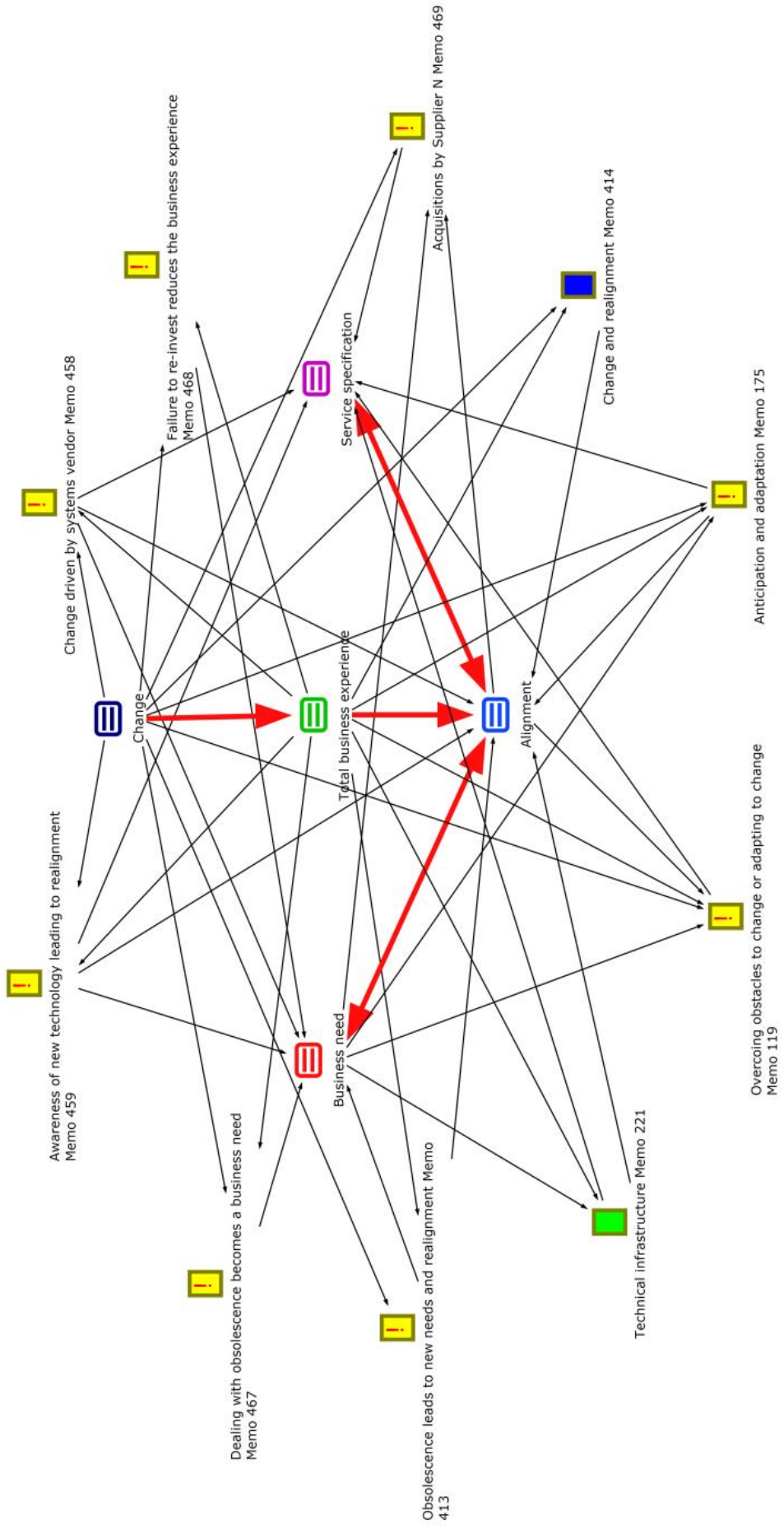
Figure 5.6: Contextual relationships showing predictive characteristics

Another senior business manager in Company 2 similarly noted that "*front-end activities demand client communications, using both e-mail and promotional material. Marketing material produced on CDROM (sourced externally) does not seem to work and […] not available to sales and technical staff. With the delays associated with the [operating system] rollout and delays created by the investment process, staff have resorted to using higher spec [personal equipment]*" (Interview 0217, paragraph 4).

Another example where the corporate experience was worse than what was available elsewhere and business people were taking action which is prompting a call for a re-alignment with current industry standards. This was not a case of internal systems deteriorating but of new technology creating new demands. In Company 4 it was a dissatisfaction with the experiences with current suppliers and their products and services that triggered a change first to Supplier M and then to Supplier N. (Interview 401, paragraph 5) (Interview 404, paragraphs 2 and 3). A demonstration of the features of Vendor J's product made the system currently in use look to be out of date technically. The business experience of existing systems and infrastructure is reduced when solutions that are more modern and feature-rich are demonstrated. This prompted new business needs and a procurement process which brought Supplier M to the company. This example also exposed product and production thinking from a business rather what might have been expected which was a more analytical approach to explore the best way forward.

Supplier M wasn't meeting the business needs so after two years Supplier M was replaced by Supplier N. Supplier N also failed to provide an adequate business experience whilst the vendor representative in the UK was clearly more interested in licenses (Interview 0406, paragraphs 10, 31, 32, 37). The Finance Director had observed that *"the vendor representative was only responsible for the high volume business through a few key suppliers in the UK. He wants to see UK licenses sold through UK distributors."* There was a great deal of feedback given to Vendor J about the service capability of its suppliers in the UK and shortly afterwards Supplier N announced an acquisition of two companies that would bring about a restructuring of the UK supply industry enabling it to extend its range of services to customers, including Company 4, wishing to install the Vendor J product set (Interview 0408, paragraph 1).

A senior IT manager in Company 1 said, "*Business people are increasingly involved in business opportunities involving high technology companies and business opportunities may actually move to the web. Systems must anticipate the needs of the business (or be much closer to them!).*" (Interview 0126, paragraph 4). The manager here is speculating about future business opportunity in Company 1 but the observation that 'systems must

anticipate the needs of the business (or be much closer to them)' could be applied to IT management generally.

The examples above demonstrate that the BITRM is a logically correct frame of reference for this subset of the data. What was also seen from the data was that the business experience is often, even without any formal definition or awareness of its existence, the first indicator used by business people when they become aware of CHANGE having taken place – especially when this gives rise to new BUSINESS NEEDs.

Thus the TBE could be used to determine that CHANGE may have occurred. From the analysis examples can be found where:

- An unsatisfactory TBE identified a lack of ALIGNMENT and a NEEDS GAP;
- Identifying a NEEDS GAP also identified where in the business the NEEDS GAP was to be found and the nature of the external CHANGE;
- Where the IT service provider failed to respond to a CHANGE the business found ways to do so but in the first instances these were outside of the normal GOVERNANCE processes;
- The earlier detection of CHANGE would have led to the earlier and more appropriate re-ALIGNMENT of IT and the problems experienced would have been avoided thus providing an opportunity for a degree of control.

5.6   A Further Case Illustrating the Characteristics of the Theoretical Model

The BITRM was used in practice to intervene to correct a complex and expensive implementation overrun where it demonstrated all three of its characteristics: heuristic, deterministic, and control. This was not intended as an *evaluation* of the BITRM but an opportunity to reflect upon it in an empirical manner in a client problem area.

Company 4 was looking to get benefits from the further integration of its systems. In the course of advising them it was discovered that the business had been trying to implement a world class CRM system for almost three years with little success. It had changed from Supplier M (its first supplier which is a major UK reseller and integrator) after two years because of a lack of progress and a poor business experience. During the handover to the second supplier, Supplier N (another well-known UK reseller and integrator of the same product), the source code that had been developed by that first supplier to address the customisation requirements of the business was 'lost'. During the year that followed Supplier N had not been any more successful. Again the business experience was so bad that the supplier was about to be changed again for a third supplier and alternative

product solutions were being considered. There had been a detailed specification at the start and the required functionality had not changed since the outset.

The Sales Director explained the relationship with the supplier, "*The relationship between Supplier N and myself and Company 4 makes me very cross. I have to fight to get delivery and visit dates from them. Testing takes a lot of my time. It appears as though the software has not been tested by Supplier N before it is delivered. When I identify errors in the way in which the system works – even though the specification is shown to be correct and has clearly been ignored – they raise a charge for correcting their errors.*" (Interview 0404, paragraph 4). He goes on to talk about the broader aspects of the problem including weak account management, their lack of understanding of the requirements, their lack of both internal and stakeholder communications skills, and their poor project management capabilities. Internal correspondence (Supplier N) also suggested that there was a cultural problem where one party needed to create a false impression that progress was being made and meetings were taking place when this wasn't the case. Company 4 was asking for financial compensation from Supplier N. The Finance Director adds, "*The proposals we received from them did not set out the business problem but the resource requirement and didn't address the business requirement at all. And the skills didn't seem to include business analysis or design but just hit the coding. The method of working is completely geared around their requirements and not ours as the client. It's like, 'Well what do you want?', 'here is the estimate', 'we will have somebody available in a couple of weeks', then we find it doesn't work, and the process gets repeated: 'Well what do you want?' etc.*" (Interview 0406, paragraph 65). This is a PDCA cycle as in the Deming cycle (Section 1.3). The business experience was summed up by the Finance Director when he said to the country product manager for Vendor J, "*But you really need to understand from a customer's perspective how as end users, as such, we are being treated. That to us is very important because we are also a software house so you understand how we feel. We are also a software house and we are also a customer focused and customer driven industry and we would not treat our customers the way that we are being treated. We just feel so aggrieved that we are just literally on the verge of pulling the plug with Vendor J*" (Interview 0406, paragraph 61). There was a clear mismatch between needs, services provided, and the business experience. Moreover, as directors of a software and services business the directors of Company 4 understand how to go about delivering customer service in this industry but is not seeing these companies offer anything like a suitable service to them.

Even though the functionality required had not changed since providing a specification to Supplier M there was external CHANGE taking place that was increasing the urgency. A

combination of recessionary and competitive pressures were increasing the need to save money and introduce greater efficiencies into the business and an imminent product launch meant that staff time would be at a premium if the problems with implementation could not be addressed quickly. Working with the client and the second supplier (Supplier N) and, utilising the output from the research, within six weeks (the duration of the engagement) it was possible to recover the project to the point where a target date for implementation could be set. The system is now implemented and the further integration of the systems is being planned.

Four things were surprising about this assignment:

- Nothing of value had been delivered by two major suppliers (resellers and systems integrators) over a period of three years
- Both suppliers appeared to be using industry best practice to determine the IT requirement and accredited software engineers to deliver the solution
- The client was also an IT software products vendor and so not unaccustomed to this work
- During the six week period of the remedial activity everything was rewritten by Supplier N and it became clear that a reasonable estimate for the maximum time that the implementation project should have taken from beginning to end was close to four months
- The global and country vendor product managers for Vendor J empathized with the client's problem, thanked the independent consultancy for its help in recovering the situation for them, but requested that their company name and those of their suppliers were not mentioned in the research.

The vendor and the suppliers of its products may have many thousands of satisfied customers worldwide but sadly situations of this kind are not unusual.

There was a further unexpected outcome to the story. A few weeks after the assignment Supplier N announced an acquisition of two companies that would enable it to extend its range of services to customers wishing to install the Vendor J product set. The press release stated that the group wanted to launch its expansion programme with acquisitions on the software side as the software business has been in the shadows. The aim was to put it in a position where it can develop as a separate business in its own right. Supplier N said that the Vendor J business was long overdue for consolidation in the UK, and had been largely left behind due to an inefficient channel structure. (Document 0408, paragraphs 4, 5, and 6). This was the response by Supplier N (possibly prompted by Vendor J in the UK) to the intervention by Company 4 which would have signaled an

external <u>CHANGE</u> requiring (re) <u>ALIGNMENT</u> of the supply side business. I argue that this is seen as evidence of the model at work influencing the UK industry structure and encouraged by Vendor J in its governance role for the channel.

Though not an evaluation of the BITRM it was an opportunity to reflect upon it in an empirical research facility that was situated in a specific client problem area where the ideas that had validity in the research context were used and where real business improvement was required and delivered. The research provided a rich source of service descriptors for describing the relationship between the client business and Supplier N and for motivating Supplier N to change by improving the alignment and governance processes for Company 4. In this way there was a greater choice of possible responses for Company 4 which could be achieved quickly. Supplier N became aware of its own weaknesses and Vendor J was made aware of the channel weaknesses. As well as achieving an immediate short term solution for Company 4 a long term solution was achieved by the Vendor sorting out the channel problem. The concepts were understood by all parties involved. The significance of the <u>TBE</u> as a means of assessing and improving services was clearly observed and active management is probably more important than the Deming cycle to business in the long term but there is more to find out about how to use it.

5.7   Summary

This chapter described the business and IT relationship model (BITRM) that emerged from the research process. The model in combination with the code system arising from the research provides a detailed understanding of the relationship between business and IT. The BITRM has heuristic, deterministic, and control characteristics. The two themes are Closeness, providing an expression and potentially the basis for a measure of <u>ALIGNMENT</u>, and Agility of response, providing an expression of Agility or time to respond to <u>CHANGE</u>. Although a logically correct frame of reference for the relationship the manner in which the model was seen to work from business and IT perspectives differed.

From a business perspective, the decisions the business people took with regard to IT were often based upon their <u>TOTAL BUSINESS EXPERIENCE</u> (<u>TBE</u>) and yet prior to this research this has lacked any kind of formal definition. It was also clear from these examples that <u>CHANGE</u> often gave rise to a NEEDS GAP that made re-<u>ALIGNMENT</u> necessary. Whilst IT <u>ALIGNMENT</u> and GOVERNANCE were critical to these businesses being able to achieve their aims or to be able to respond to external <u>CHANGE</u> that had taken place, the methods used were failing these businesses.

From an IT perspective, IT people were aware of technological <u>CHANGE</u> that was taking place but there was little awareness of the <u>BUSINESS NEED</u> or what the business thought about the services the IT people provided. IT organizations mostly responded to a requirements specification and were technology focused. Any measurements that existed were confined to product and production measures of performance. The IT people interviewed often relied on the GOVERNANCE processes within their organizations for their proposals to be approved and prioritised but the processes were not satisfactory. One consequence was that IT management appeared to be weak.

In the instances where a reduced <u>TBE</u> had indicated that a <u>CHANGE</u> may have occurred, it not only indicated what had changed but where in the business the NEEDS GAP was to be found. Where in the data IT had failed to respond to a need the business found ways to do so and these responses were outside of the normal GOVERNANCE processes. The earlier detection of <u>CHANGE</u> in these instances would have avoided the problems that were being experienced.

A case study for Company 4 is described where the BITRM was used in its entirety using all of its heuristic, deterministic, and control characteristics that provided business improvement in a specific client problem area.

CHAPTER SIX

A Future Delivery Model

6.1 Introduction

This chapter posits the business and IT relationship model (BITRM) as an a*ctive management* framework that can be considered a new IT delivery model as anticipated by the research question (Section 1.6).

This chapter will show that rather than being a replacement for current IT methods active management is seen as an over-arching framework that addresses the deficiencies of the current IT delivery model (according to practice, the literature, and the data) thus avoiding the partial implementations of the BITRM reported as having been observed in Chapter 5.

Section 6.2 proposes the active management framework. Section 6.3 explains the importance of a managed business experience. Section 6.4 describes a continuous assessment and alignment process. Section 6.5 discusses *active governance.* Section 6.6 considers active management in the context of emergent technologies and future systems.

6.2 Overview of Active Management

The proposed active management framework is illustrated in Figure 6.1. It is intended as a service-based over-arching framework to existing and future methods for enterprise IT management. The categories from the BITRM that were named from the data are replaced by event and services groups as follows:

- Business Envisioning and Processing incorporates the <u>BUSINESS NEEDS</u>
- Service Provision according to the <u>SERVICE SPECIFICATION</u>
- Managed Business Experience based on the <u>TOTAL BUSINESS EXPERIENCE</u>
- Change as in <u>CHANGE</u>
- Active Governance for <u>ALIGNMENT</u>.
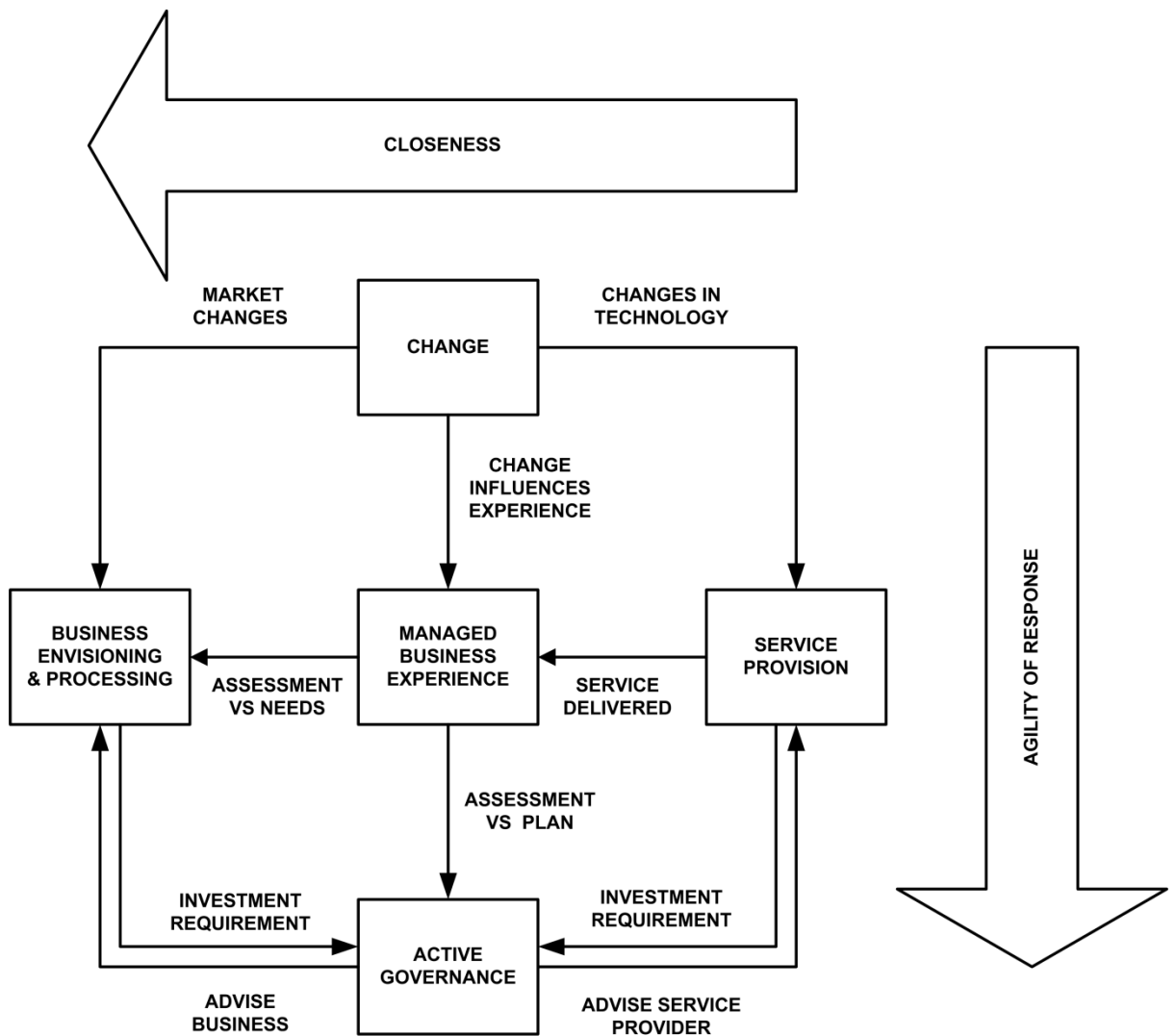
Figure 6.1: The active management framework

Active management is designed to amend the storyline in Section 4.2 to the following:

- Services are provisioned to the business according to the <u>SERVICE SPECIFICATION</u> to meet the implicit and explicit <u>BUSINESS NEED</u>

- The <u>TBE</u> is continuously assessed by the business and others

- Any gap between ideal needs and the <u>TBE</u> indicates a lack of <u>ALIGNMENT</u> and will be investigated to identify any <u>CHANGE</u> and where the need or impact has occurred

- Long term plans will be reviewed and short term action instigated where necessary by adjusting the Service Provision to achieve <u>ALIGNMENT</u>

- <u>ALIGNMENT</u> is subjected to Active Governance which becomes a dynamic key control point for the business

- The Closeness of <u>ALIGNMENT</u> and the Agility of response are actively managed by the business and the IT service provider.

Active management addresses the observed weaknesses associated with current practice (Sections 5.3 and 5.4) and utilizes the deterministic and controlling characteristics of the BITRM (Section 5.5). In this regard it is also beneficial for the management of complex programmes and major projects where the focus is often the construction, implementation and deployment of product (Section 1.3).

Whilst the current underlying IT methods can be left in place the over-arching framework benefits the enterprise in three key areas: by shifting the focus to one of managing the TOTAL BUSINESS EXPERIENCE, through continuous assessment and alignment, and by active governance. These are explained below with further reference to the data and the research.

6.3 A Managed Business Experience

During the GTM analysis, the TBE was selected as the core category because in the data it was central to the relationship between the business and IT organizations (Section 4.2). Managing this core category then should be important to both the business and to the IT service provider.

From the literature and from practice it has been shown that IT methods are popular (Section 1.2) and there are many of them (Section 1.3). They are used by IT service providers to help to ensure or show that what is delivered meets an established standard of quality, i.e. there is an assumption that if best IT practices are followed the quality of the output from a business perspective is assured. Quality though is judged by the customer (Section 2.4), i.e. the business, and from the literature it was clear that the quality management of IT from a business perspective is not assured and not currently addressed in any substantive way (Sections 2.2, 2.4).

From the data the IT view of the BUSINESS NEED can be weak (Section 5.4). Perhaps it is an awareness of this weakness in addition to the poor success rate (Section 1.4) that has led to the emphasis on IT process and standards. From the data the IT people rely on product quality and production measures of performance (Section 5.4). From the language used it would seem that business and IT may sometimes have different views of what is to be managed (Section 4.3). Even where a requirements specification existed, a PDCA cycle has been observed to be preferred by the IT service provider (Section 5.6).

Major decisions taken by business people in the data with regard to IT services are often based upon their experiences of the IT services being received (Section 5.3). From the literature there are frequent mentions of the importance of the service experience to the business/customer and yet there is no widely adopted expression for measuring the

business experience of service (Section 2.4). The following examples from the data show that a wide variety of meanings can be implied and more specificity is required to facilitate measurement.

An IT manager in Company 1 is talking about the business people and the services they receive from IT when he observes, *"Overall they are probably satisfied; we do a lot for them and try our best. Much will depend upon their last experience…"* (Interview 0117, paragraph 4). An IT manager at group headquarters in Company 3 remarked, *"The whole business needs a better user experience."* (Interview 0325, paragraph 29). The Finance Director of Company 4 in conversation with a senior representative of a major vendor asked, *"Now, does it [Company 4] engage with Supplier N in the way that you describe to do that work, and that would be a bit of a call for Company 4 because of its experience over the last couple of years, or does it talk to Supplier O or other organizations?"* (Interview 0406, paragraphs 110 and 111).

Using GTM the TBE has been identified and defined together with a composite set of properties and dimensions that comprehensively describe what it is like to experience the services of an IT service provider (Section 4.2). Just like service-dominant logic (Section 2.4) the data provides evidence that services embrace the product and production paradigm (Section 5.4) and any existing measures of quality and performance pertaining to this are incorporated into the code system (Appendix D). Active management uses this definition of the TBE to provide a 'managed business experience', i.e. active management aims to maintain a level of service that is close to the ideal for a given business.

By managing the business experience as well as service provision it is not only necessary to find out what business people think about the services provided, and so improve them where necessary, but also to detect altered perceptions outside of the normal range. Altered perceptions of the business experience arise from variations in quality and performance of service provision but, as can be seen from the GTM coding, it has been shown that the TBE could be used to determine that CHANGE may have occurred (Section 5.5) and ALIGNMENT is necessary.

This is certainly the case where CHANGE gives rise to a new BUSINESS NEED that IT must play a part in addressing, e.g. the director responsible for health and safety in Company 2 observed, *"Regulatory requirements are expanding the scope, role, and responsibilities of [H&S]"* (Interview 0203, paragraph 2); the head of accounts in Company 2 said, *"The future lies in world markets and so this practice must change…"* (Interview 0215, paragraph 2); a site manager in Company 2 said, *"The new legislative requirement is proving to be a challenge"* (Interview 0219, paragraph 4); the head of quality and

standards at Company 2 said, *"There is an increased interest in the people and training issues from a compliance perspective."* (Interview 0219, paragraph 7); a manager at the Group HQ of Company 3 said, *"The regulatory environment is complex and increasingly so. The group structure may change as early as 2013."* (Interview 0301, paragraphs 11 and 12). It known from the literature that that uncertainty arising from the specification of the requirement can diminish over the life of a project as more becomes known about the requirement but there are other uncertainties resulting from CHANGE that are constant over the life of a project and these must also be managed (Section 2.2). If the experience is managed in conjunction with the service provision there is a mechanism for managing quality and also for detecting CHANGE and managing any necessary response. This is particularly valuable when considering the importance of the macro environment and the extended scope of enterprise systems in E2E or B2I contexts (Sections 1.5, 2.3, 2.4).

During the coding, CHANGE was defined as any event, business activity or condition that has the potential to create a need for the business or service provider to do something differently (Section 4.5). This CHANGE is often external to the business or service provider.

Gradual CHANGE is continuous but other CHANGE can be more sudden. Some CHANGE can be anticipated and monitored such as CHANGE in market size and share as a result of marketing campaigns, forthcoming legislation, currency shifts, or incremental product innovation. Many CHANGEs can be very difficult to anticipate such as unexpected competitive activity resulting from a new entrant to the market or discontinuous product innovation, a meltdown of the financial sector or environmental disasters. The condition may have developed over a long period of time making the IT services provided gradually less relevant over this period. Even cumulative CHANGE can have a sudden impact where it was unnoticed or its effect was unexpected. Knowing when CHANGE is taking place and responding promptly and appropriately is very important but knowing what signs to look for is difficult.

In Table 4.2 (Section 4.2) it can be seen that out of the 2392 text segments in the data only 47 refer to CHANGE directly, i.e. from Table 5.1 (Section 5.2) this is only approximately 2% of the total. Those trying to detect change by relying on being told about it may not be able to maintain an adequate service to their business customers. Also, knowing that a CHANGE has occurred is unhelpful in terms of formulating a response unless the business implications of that CHANGE are understood.

Monitoring the TBE is an important means of detecting when CHANGE may have occurred, understanding the implications (Section 4.4), and ensuring a timely response

(Section 4.5). If a NEEDS GAP can be closed as soon as possible after it arises there is no possibility of a perception gap (Section 1.2) being created. To maintain a managed business experience it is necessary to assess all of the data continuously and undertake any ALIGNMENT as necessary.

6.4   Continuous Assessment and Alignment

From the literature, alignment has long been treated as an architectural problem though there is a general acceptance that this is an incomplete understanding. Both the intellectual and the social aspects have been considered in research but the latter is not in general use and more grounded research has been stated as being required (Section 2.3).

During the coding the working definition for the act of ALIGNMENT was the matching of the delivery of IT services or the operation of the business to appropriately meet the circumstances. It was seen from the data as the response to external CHANGE or an intervention designed to assess and address shortfalls/gaps in services to better meet the needs of the business. This included service in every sense, i.e. any kind of value-in-exchange (Section 2.4) from a value realization by developing a unit of software functionality or the deeds of people engaged in value-creation (Section 2.4) involving the analysis of or management of problem areas and the dissemination and adoption/exploitation of know-how (Section 4.6). Two key indicators of ALIGNMENT in the data are Closeness for expressing the extent of alignment (Section 4.4) and Agility of response for expressing time to respond (Section 4.5).

Closeness is used both literally and figuratively within the data to mean both physical proximity and as a proxy for ALIGNMENT. An applications development manager in Company 1 combined both meanings when he said, *"Satisfaction will not be as high as when Systems was set amongst the business people. Separation has brought a remoteness; the business probably feels it is getting nothing."* (Interview 0129, paragraph 5). A senior operations manager in Company 1 said, *"To improve business awareness should try to locate close to the business."* (Interview 0136, paragraph 7). Where suppliers are concerned there are a range of interpretations of closeness from weakness through appropriateness to exploitation. An IT applications development manager in Company 1 said, *"Suppliers want to be closer to, in some cases even own, the customer/end user."* (Interview 0103 paragraph 8). A senior administration development manager for Company 1 in the US did however say, *"Relationships with suppliers has moved from one of arms-length competitive procurement to a closer one involving planning and forecasting."* (Interview 0138, paragraph 9*). "Supplier management works well where a partner is*

willing to be leveraged. Maintenance and testing services are outsourced. Close relationships with both Oracle and Microsoft." (Interview 0108, paragraph 17). There is not immediately the same recognition that this is the nature of the relationship that the IT function should have with its own business customers. It does however suggest that IT recognises that alignment includes the relationship it has with its suppliers and that these contribute to the TOTAL BUSINESS EXPERIENCE (TBE). Asking the sales manager and operations manager from Supplier N what if anything was needed from Company 4 to help them to improve their service, the reply was, *"more access to Company 4 to better understand the business needs."* (Interview 0407, paragraph 15).

From the data it can be seen that the spectrum of needs spans those concerning the BUSINESS NEED, the SERVICE SPECIFICATION, and any aspect of the TBE (Section 4.4). Closeness is achieved when there is ALIGNMENT between the three. These different needs are identified in discussion with both the business and IT people. From the literature (Section 2.4) and from the data, services are of different types operating at different levels (Section 4.2) and it is necessary to determine what kind of service will be required to target each BUSINESS NEED (Section 4.6). The many properties of the TBE together provide an expression of how the combined effects of the IT services and solutions are viewed by key stakeholders and are the common basis for assessing services including existing product and production based methods of measuring quality and performance (Section 4.2). In active management the spectrum of needs is addressed by a Managed Business Experience that ensures that the Service Provision aligns with the needs of Business Envisioning and Processing.

ALIGNMENT has often been seen as a technical role and one managed by the IT service provider. As the process that has been described is technology-agnostic and independent of the IT methods being used (i.e. can be applied in any situation where a BUSINESS NEED is being satisfied) it can be assessed by the business, by IT or jointly. From the data it is known that business and IT people are separated by language (Section 4.3) and perspective (Sections 5.3 and 5.4) yet from the analysis it is known that the properties of the TBE come from both the business and IT people in shared if not equal amounts (Section 4.3). With input from both the business and the IT services provider the assessment of the TBE becomes a shared activity and, by closing the "blind spots", a more complete measure of service quality. The assessment could be carried out by any party independently of any other if necessary provided there was visibility of the experience being delivered and it is remembered that service quality can ultimately only be judged by the customer (Section 2.4).

Closeness and Agility are arguably the key overall measures of successful IT management. They represent the two themes of the BITRM (Sections 4.4 and 4.5) and are the management objectives for active management (Section 6.2), When discontinuous innovation is being experienced this too will impact the Business Envisioning and Processing, e.g. by creating a need for new processes, by creating a need to modify processes, or by making processes redundant. Assessments can thus be made most easily by asking stakeholders to compare the TBE with the BUSINESS NEED rather than by using more abstract concepts such as expectation, satisfaction, maturity scales, etc. Because CHANGE is continual, assessment and re-ALIGNMENT must also be a continuous process – just as SOA governance is said be an incremental and continuous process (Section 2.3) and just as continuous improvement requires mechanisms for assessment and improvement (Section 4.3). There will still be a need to assess the TBE and any ALIGNMENT proposals against the longer term plans and these may have to be re-aligned as well where necessary. These assessments are both reflected in Figure 6.1.

An assessment profile for an IT service is derived by scoring the adequacy of each property of the TBE compared with what would ideally meet the BUSINESS NEED and expressing these as percentages. The profile is typically based upon multiple perspectives involving the triangulation of stakeholder views to constitute a consensus view or one held as true by the key stakeholders (Becker and Bjorn, 2007). Each property is scored at the dimension level and abstracted to create a score for each property and the TBE as a whole. Different Likert scales (Section 2.4) are avoided in order to bring clarity of presentation of the relative strengths and weaknesses of the TBE. Questionnaires are not used because the purpose is to gather detail to describe any gaps. In the process of reaching consensus it will be necessary for the stakeholders to discuss the detailed nature of any needs gaps and agree on what might be done to improve service at every level. The improvement and developmental ideas resulting from the associated gap analysis are ranked in importance to the business to achieve agreement on tactical re-ALIGNMENT and the formulation of strategy.

Because the scale used for profiling the TBE is the same for each property, and because each is scored relative to the ideal need, scores can be represented in the form of a radar diagram with the 100% line as the outer limit representing the ideal. Assessments can be contained within this. Comparisons with other businesses or with notions of maturity are avoided unless these are relevant to any of the stakeholders or the business case. This avoids the problems of interpretation identified by the literature (Section 2.3), any risk of the over-engineering of the services, i.e. investments are not encouraged on non-

commercial grounds, and enables fluctuations in the TBE to be detected over time that would indicate CHANGE.

Any investment in existing methods from the current IT delivery model is not wasted but these only partially address 4 of the 10 properties within the scope of this assessment framework based on the TBE. Current methods are typically focused on properties concerning the delivery/deployment and execution of IT products (Section 1.3). This same emphasis can be seen, for example, in the work of the SFIA Foundation (SFIA, 2003). Service quality data (SERVQUAL) is similarly restricted (Section 2.4).

The clarity of the visual representation of a TBE profile requires minimal explanation and is suited to use in business dashboards. It has been used in boardroom presentations and workshop sessions (for arriving at quick assessments) with good results. Board presentations where the assessments were presented have prompted sufficient debate to agree an action plan. To a large extent this is made possible because all of the concepts used in an assessment are well-known management terms that needed little introduction or explanation to provoke deep discussion (Section 4.3).

IT management based upon the active management framework encourages discussion of the business needs, the IT services, and the business experience resulting from the delivery of the services. It is a dynamic real time assessment and includes the ALIGNMENT of soft and hard skills thus addressing the needs identified by the literature (Section 2.3). It brings the IT industry up to a level with other experience-centric industries (Section 2.4) with a defined business experience but without burdensome procedures that are likely to inhibit mindfulness, creativity and innovation (Section 2.4).

Assessment shouldn't automatically trigger ALIGNMENT but must first be subjected to governance controls.

6.5   Active Governance

From the literature it can be seen that governance is currently a board or executive committee agenda item that is managed according to an annual schedule with delegated powers through a RACI framework. This process will deal with strategy, investment priorities, and the outputs of IT projects and IT operations (Section 2.3). From the code system (Appendix D) governance is described from the data as the roles and responsibilities associated with detecting CHANGE and maintaining ALIGNMENT (across all of the properties of the TBE) and for ensuring that both business and IT are managed effectively in order to re-align with the new circumstances. From the data the scope of governance is defined by the BITRM (Figure 5.1). To step up to this broader role,

GOVERNANCE must play its part in ensuring that assessment and <u>ALIGNMENT</u> are taking place in a managed way, i.e. in a way that maintains the managed business experience and that funding and leadership are present wherever they are needed (Section 4.2) in order to modify the profile where necessary, i.e. a solution that could fit all organizations where none exists at the current time (Section 2.3). If continuous assessment is adopted it is logical that IT governance must be timely, i.e. active, rather than passive according to some fixed agenda.

If, as can be seen from the data, IT management was sometimes seen to be weak (Section 5.4), leadership was sometimes lacking as well. Throughout the data the term leadership is applied to the top man/woman or to the senior management team of the company, region, or function. Examples of how this creates difficulties are as follows: where a senior operations manager in Company 1 said, *"Major concern is the use of functional teams as way of overcoming knowledge flow and management difficulties, personal E-mails now up to 100 a day because senior [managers] want to know everything (not smart and a bottleneck on everything), lack of control of operational environment and yet operations tasked with maximising up time."* (Interview 0101, paragraph 3). This indicates that Company 1 already acknowledges that leadership is a problem and functional teams were a way of introducing subject leadership. An application developer in Company 1 said, *"Must also address leadership issues: capable and strong but seen to be disconnected, others emulate."* (Interview 0107, paragraph 25); another applications development manager but on a different continent in Company 1 in contrast to the previous statement said, *"New structure is better, less flat; roles are better defined, feels progress is being made. Great culture, great people, team working is a major strength. […] Some senior managers are unable to delegate. Issues about management styles and empowerment that are disliked."* (Interview 0112, paragraph 16); a senior quality manager in Company 1 said, *"Major concern is that the structure and processes are not scaling. Internal communications are weak and are exacerbated by the influx of new people. The management team has no experience of large organizations."* Interview 0126, paragraph 3).

The management teams in these cases did not map to the profile of what was needed yet if the business experience is being managed then leadership and budgetary provision must be aligned to address these issues. The original coding identified the leadership and budget as single properties or sub-categories of the TBE yet in practical terms it is known that to effectively control the business experience it is necessary to have the power to assign leadership and budgets to each property as a means of managing outcomes

(Section 4.2). In the larger organizations it is possible that each property has its own leader but in smaller ones the roles are more frequently combined.

In conjunction with the findings of this research, governance becomes a key control element for the business tied to assessment, alignment and management. Whilst there will be periodic assessments to review long term strategy and fix budgets that may require a committee structure it is likely that a more dynamic management process based on the continuous assessment and management of the business experience will help business and IT to maintain better alignment, be more agile and ensure improved success rates. This will allow organizations to deal with a broader spectrum of computing issues and connect IT and the business more effectively and on more levels as called for in the literature (Section 2.3). This may challenge existing accountabilities which will need to respond more dynamically.

Active governance is the process of dynamically responding to these problems by allocating resources in order to manage the short term and long term demands of the business according to cost, benefits, risk and time to deliver. The purpose of the active management framework is to both improve ALIGNMENT and Agility.

Active governance has the potential to become an over-arching key control point for the business as follows:

- to manage the overall IT risk
- to monitor the frequency and the effectiveness of the IT assessment process in terms of managing the business experience and detecting any CHANGE
- to empower the organization to be responsive by ensuring that IT leadership and budgetary resources are available according to priorities
- to monitor the Closeness of the IT Service Provision and TBE to the needs of Business Envisioning and Processing before and after a response
- to monitor the Agility of responses to CHANGE.

6.6 Emergent Technologies and Future Systems

The more traditional experiential customer service organizations (restaurants, airlines, call centres, etc.) are increasingly managing experience to promote differentiation and customer loyalty (Section 2.4). IT services organizations have been slow to manage the business experience; the term *user experience* being used to describe the human computer interface (Section 2.4) and *customer experience* to describe the end user experience in a B2C context. Once the TBE has been adopted as a business-focused measure of service quality it can be expected to have a graphical user interface providing

a business/management overview with access to more detail at the architectural (Section 2.3) and the operational levels. These will evolve as the technology evolves but what is available today is more about the visualization of IT infrastructure performance and availability.

Typical solutions today involve the "orchestration" of layered commercially available reporting features to provide management information that attempts to integrate business and IT views of the IT service. Layers may include a service owner layer of the live system that provides a visual representation of any system failures, a portal layer for the service catalogue integrating features such as billing, usage, requirements management, identity, service desk etc., and more detailed service management layers for service mapping, the distributed application diagram (DAD), and the problem path (cause/resolution). The blueprint for the service catalogue is ITIL. Commercially available solutions for meeting some of the service-mapping requirements include Savision Vital Signs and Microsoft Systems Centre Operations Manager. These individually and jointly monitor system performance or diagnose and correct hardware/software failure. Business Service Management (BSM) currently locates the part of the business affected by a hardware malfunction using configuration management. The BSM facility is offered by most hardware systems manufacturers (including HP, IBM) and software suppliers (e.g. BMC Software, Compuware, Oracle). Typically they respond to failures immediately after they have happened but the latest service performance management products use multivariate analytics for predictive and preventive management. These systems learn the relationship between the variables and work to predict and prevent outages through more timely intervention (an example is the well trailed plans for using this technology in IBM's Tivoli service management software). This control software maintains service-thinking within the product and production paradigm for IT management. The net effect of these solutions is that hardware failure can be fixed immediately or even be anticipated so that failure is avoided.

By contrast if new business requirements emerge they must first be identified and then worked up into a specification and funding must be sought before development, testing and deployment (Section 1.3). Where I have been involved with an architectural solution to alignment (Section 2.3) in the past it failed because of the complexities and uncertainties described by others in the literature (Section 2.3). Although the technology has improved, the same complexities and uncertainties still exist which inhibit solutions from being deployed with agility.

It is clear from the top ten concerns of IT managers (Section 1.2) and from the data (Section 4.5) that there is a need for IT organizations to respond more quickly to the

needs of the business. Emerging technologies require even greater immediacy (Section 1.5) and it may only be possible to define and test some future systems at run time (Section 1.5). The literature calls for real time alignment (Section 2.4). There is a requirement for controls in the business experience arena which match BSM for immediacy that active management could satisfy.

If the business experience is being managed any reduced assessment must be investigated. The source and cause of the new requirements will be traceable from the groups with a reduced assessment. Regular monitoring of the TBE will provide this information and a business can make immediate decisions about ALIGNMENT that the business will find attractive (Sections 1.5, 4.5, and 5.2). Today this can be achieved by management or consultancy processes but they can be time-consuming and expensive. With automation this might eventually be achieved in much the same way as BSM. During the early stages of the detection of CHANGE in active management there are no constraints on ideas for solutions allowing maximum opportunity for mindfulness, innovation, and creativity (Section 2.4).

The greater levels of automation offered by autonomic computing, bio-computing, self-adaptive and self-managing systems, and cognitive informatics will give rise to systems that can think for themselves (Section 2.5). If the loss of human primacy, even the "overpowerment of humans", as described by Boehm (Section 2.5) is to be avoided these technologies will require a control mechanism. This is more likely to be one based upon a managed business experience, involving ALIGNMENT and continuous assessment, and Active governance, than one just based on managing IT resources, processes, and people (Section 1.3). With better data collection mechanisms than are available today to facilitate more frequent sampling, active management could provide a mechanism to assist with the detection of CHANGE and the control over the consequences of inappropriate automated responses. At the highest level, above BSM, active management could in future be integrated with the layers of planning and operational control systems below alerting the business to the first signs of any lack of ALIGNMENT.

The deterministic characteristics of the BITRM (Section 5.5) potentially provide a mechanism for detecting CHANGE or new BUSINESS NEED. When an event occurs externally which creates the belief amongst stakeholders that the current business solution is no longer adding so much value there will be a perceived reduction in the assessment of the TBE. What has happened is that the BUSINESS NEED has increased but as it is still set to 100% the affected user is re-calibrating the TBE and down-rating it. This can be compared with the manner in which financial markets downgrade securities when external events take place e.g. wars, recession, poor profit forecasts. By constantly

monitoring the <u>TBE</u> these fluctuations can be detected. Active management is the process of monitoring the business experience and managing any necessary <u>ALIGNMENT</u> combined with active governance to deal where possible with needs as they arise. As most problems occur when the needs are left undetected for a long period of time (Section 5.5) a prompt response with continuous monitoring is helpful. The assessment process that leads to the profile is technology-agnostic, i.e. it doesn't matter what technology is being used, or which organization (internal or external) is supplying the service the <u>TBE</u> can always be assessed.

6.7   Summary

This chapter has shown how the business and IT relationship model (BITRM) that has emerged from the research can become an active management framework that can be considered to be the new IT delivery model as anticipated by the research question.

As an over-arching framework it addresses the deficiencies of the current IT delivery model thus avoiding the partial implementations of the BITRM reported as having been observed in Chapter 5. Active management eliminates the "blind spots" that have been seen to weaken the management process under the current arrangements.

A managed business experience is important for maintaining service quality and for detecting when <u>CHANGE</u> may have occurred, understanding the business implications of <u>CHANGE</u> and ensuring an agile response. It is applicable where IT solutions are deployed or are being developed and is particularly helpful in E2E and B2I contexts.

In active management the spectrum of needs is addressed by a Managed Business Experience that aligns the Service Provision and the needs of Business Envisioning and Processing. GTM and the code system have provided an understanding of the business and IT relationship and a mechanism for achieving <u>ALIGNMENT</u>.

To manage the business experience it is necessary to assess it continuously and undertake any <u>ALIGNMENT</u> as necessary. Using the code system IT services can be profiled against the needs of the business to enable the strengths and weaknesses of all properties to be compared with the ideal. Gaps can be explored in detail. The simple scale and the visual representation bring clarity to management dashboards, boardroom presentations, and workshop sessions. Although assessment is a technology-agnostic process and capable of being undertaken by the business alone, assessment and <u>ALIGNMENT</u> are best carried out as shared activities because of the language and perspective differences between business and IT people.

Active governance should become a key control point for the business for monitoring the success of the assessment and <u>ALIGNMENT</u> process moving GOVERNANCE from being an agenda item to a more immediate activity that is more integral to the business.

Active management would be suitable for providing a mechanism for applying business control to future IT delivery by providing a layer above BSM. It would be integrated with planning and operational control systems to mitigate against inappropriate automated responses.

Active management addresses a number of issues associated with IT delivery, <u>ALIGNMENT</u>, and GOVERNANCE raised in the literature and these are identified during the evaluation of the research.

CHAPTER SEVEN

Evaluation and Critical Assessment

7.1   Introduction

This chapter contains an evaluation of the research according to the criteria defined as part of the research design (Section 3.5).

Section 7.2 considers the research process according to the evaluation criteria. Section 7.3 considers the research outcome, the BITRM and active management, according to the evaluation criteria.

The Deming PDCA cycle has been identified as the bedrock of Total Quality Management and the basis for many of the methods and standards in common use today (Section 1.3). By comparing the PDCA cycle with active management this chapter also demonstrates that the PDCA cycle is an overused concept in business and IT management. Section 7.4 compares active management with the Deming cycle.

Finally, Section 7.5 considers the validity of active management in the context of possible future scenarios and Section 7.6 is a critical assessment of the whole programme.

7.2   Evaluation of Process

The GTM, and the Straussian approach in particular, was adopted because it meets the research requirements, provides rigour, and has a documented process (Section 3.4). Thus I was able to apply the process with confidence. It's rigour prompted its originators to describe the process as self-validating (Glaser and Strauss, 1967) by virtue of the coding method (i.e. constant comparison). The evaluation of process according to the GTM is now considered to be based on credibility (Corbin and Strauss, 2008). The Corbin and Strauss criteria and criteria defined by others (Section 3.5) relevant to the credibility of the process are as set out in Table 7.1. The last column of Table 7.1 discusses the evidence that supports the criteria listed.

Table 7.1: Credibility of the process

Source	Criteria	Evidence
Corbin and Strauss (2008) and earlier	Sufficient detail and description so that readers feel they are in the field and able to judge for themselves.	Large number of text segments of interviews featured in the text, some with commentary from memos written at the time of the coding. These provide a comprehensive description of the business situation.
Corbin and Strauss (2008) and earlier	Should be sufficient evidence on how the data was gathered and how the analysis was conducted to be able to understand how conclusions or findings were reached.	The data and the planned approach are described in Chapter 3 and the description of the analysis in Chapter 4. Coding and memoing is fully auditable by those with access to the detail in MAXQDA.
Corbin and Strauss (2008) and earlier	Theory should be based on multiple comparison groups (multiple cases and known variables).	Data from over 100 interviews across four companies with known variables.
Corbin and Strauss, 2008, and earlier	The researcher should specify the kinds of data upon which the interpretation rests.	Many examples from the data are featured in the thesis and interpretation is fully recorded in coding and memoing.
Cho and Trent, 2006	Transactional aspects of evaluation	Adherence to process as defined by the Straussian approach in Chapter 3 and which is documented in its execution in Chapter 4.
Yardley, 2000.	Sensitivity to context, commitment and rigour, and transparency and coherence	Sensitivity to context was high and this was the motivator behind the commitment and rigour deployed and the essential need for transparency and coherence. Coherence of process was problematic and extensive research was undertaken to interpret and report the process as the authors intended. Approach to axial coding was fruitful and justified the choice of GTM.
Stige *et al.,* 2009.	Engagement, processing, interpretation, and (self-) critique, i.e. the EPIC of EPICURE.	Sensitivity to the problem was high but no solution had been found during earlier work. Reflexivity toward the engagement with the data, process and interpretation as described by Stige *et al.* was important. Self-critique often took the form of questions such as: "Would those participating believe this to be the case?" "Would this explain my past experiences?" "Why should anyone not involved in the analysis believe this?"
Lincoln and Gruba, 1985.	The credibility and confirmability of the process	The process was thoroughly researched, selected on the basis of its suitability, followed, and the execution can be audited.

7.3   Evaluation of Outcome

The process is capable of yielding a theoretical model (Corbin and Strauss, 2008) the validity of which is evaluated according to its applicability. The Corbin and Strauss criteria and criteria defined by others for assessing the outcome of its applicability (Section 3.5) are as set out in Table 7.2. The last column of Table 7.2 discusses the evidence that supports the criteria listed

Table 7.2: Applicability of the outcome

Source	Criteria	Evidence
Corbin and Strauss (2008) and earlier	Outcome fits the area from which it was derived and in which it will be used.	Provides a satisfactory explanation of why IT management was problematic in the four companies within the research and why it is problematic more generally (Section 5.4). Reflexive stance throughout has provided a continuous check on process to ensure the broader relevance of the findings. Reflexivity increased the workload but the outcome is being used successfully in other situations outside of the research programme.
Corbin and Strauss (2008) and earlier	Readily understood and seen to be reasonable by laymen and professionals (i.e. by business and IT people).	The concept of *managing the business experience* is used elsewhere if not yet in the context of IT services (Section 2.4). The research also related this to other more well-known concepts such *as* ALIGNMENT and Agility but the outcome provides a better understanding of all three (Sections 2.3, 6.2). Because the theoretical model uses concepts from business and IT in common use internationally it has been accepted where it has been applied without a need for explanation and is likely to be useable in most business situations (Section 6.4).
Corbin and Strauss (2008) and earlier	Be sufficiently general to be applicable to diverse situations and populations.	Early indications are good but these have mainly been subjected to client scrutiny. Some of the early research output was the subject of a Software AG webinar and Forrester has picked up on some aspects most notably the avoidance of maturity scales (Section 6.4).
Corbin and Strauss, (2008), and earlier	Provide the user with sufficient control over structure and process to bring about change in situations through time.	As a management approach there is no question that managing the business experience combined with tighter business-focused definitions of closeness and agility (Sections 4.4, 4.5) and as described in Chapter 6 provides control, offers choice, and brings about change through time.
Cho and Trent, 2006	Achieves transformational validity, i.e. an eventual ideal.	The outcome is consistent with the need for a suitable measure of IT service quality (Section 2.4), it facilitates transformational change, even dynamic transformational change, (Section 6.2) and is likely to continue to do so in the context of future technologies as well as current and emerging technologies (Section 6.6, and Section 7.5).
Yardley, 2000.	Transformational importance or impact and importance	Deals with the problems that business has with IT (Section 1.2). Anything that focuses services (including product) on business needs and is designed to manage a defined business experience by measuring the needs gap (Chapter 6) is likely to reduce high profile failures (failures to meet the business needs) and reduce the perception gap (Section 1.2) however it might have arisen. Any assessment that is a shared activity will overcome the problems of jargon (Section 1.2) as well as those of language and perspective (Sections 4.3). Makes ALIGNMENT a real time activity (Section 2.3, 6.4) and governance requires greater business involvement rather than it being an agenda item (Sections 2.3, 6.5). The indicative and deterministic nature of the theoretical model means that it is capable of detecting discontinuous innovation and is technology-agnostic (Section 5.5, 6.6).
Stige *et al*., 2009.	Critique (social), usefulness, relevance, and ethics, i.e. CURE of EPICURE.	Of the examples of top ten challenges for CIO's (Section 1.2) around 50% can be considered to be concerned with ALIGNMENT, Agility, governance, legacy issues, change, and culture where the theoretical model could be of value. In terms of ethics the outcome is focused on BUSINESS NEED (Sections 4.5, 4.6) and value creation as well as value delivery (Section 4.6).
Lincoln and Gruba, 1985.	Transferability and dependability of the output	The concept has been used successfully in a number of consultancy situations outside of the research and dependability is high (Sections 5.6, 8.6).

7.4   Comparison with the Deming Cycle

Although the active management framework, and the BITRM upon which the former is based, contains management terms that are familiar to most people in business and industry (Section 6.4) it is very different to the existing management frameworks and the widely used Deming cycle.

The PDCA cycle has been mentioned in the context of the current IT delivery model (Section 1.3), from the work of others in connection with governance (Section 2.3) and SOA governance (Section 2.4), and as observed in practice (Section 5.6).

Variants can also be found in discussions on change management, e.g. plan–acquire–deploy–review (Manwani, 2008), branches of software engineering[11] (Pressman, 1992) (Gilb, 1988), lean production (Womack and Jones, 2003) (Liker, 2004), and Six Sigma (Pande *et al.*, 2000).

The main characteristic of the Deming cycle is that it appears to be a closed sequential loop consisting of four processes, i.e. Plan, Do, Check, and Act (Figure 7.1), and is often project-focused, i.e. it is looking to ensure a specific outcome (or improvement) as in the data (Section 5.6). Advocates of Deming would say that the *plan* and *check* processes provide a control on external relevance. However, it is my experience that more commonly these activities are looking at internal project related data.
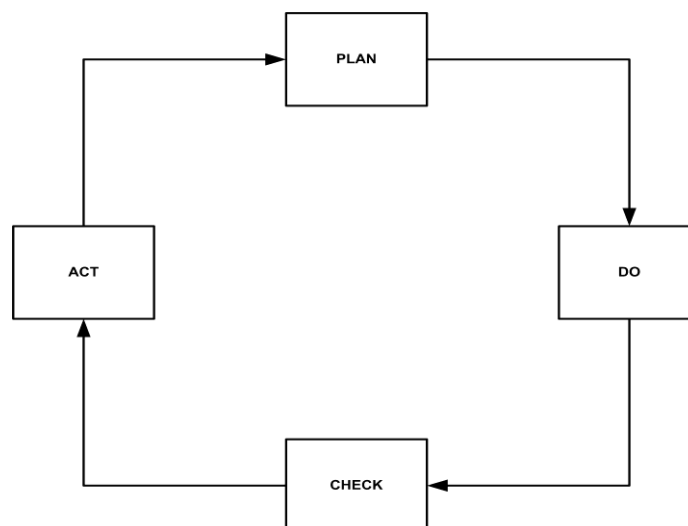
Figure 7.1: The Deming cycle

The delivery of software or operational services according to the Deming cycle rather than the active management framework could be contributing to the stubbornly low rates of success associated with IT investment (Section 1.4) as well as the other problems often associated with IT delivery (Section 1.2). Persistent and inappropriate use of the Deming cycle in the future could be seen by the business as a cause of service failure that is within the control of the firm and likely to occur again (Bitner, 1990) (Section 2.4). Where, as a consequence, the TBE consistently fails to meet the BUSINESS NEED, prompt precipitative action by the business to bring about ALIGNMENT may follow (e.g. to

---

[11] Examples include design evaluation cycles (Pressman) and evolutionary delivery cycles (Gilb)

outsource or to instigate a change of IT service provider: *"Do it or we will find someone else to do it."* (Company 1 pre-assignment file notes).

The people from Supplier N working for Company 4 were applying a PDCA cycle as a simplistic project management tool to ensure that they delivered the improvement that had been requested. They responded to Company 4 requests with resource and cost estimates and supplied a body to code the requirement that has been specified once the estimate had been accepted. The coding was followed by a request by Supplier N to test the output (Section 5.6). Even though all participants were experienced people the only alignment being considered was that of the written code with the functional specification. Observing this process and intervening to improve the relationship using the BITRM opened up many possibilities. These included questioning the <u>BUSINESS NEED</u>, assessing the <u>TBE</u>, and considering the service provision needed to bring about <u>ALIGNMENT</u>.

Active management is compared with the Deming cycle in Table 7.3.

Table 7.3: Comparing active management with the Deming cycle

No.	Deming Cycle (Plan–Do–Check–Act)	Active Management
7.3.1	Use in 'continuous improvement' said to be based on the Scientific Method *(*Knouse *et al.,* 2009*) (*Anderson *et al.,* 1994*)*	Grounded in the actual relationship between business and IT (Section 5.2).
7.3.2	Developed to meet the continuous quality improvement needs of mass production in the early 20th century (Rungtusanatham *et al.*, 2003)	Developed to control IT delivery to business and based on the BITRM (Sections 5.2, 6.2)
7.3.3.	Being manufacturing based the "Deming Management Method" is predominantly product and production oriented (Rungtusanatham *et al.*, 2003)	Service-based and employing service-dominant logic (Sections 2.4, 6.2)
7.3.4	Bedrock of Total Quality Management (Knouse *et al.*, 2009) and featured explicitly or implicitly in IT methods, standards, software engineering and Six Sigma (Sections 1.2, 7.4)	Candidate framework to assist with the current and future control and management of IT (Chapter 6) but arguably generally applicable to the delivery of all services
7.3.5	Tendency toward quantitative measurement (Petersen, 1999), in fact requires targets to be set	Requires intellectual as well as social judgment (Section 6.4) but is self-regulating in that any gap that is detected shows that <u>ALIGNMENT</u> is incomplete
7.3.6	Deming focus was transformational (Petersen, 1999) but PDCA today is used pro-actively in a deterministic manner (Section 5.6) and "Planning" and "Checking" are internally focused on an outcome where a specific outcome, target or incremental improvement is sought (Section 7.4).	Indicates that <u>CHANGE</u>, including change brought about by discontinuous innovation, may have occurred and identifies the nature of the change and determines the parts of the business affected (Section 6.2, Section 6.4). Can be used reactively and pro-actively. Appropriate in all IT management (and service management) contexts as an over-arching framework where Closeness and Agility are sought and the unexpected may occur (Section 6.2).

7.5 Evaluation in the Context of Future Scenarios

The framework for the evaluation of any findings in terms of their fitness for the future was set out in Table 3.3. These included in the short term the emerging technology observable through current trends (Section 1.5), in the medium term the 2020 scenarios (Gray and Hovav, 2007) (Section 2.5), and in the longer term the truly self-adaptive and self-managing systems and cognitive informatics (Section 2.5).

Emerging Technology

Although there is criticism of the current IT delivery model in today's world in the literature (Section 2.2), it has nothing to say about its appropriateness in the emerging world characterized by the current trends (Section 1.5).

In the converged world business people may want to take more responsibility and it is unlikely that they be sufficiently trained in IT methods to readily adopt the current IT delivery model. The need will be for a model which can orchestrate a larger community to identify needs (Section 1.5). The active management framework would fulfill this purpose.

An IT management control system based on the product and production paradigm for IT management (Section 1.3) may not be relevant in a commoditised world where much of the information about the utilization of IT resources, processes, and people upon which the current IT management methods depend may no longer be available to the business, e.g. when accessing the cloud. Business people may well procure solutions directly and these will be assessed according to price and how well they meet the needs of the business (Section 1.5). An active management framework would fulfill this purpose.

In a connected world the management challenge is one of immediacy and as such it is often unsuited to the current IT delivery model (Section 1.5). An active management framework would fulfill this purpose.

In a consumerised world there are many users and gathering everyone's requirements into a requirements specification is impossible (Section 1.5). An active management framework would fulfill this purpose.

In all of the above cases active management will provide an over-arching framework that allows business to assess and maintain quality and performance whilst maintaining any existing practice in the form of IT methods, frameworks, and standards. Business people will enjoy a managed business experience where Closeness to the BUSINESS NEED and Agility of response are the most important operational factors. In many cases these are

inadequate (Section 1.2). In the case of emerging technologies, the research question (What constitutes a new IT delivery model that can make successful business outcomes more likely both now and in the future?) can be considered to have been answered.

Medium Term

The evaluation of active management in the context of the medium term 2020 scenarios (Gray and Hovav, 2007) is summarised in Table 7.4. Column two summarises the scenario. Column three suggests how well the current IT delivery model would cope with the scenario. Column four states the opportunity offered by active management.

Table 7.4: Qualitative evaluation according to the Gray and Hovav scenarios

No.	Scenario (Gray and Hovav, 2007)	Current IT Delivery Model	Active Management
7.4.1	Back to the Dark Ages: Recession and monetary crises, energy crisis, globalization slows, unreliable communications, return to centralized IT, aging infrastructure, little innovation, Moore's Law ends, IT support requires more staff but people not attracted to the profession. Power shifts to Asia.	Current situation continues. Success rates associated with IT investment likely to remain unchanged at 35%.	Offers a clear improvement opportunity to provide services that are closer to be needs of the business. Important if there is a desire to reduce costs and risks.
7.4.2	Slow Growth: Information systems evolve slowly, innovation not at the pace of the last 25 years, Moore's Law slows down, poor telecoms infrastructure and internet speed very slow to improve, transmission of corporate data not trusted. Still islands of IT in companies. Reduced requirement for IT staff.	Current IT delivery model sustained by islands of IT but as Moore's Law slows businesses become more concerned about success rate of 35%	Offers clear improvement opportunity over current situation as businesses look for better value as well as better quality.
7.4.3	Technology Driven: Highly developed telecoms infrastructure and highly trained (technically) workforce. Internet becomes segmented and new computing devices emerge. Large enterprises outsource most of their computing relying on standards, packages and automated software coding to ensure quality. Cyber-crime is low. Focus on development of automated processes. Lower demand for IT staff (40% of 2006 level). Alignment expected to be low.	Current delivery model still relevant to developers and data centre managers but success rates may still not be good enough. Poor alignment could continue.	Essential if businesses are to make their own assessment of service if alignment is to be improved.
7.4.4	Nirvana: Unlimited low cost ubiquitous internet. Secure. Computing as a service is universal. Few IT departments. Competitive advantage gained from way in which they combine modules to achieve alignment. No problems with information security or cybercrime. Requirement for IT staff confined to central planning, high end consultants and low end technicians.	Probably only relevant to developers and data centre managers and then not good enough	Essential: businesses will only be able to judge quality according to their experiences of using the technology.

The current IT delivery model alone would not be relevant in any but scenario 1 (*Back to the Dark Ages*). Because Moore's Law is slowing, the efficiency improvements from Moore's Law enjoyed by IT over the past 50 years may no longer offset the low success rate. If businesses wanted to reduce the wastage associated with IT investment there would be a case for adopting active management.

In all other scenarios there would be a need to manage the business experience as this (and cost) could become the principal way for businesses to be certain of managing service quality. This is particularly so in scenario 4 (Nirvana) where active management would be essential for the business as it is likely to be the only way of assessing service quality.

Longer Term

The evaluation of active management in relation to long term futures, i.e. self-adaptive, self-managing, and cognitive informatics, centres on the extent to which active management can be developed to detect and respond to <u>CHANGE</u> and whether this would provide an adequate safeguard against the "potential for harm" mentioned by Boehm (Section 2.5). The arguments against active management are that it relies on qualitative judgments which may not be sufficiently sensitive or reliable. The argument for active management is that it is based on managing the <u>TBE</u> and detecting a deteriorating <u>TBE</u>. By managing the <u>TBE</u> service quality is assured. When a deteriorating <u>TBE</u> is detected something must be done if a business is not to take action itself. The cause of the concern must be located and addressed. An inappropriate or erroneous response would create a further deterioration of the <u>TBE</u> thus active management could, if sufficiently sensitive and reliable, be considered to be self-regulating.

Adoption

Even though the current IT delivery model is problematic (Chapter 1), the analysis in this thesis suggests that the take-up or adoption of active management by business may be very slow. Although active management offers benefits in all scenarios, scenarios three and four may be some way off. Also, methods are often sustained by membership groups, e.g. ISACA and itSMF, through the accreditation of process and an existing investment in training. Methods are changed by agreement between representatives of the membership of these groups. Updates then have to be adopted by business; it is a slow process and dependent upon the availability of supporting training and reference material.

The traditional methods based on the management of IT resources, processes and people may continue to be relevant to suppliers of outsourced IT services or software houses if not to the buyers of those products and services but their usefulness, based on this research, must always be in question from now on.

Adoption may be speeded up by the availability of product that will enable active management to be deployed quickly and easily.

7.6　Critical Assessment

GTM as a process worked successfully (Section 4.2) for what was a large scale problem (Section 3.4) with a large data set (Section 3.3) in a practitioner-researcher context (Section 3.4). The coding process and the methodology executed as expected. A theoretical model emerged as much of the literature suggested it would. The outcome was unexpected and pleasing, providing an answer where none was previously available. The combination of high theoretical sensitivity, critical realism and reflexivity were important for ensuring that there was good reason to use the codes chosen and that others would make similar decisions assuming they had the same experience of the field in question and access to the same or similarly detailed data. The CAQDAS was useful throughout. In the coding phase it kept track of the codes. The code and text memos were easy to create as data was analysed and constant comparison was swift and efficient. In the latter stages the colour coding and the visualizations facilitated a more thorough analysis making patterns more obvious before working on tables to detail the analysis (Sections 5.3, 5.4, 5.5). All of this could have been done manually but because of the extent of the analysis and the size of the data set being managed this would have been difficult. Perhaps it would have been more satisfactory if the analysis of the weakened relationships in the IT perspective illustrated in Figures 5.4 and 5.5 had matched precisely but the conclusion was clear enough.

The principal outcome from the research is the BITRM. The concepts and categories came from the data so cannot be new. All are known to business and/or IT people. This is perhaps the strength of the outcome being based upon empirical concepts coming from the research method described and a high proportion of *in-vivo* coding. There is nothing new in the idea that business people act on their experience. The central importance of the business experience to the relationship between business and IT is new. A detailed definition for the TBE and the proposition that the TBE should be a management focus are both new.

The most value from the research comes from the further more detailed analysis phase based on known variables described in Chapter 5. The solution developed for axial coding helped to expose some important differences in behaviour between the business people and the IT people with regard to the BITRM. Differences in the use of language and perspective identified weaknesses in terms of the observed relationships which emphasized the importance of business-led or shared assessments of a business and IT relationship. It was during this analysis phase that the model's deterministic characteristics were discovered giving rise to its potential as a means of controlling the business and IT relationship. It was these combined discoveries during this phase of the

analysis that gave rise to the notions of active management, a managed business experience and active governance in connection with IT service provision.

Given the industry knowledge and the experience of the researcher there was a responsibility for critical realism and for reflexively questioning what was emerging from the process as concepts and theories to ensure that these had a wider relevance thus improving the rigour of the process (Section 3.5). It is believed that this has been achieved. The coding and the outcome can only reflect the data used and every opportunity has been taken to ensure the accuracy of what has been noted in codes and memos and described in this thesis.

There will inevitably be further research into the types of CHANGE detectable by managing the business experience. The continuous assessment process (Section 6.4) is important. With over 80 properties and dimensions to score there is a mixture of measurement and judgment required. Each dimension would typically be scored and then abstracted to the property and category level. Validity would be checked at each level. This granularity offers opportunities to cross check with previous scores and to identify variations. How reliable this will be outside of a consultancy situation, how quickly CHANGE can be detected and localised (i.e. how practical it will be as a method of identifying where in a business the CHANGE is having an impact) have yet to be determined. The method should not depend upon the nature of the CHANGE – if it can affect BUSINESS NEED, the TBE, or requires a new or modified IT SERVICE SPECIFICATION it should be detectable. This means that discontinuous CHANGE will also be embraced. If a reduced business experience can be detected with some reliability then there will be an expectation that there should be a quick response. Active governance rather than governance by agenda is essential longer term so this has to be developed though immediacy is a theoretical notion and dependent upon automated approaches becoming available.

Already there are some important differences emerging between the current IT delivery model and delivery based on a managed business experience and active governance. They are listed in Table 7.5.

At various stages during the research there was the opportunity to reflect on the outcomes situated in various client problem areas. These were extremely positive experiences but they form no part of the research.

Table 7.5: Comparing the current IT delivery model with that from the research

No.	Current IT Delivery Model	Active Management
7.5.01	Management of products and production (Section 1.3).	Reflects the importance of services as well as associated products/production (Section 4.6) and the management of the TBE (Section 6.3)
7.5.02	Focus on IT constructs such as the requirements specification and SLA (Section 1.2).	Focus on the TBE, BUSINESS NEED, the services targeting those needs, and the Agility of response (Sections 4.2, 4.4, 4.5, 6.3).
7.5.03	Change control and change management (Section 1.3).	CHANGE, response and (re-)ALIGNMENT (Section 4.5).
7.5.04	Alignment as a concept is recognised, regularly appears in the top ten CIO list of issues (Section 1.2), but is not well understood (Section 2.3).	ALIGNMENT is total (products and services) and measured by Closeness and Agility (Sections 6.4, 6.5).
7.5.05	Predominantly concerned with value realization (Section 2.4).	Value creation and value realization (Section 4.6.).
7.5.06	Prescriptive and procedural methods that may inhibit mindfulness (Section 2.4).	More intuitive and Less likely to inhibit creativity and innovation (Section 6.4).
7.5.07	IT-driven IT service assessment and governance using disconfirmation model and SERVQUAL not easily used and not sustainable (Section 2.4).	Experience is suggesting that active management and active governance are easily understood by business managers (Section 5.6)
7.5.08	Reactive i.e. reacts to a requirements specification, request for change etc. (Sections 1.3, 2.4, 5.4).	Capable of being used pro-actively and reactively. Capable of being deterministic by indicating where CHANGE, including discontinuous innovation, may have occurred. Perhaps scope for some automation (Sections 5.5, 6.2, 6.3, 7.3).
7.5.09	Frequent mentions in the literature about the importance of the business experience (Section 2.4) and the data shows that some critical management decisions are based on the business experience but there is no industry definition for it (Sections 4.4, 5.5). Assessment is undertaken by IT auditors or external independent consultants. Experience management better understood in other industry sectors (Section 2.4).	TBE is central to the BITRM, a managed business experience and to active governance and is described in detail within the code system (Section 5.2, Section 6.1, Appendix D). Assessment is recommended to be a shared process (business and IT management) but can be carried out by the business alone.
7.5.10	Governance is an administrative process often treated as a board level or executive agenda item (Section 2.3) and regularly appears in the list of top ten challenges for CIOs (Section 1.2).	Governance becomes a key control point for the business dynamically facilitating and enabling strategic and tactical leadership (Sections 5.2, 6.5, 6.6).
7.5.11	Features closed loop PDCA delivery e.g. Deming (Section 1.3).	Managed business experience designed to detect and respond to change (active management, active governance and themes of closeness and agility). Fully described by the code system (Appendix D) defining all categories and sub-categories within the model (Chapter 6, Chapter 7).
7.5.12	Problematic today and not (on its own) suited to any future scenario (Sections 1.4, 2.2, 7.5).	Technology-agnostic and so thought to be universally applicable and meets tests of future scenarios (Sections 6.4, 6.6, 7.5).
7.5.13	Language of traditional IT constructs (Sections 1.3, 2.2, 2.3, 2.4, 4.3, 4.6).	Language of business and IT (Section 4.3).
7.5.14	35% success rate, i.e. frequently fails to meet some of the objectives set by business (Section 1.4).	Active management is a means of maintaining ALIGNMENT to the business which can be measured by its Closeness and Agility. Likely to be seen to be more successful by business managers (Chapter 6).
7.5.15	Responsive to hardware and software malfunction. Multivariate analytics predict hardware malfunction (Section 6.6).	Responsive to any lack of ALIGNMENT with the business that will give rise to new needs or a weakened experience (Section 6.6).
7.5.16	IT driven	Business driven

7.7 Summary

From the literature any evaluation of the grounded theory method (GTM) must address the process used as well as the outcome itself.

The GTM process was researched and followed carefully. The evaluation showed that the process was successful and is credible. It is credible (and confirmable) because there is sufficient detail and description about the business situation, there is sufficient evidence of process to understand how the conclusions were reached, it is based on multiple cases and known variables, and it specifies the kind of data upon which the interpretation rests. Further reassurance as to the credibility of the process can be drawn from the fact that the sensitivity to the context was high as was engagement, processing and interpretation.

The evaluation of the outcome from the research is applicable, transferable and dependable. It is applicable because it fits the area from which it was derived, fits the areas in which it will be used, is understood and seen as reasonable by laymen and professionals alike, is sufficiently general to be applicable to diverse situations and populations, and provides the user with sufficient control over structure and process to bring about change in situations through time. It also deals with many of the problems that business has with IT as well as many of the challenges for CIOs.

Active management as an over-arching framework is likely to improve existing methods including those that use Deming-like cycles because it provides an external context and is capable of indicating that <u>CHANGE</u> (including <u>CHANGE</u> resulting from discontinuous innovation) may have occurred and of determining the impact.

Active management was evaluated against all emerging and future scenarios and the evaluations showed that its use is likely to be beneficial but take up could be slow unless it is supported by product.

Active management and the current IT delivery model were compared and there are some important differences. Whether these are combined, as may be the case today, or businesses come to rely on active management in the future remains to be seen. At the moment there is a need to discover how sensitive and reliable active management can become.

CHAPTER EIGHT

Conclusions

8.1   Introduction

This concluding chapter summarises the research so far and reflects on the value of its contributions to practice and research already gained and the potential for further value.

The research addresses a problem which has existed for more than forty years and as a consequence as much as $2.5 trillion p.a. is at risk globally. The active management framework provides a future delivery model which has the potential to reduce these losses today and which is also suited to the management of future complex business and IT landscapes. The research and its contributions are summarised and consideration is given in this chapter as to how the findings might be implemented.

The research is summarised in Section 8.2 and the research findings in Section 8.3. The contributions to knowledge relating to management practices are described in Section 8.4 and those relating to research methodology in Section 8.5. There is earlier work by the author in this field and Section 8.6 draws a comparison between that earlier work and this research. The limitations of the research are described in Section 8.7and the future work is described in Section 8.8.

8.2   Summary of the Research

At the outset of the research the current IT delivery model was identified as being unsatisfactory. It was thought to be possibly linked to frequently reported problems with alignment, agility, innovation, governance, and value. The current delivery model is the basis for the functional and the commercial relationship between a business and IT service providers yet there is an observable perception gap, high profile failures are too frequently reported in the media, and success rates are such that there is too much uncertainty associated with IT investment. Early investigations showed that the many attempts to address its inherent problems were ill-founded. The persistently low rates of success and the scale of the problem are such that the problem should be no longer ignored. The IT delivery model needs to be much more effective today because the waste

associated with IT investment should no longer be tolerated. The IT delivery model also needs to be more relevant to emerging and future technologies and capable of managing the complex business and IT landscape that can be anticipated. Rather than speculate on why the IT delivery model is flawed an inductive qualitative research method was adopted to determine what an alternative IT delivery model might look like. The research question was, "What constitutes a new IT delivery model that can make successful business outcomes more likely both now and in the future?" (Chapter 1).

There was no predefined view of what such an alternative delivery model might look like. The investigative requirement was for a research method that would provide an understanding of the needs of the relationship between business and IT (Chapter 3). An interpretivist methodology was required and grounded theory was chosen as being the most appropriate method for producing an inductively derived theory about the phenomena. The Straussian approach to grounded theory was followed because it favours a more formalised methodology, stressing the need for more process to yield reliable results, and it is well documented. This was combined with high quality primary research data from three international businesses. The size of the database was such that a CAQDAS was employed to help to manage the organization and retrieval of large amounts of data (Chapter 3).

The TOTAL BUSINESS EXPERIENCE (TBE) was selected as the core category because it accounted for the most variation around the problem of IT delivery. Further data was made available for the purpose of theoretical sampling and selective coding (Chapter 4). The TBE was observed as being central to code co-occurrence models, code theory models and the storyline and the research achieved good theoretical integration with the emerging over-arching theoretical model for the business and IT relationship. Saturation was achieved meaning that the point had been reached where it was not possible to learn more about the categories, their properties and their relationship to the TBE. The qualitative research revealed major differences in the use of language between business and IT people, the different ways in which business requirements can be expressed, the difference between CHANGE and the response to change, and the importance and meaning of service in the IT context and the different meanings currently attached to it.

The BITRM, the theoretical model that emerged from the coding phase and the associated code system provides an improved understanding of the complex relationship between business and IT. Further analysis of the data in relationship to this model also reveals why the success rate associated with IT investment has traditionally been so low. This analysis showed that the model is a logically correct frame of reference for describing the relationship between business and IT organizations but it illustrated how the behaviour

of each group relates to the model differently according to the constraints of their different perspectives and current practice. The observed behaviour patterns made IT decision making difficult often leading to a perception that IT management was weak. The further analysis also showed how the theoretical model can also be used to determine that CHANGE may have taken place, what parts of the organization are affected, and what new requirements or needs gaps this has generated (Chapter 5).

The research proposes an alternative delivery model called active management which is focused on a managed business experience and active governance. This combines the business and IT perspectives to eliminate the "blind spots" associated with current practice, and exploit the deterministic and control properties of the findings from the research (Chapter 6).

The research process and the outcome were tested against various pre-determined evaluation criteria to establish their credibility and applicability respectively (Chapter 7). The evaluation suggests that active management is more appropriate today than the current IT delivery model alone, has important differences when compared with the classic Deming cycle upon which many of the methods and standards in the current IT delivery model are based, and is more appropriate in all of the alternative future scenarios that were considered.

8.3   Summary of the Research Findings

At the outset of the research it was assumed that the current IT delivery model was either incorrect or incomplete (Chapter 1). My research shows that the current IT delivery model is such that where there is an incomplete set of relationships with the business this will reflect badly on IT management (Chapter 5) and as a result of the research active management is proposed as a solution (Chapter 6).

The relationship between business and IT organizations is problematic. From the perspective of the CIO the issues are frequently ones of alignment, agility, governance, innovation, and legacy/application modernization. From a business perspective the issues are frequently the uncertainty of the outcome and communicating effectively with the IT people (Chapter 1). These problems are well-known and have appeared within the literature over a number of years. No satisfactory solution has been found to the general problem and there have been calls for more qualitative research to find a solution (Chapter 2).

There are many reasons why an IT organization might be deemed not to have been successful. In the data it was because not all of the BUSINESS NEED has been met by

the products or services the IT organizations have provided (Section 4.6) and it can be assumed that this is generally applicable. In particular, the need for services is often not addressed so rigorously and yet these are important for innovation and the creation of value (Section 2.4). Also in the data there is evidence that the IT service providers often did not understand the <u>BUSINESS NEED</u> as much as they might. My research shows that these can be expressed in many different ways (Section 4.4) and new needs gaps are frequently arising through external <u>CHANGE</u>. There was previously no complete and formal measure or expression of the business experience resulting from an IT product or service but in the data a poor business experience was in every case the main reason for a business taking action (Chapter 4). <u>CHANGE</u> and a lack of agility in responding to <u>CHANGE</u> are also problematic in the data. Where an IT organization was slow to respond to <u>CHANGE</u> the business might address its needs by introducing its own solutions independently of the IT organization (Chapter 5). All of these problems can now be considered to be a consequence of an historical lack of an effective management framework.

The active management framework is based upon a managed business experience where Closeness (the extent of the <u>ALIGNMENT</u> between the <u>BUSINESS NEED</u>, the <u>SERVICE SPECIFICATION</u>, and the required <u>TBE</u>) and Agility (of response to change) are key measures. Continuous assessment of the <u>TBE</u> enables gaps to be detected regardless how they arise. GOVERNANCE becomes a key control point for the business rather than an infrequent agenda item for senior management. Because the findings are technology agnostic the framework is relevant to managing any complex business and IT landscape incorporating legacy, emerging technologies and future systems, and expanded communities within and external to the business (Chapter 6).

Because the framework is business-focused, jargon becomes of secondary importance i.e. jargon will become necessary when solutions are considered but not necessarily when describing the <u>BUSINESS NEED</u> or the business experience. Where it has been possible to use the outcomes situated in client problem areas the concepts were understood by all parties involved and the significance of the <u>TBE</u> as a means of assessing and improving services was clearly observed (Section, 5.6).

8.4   Contribution to Knowledge: IT Management Practice

The direct contributions of this research to management practice are listed below.

The Business and IT Relationship Model

The BITRM visualizes the relationship between business and IT as revealed by the research (Section 5.2). The model is supported by a code system that defines all of the terms used including, the <u>BUSINESS NEED</u>, the <u>SERVICE SPECIFICATION</u>, <u>TOTAL BUSINESS EXPERIENCE (TBE</u>), and <u>ALIGNMENT</u> and GOVERNANCE.

The discovery of the BITRM gives rise to a number of secondary discoveries which themselves are very significant contributions to knowledge in the area of IT management practice:

- **The Total Business Experience**

  The <u>TBE</u> is central to the relationship between business and the IT service provider (Section 4.2) and business decisions are often based upon this even though hitherto it has not been defined.

- **The Spectrum of Business Requirement**

  The spectrum of the business requirement includes those things characterized by <u>BUSINESS NEED,</u> <u>SERVICE SPECIFICATION</u> and the <u>TBE</u> (Section 4.4). This is an improvement over simply classifying requirements as functional and non-functional (Section 1.2). Total <u>ALIGNMENT</u> brings the services and the business experience close to the <u>BUSINESS NEED</u>. Closeness is suggested as an expression of the extent of <u>ALIGNMENT</u>. This helps to address the concern in the literature that alignment remains elusive (Section 2.3).

- **Change vs. Response to Change, and Agility of Response**

  Change is a widely used term within the data. During the coding a distinction was made between an event that prompted a new <u>BUSINESS NEED,</u> and this was called a <u>CHANGE</u>, and the *response* of the business and IT people to that change. The response could involve the <u>ALIGNMENT</u> of products, IT and other services, people, business processes, architectures, etc. (Section 4.5). The *Agility* of the response becomes another key measure for <u>ALIGNMENT</u> addressing many of the concerns expressed within the data (Section 4.5). Agility is measured from the point in time that a <u>CHANGE</u> takes place and the need first arises, i.e. not when the IT services provider receives a request for change.

- **Importance of Service**

  The process of adding value to business is now recognised to be complex and often unlocked through services where value is co-created by the business and IT people working together. Service means many things within an IT context. Real service is identified as a critical aspect of the relationship between business and IT and is essential to value creation as well as value realization and to achieving total ALIGNMENT (Section 4.6). Whilst the contribution to profits of an idea for creating value can be measured, there has previously been no measure in widespread use for managing IT service quality (Section 2.4) and this is now provided by the TBE (see below).

- **The TBE as a Measure of Service**

  The TBE is a meaningful measure of service, product, quality and performance (Section 6.3). Assessing the TBE against the ideal BUSINESS NEED provides a method of measuring service quality (Section 6.4) whilst avoiding the complications of determining *expectation minus perception* for the disconfirmation model, a narrow definition of service, abstract terms or constructs, and complexities arising from differing Likert scale comparisons, etc. Regardless of the technology deployed or IT methods used, the business management can take a position on the adequacy of the resulting business experience and define what must be done to make this closer to the needs of the business community. The research also provides the arguments favouring a shared assessment process between the business stakeholders and the IT service provider (Section 6.4) and explains why assessments that are undertaken by the IT service provider alone are unlikely to be credible (Section 5.4).

- **The Current IT Delivery Model Makes IT Management Look Weak**

  The current IT delivery model, the language and perspective differences between business and IT people, can create "blind spots" that make IT decision making difficult leading to a perception that IT management is weak (Section 5.4).

- **The TBE as an Indicator of Change**

  The TBE is sensitive to gaps appearing between the BUSINESS NEED and the SERVICE SPECIFICATION when none previously existed. The research has shown that this can happen when CHANGE is the catalyst (Section 5.5). By continuously assessing or monitoring the TBE it is possible to detect when CHANGE may have occurred, understand the business implications of CHANGE,

and ensure an agile response in order to maintain a managed business experience. This characteristic has the potential to provide a safeguard for the business where self-adaptive and self-managing systems are deployed (Section 6.6) or where other complex business and IT landscapes may arise.

Active Management

In describing the nature of the current IT delivery model it is now evident that there is no such thing – at best one might be implied from the *bricolage* of IT methods and standards for creating and operating IT product. Individually or severally these may be currently managed using a Deming or Shewart-like closed loop PDCA cycle (Section 1.3) but the discovery of the BITRM suggests that this may often be inappropriate in a business/IT context (Section 7.4).

Active Management (Section 6.2), based upon a need to pro-actively manage the total business experience (Section 6.3, 6.4), is proposed as the delivery model. This enables a continuous shared assessment of the TBE to:

- eliminate the "blind spots" (Sections 5.3, 5.4)
- assess service quality (Section 6.4)
- identify CHANGE (Section 5.5) and its impact
- enable active governance (Section 6.5) to align Service Provision with Business Envisioning and Processing.

As an over-arching management framework it can improve outcomes by monitoring and controlling Closeness and Agility of response. Perception gaps are unlikely to survive under active management if closeness and agility are maintained. Active management is technology agnostic and so relevant to existing, emerging and future technologies (Sections 6.6, 7.5) and complex future business and IT landscapes (Section 1.7).

Two additional contributions to knowledge relating to active management are evident:

- **Active Management as a Contractual Framework**

   The functional and commercial relationships between businesses and their IT service providers are defined by the current delivery model (Section 1.3). Active management has the potential to change this so that it may be possible to base future contractual relationships upon maintaining a certain level of business experience. This offers further insight into the meaning of value-in-use and value-in-exchange (Sections 2.4, 6.4).

- **Active Management for Other Complex Services**

  Although the research was focused on the inadequacies of IT delivery, active management is probably more widely applicable and could be generalised so that it is relevant to managing any complex service in any domain where IT is ubiquitous (Section 2.5, 7.5).

8.5   Contribution to Knowledge: Research Methodology

During the research design uncertainty in the literature was identified concerning the suitability of grounded theory to the task in hand. Although the method was a good fit in terms of what had to be done, it would be necessary to ensure that it was able to handle the scale and scope of the task and the problem domain.

The direct contributions to research methodology can be summarised as follows.

GTM for Practitioner/Researchers

On this evidence grounded theory is ideally suited to practitioner researchers (with prior knowledge of the business/IT domain) for the analysis of large scale and complex problems thus supporting the work of others as stated earlier in Section 3.4 (Pianatanida *et al.*, 2002) (Turner, 1983).

CAQDAS Solution for Axial Coding

Axial coding is important to the Straussian approach to GTM for analysing the conditions, actions, interactions, and consequences observed and coded during the analysis but the conditional/consequential matrix does not capture the complexity of the many diverse patterns of connectivity (Section 3.4). The analysis of code theory models generated by the CAQDAS to analyse the coding in text memos provided a practical solution (Section 4.2). Undertaking the research without axial coding (as in the Glaserian approach, Section 3.4), or without a solution for axial coding that was appropriate on this scale, may not have yielded such useful outcomes.

GTM for Business Analysis

The importance of meaning, language, and perspective in business analysis is such that the GTM could sometimes be a useful addition to the business analysis toolkit, e.g. during the discovery stages.

GTM for Maintaining the Theoretical Model

Although the research has concluded that the BITRM and the active management framework are technology-agnostic and independent of the IT methods used (Sections

6.4, 6.6), the future is always uncertain. This being the case, the validity of the outcomes from the research needs to be maintained. The GTM scores highly in terms of its credibility, applicability, transferability, dependability and confirmability in this context and so is suited to the task of pro-active maintenance to ensure that research in this area keeps pace with changes in the business and IT landscape. In this way the model, management framework and supporting code system can respond to change and remain relevant.

8.6   Comparison with the Author's Earlier Work in This Field

My earlier work was based on an empirical/practitioner approach; it was published under the general heading of "Business-Focused IT" (Miller, 2005) (Miller, 2008a). This argued the importance of the focus on the business need. Whilst in practice the approach clearly improved the likelihood of a successful business outcome the work was incomplete. The purpose of this work reported in this thesis was to develop a greater understanding of the phenomena associated with IT delivery through a more principled and methodical approach.

The research has contributed significantly to this understanding and differs significantly from the earlier work as follows:

- The framing of the problem, the extent of the problem and the research question
- Access to the literature provided greater insight into the work of others
- The understanding of research methods and research design
- Detailed analysis which provided a greater understanding of the problem and the business and IT relationship
- A thorough understanding of the weaknesses of the current IT delivery model
- A thorough understanding of how the current weaknesses can be overcome.

The earlier work (2008) led to proposing a New Maturity Model (NMM), a concept that illustrates theoretical perfection used to describe a future complex adaptive system (Miller, 2008b) using constructs based on the disconfirmation model (Section 2.4).

Active management, based on the BITRM, provides an improved management framework that can be implemented now, meets the needs of future scenarios, and potentially provides a degree of control over self-adaptive/self-managing systems and other complex business and IT landscapes.

8.7   Limitations

Specifically excluded from the scope of the research were the following:

- Any consideration of the broader political, moral and spiritual implications of global society (Heslam, 2011) that might be prevalent in some undertakings (e.g. public sector, not-for-profit, religious, etc.). Aspects of the research output have been used to improve the assessment and <u>ALIGNMENT</u> of IT in public sector businesses with great success. Where the culture is less business-like than in commercial enterprises there are complexities that need to be considered further in order to arrive at a robust, generalized solution. There is no reason to assume that this could not be undertaken but it was excluded from this research.

- Estimates of the extent to which the success rates associated with IT investment might be improved as a result of implementing active management. Where aspects of the approach have been used to address real world problems, successful outcomes have been encouragingly high. Success rates have benefited from an improved <u>TOTAL BUSINESS EXPERIENCE</u> through constant attention to needs gaps and improved response to change.

- An automated or software solution. Although the findings can be expected to be supported by a software tool or integrated into existing toolsets at some point in the future, a software solution requires funding, a development platform and a channel to market and is outside of the scope of the research design.

- Access to the data. As is usual with primary research data in private ownership, ethics and fiduciary responsibilities dictate that access to the data and the actual coding is limited to those with legitimate interests.

- The total elimination of subjectivity associated with assessing the <u>TBE</u>. The assessment process relies on being able assess the gap between the actual service and the ideal and this is expressed as a percentage. Some subjectivity is involved in making this judgment. However, when using the code system to assess a service provider, some 10 properties of the <u>TBE</u> are considered each with seven or eight dimensions making 70 or 80 concepts that have to be evaluated to create a profile. This allows the service to be scrutinized in some detail. Views will be sought such that triangulation or consensus is achieved and the reasons for any shortfall noted together with causes and opportunities. In practice no scores determined in a consultancy situation have ever been disputed. What was achieved in each case was a better way of expressing the need or the gap all of which gave rise to value creation opportunities. As the IT industry changes it may be that fewer technical decisions are made by businesses and even in what remains of the IT function. This being the case it is more likely that the management of the IT services will involve assessing the <u>TBE</u>. Subjectivity cannot

be eliminated totally when measuring the business experience and so managers must get used to making subjective assessments.

8.8   Future Work

Future work consists of four types: the development of the coding system, qualitative research to explore the applicability of these finding in non-business environments, quantitative research to examine the effect of the findings on success rates, and the creation of a prototype solution which can help businesses to implement the active management framework and so convert the research into business benefits.

Developmental

All definitions are currently grounded in the data through coding and constant comparison (Chapter 4). To generalize the output there is a need to review all definitions derived from the data and if necessary modify them for the further work. This will entail incorporating, where appropriate, any commonly used management and technical terms from the work of others (Chapter 2) including current practices (Section 1.3) that couldn't be derived from the data.

Future Qualitative Research

The concepts developed through this research have been used successfully in public sector as well as private sector businesses even though there are clear differences between the two. As was expressed under limitations (Section 8.7), further research is required to understand whether active management suitably caters for the more broadly based needs of the stakeholder groups present in other, non-business, organizations, i.e. central and local government, non-departmental public bodies, non-governmental organizations, charities, religious organizations, etc.

Whilst the internal behaviour towards needs gaps may, in many cases, be equivalent to what might be expected in a commercial business, personal experience suggests that this is not always the case. The cultural differences may necessitate some recalibration of the model, e.g. there is likely to be a difference in tolerance levels where gaps occur such that they may not be as easily measurable in all cases. This could be enough to render the model less sensitive to <u>CHANGE</u> and so less effective in these kinds of organizations.

Future Quantitative Research

The research findings will help to maintain the alignment between IT services and the business needs and make governance a more dynamic and responsive process. This addresses many of the perennial problems for CIOs and for businesses but there is a

need to establish the extent to which this translates into savings from improved success rates.

There is a requirement to undertake some field trials to ascertain what improvement in the success rate associated with IT investment can be expected from adopting active management. Quantitative research in this area will help to improve the management framework and refine the detailed definitions. If significant improvement could be proven this would accelerate adoption.

Collecting evidence will be difficult. It will not be possible to compare the same business with and without active management, for example. Where active management is implemented the success rates may be measured to see if they have improved but a history of success rates would be required for comparison purposes and any other changes that were introduced at the same time could invalidate the findings.

A wide and rapid adoption of active management in businesses across many industry sectors would be more convincing if they all provided evidence of improvement. Given that success rates have been so consistently low for so long, consistently high success rates where active management had been introduced compared with no improvement elsewhere would be persuasive. A product which helps organizations to implement active management would help to accelerate its adoption (Section 7.5) and generate this greater volume of data to provide evidence of the benefits.

Converting the Research into Business Benefits

The aim over the short term is to fund and build a prototype active management solution to speed adoption and to facilitate evaluation, i.e. the future quantitative research. The rationale for this and the visualization is as illustrated below.

The IT industry is reaching a stage where hardware failure can be fixed immediately or even be anticipated so that the effects of hardware failure are totally avoided (Section 6.6). Unless the remainder of the IT delivery model (Section 1.3) can be improved the developments in the management of hardware will serve to further highlight its inadequacies, as follows:

- A product and production paradigm where service takes second place or is ignored completely and business needs only get addressed when they are included within a requirements specification (Section 1.3);
- Risks and cost of failure remain unchanged (Section 1.4);
- The extent to which I have seen IT methods deployed is in practical terms arbitrary: businesses are not encouraged to implement all elements of a

methodology because it is known that this would be excessively burdensome but instead method vendors encourage their clients to tailor the IT method to their own needs – if there is no control over outcome and only partial control over process, there is no control at all;

- Accreditation and auditing is encouraged by the method vendors but I know this is expensive and often not maintained: what control at what cost?

- The latest version of COBIT (i.e. COBIT 5) is seeking to align more closely with the business strategy recording the nested business and IT objectives and the mapping of business processes: assuming the business strategy can be defined (Section 2.3) this could potentially be managed with an enterprise architecture but it is still complex to build and maintain adversely affecting the IT supply organization's ability to deliver useful business functionality with any degree of agility (Section 2.3);

- Extended enterprise solutions are rapidly expanding beyond the closed communities making IT services more difficult to manage by conventional means;

- Given that CHANGE is infinite and unpredictable (Section 4.2) this will be difficult to manage within EA and will introduce further complications.

The current IT delivery model is probably unsustainable. Active management offers an additional approach which is explained by the following fictitious scenario.

Suppose an active management prototype solution was available at the time the field notes for Company 1 were taken and that the CIO involved had installed it in order to help him to bring the IT services under control. The system comes with a dashboard display illustrating the active management framework, the organization, and the services. Figure 8.1 is a visual representation of the organization.
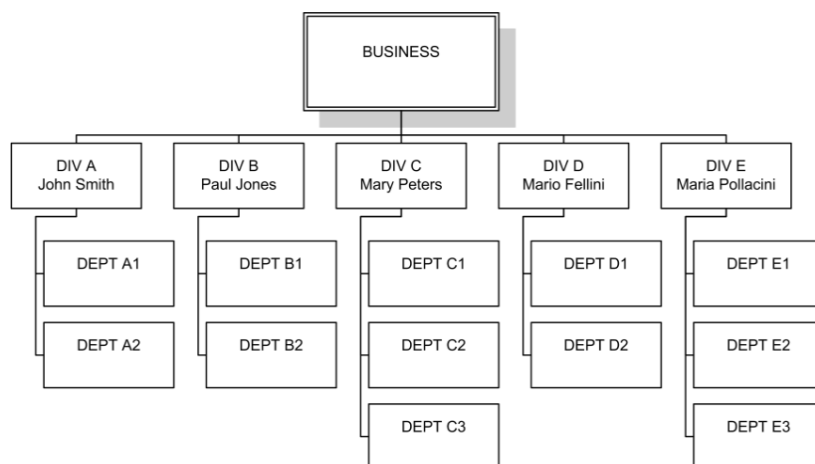
Figure 8.1: Organization chart of the business

The organization chart illustrated here shows for simplicity the structure of the internal divisions and departments of the business but this could easily be enlarged to include stakeholders in all internal and external user groups across the extended enterprise or in a B2I manner.

Figure 8.2 is a visual representation of the *service stack* reflecting the structure of the SERVICE SPECIFICATION as it is defined within the code system (Appendix D) and as it appears in Table 4.1. The service stack can also be considered to represent the major touch-points with the business (Section 2.4).
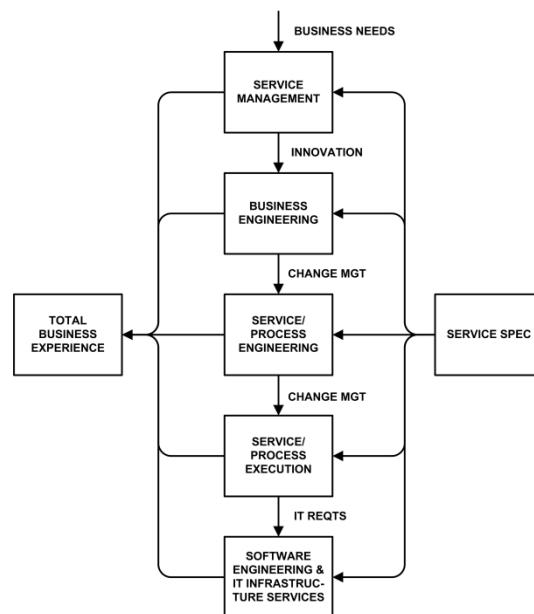
Figure 8.2: Service stack of service related activities

A business dashboard incorporates the active management framework, the organization chart, and the service stack. This would have been implemented in addition to the IT delivery model the CIO was already using as there was no conflict between the two.

When the active management dashboard was first turned on almost everything was red[12] reflecting the extent of the combined concerns of the business at the time the field notes for Company 1 were taken. This is illustrated in Figure 8.3. The CIO hadn't realised just how bad things had become.

The CIO set about addressing the concerns but whilst doing this an unexpected CHANGE occurred. A new competitor had entered the market with a product that had a much lower cost using a channel to market that was not familiar to Company 1. It was some time before this was recognised and during this delay the competitor took 5% of the market

---

[12] The dashboard colour coding is RED for out of tolerance, AMBER for close to tolerance, and GREEN for within tolerance

share. The business worked out that the competitor's manufacturing process was superior and this was reducing material utilization. To remain competitive Company 1 had to respond with an improved manufacturing process and the channel to market required systems changes. The CIO asked for a requirements specification.

Two weeks into the specification the business learnt that it has lost a further 5% of market share. The CIO hears that marketing had raised a concern about the new market entrant with the CEO some months previously but no action had been taken. Manufacturing was cut back as a matter of urgency. Redundancies were announced. The business eventually sorted out its manufacturing process and introduced a new channel to market but it had to settle for a smaller market share.
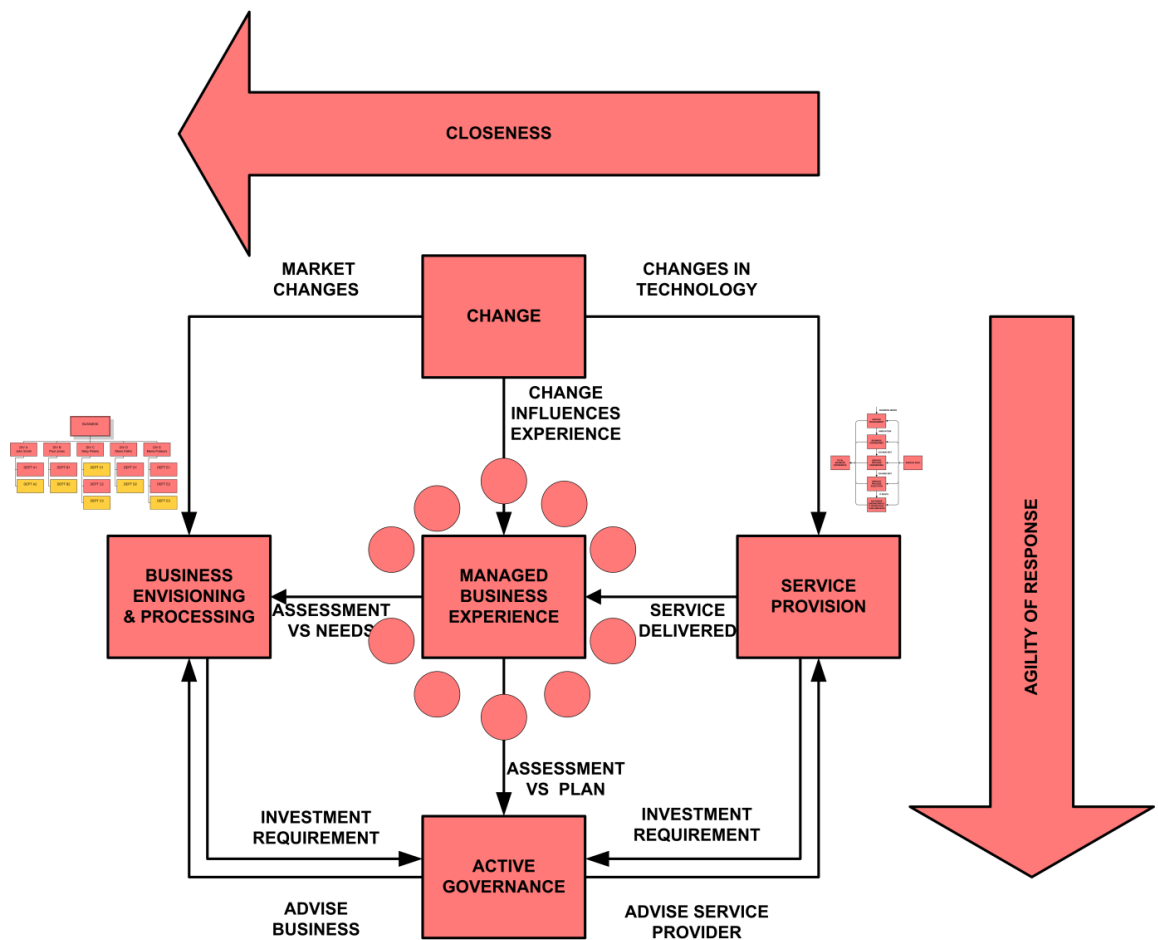
Figure 8.3: Active management dashboard showing the initial business concerns

After the IT service had stabilized the dashboard was green most of the time indicating that all IT services were within the tolerances agreed by the key stakeholders. During the early days of the implementation there were a few false reds where alerts were triggered by comments and assessments that turned out to be false alarms, where the tolerances were too low, or where the sensitivity was such that large variations could be expected.

The active management system was constantly sampling the whole of the business to monitor the TOTAL BUSINESS EXPERIENCE and to highlight a new BUSINESS NEED. The dashboard was now visible to key stakeholders responsible for the business governance of IT and to all board members.

Six months after the stabilization of active management parts of the dashboard were lit red again (Figure 8.4).
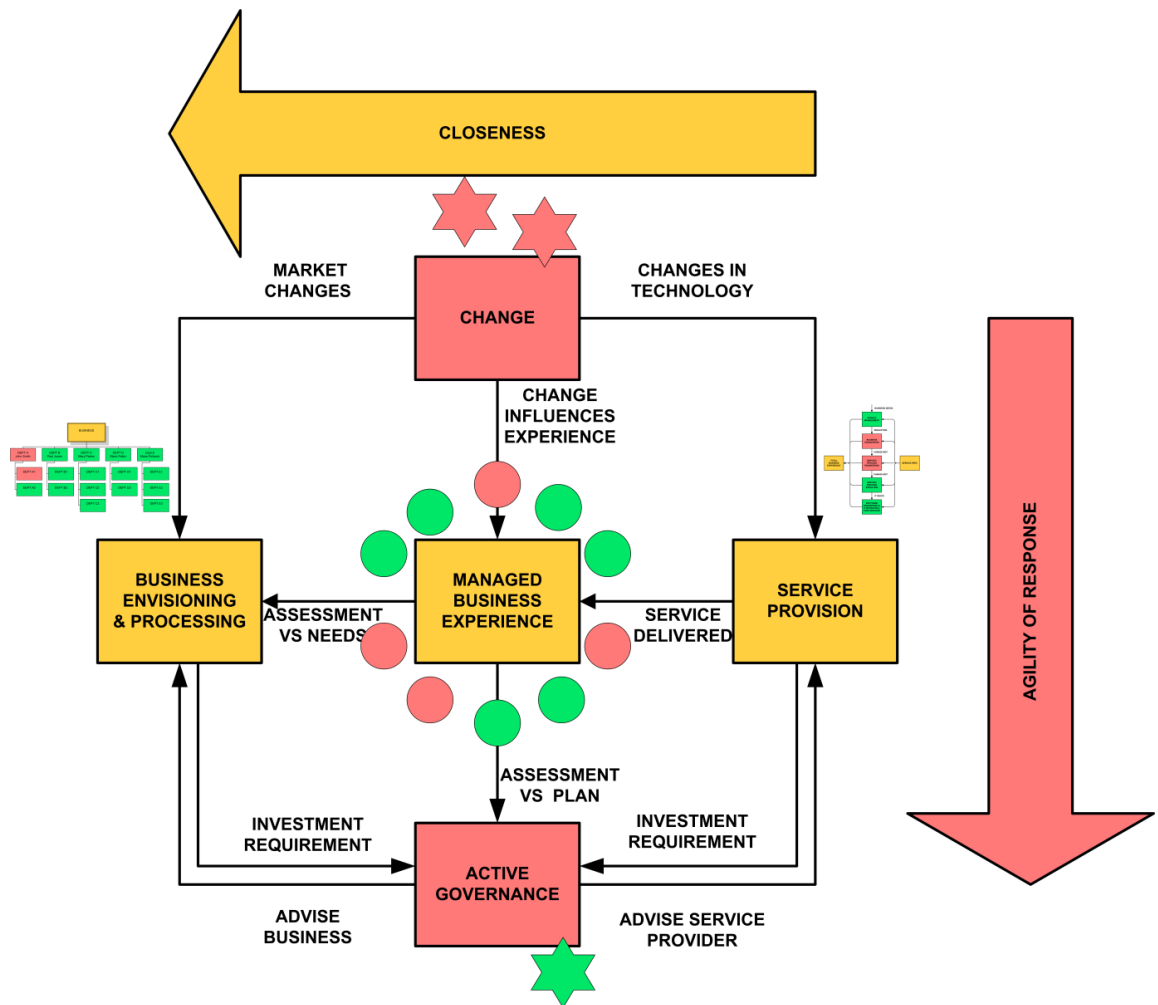
Figure 8.4: Active management dashboard alerting a need for alignment

It started with red alerts on the TBE. The red spots indicated which aspects of the business experience were being reported as inadequate, in this case SALES/VALUE ADD, DESIGN AND DEFINITION OF IT PRODUCTS AND SERVICES, DELIVERY OF IT PRODUCTS AND SERVICES, and the TECHNICAL INFRASTRUCTURE. The organization chart indicated that the problem had been identified by the people in marketing. The service stack indicated that BUSINESS ENGINEERING and BUSINESS PROCESS ENGINEERING services of the SERVICE SPECIFICATION were needed. Additional information had been provided as indicated by the red stars at CHANGE noting

another competitor "me-too" product but with a channel variation that was capable of stealing further market share.

Within 24 hours a modification to the channel strategy had been developed jointly between the IT business analysts and the marketing department. A proposal was available to the key stakeholders for comment and approval at the green star by Active Governance. The modification was approved and the competitor activity was thwarted.

The dashboard was now showing concerns from a different department about a major existing investment project (Figure 8.5).
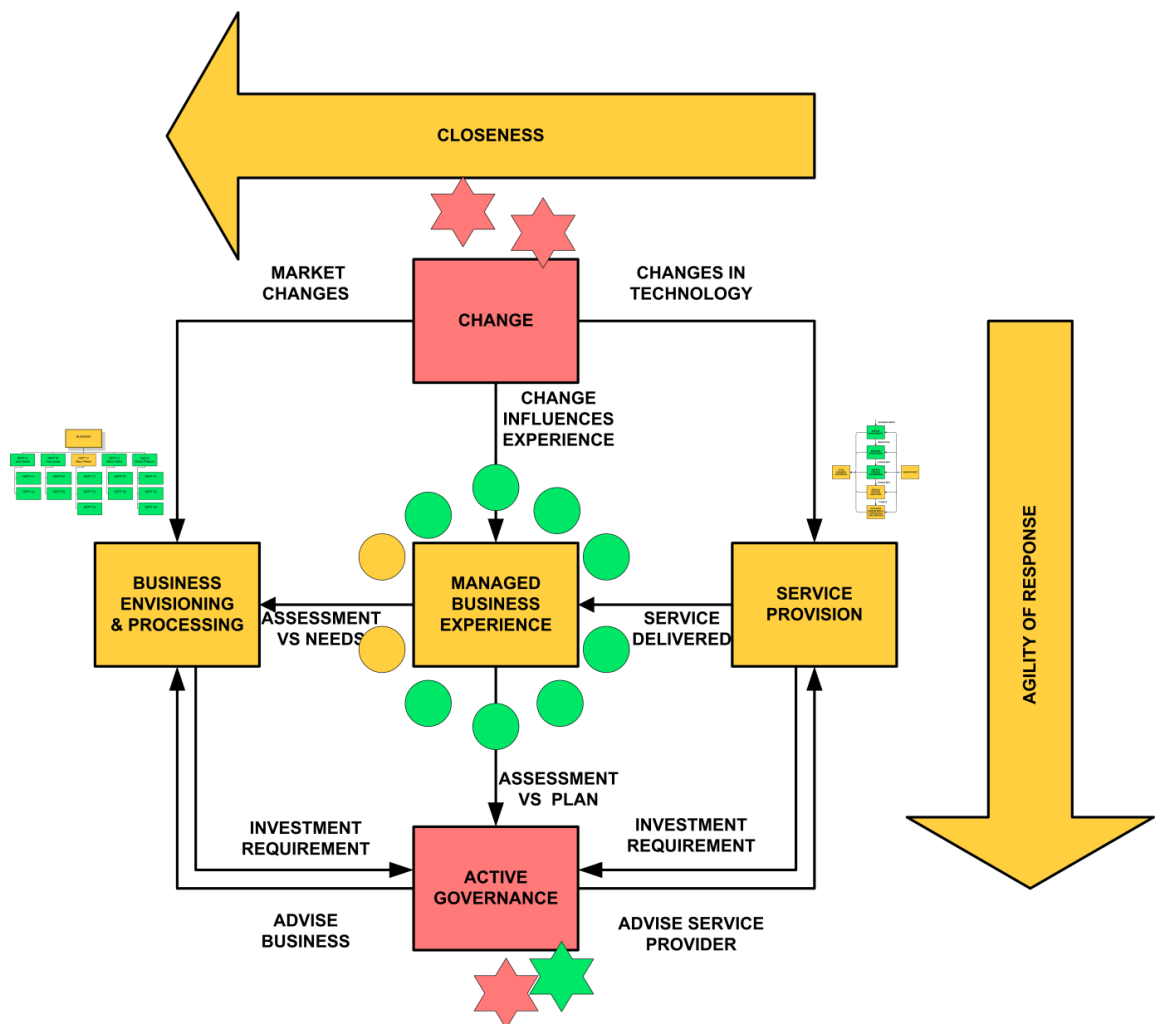
Figure 8.5: Active management dashboard with alert about existing project

The suggestion was that a solution that was being acquired and deployed may no longer be suitable. The divisional head who had raised the concern was the primary business sponsor for the investment who had noticed the same market CHANGE and was concerned about the long term viability of the new investment. She saw the competitor's channel strategy and decided to raise the investment concern as a governance issue as

indicated by the red star alongside the Active Governance box. Her instincts were correct and the view of the business was to axe the investment.

The CIO has become more popular and now receives the full support of his senior business colleagues. The dashboard is now integrated into the architecture and operational data and provides drill-down capabilities. As the CEO said, "*I wouldn't be where I am now if it wasn't for active management.*" The idea that the IT can be managed without any real knowledge of what the business stakeholders are thinking about the IT services they are receiving is strange but in the data this has been happening. If I relate this to my own experience this is also the case. Often the world has changed before anything gets delivered, especially on very large projects, and not delivering anything is often just as bad.

This illustration of how active management might work is completely fictitious but could have occurred as described in any of the four companies used for the research where it would have been very effective. It would also have been very effective in all of 20 or 30 companies that I have worked with over the last ten years.

Footnote to the Research Programme

The NHS National Programme for IT was used in Chapter 1 as an example of a high profile failure that recently cost the country £12B or more when it was cancelled in September 2011

 (Section 1.2). A newspaper article appeared in The Times on Monday December 17, 2012, a cutting of which is shown in Figure 8.6.

With a heading of "Hospitals offered cash to take 'cowboy' IT system" it reported that *"Hospitals in the UK are now being offered cash incentives to install a computer system at the centre of the disastrous health service IT programme in a deal MPs have described as bribery and 'mind-boggling waste'. An American company last year branded 'cowboys' by the Head of HMG Public Accounts Committee says it will pay local hospitals millions of pounds in signing-on fees to use the software because the company itself will be paid through a central NHS fund […] The plan reveals the lingering after-effects of the £11.4 billion National Programme for IT, which was supposedly killed off last year after ten years of failure to deliver easily accessible electronic patient records."* (Smyth and Pitel, 2012).

If an active management solution was an essential government pre-requisite to the development or installation of such a system at any NHS site the "waste" could perhaps have been avoided and the subsequent service could be managed in such a way that pricing was dependent upon the resultant TBE. If this didn't restrict the ambitions of over-

zealous suppliers it would at least help to ensure that business customers received the kind of business experience they needed.

Figure 8.6: The Times on Monday December 17, 2012

Regardless of the technology deployed or the service provider used, the total business experience should always be close to the business need and service providers should always respond to change with agility. This is a good philosophy for the next generation of the business management of IT. It is likely that active management in one form or another will become the basis for this and be linked to the other control mechanisms for infrastructure, architecture and services.

BIBLIOGRAPHY

Abdul-Gader, A.H. & Kozar, K.A., 1995. The Impact of Computer Alienation on Information Technology Investment Decisions: An Exploratory Cross-National Analysis. *MIS Quarterly*.

Abualkibash, M. & Elleithy, K., 2012. Cloud Computing: The future of the IT industry. *International Journal of Distributed and Parallel Systems,* 3**,** 1-12.

Adolph, S., Hall, W. & Kruchten, P., 2008. A Methodological Leg to Stand On: Lessons Learned Using Grounded Theory to Study Software Development. *In* M. Chechik, M. Vidger & D. Stewart (eds.) *In Proceedings of the 2008 Conference of the Center For Advanced Studies on Collaborative Research: Meeting of Minds.* Ontario, Canada, .

Ahituv, N., Zviran, M. & Glezer, C., 1999. Top Management Toolbox for Managing Corporate IT. *Communications of the ACM,* 42**,** 7.

Anderson, J.C., Rungtusanatham, M. & Schroeder, R.G., 1994. A Theory of Quality Management Underlying the Deming Management Method. *Academy of Management Review,* 19**,** 472-509.

Angell, I.O. & Smithson, S., 1990. Managing Information Technology: A Crisis of Confidence? *European Management Journal,* 8.

Ashton, K., 2010. That 'Internet of Things' Thing. *RFID Journal.*

Babakus, E. & Boller, G.W., 1992. An Empirical Assessment of the SERVQUAL Scale. *Journal of Business Research,* 24**,** 253-268.

Bahsani, S., Himi, A., Moubtakir, H. & Semma, A., 2011. Towards a pooling of ITIL V3 and COBIT. *International Journal of Computer Science Issues,* 8**,** 7.

Bakry, S.H. & Alfantookh, A., 2006. IT-governance practices: COBIT. *Saudi Computer Society*.

Baskerville, R.L., 1999. Investigating Information Systems with Action Research. *Communications of AIS,* 2 Article 19.

BCS, 2013. *The Chartered Institute for IT* [online]. http://www.bcs.org/ [Accessed 2013]

Becker, J. & Bjorn, N., 2007. Epistemological perspectives on IS research: a framework for analysing and systematizing epistemological assumptions. *Information Systems Journal,* 17**,** 197-214.

Ben-Menachem, M. & Gelbard, R., 2002. Integrated IT Management Tool Kit. *Communications of the ACM,* 45**,** 7.

Berry, L.L., Carbone, L.P. & Haeckel, S.H., 2002. Managing the Total Customer Experience. *MIT Sloan Management Review,* 43**,** 7.

Bicknell, D., 2012. Cabinet Office promises to challenge 'culture of secrecy' on IT projects. *The Guardian.* London: Guardian Professional.

Bitner, M.J., 1990. Measuring Service Quality: A Reexamination and Extension. *Journal of Marketing,* 54**,** 15.

Boehm, B., 2003. Value-Based Software Engineering. *ACM Software Engineering Notes,* 28**,** 12.

Boehm, B., 2008. Making a Difference in the Software Century. *Computer,* March 2008**,** 32-38.

Bourque, P. & Dupuis, R., 2004. *SWEBOK: Guide to the Software Engineering Body of Knowledge.* : IEEE CS.

Brady, M.K., Cronin, J.J. & Brand, R.R., 2002. Performance-only measurement of service quality: a replication and extension. *Journal of Business Research,* 55**,** 17-31.

Bratman, M.E., Israel, D.J. & Pollack, M.E., 1988. Plans and Resource-Bounded Practical Reasoning. *Computational Intelligence,* 4.

Bryant, A., 2003. A Constructive/ist Response to Glaser. *Forum Qualitative Social Research,* 4.

Brynjolfsson, E., 1993. The Productivity Paradox of Information Technology: Review and Assessment. *Communications of the ACM,* December.

Burn, C. & Thompson, C., 2011. Misconceptions about cloud computing. *FT.com.* London: Financial Times Ltd.

Burrows, S., 2010. Has the private sector caught the public sector IT disease? *In* A. Mari (ed.) *Computerweekly.com: Management Matters.* London: Computer Weekly, This is a guest post by Steve Burrows, principal consultant at Isle of Man-based Business & IT Consultancy SBA. He is a chartered Fellow of the British Computer Society (BCS) and a member of the CW500 Club and the BCS ELITE senior IT leadership forums.

Buyya, R., Yeo, C.S., Venugopal, S., Broberg, J. & Brandic, I., 2008. Cloud Computing and Emerging IT Platforms: Vision, Hype, and Reality for Delivering Computing as the 5th Utility. *CloudITPlatforms2008.* 28.

Campbell, B., Kay, R. & Avison, D., 2005. Strategic alignment: a practitioner's perspective. *Journal of Enterprise Information Management,* 18**,** .653 - 664.

Carlzon, J., 1987. *Moments of Truth* Cambridge, MA: Ballinger Publishing Company

Cavano, J.P. & McCall, J.A., 1978. A Framework for the Measurement of Software Quality. *Proceedings of the Annual Reliability an.d Maintainability Symposium*

Chan, Y.E. & Reich, B.H., 2007. IT alignment: what have we learned? *Journal of Information Technology,* 22**,** 297-315.

Charmaz, K., 2000. Grounded Theory: Objectivist & Constructivist Methods. *In* N. Denzin & Y.S. Lincoln (eds.) *Handbook of Qualitative Research, 2nd edition.* Thousand Oaks: Sage., pp.509-535.

Chen, H.-M., 2008. Towards Service Engineering: Service Orientation and Business-IT Alignment.*1st Annual International Conference on System Sciences* Hawaii 114-114.

Chesbrough, H. & Spohrer, J., 2006. A Research Manifesto for Services Science. *Communications of the ACM,* 49**,** 8.

Cho, J. & Trent, A., 2006. Validity in qualitative research revisited. *Qualitative Research,* 6**,** 319-340.

Clark, A., 2006. Anonymising Research Data. *ESRC National Centre for Research Methods,* 06.

Collins, T., 2007. Only a third of government IT projects succeed, says CIO. *Computer Weekly.* London: ComputerWeekly.com.

Collis, J. & Hussey, R., 1997. *Business Research A Practical Guide for Undergraduates and Postgarduate Students,* Third Edition ed.: Palgrave MacMillan.

CompTia, 2013. *CompTIA Certifications* [online]. http://certification.comptia.org/getCertified/certifications.aspx [Accessed 2013]

Cooke, D., Gelman, L. & Peterson, W.J., 2001. *ERP Trends*: T.C. Board.

Corbin, J. & Strauss, A., 2008. *Basics of Qualitative Research,* third edition ed.: Sage.

Corso, M. & Pellegrini, L., 2007. Continuous and Discontinuous Innovation: Overcoming the Innovator Dilemma. *Creativity and Innovation Management,* 16**,** 333-347.

Cronin, J.J. & Taylor, S.A., 1994. SERVPERF vs. SERVQUAL: Reconciling performance-based and perceptions-minus-expectations measurement of service quality. *Journal of Marketing,* 58**,** 125-131.

Cronin., J.J. & Taylor, S.A., 1992. Measuring Service Quality: A Reexamination and Extension. *Journal of Marketing,* 56**,** 15.

Cumps, B., Viaene, S. & Dedene, G., 2006. Managing for Better Business-IT Alignment. *IT Pro.* IEEE.

Dalcher, D. & Drevin, L., 2003. Learning from Information Systems Failures by Using Narrative and Ante-narrative Methods. *South African Institute for Computer Scientists and Information Technologists.*

Datardina, M. & Parker, R., 2011. The top ten TECH issues. *CA Magazine.* Toronto: Canadian Institute of Chartered Accountants, 20-25.

Dedeke, A., 2012. Improving Legacy-System Sustainability: A Systematic Approach. *IT Pro.* Washington DC: IEEE Computer Society, 38-43.

De Haes, S. & Grembergen, W.V., 2005. IT Governance Structures, Processes and Relational Mechanisms: Achieving IT/Business Alignment in a Major Belgian Financial Group. *38th Hawaii International Conference on System Sciences.* Hawaii, 10.

De Haes, S. & Grembergen, W.V., 2009. An Exploratory Study into IT Governance Implementations and its Impact on Business/IT Alignment. *Information Systems Management,* 26**,** 123-137.

Delone, W.H. & McLean, E.R., 1992. Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research,* 3**,** 60-95.

Dey, I., 1993. *Qualitative Data Analysis: A User Friendly Guide for Social Scientists* Abingdon, Oxon.: Routledge.

Diaconita, V., 2011. Considerations Regarding Designing and Administrating SOA Solutions. *Database Systems Journal,* 11**,** 10.

Dobson, S., Denazis, S., Fernandez, A., Gaiti, D., Gelenbe, E., Massacci, F., Nixon, P., Saffre, F., Schmidt, N. & Zambonelli, F., 2006. A Survey of Autonomic Communications. *ACM Transactions on Autonomous and Adaptive Systems,* 1**,** 223-259.

Douglas, D., 2003. Inductive Theory Generation: A grounded approach to business inquiry. *Electronic Journal of Research Methods,* 2**,** 47-54.

Dowling, M., 2006. Approaches to reflexivity in qualitative research. *Nurse Researcher,* 13**,** 7-21.

Elbanna, A. & Murray, D., 2009. Organising IS projects for innovation: A collective mindfulness perspective. *Americas Conference on Information Systems: AMCIS 2009* San Francisco, 14.

EMC, 2012. *Press Release: Better Use of Big Data is Key to Unlocking Growth* [online]. EMC Corporation. Available from: [Accessed Access Date

Engelbart, D.C., 1963. A conceptual famework for the augmentation of man's intellect. *Computer-supported cooperative work: a book of readings* San Francisco: Morgan Kaufmann Publishers Inc. .

Eriss, 2010. *What is Service Science?* [online]. Tilburg University. Available from: http://www.tilburguniversity.nl/eriss/research/science/ [Accessed 2010].

Espiner, T., 2011. NHS IT project faces 'acceleration of dismantling'. *ZDNet UK.* London: CBS Interactive.

Eveleens, J.L. & Verhoef, C., 2010. The Rise and Fall of the Chaos Report Figures. *IEEE Software*.

Feldman, S.I., Nathan, K.S., Li, T., Hidaka, K. & Schulze, C., 2006. The Clarion Call for Modern Services: China, Japan, Europe, and the U.S. *Communications of ACM* 49**,** 4.

Finlay, L., 2002. "Outing" the researcher: The provenance, process, and practice of reflexivity. *Qualitative Health Research,* 12**,** 531-545.

Frye, D.W. & Gulledge, T.R., 2007. End-to-end business process scenarios. *Industrial Management & Data Systems,* 107**,** 749-761.

Galup, S., Dattero, R., Quan, J.J. & Conger, S., 2007. Information Technology Service Management: An Emerging Area for Academic Research and Pedagogical Development. *SIGMIS CPR'07.* St. Louis, Missouri: AMC.

Gartner, 2012. *Gartner Says Worldwide IT Spending to Grow 3.7 Percent in 2012* [online]. Gartner. Available from: http://www.gartner.com/it/page.jsp?id=1888514 [Accessed 2012].

Gilb, T., 1988. *Principles of Software Engineering Management* London: Addison-Wesley.

Glaser, B., 2004. Remodeling Grounded Theory. *The Grounded Theory Review,* 4**,** 24.

Glaser, B. & Strauss, A., 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*: Transaction Publishers / London, Weiderfeld and Nicolson.

Glass, R.L., 2006. The Standish Report: Does it really describe a software crisis? *Communications of the ACM*

Glushko, R.J., 2008. Designing a service science discipline with discipline. *IBM Systems Journal,* 47**,** 13.

Goddard, H., Murphy, S. & O'Neill, N., 2011. *CIO Survey Report 2011 The 'Guerrilla' CIO: working smarter to add value.* Dublin.

Godfrey, A., 2012. CIM Strategy. *The Marketer.* London: Chartered Institute of Marketing, 50-50.

Google, 2013. *WEBRTC* [online]. Google Chrome Team. Available from: http://www.webrtc.org/ [Accessed 2013].

Gray, P. & Hovav, A.Z., 2007. The IS Organization of the Future: Four Scenarios for 2020. *Information Systems Management,* 24**,** 113-120.

Grembergen, W.V., De Haes, S. & Moons, J., 2005. Linking Business Goals to IT goals and Cobit Processes. *Information Systems Control Journal,* 4.

Gummesson, E., 2002. Relationship marketing and a new economy: It's time for de-programming. *Journal of Services Marketing,* 16**,** 585-589.

Henderson, J.C. & Venkatraman, N., 1989. *Strategic alignment: A framework for strategic information technology management.* Boston: M.C.F.I.S.R. Cambridge, Sloan School of Management, Massachusetts Institute of Technology, CISR WP No. 190 Sloan WP No. 3039-89-MS 90's WP No. 89-076.

Henderson, J.C. & Venkatraman, N., 1993. Strategic alignment: Leveraging information technology for transforming organisations. *IBM Systems Journal,* 32.

Heslam, P., 2011. *Transforming Business* [online]. www.transformingbusiness.net [Accessed 2011]

Hodge, M., 2011. Public Accounts Committee publishes report into FiReControl project *In* P.A. Committee (ed.) 20 September 2012 ed. London: HMG.

Huang, C.D. & Hu, Q., 2007. Achieving IT-Business Strategic Alignment via Enterprise-Wide Implementation of Balanced Scorecards. *Information Systems Management,* 24**,** 173-184.

Hughes, B., 2008. *Exploiting IT for Business Benefit,* First ed.: The British Computer Society.

IBM. ISACA. Available from: http://www.isaca.org/COBIT/Pages/default.aspx [Accessed 2012].

ISO9001, 2008. Quality management systems -- Requirements. International Organization for Standardization.

ISO/IEC20000, 2012. Service Management. Switzerland: International Organization for Standardization.

ISO/IEC27000, 2012. Information Security. *Information technology -- Security techniques -- Information security management systems -- Overview and vocabulary.* Switzerland: International Organization for Standardization.

ISP/IEC38500, 2008. Corporate governance of information technology. Switzerland: International Organization for Standardization, 15.

ITIL, 2010. *Welcome to the Official ITIL® Website* [online]. Cabinet Office, formerly the OGC. Available from: http://www.itil-officialsite.com [Accessed 2010].

ITS, 2013. *ITS United Kingdom* [online]. http://www.its-uk.org.uk/ [Accessed 2013]

Jia, R. & Reich, B.H., 2011. IT Service Climate—An Essential Managerial Tool to Improve Client Satisfaction With IT Service Quality. *Information Systems Management,* 9**,** 174-179.

Jia, R., Reich, B.H. & Pearson, J.M., 2008. IT Service Climate: An Extension to IT Service Quality Research. *Journal of the Association for Information Systems,* 9**,** 294-320.

Junarsin, E., 2009. Managing Discontinuous Innovation. *International Management Review,* 5**,** 10.

Kang, D., Lee, J., Choi, S. & Kim, K., 2010. An ontology-based Enterprise Architecture. *Expert Systems with Applications,* 37**,** 1456-1464.

Kaplan, R.S. & Norton, D.P., 1996. *The Balanced Scorecard*: HBS Press.

Karagiannis, D., Ronaghi, F. & Fill, H.-G., 2007. Business-Oriented IT Management: Developing E-Business Applications with E-BPMS. *ICEC'07.* Minneapolis, Minnesota, USA, 97-100.

Karnwal, T., Sivakumar, T. & Aghila, G., 2011. Cloud Services in Different Cloud Deployment Models: An Overview. *International Journal of Computer Applications,* 34**,** 7.

Kemerer, C.F. & Sosa, G.L., 1990. Systems development risks in strategic information systems. *Information and Software Technology,* 33**,** 12.

Kemp, P. & McManus, J., 2009. Opinion: Enterprise architecture - dogmatic and over-ambitious? *ITNOW.* London: British Computer Society, 20-21.

Kephart, J.O. & Chess, D.M., 2003. The vision of autonomic computing. *Computer.* IEEE Computer Society, 41-50.

Khaiata, M. & Zualkernan, I.A., 2009. A Simple Instrument to Measure IT-Business Alignment Maturity. *Information Systems Management,* 26**,** 138-152.

Knouse, S.B., Carson, P.P., Carson, K.D. & Heady, R.B., 2009. Improve constantly and forever The influence of W. Edwards Deming into the twenty-first century. *The TQM Journal,* 21**,** 449-461.

Koller, T., 1994. Value Based Management. *The McKinsey Quarterly* 1994.

Kotler, P., Hayes, T. & Bloom, P., 2002. *Marketing Professional Services,* 2 ed.

Krigsman, M., 2012. Worldwide cost of IT failure (revisited): $3 trillion. *ZDNet.* Blog post talking about a rationale for calculating the global cost of IT failure prompted by flawed estimates by Roger Sessions of $6 trillion.

Langer, E.J., 1989. *Mindfulness ,* : Addison-Wesley, Reading, MA, .

Langer, E.J. & Moldoveanu, M., 2000. The Construct of Mindfulness. *Journal of Social Issues,* 56**,** 1-9.

Lansley, A. & Maude, F., 2011. Dismantling the NHS National Programme for IT. *In* D.O. Health (ed.) London: HMG.

Leitner, P.M., 1999. Japan's post-war economic success: Deming, quality, and contextual realities. *Journal of Management History,* 5**,** 489-505.

Leonard, A., 2005. A Conceptual Framework for Explaining the Value of End User Maturity Levels for IT Managemented. *SAICSIT 2005.*

Liker, J.K., 2004. *The Toyota Way* New York: McGraw-Hill.

Likert, R., 1932. A Technique for the Measurement of Attitudes. *Archives of Psychology,* 22.

Lillington, K. 2005. Visionary professor takes a look at the wild-card future of computer science *Irish Times.*

Lincoln, Y.S. & Guba, E.G., 1985. *Naturalistic inquiry* Beverly Hills, C.A.: Sage Publications.

Little, T., 2006. Schedule estimation and uncertainty surrounding the cone of uncertainty. *IEEE Software.* IEEE

Luftman, J., 2003. Assessing IT/Business Alignment. *Information Systems Management,* 6**,** 8.

Luftman, J. & Brier, T., 1999. Achieving and Sustaining Business/IT Alignment. *California Management Review,* 42.

Luftman, J. & Kempaiah, R., 2007. An Update on Business-IT Alignment: "A Line" Has Been Drawn. *MIS Quarterly,* 6.

Luftman, J.N., Papp, R. & Brier, T., 1999. Enablers and Inhibitors of Business and IT Alignment. *Communications for the Association of Information Systems,* 1**,** 33.

Mack, C.A., 2011. Fifty years of Moore's Law. *IEEE Transactions on Semiconductor Manufacturing,* 24.

Maes, R., Rijsenbrij, D., Truijens, O. & Goedvolk, H., 2000. Redefining business-IT alignment through a unified framework. *Landelijk Architectuur Congres 2000.* Amsterdam, 25.

Mansfield-Devine, S., 2012. Interview: BYOD and the enterprise network. *Computer Fraud & Security.* Elsevier Ltd, 4.

Manwani, S., 2008. *IT Enabled Business Change* Swindon: BCS.

Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J. & Ghalsasi, A., 2011. Cloud computing — The business perspective. *Decision Support Systems,* 51**,** 176-189.

Martin, D., 2011. £12bn NHS computer system is scrapped... and it's all YOUR money that Labour poured down the drain. *Mail Online.* London: Associated Newspapers Ltd.

Martin, J.E., 1989. *Information engineering: a trilogy* New Jersey: Prentice Hall PTR.

Matavire, R. & Brown, I., 2008. Investigating the Use of "Grounded Theory" in Information Systems Research. *SAICSIT 2008.*

Maxqda10, 2012. *VERBI Software* [online]. http://www.maxqda.com/products/maxqda10 [Accessed 2012].

McBride, N., 2002. Autonomic Computing and the Future of IT Service Management. *Journal of the IT Service Management Forum,* February 2002**,** 4.

McConnell, S., 1998. *Software Project Survival Guide: How to be Sure Your First Important Project isn't Your Last* Washington: Microsoft Press.

Melville, N., Kraemer, K. & Gurbaxani, V., 2004. Review: Information technology and organisational performance: an integrative model of IT business value. *MIS Quarterly,* 28**,** 283-322.

Meyer, C. & Schwager, A., 2007. Understanding Customer Experience. *Harvard Business Review,* 85**,** 13.

Michel, S., Vargo, S.L. & Lusch, R.F., 2007. Reconfiguration of the conceptual landscape: a tribute to the service logic of Richard Normann. *Journal of the Academy of Marketing Science,* 36.

Miller, D., 2005. *Business-Focused IT - How 'brand value' enhances IT product and service excellence*: ITDYNAMICS Ltd.

Miller, D., 2008a. *Business-Focused IT and Service Excellence,* second edition ed.: British Computer Society.

Miller, D., 2008b. *Business-Focused IT and Service Excellence: A New Marturity Model (Figs 5.2, 5.4. pp 165-167).* Second Edition ed.

Miller, D. & Woodman, M., 2011a. A Business-Focused IT Service Model for Cloud. *1st International Conference on Cloud Computing and Service Science CLOSER 2011.* Noordwijkerhout, The Netherlands, 10.

Miller, D. & Woodman, M., 2011b. Service Models For IT Management, IT Alignment and IT Governance. *The UK Academy for Information Systems 2011.* Oxford University, England, 25.

Mills, J., Bonner, A. & Francis, K., 2006. The Development of Constructivist Grounded Theory. *International Journal of Qualitative Methods,* 5.

Mingers, J., 2001. Combining IS Research Methods: Towards a Pluralist Methodology. *Information Systems Research,* 12.

Mingers, J., 2004. Real-izing information systems: critical realism as an underpinning philosophy for information systems. *Information and Organisation,* 14**,** 17.

Moore, G.E., 1965. Cramming more components onto integrated circuits. *Electronics,* 38**,** 4.

Myers, B.L., Kappelman, L.A. & Prybutok, V.R., 1997. A Comprehensive Model for Assessing the Quality and Productivity of the Information Systems Function: Toward a Theory for Information Systems Assessment. *Information Systems Management Journal,* 10.

Narasimhan, B. & Nichols, R., 2011. State of Cloud Applications and Platforms: The Cloud Adopters' View. *Computer Weekly*.

Niekerk, J.C.V. & Roode, J., 2009. Glaserian and Straussian Grounded Theory: Similar or Completely Different? *SAICSIT'09.* Vanderbijlpark, South Africa.

Nolan, R. & McFarlan, W., 2005. Information Technology and the Board of Directors. *Harvard Business Review,* October**,** 11.

Nolas, S.-M., 2011. Grounded Theory Approaches. *In* N. Frost (ed.) *Qualitative Research Methods in Psychology: Combining Core Approaches.* New York: Open University Press, 223.

Normann, R. & Ramírez, R., 1993. From Value Chain to Value Constellation: Designing Interactive Strategy. *Harvard Business Review,* 71**,** 16.

O'Neill, P., Mendel, T., Garbani, J.-P. & Reedwan, I., 2006. *BSM Is Coming Of Age: Time To Define What It Is*.

Oliver, R.L., 1980. A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research,* 17**,** 460-469.

Otgi, 2008. Permitted use of Best Management Practice White Papers The IT Governance Institute and Office of Government Commerce, 131.

Pande, P.S., Neuman, R.P. & Cavanagh, R.R., 2000. *The Six Sigma Way* New York: McGraw-Hill.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L., 1985. A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing,* 49.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L., 1988. SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing,* 64**,** 12-40.

Parasuraman, A., Ziethaml, V.A. & Berry, L.L., 1994. Reassessment of Expectations as a Comparison Standard in Measuring Service Quaiity: implications for Furtiier Research. *Journal of Marketing,* 58**,** 111-124.

Petersen, P.B., 1999. Total quality management and the Deming approach to quality management. *Journal of Management History,* 5**,** 468-488.

Pianatanida, M., Tananis, C. & Grubs, R., 2002. Claiming Grounded Theory for Practice-based Dissertation Research: A Think Piece. *Conference on Interdisciplinary Qualitative Studies: Roundtable Discussion* Athens, Georgia., 4.

Pijpers, V., Gordijn, J. & Akkermans, H., Year. Business strategy-IT alignment in a multi-actor setting: A mobile e-service case. *10th International Conference on Electronic Commerce (ICEC) '08*, Innsbruck, Austria: ACM.

Pinhanez, C., 2008. A Service Science Perspective for Interfaces of Online Service Applications. *IHC 2008 – VIII Simpósio Sobre Fatores Humanos em Sistemas Computacionais.* Porto Alegre, RS, Brazil., 10.

Pitt, L.F., Watson, R.T. & Kavan, C.B., 1997. Measuring Information Systems Service Quality: Concerns for a Complete Canvas. *MIS Quarterly,* June 1997**,** 13.

Poba-Nzaou, P., Raymond, L. & Fabi, B., 2008. Adoption and risk of ERP systems in manufacturing SMEs: a positivist case study. . *Business Process Management Journal,* 14**,** 20.

Porter, M.E., 1980. *Competitive Strategy* New York: Free Press

Prahalad, C.K. & Ramaswamy, V., 2004a. Co-creating unique value with customers. *Strategy & Leadership,,* 32**,** 4-9.

Prahalad, C.K. & Ramaswamy, V., 2004b. *The Future of Competition: Co-Creating Unique Value with Customers* Boston: Harvard Business School Press.

Pressman, R.S., 1992. *Software Engineering: A Practitioner's Approach,* third edition ed.: McGraw Hill.

Preston, R., 2011. Top 10 CIO Priorities. *Global CIO.* Information Week, 1-3.

Puresystems, 2012. *Expert integrated systems* [online]. IBM. Available from: http://www.ibm.com/ibm/puresystems/us/en/index.html [Accessed 2012].

Raghupathi, W.R., 2007. Corporate Governance of IT: A Framework for Development. *Communications of the ACM,* 50**,** 6.

Ramakrishna, D.H.V. & Lin, D.X., 1999. Perception of the Role of Information Technology Function in Organizations: Toward the Development of a Measure.

Reason, P. & Bradbury, H. (eds.) (2008) *The Sage handbook of action research : participative inquiry and practice / edited by* London: Thousand Oaks.

Reich, B.H. & Benbasat, I., 2000. Factors that influence the social dimension of alignment between business and information technology objectives. *MIS Quarterly,* 24**,** 81-113.

Roberts, R., Sarrazin, H. & Sikes, J., 2010. Reshaping IT management for turbulent times. *McKinsey Quarterly***,** 8.

Rodrigues, L.L.R., Barkur, G., Varambally, K.V.M. & Motlagh, F.G., 2011. Comparison of SERVQUAL and SERVPERF metrics: an empirical study. *The TQM Journal,* 23**,** 629-643.

Rosen, L.D., Karwan, K.R. & Scribner, L.L., 2003. Service quality measurement and the disconfirmation model: taking care in interpretation. *Total Quality Management,* 14**,** 13.

RR, 2012. *Monitoring systems: engine health management* [online]. Rolls Royce. Available from: http://www.rolls-royce.com/about/technology/systems_tech/monitoring_systems.jsp [Accessed 2012].

Rungtusanatham, M., Ogden, J.A. & Wu, B., 2003. Advancing theory development in total quality management: A "Deming management method" perspective. *International Journal of Operations & Production Management,* 23**,** 918 - 936.

Sauer, C. & Cuthbertson, C., 2003. The State of IT Project Management in the UK 2002-2003. Templeton College, University of Oxford, UK., 82.

Saunders, C.S. & Jones, J.W., 1992. Measuring Performance of the Information Systems Function. *Journal of Management Information Systems,* 8**,** 63-82.

Schäfer, D. 2012. Sir Mervyn calls for probe on RBS glitch *Financial Times*, 26 June 2012.

Schepers, T.G.J., Iacob, M.E. & Van Eck, P.A.T., Year. A lifecycle approach to SOA governance. *SAC'08*, Fortaleza, Ceara, Brazil: ACM.

Searle, J., 1990. Is the Brain's Mind a Computer Program? *Scientific American,* January 1990**,** 6.

Security, 2011. ISF advises on consumerisation. *Computer Fraud and Security.* Elsevier, 2.

SFIA, 2003. *Skills Framework for the Information Age* [online]. SFIA Foundation. Available from: http://www.sfia.org.uk/cgi-bin/wms.pl/46 [Accessed 2010].

Sharif, A., 2010. It's written in the cloud: the hype and promise of cloud computing. *Journal of Enterprise Information,* 123**,** 4.

Silva, E. & Chaix, Y., 2008. Business and IT Governance Alignment Simulation Essay on a Business Process and IT Service Model. *Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008).* Hawaii: IEEE, 434.

Silvius, A.J.G., Year. Business & IT Alignment in Theory and Practice. *40th Annual Hawaii International Conference on System Sciences*, Waikoloa, HI IEEE, 211b-211b.

Smith, T. & Booth, R., 2000. *IT Project Failures Costly, TechRepublic/Gartner Study Finds* [online]. TechRepublic, Inc. and Gartner Group, Inc. Available from: http://www.techrepublic.com/article/it-project-failures-costly-techrepublicgartner-study-finds/1062043 [Accessed 2011].

Spohrer, J. & Maglio, P.P., 2008. The Emergence of Service Science: Toward systematic service innovations to accelerate co-creation of value.

SSMED, 2010. *Service Science Worldwide Community* [online]. http://service-science.info/ [Accessed 2010].

Standish, 2009. *CHAOS Summary 2009* [online]. Standish Group. Available from: http://www1.standishgroup.com/newsroom/chaos_2009.php [Accessed 2010].

Stige, B., Malterud, K. & Midtgarden, T., 2009. Toward an Agenda for Evaluation of Qualitative Research. *Qualitative Health Research,* 19.

Strauss, A., 1993. *Continued permutations of action* Hawthorne, New York: Aldine de Gruyter Inc.

Swanson, E.B. & Ramiller, N.C., 2004. Innovating Mindfully with Information Technology pp 553-583. *MIS Quarterly,* 28**,** 31.

Tallon, P.P., 2007. A Process-Oriented Perspective on the Alignment of Information Technology and Business Strategy. *Journal of Management Information Systems,* 24**,** 227-268.

Tarafdar, M. & Qrunfleh, S., 2009. IT-Business Alignment: A Two-Level Analysis. *Information Systems Management,* 26**,** 338-349.

Teacher, 1991. Jargon: Bringing the fuzziness into focus. *The Reading Teacher.* International Reading Association, 366-367.

Ten Have, S., Ten Have, W., Stevens, F., Van Der Elst, M. & Pol-Coyne, F., 2003. *Key Management Models* London: Pearson Educatio Limited.

Tien, J.M. & Berg, D., 2003. A case for service systems engineering. *Journal of Systems Science and Systems Engineering,* 12**,** 13-38.

TOGAF, 2010. *TOGAF Version 9* [online]. The Open Group Available from: www.opengroup.org [Accessed 2010].

TSO, 2007. *The official introduction to the ITIL service lifecycle*: The Stationery Office.

Turner, B.A., 1983. The Use of Grounded Theory for the Qualitative Analysis of Organisational Behaviour. *Journal Management Studies,* 20**,** pp 333 - 348.

Van Dyke, T.P., Kappelman, L.A. & Prybutok, V.R., 1997. Measuring Information Systems Service Quaiity: Concerns on the Use of the SERVQUAL Questionnaire. *MIS Quarterly,* 21**,** 195 - 208.

Vargo, S.L. & Lusch, R., 2004. Evolving to a new dominant logic for marketing. *Journal of Marketing,* 68**,** 1-17.

Vargo, S.L. & Lusch, R.F., 2007. Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science,* 36**,** 11.

Velitchkov, I., 2008. Integration of IT Strategy and Enterprise Architecture Models. *International Conference on Computer Systems and Technologies - CompSysTech'08.* 6.

Venkatraman, N., 1994. IT-enabled business transformation: from automation to business scope redefinition. *Sloan Management Review,* 35**,** 73-87.

Voelpel, S.C., Von Pierer, H. & Streb, C.K., 2006. Mobilizing organizations for innovation and value creation: an integrated model of the mobile company. *Journal of Knowledge Management,* 10**,** 5-21.

Vouk, M.A., 2008. Cloud Computing – Issues, Research and Implementations. *Journal of Computing and Information Technology,* 16**,** 12.

Walford, C., 2011. Failed NHS computer fiasco costs taxpayers ANOTHER £2bn - even though the £12bn modernisation project has been scrapped. *Mail Online.* London: Associated Newspapers Ltd.

Wang, Y.-S. & Liao, Y.-W., 2007. Assessing eGovernment systems success: A validation of the DeLone and McLean model of information systems success. *Government Information Quarterly,* 25**,** 717-733.

Wang, Y., 2006. Cognitive Informatics: Towards Future Generation Computers that Think and Feel. *In* Y.Y. Yao, Z.Z. Shi, Y. Wang & W. Kinsner. (eds.) *5th IEEE Int. Conf. on Cognitive Informatics (ICCI'06).* Beijing, China.: IEEE, 7.

Watson, R.T., Pitt, L.F. & Kavan, C.B., 1998. Measuring Information Systems Service Quality: Lessons From Two Longitudinal Case Studies. *MIS Quarterly,* March 1998**,** 19.

Wegmann, A., Regev, G., Rychkova, I., Le, L.-S. & Julia, P., 2007. Business and IT Alignment with SEAM for Enterprise Architecture. *11th IEEE International Enterprise Distributed Object Computing Conference (EDOC 2007)***,** 111.

Weick, K.E., Sutcliffe, M. & Obstfeld, D., 1999. Organising for High Reliability: Process of collective mindfulness. *Research in Organizational Behavior* 21**,** 81-123.

Wernerfelt, B., 1995. The Resource-Based View of the Firm: Ten Years After. *Strategic Management Journal,* 16**,** 171-174.

Whittaker, B., 1997. What went wrong? Unsuccessful information technology projects. *Information Management & Computer Security,* Vol. 7 7.

Wiles, R., Crow, G., Heath, S. & Charles, V., 2008. The Management of Confidentiality and Anonymity in Social Research. *International Journal of Social Research Methodology,* 11**,** 11.

Winniford, D.M., Conger, S. & Erickson-Harris, L., 2009. Confusion in the Ranks: IT Service Management Practice and Terminology. *Information Systems Management,* 26**,** 12.

Womack, J.P. & Jones, D.T., 2003. *Lean Thinking* London: Simon & Schuster.

Yardley, L., 2000. Dilemmas in qualitative health research. *Psychology and Health,* 15**,** 215-228.

Zachman, J., 1987. A framework for information systems architecture. *IBM Systems Journal,* 26**,** 17.

Zachman, J.A., 1978. The Information Systems Management System: A Framework for Planning. *Data Base,* Winter 1978**,** 6.

Zarvic, N., Wieringa, R. & Van Eck, P., 2008. Checking the Alignment of Value-Based Business Models and IT Functionality. *SAC'08.* Fortaleza, Ceara, Brazil: ACM, 607-613.

Ziethaml, V.A., Berry, L.L. & Parasuraman, A., 1988. Communication and Control Processes in the Delivery of Service Quality. *Journal of Marketing,* 52**,** 15.

Zomerdijk, L.G. & Voss, C.A., 2009. Service Design for Experience-Centric Services. *Journal of Service Research,* 13**,** 17.

APPENDIX A: LIST OF COMMONLY USED IT MANAGEMENT TOOLS

The principle IT management tools (and the groups that gave rise to them) include:

The IT Infrastructure Library (ITIL) from HMG Cabinet Office (formerly the OGC), APM Group, and *it*SMF. ITIL claims to be "the most widely accepted approach to IT service management in the world. ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally".

Control Objectives for Information related Technologies (COBIT) from ISACA. Claim a membership of 95,000 individuals in 160 countries.

The IT Capability Maturity Framework, IT-CMF, comprises four macro-capabilities for managing IT for business value. Owned by the Innovation Value Institute of the National University of Ireland (Maynooth, Co. Kildaire) with 75 members drawn from major enterprises.

The Business Information Services Library (BiSL) is a public domain framework for the effective control of the organizations information systems. The current owner of the BiSL copyright is the ASL Foundation but it was developed by PinkRoccade now part of Getronics.

The Capability Maturity Model Integration (CMMI) from the Software Engineering Institute at Carnegie-Mellon University.

e-Sourcing Capability Model (eSCM) from the IT Services Qualification Center at Carnegie Mellon University.

The Generic Framework for Information Management is an information management model which can be applied by any organization to better align IT with organizational strategy.

Guidelines for enterprise architecture from The Open Architecture Group (TOGAF).

The enhanced Telecoms Operations Map (eTOM) from the TeleManagement Forum.

ISPL – the Information Services Procurement Library is a European best-practice method for tendering and delivering IT projects and services originally by Euromethods.

The IT Balanced Scorecard is a metrics based mechanism that can used to enable better IT performance and enable alignment between the overall business goals and IT.

M_o_R (Management of Risk) originally developed by the UK Office of Government Commerce (OGC).

The OCEG Framework Approach to Integrated GRC from the Open Compliance and Ethics Group.

OPM3 stands for 'Organizational Project Management Maturity Model'. It was first published by the Project Management Institute (PMI) in the United States in 2003.

Software Engineering body of knowledge (SWEBOK).

Project and programme management methods (e.g. PRINCE2 and MSP from the CCTA/OCG, PMBOK from the Project Management Institute).

ASL – Application Services Library from the ASL BiSL Foundation.

Skills For the Information Age (SFIA) a skills profiling framework from the UK government.

Six-Sigma – Increasingly being applied to IT processes.

Tick-IT Software Quality Management (IT software implementation of the ISO9001 standard).

TOGAF – The Open Group Architecture Forum.

Other proprietary methods (many).

Standards from the industry standards bodies (BSI and ISO/IEC) e.g.

ISO/IEC 20000:2005 Information technology – Service management.

ISO/IEC 17799:2005 Information technology – Security techniques.

ISO/IEC 38500:2008 Corporate governance of information technology.

ISO/IEC 27000:2009 Information security management system.

APPENDIX B: DATA MANAGEMENT WORKSTATION OF MAXQDA

SELECTED
DOCUMENT

SELECTED
TEXT
SEGMENTS

DOCUMENT
SYSTEM
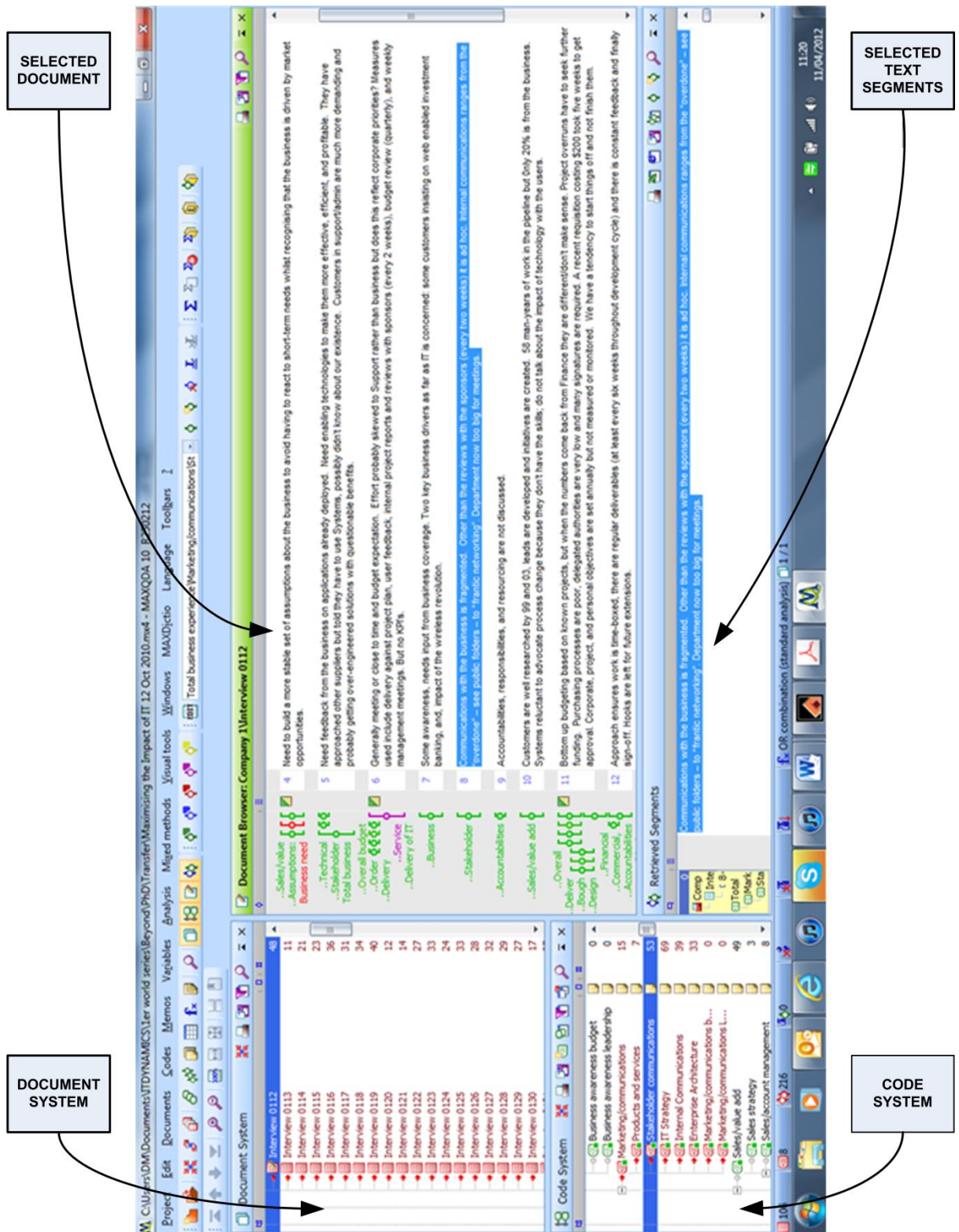
CODE
SYSTEM

Figure B.1: Screen print from MAXQDA workstation

APPENDIC C: CODE RELATIONS

Table C.1: Code relations for all concepts and all documents

	Change	Alignment	Business need	Service specification	Total business experience	Total
Total	47	311	283	172	1579	2392
Technical infrastructure	2	22	27	17	138	206
Security	0	18	20	2	71	111
Bought-in products and services	1	10	10	10	76	107
Delivery of IT products and services	0	13	15	11	147	186
Design & definition of IT products and services	2	17	45	14	130	208
People and organisation	3	30	5	8	112	158
Commercial administration	1	13	8	20	217	259
Sales/value add	1	20	12	2	61	96
Marketing/communications	3	33	22	10	105	173
Business awareness	0	7	17	6	12	42
Business experience	0	11	3	4	15	33
Service specification	4	17	17	30	104	172
Business need	16	42	24	17	184	283
Alignment	14	44	42	17	194	311
Change	0	14	16	4	13	47
Total	47	311	283	172	1579	2392

Table C.2: Code relations for all concepts relating to business participants

	Change	Alignment	Business need	Service specification	Total business experience	Total
Total	24	96	182	52	488	842
Technology infrastructure	2	17	26	14	50	109
Security	0	8	9	0	31	48
Bought-in products and services	0	1	7	2	43	53
Delivery of IT products and services	0	9	13	2	34	58
Design and definition of IT products and services	1	4	38	2	41	86
People and organisation	0	5	4	1	9	19
Commercial administration	0	2	2	2	15	21
Sales/value add	0	1	5	0	6	12
Marketing/Communications	3	12	15	4	28	62
Business awarness	0	1	9	2	5	17
Business experience	0	0	1	0	2	3
Service specification	1	7	5	10	29	52
Business need	10	18	20	5	129	182
Alignment	7	4	18	7	60	96
Change	0	7	10	1	6	24
Total	24	96	182	52	488	842

Table C.3: Code relations for all concepts relating to IT participants

	Change	Alignment	Business need	Service specification	Total business experience	Total
Total	15	169	57	95	916	1252
Technical infrastructure	0	5	0	3	86	94
Security	0	1	3	2	17	23
Bought-in products and services	0	6	0	3	21	30
Delivery of IT products and services	0	10	4	7	130	151
Design and definition of IT products and services	1	2	2	6	41	52
People and organisation	2	24	0	6	87	119
Commercial administration	1	10	3	15	187	216
Sales/value add	1	17	6	1	53	78
Marketing/communication	0	19	6	6	74	105
Business awareness	0	6	5	4	6	21
Business experience	0	11	1	3	12	27
Service specification	3	7	9	20	56	95
Business need	3	13	2	9	30	57
Alignment	4	34	13	7	111	169
Change	0	4	3	3	5	15

APPENDIX D: CODE SYSTEM

Code System [2406] – Categories in bold type

Change [47] Change is any identifiable change to the business or its trading circumstances, trading environment, or something new and relevant in terms of IT or technology, or a combination of these that means that the business or IT services should be adapted or managed to meet the new needs in order to remain competitive or improve its competitiveness.

Alignment [71] The matching of the delivery of IT services or the operation of the business to appropriately meet the circumstances. Often not well conceived or defined. Alignment here is defined as any response to change or an intervention designed to assess and address shortfalls/gaps in services in meeting the needs of the business. These gaps are detected in discussion with both the business and IT people and the business experience is the common ground for defining service content. Often simplified to architectural alignment i.e. of data, process, and network but from the data, alignment should clearly involve services and product alignment. Perhaps a degree of business planning/engineering/BPM where a technology can change the business model, a change of priorities or resource allocation, or an adjustment arising from an infrastructure failure (BSM). The need for alignment may be driven by a time-based cyclic process or could be sensed from a number of mechanisms connected to the service specification, TBE and business need, i.e. a continuous process of adaption or a continuous management process. The properties are governance, resource management, and risk assessment. Dimensions are closeness (i.e. the extent of alignment) and responsiveness (i.e. the speed of the response).

Governance [57] The roles and responsibilities associated with detecting change and maintaining alignment (across all properties of the TBE) and for ensuring that product and service needs and specification roles and responsibilities for both business and IT are managed effectively. The dimensions of Governance from the data are as follows: process awareness and process enforcement, role, accountability, performance indicators, decision making processes, communication processes, IT strategy approval, investment priorities and processes, data management accountabilities, responsibility for introducing best practice, approved access to and use of facilities, selection and acquisition processes for IT solutions, technical standards, investment proposals and processes/funding approval, transparency of governance structures, over-prescriptive governance structure, scope, licensing, costs, information, systems owners, information security, network security, demand management board, approval levels, benefits realization, user groups, management council, information risk management, audit. By contrast the corporate arrangements for managing IT according to ISO38500 restricts this to responsibilities, strategy, acquisition performance and human behaviour: Individuals and groups within the organization understand and accept their responsibilities in respect of both supply and demand for IT. Those with responsibility for actions also have the authority to perform those actions. The organization's business strategy takes into account the current and future capabilities of IT; the strategic plans for IT satisfy the current and ongoing needs of the organization's business strategy. IT acquisitions are made for valid reason, on the basis of appropriate and ongoing analysis, with clear and transparent decision making. There is appropriate balance between benefits, opportunities, costs, and risks, in both the short term and the long term. IT is fit for purpose in supporting the organization, providing the services, levels of service and service quality required to meet current and future business requirements. IT complies with all mandatory legislation and regulations. Policies and practices are clearly defined, implemented and enforced IT policies, practices and decisions demonstrate respect for human behaviour, including the current and evolving needs of all the 'people in the process'. This tends to be far to generalized for common usage.

Resource management [43] The active management of resources including the funding and alignment of resources (e.g. people, assets, facilities, solutions and finance) with business needs and the IT services and projects.

Risk assessment [25] The assessment of the risk associated with any (re) alignment

Closeness/Excellence [30] A measure of the extent to which resources and service meet the needs of the business. The properties will be the same as the TBE. The effectiveness of a relationship (e.g. from the coded segments between IT and the business, IT and a supplier, a supplier and the business) is considered to be

improved by proximity. This may be physical or other but it is assumed that it leads to improvements in communications, awareness of needs and eventually the relevance of solutions. Prior research has identified closeness as being a significant factor when it comes to achieving successful business outcomes. Associated with achieving a good business experience. The dimensions include services, products, and the ontology/architecture.

Responsiveness/Agility [19] The timeliness of the response to any change as part of a (re) alignment process, or the response to any assessment which suggests that re-alignment is necessary. Dimensions from the data include, time to detect the need or the change to the needs, time to agree remedial plans, time to deliver.

Business need [146] An expression of the business need as opposed to the IT requirements specification. Essential for better planning and better service delivery. The properties are the business context, the business strategy, the needs gap, and the business expectation. The needs can also be expressed using the properties of the TBE to provide a comparison between what is needed, expected, the service specification, and what is delivered. The dimensions are individually defined for each property suggesting an unlimited range of possibilities and perhaps one reason why the software engineer's preference to be able to make this an element of the enterprise architecture.

Business context [81] The contextual business situation in terms of its internal and external value networks and the role and importance of IT to that context. Dimensions are the internal and external value networks. This can be further subdivided into its components of business plan, plant facilities and real estate, people, process, suppliers, markets, and technology.

Business strategy and objectives [34] The plans of the business in response to its current situation and ultimate aims. Dimensions are typically based on product and market segmentation.

Needs gap [135] Any IT service or product requirement expressed by the business as a gap in terms of what is available to them today. Dimensions can be observed from the service excellence model as being either in the planning domain or the delivery domain and these can be further subdivided as necessary from the same model.

Business expectation [20] What might be expected of the service provider. Many in IT are concerned about meeting expectation, talk about "managing expectation" and link expectation with satisfaction. Expectation must be understood. It may be less that the business need and more than the business experience of receiving the service. The expectations can be expressed using the properties of the TBE to provide a comparison between what is needed, expected, the service specification, and what is delivered.

Service specification [28] Any expression of current or planned services and service levels, for a collection of services or for an aspect of a service. Properties from the data include service management, business engineering, business process engineering, business process execution, the management of the IT requirements portfolio, and IT service management. Dimensions are planning and delivery of the IT service (and further refinements of any gaps as per the SEM) but the service specification can also be expressed using the properties of the TBE to provide a comparison between what is needed, expected, the service specification, and what is delivered.

Service management [15] The planning and delivery of all activities in the service stack including core IT service and brand management. Involves ensuring that the service specification includes all of the required services and that the services meet the needs of the business.

Business engineering [4] Transformational change arising from a change to the business model - requires innovation, design and change management capabilities.

Business process engineering [8] Design of the business processes for efficiency and effectiveness improvement involving innovation, detailed analytic and change management capabilities. Business process improvement often introduces dis-intermediation as processes are eliminated.

Business process execution [8] Improvement through a quicker execution time – usually arising through process automation and service discovery. Business Service Management becomes important as automation improves. This links the infrastructure to the process so that a failure through configuration management and a configuration management database can identify the part of the business that will be affected, isolated and

addressed.

IT requirements portfolio [4] Any business requirement identified which can be prioritised during alignment according to the needs of the business. This may be for a service, an application, resource/capability, enhancements etc.

IT service management [8] Planning and delivery of day to day IT services to develop and deploy solutions, and to maintain availability and throughput at minimum cost. The land of ITIL. Properties are service performance and service quality.

Service quality [7] Measures or surveys of the perception of the quality of IT service management. The literature talks about SERVQUAL (a gap-based scale by PZB) and quality of service (comms). This might include the dimensions of "tangibles, reliability, responsiveness, assurance, knowing the customer, and access" or be more specific. Source will be IT metrics and sometimes the business view will be determined by a customer satisfaction survey as in Interview 0211 (Company2). Clear that this is a very limited view of service quality (i.e. focused on the bottom level of the service stack) and has a marketing source. SERVPERF is considered to be a refinement by its authors (Cronin and Taylor) and applies absolute measures to the same properties as SERVQUAL. Part of the problem with the literature in this area is the nature of the very generalized service terms as properties. Reliability, responsiveness, knowing the customer, and access are recognised from the data. Tangibles are very specific to the business. Test: could service quality measures be used in an SLA?

Service performance [64] Any current measure of the perception of IT service performance; typically IT measures of internal IT processes or service availability/response times etc. Note that from the literature SERVPERF is a general service quality measure (see service quality). In the data performance is a very general term often expressed in the context of concerns over a lack of any meaningful performance measures, KPIs, or goals. Test: service performance measures should be useable in the context of an SLA.

Total Business Experience [47] How the combined IT services and solutions are perceived by the business. Combines all performance and quality measures to get an overall view of the service as it is experienced. Often oversimplified by IT as can be seen by the coded segments of text. The impact of this is underestimated. The properties are business awareness, marketing and communication, sales/value add, commercial etc., people and organization, the design and definition of IT products and services, delivery of IT products and services,   bought-in products and services, security, technical infrastructure. Dimensions are the business need, the expectation, the service specification, and the actual business experience (i.e. the service that is actually delivered).

Business awareness [48] Knowledge of the business and its business sector, domain, or environment. Major concern of IT people, many of whom feel vulnerable about their lack of business knowledge and this inhibits their ability to understand the business needs and to deliver appropriate services. Major concern amongst business people. Where IT groups are co-located with the business awareness is enhanced simply because there is greater opportunity for the IT people to be exposed to what is happening in the business. Properties: KPIs, assumptions about the business. Dimensions as for the TBE are: business need, service specification, and actual business experience.

KPIs [7] Key business metrics for decision making and reporting performance etc. The information required to drive the business (for critical success factors). Dimensions will be specific to each business. E.g. sales, market share, channel and product/market segmentation, profit margins, forecasts, etc.

Assumptions: SWOT [6] The generally held assumptions about the business. The dimensions are the strengths, weaknesses, opportunities, and threats associated with the business.

Business awareness budget [0] Budgetary provision for maintaining the business awareness of IT services providers.

Business awareness leadership [0] The responsibilities for maintaining the business awareness of IT services providers.

Marketing/communications [15] The process by which the service provider communicates with the business to create an interest in its products or services communicating. As marketing and communications in other sectors its purpose is to identify, build relationships with, satisfy and keep the customer. It involves shifting the focus of the service organization from the operational aspects of IT to the needs of the business customer. Internally (e.g. between IT and the business) the term "communication" is generally used in the data presumably because it is seen to be a less commercial alternative to marketing though it still involves addressing positioning, brand, and products and markets. Often, according to the data, not done or not done well. The IT strategy is often the most talked about object of a communication externally (to the business) and the enterprise architecture (internally). Properties in an IT management context are the products and services, stakeholder (business) communication, the IT strategy, internal communications, and the enterprise architecture. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Products and services [7] The range of products and services available to the business. As is noted in the data this involves IT in shaping these products and services which in itself requires a knowledge of the business needs as well as what works and what doesn't (Interview 107, paragraph 8). Ultimately product knowledge becomes important to the business and to sales. A lot is made of a service catalogue in some methods but this can lead to a long list of capabilities. Better to develop services around known needs as the data suggests. Product management should ideally be based upon an understanding of the likely lifecycle of the product and where on that curve the product currently sits. This way product lifecycles can be managed thus avoiding unnecessary problems associated with obsolescence. Dimensions for product could be lifecycle phase, cost, fit.

Stakeholder communications [53] Communication with the business stakeholders in particular in order to build relationships, better understand their needs, and shape the IT strategy ("product and service offerings" and "road maps"). From the data dimensions will include location, forum type, stakeholder, meeting frequency, communication topic, business strategy, needs and priorities/dependencies, follow up.

IT Strategy [69] The implicit or explicit strategy and the business needs that are to be addressed. Basis for planning but elements will also be used for communication with the business and internally within IT. Dimensions will include products and services project profiles (including costs and benefits) as well as a timeline or roadmap.

Internal Communications [39] Communication internally within IT between internal stakeholders or between IT and internal or external suppliers. From the data dimensions will include purpose, forum type, mechanism, stakeholders, frequency, communication topic, decisions, follow up. Also from the data it is clear that email (for point to point communication) and publishing to the web (for broadcasting) are heavily used by IT and so a tendency to over-communicate, i.e. especially where roles and responsibilities are unclear. These mechanisms have taken over from more formal meetings where commitment can be obtained and decisions made.

Enterprise Architecture [33] The development and maintenance of the ontology including information/data, process/applications, and organization/network components. This is a major deliverable once a strategy has been agreed but must retain its relevance to the business need. From the data it can be seen that it is easy to focus internally on the architecture for its own sake (Interview 0106, paragraph 14). In Company 3 it is clear to the business at a senior level that no information architecture exists and to others that there is no enabling architecture to enable the business to bring about the desired changes. Dimensions include the features mentioned above (data, process, applications, and organization/network). Some would argue that it should contain much more information about the business and no doubt this is the direction that technology will take.

Marketing/communications budget [0] Budgetary provision for marketing/communications activities of the IT services provider.

Marketing/communications Leadership [0] The responsibility for the marketing/communications activities of the IT services provider.

Sales/value add [49] The commercial activity associated with matching needs to capabilities and solutions in ways that add value to the business and the subsequent funding commitment. In an IT situation it is a commitment process where the business typically accepts the commitment to underwrite a portion of the IT service providers budget to have the benefit of the service or solution. This will often involve a need for the service provider to demonstrate the value of the service to the business, or even to co-create the value by working with the business to understand how technology can help to improve the business model or reduce

costs etc. The output from the sales process is often subject to a further business planning or commercial/financial planning stage where priorities are considered and so investments with "flaky commitments" may not survive. From the data it is clear that there is often no such activity and commitment process and yet business and IT people talk about prioritised requirements as if they arrive in the order book by magic. The lack of such activities leads to a lack of planning data in IT. Properties are: sales strategy, sales/account management, presales analysis/innovation, and order book. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Sales strategy [3] The approach to generating sales or commitment to IT investment. From the data where the IT organizations viewed are not commercial IT service providers there is no strategic approach to this except in the case of company 1 to work through a third party. Dimensions include

Sales/account management [8] Coded from a discussion about a supplier which is identified as having great account management. Nowhere in the data does IT mimic this successful strategy internally. Dimensions for each account manager concern account management responsibility (business, product/service etc.).

Presales support/Innovation [5] The introduction of new solutions or methods. Would be applicable to situations where some preparatory work is necessary to understand how technology is best applied to create new business models or business value. Company 1 only uses the term once but this does not mean that it doesn't apply to this organization which does, they say, "stay ahead of the curve" and "deploy leading edge technology". Dimensions include (from service management) business engineering, business process engineering, business process execution.

Order book [27] The investment portfolio or sales pipeline resulting from a sales or value add/presales support process and the subsequent prioritisation. Dimensions from the data include business requirement, priority, resource requirement, timetable, cost, benefits, business impact, risk, current status, training/recruitment/capital or other implications, attractiveness of technology (for enabling an architecture or infrastructure). See notes for Sales/Value add.

Sales/value add budget [0] Budgetary provision for the sales/value add activities of IT services provider.

Sales/value add leadership [0]The responsibility for the sales/value add activities of IT services provider.

Commercial, financial, compliance and admin [58] The long term and short term commercial and financial planning that reflects the strategy, business commitments (order book), infrastructure spend, people costs etc and the administration, and controls for meeting these plans. Properties: financial management, compliance, administration management, growth. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Contractual arrangements with the business [2] The terms under which work is undertaken, e.g. what is to be done, over what period of time, at what cost, to what standard, etc.

Financial management [34] The financial and accounting activities necessary to provide good fiscal control over the IT function, its assets and activities. Dimensions from the data include: financial planning, departmental budgets, budget holder, financial management, management objectives, key performance data, financial procedures and controls.

Compliance [41] The process of establishing and meeting the requirements of any necessary legislative and quality regulations, policies, and procedures. Dimensions from the data include: QA/internal QMS, testing, test environment, other internal procedures, sign-off responsibilities, quality gates, post mortem, learning/improvement points, documentation standards, retention obligation, regulatory controls, operability, governance, risk management, assurance, software licensing, audit reviews, Data Protection Act and consent on personal data bases.

Administration management [3] The administrative activities and controls within the IT function or group of activities. Dimensions from the data include: administrative activities including travel, hotels, booking training courses, conference room bookings etc.

Growth [24] Growth is a comparative term to describe the level of activity this year compared with last/former years and is associated with commercial and financial planning and control. In Company 1 the word is being

used to describe the difficulties being experienced as a result of the scale change. Used here to describe both the growth of the business and the growth of systems (or IT). Globalization and business growth are driving IT spend and IT renewals are driving IT spend. The result is that any weaknesses in process or planning are creating major difficulties. Dimensions from the data include: growth rates (business) and targets (staff hires), investment requirement (technology implications of growth), space requirement, globalization, multi-language support, 24X7 availability, exposes weakness (internal communication, skills/training, mentoring new joiners, managing, workload, planning processes, organization, mechanisms for promotion), sustainability.

Overall budget [24] The money allocated to support the IT services provider as a whole and allocated to each property of the TBE, i.e. budget is a dimension of each service property.

Commercial & financials etc. budget [0] Budgetary provision for managing the commercial, compliance, financia/ planning/control, and admin aspects of IT services.

Commercial & financials etc. leadership [0] The responsibility for managing the commercial, compliance, financia/ planning/control, and admin aspects of IT services.

People and organization [50] The people and organizational aspects of the business experience. The properties are: accountabilities, culture and motivation, education training and development, individual and group effectiveness, performance, and recruitment. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Overall leadership [24] Guidance and direction. Authority usually goes with leadership though this may be delegated so that decisions can be taken by others (more quickly) especially in a devolved organization. Like funding, Leadership is emerging as a dimension of all properties that define the TBE and yet overall leadership is expected by everyone. See Memo 122 (Interview 0105).

Accountabilities [44] Accountabilities defined at an individual and departmental level. Responsibilities within the business and IT for all aspects of the relationship. This moves the governance framework from a generalized set of statements to something which is specific to each relationship and one which is capable of maintaining alignment. Once in place the effectiveness of the accountabilities must be monitored and when necessary improved. Company 1 experiences difficulties because there is no clear or complete service model, no clear organizational structure, and no clear accountabilities. Consensus as a means of decision making is often resorted to (Interview 0114, paragraph 11). Company 2 also has areas where accountabilities are vague. The dimensions from the data include: process clarity and responsibility, technology responsibility, clear reporting lines and lines of communication, setting of objectives (corporate, project, personal), delivery against objectives, decision making,

Culture and motivation [55] Belief systems that drive behaviour, what staff feel about the organization and their attitude to work. Dimensions from the data include: technical decision making, management decision making, direction, delegation, organised/fire-fighting, work ethic, meritocratic/political, professional, team-oriented, morale, corporate/territorial, open/closed, helpful/confrontational, discipline, trust, collaborative/autocratic, IT-centric/business-focused, trustworthy, morals/ethics.

Education, training and development [25] Organizational response to skills gaps, succession planning and personal development. Dimensions from the data include: skills audits/skills gaps, technical training, project management skills, QA skills, management skills, on the job training through new assignment, extent to which training is available, extent to which training needs are assessed, extent to which training is given having been identified as necessary, mentoring, linked to professional development plans.

Individual and group effectiveness [21] The process and reward system for assessing and improving performance of the individual and the group. Dimensions from the data: personal and group objectives clearly set and monitored, fairness, promptness of response to good/poor performance, appropriateness of reward/punishment, frequency, clear criteria for promotion, confidentiality/anonymity.

Recruitment [26] The mechanisms for the hiring of staff. Dimensions from the data are: people requirements versus business plan, professional and cultural profile of target applicant, language skills, interview process,

formal/informal selection process, time taken to hire, induction, mentoring.

People & organization budget [0] Budgetary provision for managing the human resource aspects of IT service provision.

People & organization leadership [0] The responsibility for managing the human resource aspects of IT service provision.

Design & definition of IT products and services [41] The activities involving establishing the IT requirements, the design, and the technical specification of the solution. Properties are: understanding the requirement, the user interface, product and service design, build vs buy decisions. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Understanding the requirement [61] Interpreting and specifying the business requirement for an IT solution; the IT requirements specification. Properties from the data include: extent of cover (need versus current applications), stakeholder/stakeholder groups, scope, level of detail, shared services/systems, process/functionality, data, impact of IT requirement on other systems, versus strategy for business/IT, impact on enterprise architecture, impact on legacy applications, impact on business.

User interface [10] The look and feel of the user interface across the enterprise regardless of the device or the access point. See Memo 66. Dimensions from the data include: standardised logon, standardised look and feel, standardised systems, global access, data input once, external access (suppliers), access to IT people.

Product and service design [64] The design of the solution to meet the needs of the business. The properties from the data include: agreed complete requirements, systems and data design and integration plan (addressing all needs gaps), business controls reflected in the design, ensure design caters for all requirements and historic data, ease of use, solutions fit for purpose (examples include document and records mgmt., KM, CMDB, etc.), if waiting for product development of third party solution ensure timescales for availability are firm, legacy and obsolete solutions are phased out in designs, take opportunities to standardise across a business, industry standard solutions can be attractive, document the solution, agree with stakeholders.

Build vs buy decisions [13] Consideration of the pros and cons associated with industry standard solutions as compared to bespoke solutions. Dimensions from the data include: make it part of all investment cases, establish stakeholder preferences, realistic assessment of fit/ any necessary customisation/ impact on lead time to implementation/ support costs etc., check financial viability of supplier.

Design & definition etc. budget [5] Budgetary provision for managing the design and definition activities associated with the IT services.

Design & definition etc. leadership [0] The responsibility for managing the design and definition activities associated with the IT services.

Delivery of IT products and services [53] The acquisition or development of the solution and its implementation and support operationally. Properties include: all programme and project management, data quality, software engineering, deployment, IT operations management, upgrades and change control. and support services. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Program and project management [24] The management of IT programmes or projects to deliver IT products and or IT services (development and deployment) to plan (i.e. programme or project plan), to a prescribed outcome i.e. to a requirement and design, to achieve the approval of the stakeholder (sponsoring) group. Dimensions from the data include: scope, cost, timescales, deliverables, quality outcomes, reporting and communications, change control.

Data quality [26] The quality of the data input to and available from the systems. Dimensions from the data include: relevant, structured, single occurrence, integrity, currency, accuracy, good search and retrieval capability, suitability of format, access control, responsibilities defined.

Software engineering [36] The cutting of code, systems testing, systems integration with existing systems, integration testing, and the customisation and integration of bought in solutions etc. Dimensions from the data include: application, development source/location, development type (e.g. Agile, RAD, Waterfall, etc), development platform, unit test results, time box, deliverable.

Deployment [20] The implementation of tested solutions into the business. Dimensions from the data include: deployment plan, approval from operations, approval from business, deployment progress.

IT operations management [10] The routine delivery of IT services to the business measured by reliability, availability, etc. Dimensions from the data: availability (up time), response to new requests, help desk calls, costs, objectives, management reports, communication (availability announcements).

Help/service desk [10] The first line service for all matters concerning technical support to the business

Upgrades and Change Control [6] The maintenance of IT products through the regular upgrades to maintain currency and contractual support arrangements utilising change control procedures. Dimensions from the data: Release level, version control, latest available release/version, constraints.

Delivery budget [11] Budgetary provision for managing the delivery activities associated with the IT services.

Delivery leadership [0] The responsibility for managing the delivery activities associated with the IT services.

Bought-In products and services [64] The acquisition and management of bought in IT products and services. It can be summarised as the TBE of a given service provider. The properties are logically those of the TBE plus the buying process itself as evidenced by the data. This is a more complex measure of performance of bought in services than is typically used commercially today but in the data the business expresses its opinion on the strengths and weaknesses of the third party suppliers in the same way that it does the main IT service provider. Evidence in the data and Memos 65, 73, 83 and others. Properties and dimensions as for the TBE. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Bought-In P&S: The buying process [19] The buying process leading up to the purchase procurement of the product or service and its subsequent deployment or consumption which is assessed according to the subsequent properties of "Bought-In Products and Services".

Bought-In P&S: Business Awareness [2] The business awareness as it applies to a supplier

Bought-IN P&S: Marketing/Communications [6] Marketing and Communications as it applies to a supplier

Bought-In P&S: Sales/Value add [12] Sales/value add as it applies to a supplier

Bought-In P&S: Commercial, Financial, Compliance, Admin [9] ....as it applies to a supplier

Bought-In P&S: People & Organization [9] ....as it applies to a supplier

Bought-In P&S: Design & Definition [5] Design and definition of products and services as it applies to a supplier

Bought-In P&S: Delivery of Product or Service [9] ...as it applies to a supplier

Bought-In P&S: Bought-In P&S [0] Bought-in P&S as it applies to a supplier

Bought-In P&S: Security [0] Security as it applies to a supplier

Bought-In P&S: Technical Infrastructure [0] Technical infrastructure as it applies to a supplier

TBE of the buyer of the bought-in IT services [0] This is a more complex measure of performance of bought in services than is typically used commercially today but in the data the business expresses its opinion on the strengths and weaknesses of the third party suppliers in the same way that it does the main IT service provider. Evidence in the data and Memos 65, 73, 83 and others. Properties and dimensions as for the TBE.

Security [27] Security in every sense of the term. The properties from the data include: business/site security (and any systems that support this), information security, and business continuity/disaster recovery. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Business/site security [5] Protecting the business itself and its operational and administrative sites together with any supporting systems. Properties from the data include: site security, personnel security, visitor security, emergency management, risk assessment. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Information security [19] Information security. From the data the properties include: data centre security, mobile device security, network and web security, loss of data, data access controls, regulatory requirements If addressing the ISO 17799 requirements the following could be added: risk assessment, security policy, organization, asset management, HR aspects, physical and environmental security, communication and operations management, access control, information systems (acquisition, development and maintenance), incident management, any additional compliance needs (see Conformance). See separate code for business continuity management (and DR) which, though part of ISO 17799, combines business/site and information security. Dimensions as for the TBE are: business need, service specification, and actual business experience.

Business continuity/ disaster recovery [2] The recovery of the IT infrastructure following a failure and the safeguards with respect to being able to continue to operate the business during the interim period and thereafter. Typically involves coordination between business/site security and information security. Properties: Dimensions as for the TBE are: business need, service specification, and actual business experience.

Security budget [0] Budgetary provision for managing the security aspects of the IT services

Security leadership [0] The responsibility for managing the security aspects of the IT services

Technical infrastructure [76] The utility value of the technical infrastructure (hardware and software) to the business. From the data the properties are as follows: compatibility (across internal and external value networks), connectivity, availability, response times, reliability, feature-rich (voicemail, video-conference, SOA etc.), accessibility, currency (up to date). Dimensions as for the TBE are: business need, service specification, and actual business experience.

IT skills training for the business [12] Any user training that helps the business to get the best out of the technology deployed or being introduced.

Introducing new technology [12] The means by which new technology is selected.

Technology deployed [15] Nature of the technology and its homogeneity across the internal and external value networks. see Memo 93.

Asset register [3] Register of all assets and their configuration, location etc. identified in Memo 115. Also licences for software deployed.

Technical infrastructure budget [6] Budgetary provision for managing the technical infrastructure associated with the IT services

Technical infrastructure leadership [0] The responsibility for managing the technical infrastructure associated with the IT services

MAXQDA23/02/2012

APPENDIX E: CROSS TABULATION OF LANGUAGE USAGE BY DEPARTMENT

Table E.1: Cross tabulation of language usage by department

	Business	IT	External	Group	Total
Change	32	7	1	6	46
Alignment	38	24	5	2	69
Governance	27	10	3	14	54
Resource management	1	40	2	0	43
Alignment\Risk management	5	10	2	5	22
Alignment\Closeness/excellence	5	23	2	0	30
Alignment\Responsiveness/agility	6	12	1	0	19
Alignment total	**82**	**119**	**15**	**21**	**237**
Business need	94	34	10	5	143
Business context	59	6	3	13	81
Business need\Business strategy and objectives	21	1	6	6	34
Needs gap	117	6	6	6	135
Business expectation	7	10	1	1	19
Business need total	**298**	**57**	**26**	**31**	**412**
Service specification	5	16	7	0	28
Service management	6	2	3	3	14
Business engineering	2	8	0	0	10
Business process engineering	4	4	0	0	8
Business process execution	5	3	0	0	8
IT requirements portfolio	1	3	0	0	4
IT service management	5	1	2	0	8
IT service management\Service quality	4	3	0	0	7
IT service management\Service performance	8	53	3	0	64
Service specification total	**40**	**93**	**15**	**3**	**151**
Total Business Experience	5	37	3	1	46
Business awareness	4	43	1	0	48
KPIs	3	1	2	1	7
Assumptions: SWOT	3	2	1	0	6
Business awareness budget	0	0	0	0	0
Business awareness leadership	0	0	0	0	0
Business awareness total	**10**	**46**	**4**	**1**	**61**
Marketing/communications	0	14	0	0	14
Products and services	3	2	2	0	7
Stakeholder communications	18	35	0	0	53
IT strategy	33	19	3	13	68
Internal communications	2	36	0	0	38

	Business	IT	External	Group	Total
Enterprise architecture	9	23	1	0	33
Marketing/communications budget	0	0	0	0	0
Marketing/communications Leadership	0	0	0	0	0
Marketing/Communications total	**65**	**129**	**6**	**13**	**213**
Sales/value add	3	46	0	0	49
Sales strategy	1	1	1	0	3
Sales/account management	4	1	5	0	10
Presales support/Innovation	1	2	2	0	5
Order book	4	23	0	0	27
Sales/value add budget	0	0	0	0	0
Sales/value add leadership	0	0	0	0	0
Sales/value add total	**13**	**73**	**8**	**0**	**94**
Commercial administration	1	54	2	1	58
Contractual arrangements with the business	4	5	3	4	16
Financial management	9	22	2	0	33
Compliance	8	28	1	2	39
Administration management	1	1	1	0	3
Growth	0	22	0	0	22
Overall budget	0	22	0	2	24
Commercial & financials etc. budget	0	0	0	0	0
Commercial & financials etc. leadership	0	0	0	0	0
Commercial administration total	**23**	**154**	**9**	**9**	**195**
People and organization	3	41	0	0	44
Overall leadership	0	23	0	0	23
Accountabilities	3	40	1	0	44
Culture and motivation	6	38	4	0	48
Educn, training and devt	4	21	0	0	25
Individual and group effectiveness	1	20	0	0	21
Recruitment	0	26	0	0	26
People & organization budget	0	0	0	0	0
People & organization leadership	0	0	0	0	0
People and organization total	**17**	**209**	**5**	**0**	**231**
Design & definition of IT products and services	14	22	1	2	39
Understanding the requirement	54	0	6	1	61
User interface	8	2	0	0	10
Product and service design	61	0	1	2	64
Build vs buy decisions	5	8	0	0	13
Design & definition etc. budget	0	4	1	0	5
Design & definition etc. leadership	0	0	0	0	0
Design and definition total	**142**	**36**	**9**	**5**	**192**
Delivery of IT products and services	5	44	3	0	52

	Business	IT	External	Group	Total
Program and project management	14	10	1	0	25
Data quality	22	1	1	2	26
Software engineering	5	21	8	0	34
Deployment	8	8	3	0	19
IT operations management	2	7	0	0	9
Help/service desk	9	0	1	0	10
Upgrades and Change Control	4	1	1	0	6
Delivery budget	0	11	0	0	11
Delivery leadership	0	0	0	0	0
Delivery of IT products and services total	**69**	**103**	**18**	**2**	**192**
Bought-In products and services	20	34	5	3	62
Bought-In P&S: The buying process	8	0	11	0	19
Bought-In P&S: Business awareness	2	0	0	0	2
Bought-IN P&S: Marketing/communications	5	0	1	0	6
Bought-In P&S: Sales/value add	8	0	4	0	12
Bought-In P&S: Commercial administration	3	0	6	0	9
Bought-In P&S: People and organization	5	0	4	0	9
Bought-In P&S: Design and definition of IT product or service	4	0	1	0	5
Bought-In P&S: Delivery of IT product or service	9	0	0	0	9
Bought-In P&S: Bought-In P&S	0	0	0	0	0
Bought-In P&S: Security	0	0	0	0	0
Bought-In P&S: Technical infrastructure	0	0	0	0	0
Bought-in products and services total	**64**	**34**	**32**	**3**	**133**
Security	12	6	4	1	23
Business/site security	3	1	1	0	5
Information security	10	2	2	1	15
Business continuity/ disaster recovery	0	2	2	0	4
Security budget	0	0	0	0	0
Security leadership	0	0	0	0	0
Security total	**25**	**11**	**9**	**2**	**47**
Technical infrastructure	29	41	4	2	76
IT skills training for the business	6	6	0	0	12
Introducing new technology	8	4	0	0	12
Technology deployed	9	5	1	0	15
Asset register	2	2	1	1	6
Technical infrastructure budget	0	6	0	0	6
Technical infrastructure leadership	0	0	0	0	0
Technical Infrastructure total	**54**	**64**	**6**	**3**	**127**
TBE Total	487	896	109	39	1531
SUM	939	1172	166	100	2377

APPENDIX F: USE OF LANGUAGE BY DOCUMENT AS ILLUSTRATED BY THE CODING

Table F.1: Use of language by document as illustrated by the coding.

Document	Change	Alignment	Business need	Service specification	Total business experience	TBE\Business awareness	TBE\Marketing/communications	TBE\Sales/value add	TBE\Commercial, financial, compliance and admin	TBE\People and organization	TBE\Design & definition of IT products and services	TBE\Delivery of IT products and services	TBE\Bought-In products and services	TBE\Security	TBE\Technical infrastructure	TBE Total	TOTAL
Company 1\Company 1 PA	1	3	3	1	1	0	3	0	4	13	2	5	0	0	0	28	36
Company 1\Interview 0101	0	3	1	4	3	1	6	5	4	11	5	6	1	0	5	47	55
Company 1\Interview 0102	0	0	2	5	1	2	1	1	4	2	0	0	1	0	2	14	21
Company 1\Interview 0103	0	7	2	3	0	2	3	4	2	4	1	5	3	0	3	27	39
Company 1\Interview 0104	0	0	0	2	1	2	4	1	4	5	1	2	0	0	1	21	23
Company 1\Interview 0105	0	2	2	3	2	3	1	2	6	5	0	5	1	1	3	29	36
Company 1\Interview 0106	1	3	1	4	1	2	5	4	6	7	1	10	2	0	1	39	48
Company 1\Interview 0107	1	5	5	4	0	1	8	2	10	8	4	8	3	0	4	48	63
Company 1\Interview 0108	0	6	1	5	2	2	2	4	5	5	1	4	1	0	1	27	39
Company 1\Interview 0109	0	1	0	4	2	1	4	1	2	6	0	1	0	2	3	22	27
Company 1\Interview 0110	0	0	0	2	1	0	0	0	1	1	0	7	1	1	1	13	15
Company 1\Interview 0112	1	2	1	2	1	2	3	3	8	11	1	8	2	0	3	42	48
Company 1\Interview 0113	0	0	0	0	1	1	2	0	2	2	0	2	1	0	0	11	11
Company 1\Interview 0114	0	1	0	1	0	0	3	1	4	6	1	4	0	0	0	19	21
Company 1\Interview 0115	0	2	2	3	0	0	2	0	1	5	1	3	1	1	2	16	23
Company 1\Interview 0116	1	4	1	3	0	2	4	1	5	11	0	2	0	0	2	27	36
Company 1\Interview 0117	0	2	1	1	1	1	2	2	7	6	1	4	1	0	2	27	31
Company 1\Interview 0118	0	6	2	2	1	2	5	2	5	6	0	1	0	0	2	24	34
Company 1\Interview 0119	0	8	0	3	1	2	6	3	2	8	1	3	1	0	2	29	40
Company 1\Interview 0120	0	0	0	4	2	0	1	1	0	0	0	1	1	1	1	8	12
Company 1\Interview 0121	0	0	0	1	1	0	2	0	2	3	1	2	1	0	1	13	14
Company 1\Interview 0122	0	4	1	3	1	1	2	2	3	7	0	1	1	0	1	19	27
Company 1\Interview 0123	0	4	1	1	1	0	5	3	6	8	1	2	0	0	1	27	33
Company 1\Interview 0124	0	4	0	0	2	0	2	0	5	8	0	1	1	0	1	20	24
Company 1\Interview 0125	0	2	3	2	1	4	3	5	2	4	3	2	0	0	2	26	33
Company 1\Interview 0126	0	6	1	4	0	2	2	2	6	2	1	2	0	0	0	17	28
Company 1\Interview 0127	0	4	1	4	0	1	3	1	3	9	2	2	1	0	1	23	32
Company 1\Interview 0128	1	1	1	5	1	0	3	4	6	1	1	3	1	0	1	21	29
Company 1\Interview 0129	1	3	1	1	1	1	2	2	2	11	0	0	0	0	2	21	27
Company 1\Interview 0130	0	2	2	2	1	0	2	0	3	2	0	1	1	0	1	11	17
Company 1\Interview 0131	0	2	1	1	1	0	4	0	6	5	1	3	1	0	2	23	27
Company 1\Interview 0132	0	2	2	0	0	1	2	1	0	5	0	0	0	0	0	9	13
Company 1\Interview 0133	0	1	1	4	0	1	3	3	7	5	0	0	0	0	3	22	28
Company 1\Interview 0134	0	4	2	0	2	1	2	2	2	5	0	1	0	0	3	18	24
Company 1\Interview 0135	0	5	0	2	1	2	2	1	6	2	2	2	1	0	3	22	29
Company 1\Interview 0136	0	2	2	2	1	1	2	2	4	3	3	2	1	0	1	20	26
Company 1\Interview 0137	1	2	0	1	1	1	3	1	4	8	1	4	1	0	1	25	29
Company 1\Interview 0138	0	3	0	0	1	1	0	3	3	5	0	0	1	0	0	14	17
Company 1\Interview 0139	0	0	0	0	1	1	2	0	1	4	0	3	0	0	1	13	13
Company 1\Interview 0140	0	0	1	1	1	1	3	0	0	1	0	0	0	0	0	6	8
Company 2\Interview 0201	0	1	4	3	0	1	1	0	0	0	2	0	0	1	1	6	14
Company 2\Interview 0202	1	1	1	3	0	0	2	0	0	0	2	1	0	0	1	6	12
Company 2\Interview 0203	1	0	21	0	0	0	1	0	0	0	7	2	0	0	2	12	34
Company 2\Interview 0204	0	0	8	0	0	0	0	1	0	0	3	0	0	0	2	6	14
Company 2\Interview 0205	4	3	5	0	0	0	3	0	0	0	3	3	0	0	1	10	22

Company 2\Interview 0206	0	1	5	0	0	0	1	0	0	0	0	3	0	0	0	4	10
Company 2\Interview 0207	0	3	7	0	0	0	4	0	0	0	2	1	0	0	2	9	19
Company 2\Interview 0208	0	4	5	0	0	0	2	0	0	0	2	1	0	2	5	12	21
Company 2\Interview 0209	1	4	7	1	0	1	2	0	0	1	2	1	0	0	1	8	21
Company 2\Interview 0210	1	1	5	0	0	0	3	0	0	0	3	0	0	0	1	7	14
Company 2\Interview 0211	1	2	8	4	0	0	0	0	0	0	5	1	0	2	1	9	24
Company 2\Interview 0212	0	0	7	0	0	0	0	0	0	0	0	0	0	0	1	1	8
Company 2\Interview 0213	2	5	6	0	0	0	0	0	0	1	2	0	0	0	1	4	17
Company 2\Interview 0214	0	4	8	0	2	0	0	0	0	0	0	0	0	0	1	3	15
Company 2\Interview 0215	1	1	4	0	0	0	1	0	0	0	0	0	0	1	2	4	10
Company 2\Interview 0216	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1
Company 2\Interview 0217	1	1	6	1	0	0	3	0	0	0	0	0	0	0	2	5	14
Company 2\Interview 0218	0	2	4	0	1	1	1	0	0	0	1	3	0	0	1	8	14
Company 2\Interview 0219	2	2	3	0	0	0	3	0	0	0	0	1	0	1	1	6	13
Company 2\Interview 0220	1	2	6	2	0	0	2	0	1	1	0	2	0	0	1	7	18
Company 2\Interview 0221	1	2	4	1	0	1	1	0	0	0	1	1	0	1	1	6	14
Company 2\Interview 0222	0	0	8	1	0	0	0	0	0	0	4	1	0	1	3	9	18
Company 2\Interview 0223	3	3	13	1	0	0	1	0	2	0	0	3	0	1	4	11	31
Company 2\Interview 0224	2	2	4	0	0	0	1	0	1	0	0	0	0	0	4	6	14
Company 2\Interview 0225	0	2	5	0	0	0	0	0	0	0	1	0	0	0	2	3	10
Company 2\Interview 0226	0	0	9	0	0	0	0	1	0	0	4	0	0	0	2	7	16
Company 2\Interview 0227	2	1	6	0	0	0	0	1	0	0	3	1	0	0	3	8	17
Company 2\Interview 0228	0	0	7	0	0	0	0	0	1	3	2	1	1	0	1	9	16
Company 3\Interview 0301	3	3	6	0	0	0	0	0	1	0	0	1	0	0	0	2	14
Company 3\Interview 0302	1	0	7	0	0	0	0	0	0	0	1	0	0	0	0	1	9
Company 3\Interview 0303	2	5	8	0	0	0	7	0	3	0	1	1	1	0	0	13	28
Company 3\Interview 0304	1	1	2	0	0	0	2	0	0	0	5	1	0	1	0	9	13
Company 3\Interview 0305	0	2	8	0	0	0	1	0	0	0	2	1	0	0	0	4	14
Company 3\Interview 0306	0	2	6	2	0	0	1	0	0	0	2	0	0	0	1	4	14
Company 3\Interview 0307	0	0	4	0	0	0	0	0	0	1	4	1	0	0	1	7	11
Company 3\Interview 0308	1	0	15	0	0	0	0	0	0	0	1	0	1	0	0	2	18
Company 3\Interview 0309	0	1	1	0	0	3	1	0	0	0	0	2	0	0	0	6	8
Company 3\Interview 0310	0	0	1	0	0	0	0	0	0	0	5	0	0	0	0	5	6
Company 3\Interview 0311	0	2	6	1	0	0	0	1	0	0	5	0	1	0	0	7	16
Company 3\Interview 0312	0	3	3	0	0	0	1	1	0	0	0	0	1	0	0	3	9
Company 3\Interview 0313	2	2	10	4	1	0	0	0	1	0	4	1	2	0	1	10	28
Company 3\Interview 0314	0	2	6	2	0	0	1	0	0	0	2	1	0	0	1	5	15
Company 3\Interview 0315	1	1	1	0	0	0	1	0	0	0	1	0	0	1	0	3	6
Company 3\Interview 0316	1	3	10	0	0	0	1	0	0	1	4	0	5	0	0	11	25
Company 3\Interview 0317	0	6	2	2	0	1	3	0	0	0	2	0	2	0	0	8	18
Company 3\Interview 0318	0	3	6	0	0	0	6	0	0	1	1	1	1	2	0	12	21
Company 3\Interview 0319	0	1	2	0	0	0	0	0	0	0	0	0	3	0	3	6
Company 3\Interview 0320	0	5	3	0	0	0	1	0	2	2	0	1	0	8	0	14	22
Company 3\Interview 0321	0	4	2	2	0	0	4	1	0	1	0	0	1	0	0	7	15
Company 3\Interview 0322	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Company 3\Interview 0323	0	9	8	0	0	1	7	3	1	1	1	2	2	2	2	22	39
Company 3\Interview 0324	0	2	5	0	0	0	0	2	0	0	0	2	0	2	0	6	13
Company 3\Interview 0325	0	4	6	1	1	0	3	0	1	0	1	0	0	2	2	10	21
Company 3\Interview 0326	0	1	4	1	0	1	0	0	0	0	1	0	2	2	0	6	12
Company 3\Interview 0327	0	1	3	0	0	0	1	0	0	0	0	0	0	0	1	2	6
Company 3\Interview 0328	0	1	1	0	0	0	1	0	0	0	0	2	0	0	0	3	5
Company 3 Field Notes\S2	0	5	1	0	0	0	1	0	1	1	0	0	2	8	0	13	19
Company 3 Field Notes\S2	0	1	1	0	0	0	1	0	0	0	1	1	1	6	3	13	15
Company 4\Interview 0401	1	0	2	0	0	1	2	0	1	0	6	5	3	0	0	18	21
Company 4\Interview 0402	0	0	18	5	0	1	8	0	0	4	28	13	4	0	0	58	81
Company 4\Interview 0403	0	0	8	0	0	1	1	1	0	1	18	0	6	0	0	28	36
Company 4\Interview 0404	1	2	3	1	0	0	7	3	1	1	2	4	2	0	0	20	27
Company 4\Interview 0405	0	5	5	6	1	0	4	2	8	1	4	11	38	0	0	69	85
Company 4\Interview 0406	1	7	14	10	2	1	2	7	6	4	5	5	28	0	0	60	92
Company 4\Interview 0407	0	5	4	2	0	0	1	0	1	0	2	3	0	0	2	9	20
Company 4\Document 0408	0	0	2	0	0	2	1	1	0	0	0	0	0	0	0	4	6
TOTAL	47	245	416	146	47	61	216	94	186	245	194	197	135	53	124	1552	2406

APPENDIX G: LIST OF ABBREVIATIONS

Table G.1: List of abbreviations

Abbreviation	Meaning
B2B	Business to Business marketing/trade
B2C	Business to Consumer marketing/trade
B2I	Business to Individual marketing/trade
BITRM	Business and IT Relationship Model
BDI	The Belief/Desire/Intention architecture
BPM	Business Process Management
BSC	Business Score Card
BSM	Business Service Management
BYOD	Bring Your Own Device
CAQDAS	Computer Assisted Qualitative Data Analysis System
CDROM	Compact Disk Read Only Memory
CIO	Chief Information Officer
CMMI	Capability Maturity Model Integration by Carnegie Melon University
COBIT	Control Objectives for Information and related Technology. Current version number is 5.
COTS	Commercial Off-the-Shelf
CRM	Customer Relationship Management
DAD	Distributed Application Diagram
E2E	End to End
EA	Enterprise Architecture
EDI	Electronic Data Exchange
EFQM	European Foundation for Quality Management
EMEA	Europe, Middle East, and Africa
ERP	Enterprise Resource Planning
ERISS	European Research Institute in Service Science, Tilburg University.

Abbreviation	Meaning
F&P	Finance and Planning
FEAP	Federal Enterprise Architecture Program
GRC	Governance, risk management, and compliance
HMG	Her Majesty's Government
HQ	Head Quarters Organization
IAAS	Infrastructure-as-a-Service
IEC	The International Electrotechnical Commission – a standards body
ISACA	Information Systems Audit and Control Association
ISO	International Standards Organization
IT	Information Technology
IT-CMF	The IT Capability Maturity Framework from the Innovation Value Institute
ITAC	Information Technology Association of Canada
ITIL	The Information Technology Infrastructure Library
itSMF	IT Service Management Forum
Likert	Likert scale developed by R. Likert (see Bibliography: A Technique for the Measurement of Attitudes)
MAXQDA	A high-performance program for professional social science-oriented text analysis chosen as the preferred CAQDAS
NMM	New Maturity Model
NPfIT	National Programme for IT for the National Health Service in the UK
OGC	Office of Government Commerce of the Cabinet Office of HMG
PAAS	Platform-as-a-Service
PDCA	Plan-do-check-act cycle after Deming/Shewhart
RACI	Responsible, Accountable, Consulted, Informed framework
RAD	Rapid Application Development
Risk IT	Risk IT Framework for Management of IT Related Business Risks developed as an add-on to COBIT 4.2 as a governance feature and now

Abbreviation	Meaning
	fully incorporated into COBIT 5
SAAS	Software-as-a-Service
SERVPERF	Service Performance based on the work by Cronin and Taylor
SERVQUAL	Service quality measures based on the SQM and work by
SEM	Service excellence model
SFIA	Skills for the Information Age
Six Sigma	A six sigma process is one in which 99.99966% of the products manufactured are statistically expected to be free of defects (3.4 defects per million)
SLA	Service Level Agreement
SOA	Service Oriented Architecture
SQM	B2C Service Quality Model by Parasuraman *et al*
SSMED	Service Science, Management, Engineering, and Design, IBM.
TBE	Total Business Experience
TOGAF	The Open Group Architecture Forum
Val IT	Val IT Framework for Business Technology Management developed as an add-on to COBIT 4.2 IN 2008 for the addressing the governance of IT-enabled business investments. Being incorporated into COBIT 5 from 2012.

APPENDIX H: LIST OF PUBLICATIONS AND ARTICLES BY THE AUTHOR

Miller D., and Woodman, M., "A *Business-Focused IT Service Model for Clou*d", 1st Annual Conference on Cloud Computing and Services Science", Nordwijkerhout, The Netherlands, May, 2011.

Miller, D., and Woodman, M., "*Service Models for IT Management, IT Alignment, and IT Governance*", 16th Annual Conference of the UK Academy for Information Systems, Oxford University, April, 2011.

Miller D., and Jones A., "*A New Approach to Business-IT Alignment*", Software AG Webinar, January 2011.

Miller, D., and Woodman, M., "*Software Engineering Systems as Services Using a Business-Focused Service Framework*", 5th International Conference on Evaluation of Novel Approaches to Software Engineering", Athens, June 2010.

Miller, D., "*Staying Focused*", IT Now, May 2009, pp 12–13.

Miller, D., "Bridging the Perception Gap", Professional Manager, July 2008, p 35.

Miller, D., "*Business-Focused IT and Service Excellence*", British Computer Society, 2008.

Miller, D., "Business-Focused IT – How 'Brand Value' enhances product and service excellence", (ITDYNAMICS Ltd, 2005).

Miller, D., "Strategic *Information Engineering*", Mature candidate submission and application for registration as a Chartered Engineer, 1989.

Mainelli, M.R., and Miller, D., "*Strategic Planning for Information Systems at British Rail*", Long Range Planning, Vol. 21, No. 4, 1988, 65–75.

Feldman, P., and Miller, D., "*Entity Model Clustering: Structuring a Data Model by Abstraction*", The Computer Journal, Vol. 29, No. 4, 1986, 348–360.