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PhD in Business

Exploring the Role of the Chief Information Officer (CIO) during a Failing IS Initiative

A Process Inquiry in a Public Sector Setting

A Thesis Submitted to

TRINITY COLLEGE DUBLIN
COLLAISTE NA TRINOIDE, BAILE ATHA CLIATH

THE UNIVERSITY OF DUBLIN

For the degree of Doctor of Philosophy Ph.D

Brian Dempsey BSc, MA, MBA

Trinity College Dublin

12th July 2015

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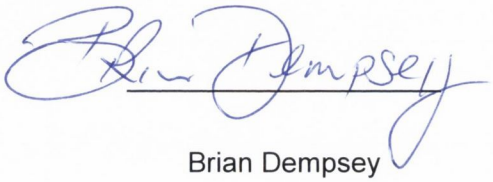

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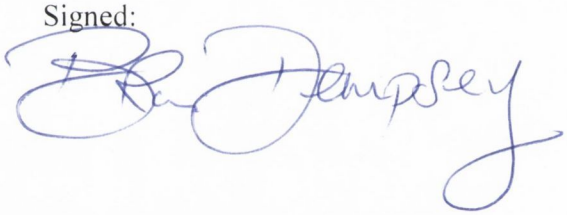

Abstract

This research is situated in the field of Information Systems (IS) and explores the role of the Chief Information Officer (CIO) over the course of a failing IS initiative. IS failure is a recurring theme in both academic and practitioner literature since the beginning of the computer age. Studies of IS failure indicate that it is widespread and is costing industry in the tens of billions of US$ per annum. The Chief Information Officer (CIO) is described as a senior executive with responsibility for establishing corporate information policy, standards, and management control of all corporate information resources. The role has evolved significantly since first coined, reflecting the growing importance of IS during the last 30 years. As the most senior IS officer in the organisation the CIO is ultimately responsible for the successful deployment of IS to meet the strategic objectives of the organisation. Extant literature on the CIO suggests however that there may be a range of issues, specific to the CIO role, which contribute to the enduring problem of IS underperformance and failure. Having reviewed extant literature in both the CIO and IS failure domains it is of note that there is a dearth of literature which provides any explanation about the relationship between IS failure and the role of CIO. This research addresses this gap and in the process transcends the boundary of two essentially discrete, yet inherently connected academic silos (IS failure and the CIO), by undertaking a novel study that connects the two.

Having analysed the range of philosophical positions, associated data gathering and analysis methods, and a range of research methodologies a qualitative/interpretive process inquiry was selected as the most appropriate for the conduct of the research. Furthermore as contextual understandings are best achieved by direct, first-hand knowledge of a research setting it was decided to undertake the process inquiry in a real life case setting. The setting chosen was the case of the Public Services Broker (PSB), a failed IT enabled Irish public service modernisation initiative. The outcome of the research is a theoretical framework that describes the role of the CIO during IS failure. The typology presented speaks to a series of phases/stages with each phase/stage delineated with a set of defining characteristics. The phases/stages are defined as *genesis, initiation and conceptualisation, design, development, operation,* and *termination*, and each phase is delineated by four dimensions of failure: *vision, support, governance, and execution capability*. The typology forms the backdrop to the performance of the role of CIO, which is central to the emergent theory. The research makes a theoretical, empirical, and methodological contribution to academia and also offers a basis for both informing and transforming professional management practice.

Dedication

This work is dedicated with love to my wife Caroline and my children Adam and Aoife.

Acknowledgements

First and foremost I wish to thank my supervisor Professor Joe McDonagh for his support during this endeavour. Without doubt I would not have completed this work except for his continued expert guidance, support, and (often) patience over my four year tenure at Trinity College Dublin, and I thank him sincerely for this.

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Go raibh maith agaibh go lear !

Brian.

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Abreviations

BPR	-	Business Process Re-engineering
CEO	-	Chief Executive Officer
CFO	-	Chief Financial Officer
CIO	-	Chief Information Officer
CKO	-	Chief Knowledge Officer
CMOD	-	Centre for Management and Organisation Development
CoP&K	-	Communities of Practice and Knowing
CT	-	Cloud Technology
DBG	-	Delivering Better Government
DEPS	-	Death Event Publication Service
DEVS	-	Death Event Validation Service
DP	-	Data Processing
DSFA	-	Department of Social and Family Affairs
EJIS	-	European Journal of Information Systems (publication)
ERP	-	Enterprise Resource Planning
EU	-	European Union
I&M	-	Information and Management (publication)
IAMS	-	Inter-agency Messaging System
ICT	-	Information and Communication Technology
IS	-	Information Systems
ISC	-	Information Society Commission
ISF	-	Information Society Fund
ISJ	-	Information Systems Journal (publication)
ISPU	-	Information Society Policy Unit
ISSS	-	Integrated Social Services System
IT	-	Information Technology
ITT	-	Invitation to Tender
JIT	-	Just in Time
MIS	-	Management Information System
NAO	-	National Audit Office
NHS		National Health Service
NOMIS	-	National Offender Management Information System
PMBOK	-	Project Management Body of Knowledge
PMI	-	The Project Management Institute

PPSN	-	Personal Public Service Number
PQDS	-	Professionally Qualified Doctoral Student
PRINCE	-	Projects in Controlled Environments
PSB	-	Public Services Broker
QCS	-	Quality Customer Service
ROS	-	Revenue On-line Service
SMI	-	Strategic Management Initiative
TAG	-	Technical Authority Group
TCP/IP	-	Transmission Control Protocol / Internet Protocol
TMT	-	Top Management Team
XML	-	Extensible Markup Language
Y2K	-	Year 2000

Chapter 1

Introduction

Chapter 1 – Introduction

A research problem is not solved by apparatus; it is solved in a man's head

(Charles F. Kettering)

1.1 Introduction

This research is situated in the field of information systems (IS)[1] (Bacon & Fitzgerald, 2001), in the research area of IS development, as described by Sidorova et al. (2008), and in the area of development, implementation, and use of systems as described by Taylor et al. (2010). It explores the subject of IS failure and the role of the Chief information Officer (CIO) over the course of a failing IS initiative.

Continuous innovation and agility, in the face of an ever more competitive and globalised business environment, is now a fundamental element of strategic planning in most contemporary organisations (Sambamurthy et al., 2003). IS has played an ever increasing role in supporting the strategic endeavours of the organisation to enhance business performance through continuous innovation in products, services, channels, and customer segments. IS has been described as the neural system of the modern organisation (Celjo et al., 2011). In particular the advent of the Internet during the late 1990s has further embedded IS into the very fabric of the organisation by redefining the relationships between consumers and enterprises, and has had a profound effect on the structure of most industries by re-aligning the competitive environment (Earl & Feeny, 2000; Porter, 2001, 2008), altering the balance of threats and opportunities, and creating additional opportunities for strategic differentiation (Seely-Brown & Hagel, 2003). Today many strategic issues faced by an organisation are either triggered by IS, or have consequences for it (Earl & Feeny, 2000), and IS is almost always on the critical path of a business change programme (Earl & Feeny, 2000). Therefore the strategic management of IS has never been more critical to business success (Peppard, 2010; Porter, 2001). It remains a fact however that since the early days of computing the process of introducing IS into large complex organisations has been fraught with difficulty (McDonagh & Coghlan, 2006; McDonagh, 2014; The Standish Group, 1995), a situation that has not improved significantly over the years.

The Chief Information Officer (CIO) is described by Synnott & Gruber (1981) as a senior executive with responsibility for establishing corporate information policy,

[1] The field of Information Systems (IS) is concerned with the management and use of Information Technology (IT) for managerial and organisational purposes (Lee, 2001)

standards, and management control of all corporate information resources. The role has evolved significantly since first coined, reflecting the growing importance of IS during the last 30 years. The role has been described as that of a business strategist, integrator, relationship architect, utility provider, information steward, and educator (Smaltz et al. 2006), and one that requires a thorough knowledge of the interconnection of the information flows of the business (Benjamin, et al., 1985), along with an enterprise-spanning viewpoint to rival that of the Chief Executive Officer (CEO) (Lepore, 2000; Thomas, 1990). As the most senior IS officer in the organisation the CIO is ultimately responsible for the successful deployment of IS to meet the strategic objectives of the organisation. Extant literature on the CIO suggests however that there may be a range of issues, specific to the CIO role, which continue to impact negatively on the success of the role, and which may also contribute to the enduring problem of IS underperformance and failure (McDonagh 2014).

1.2 Background and Justification for the Research

This research arose out of a 30 year involvement in the Information and Communications Technology (ICT) industry. The researcher, having spent much of his practitioner life in in the field of IS strategy and management, has maintained an ongoing interest in the performance of senior roles in this dynamic area. In particular the role of CIO has always been of great interest to the researcher because of its continued exposure in the popular IS press, and in particular because of the many challenges that are reported to be uniquely associated with the successful performance of the role. The genesis of this body of research began with a search for a deeper understanding of the role of CIO commencing with a trawl of academic material relating to the role.

As the highest ranking IS executive the CIO has ultimate responsibility for the successful deployment of IS to create value by meeting the strategic objectives of the organisation. The importance of aligning business and IS strategy is acknowledged as a key precursor to the success of IS investments, and the importance of the CIO, as a senior organisation executive, in creating a shared vision amongst the rest of the senior organisational management (called the top management team, TMT) is also acknowledged (Chan, 2002; Doll, 1985; Preston & Karahanna, 2005; Raymond et al., 2008). A review of literature on the role of the CIO suggests however that there may be a range of issues specific to the CIO role which continue to impact negatively on the success of the role, and which may also be contributory factors in the enduring problem

of IS underperformance and failure. For example evidence persists that the *knowledge gap* (the lack of understanding among executive management of the nature and role of IS within an organisation), and *credibility gap* (many CIOs experience difficulty in making the transition from functional manager to executive manager), which were symptomatic of the fledgling CIO role when conceived, are still factors affecting the ability of the modern CIO to elevate the IS function as an equal partner with the business (Preston & Karahanna, 2005; Watts & Henderson, 2006). For many CIOs technology continues to be a comfort zone, and making the transition to business strategist remains difficult (Karahanna & Watson, 2006). There continues to be a lack of IS literacy among members of the TMT as evidenced by the prevailing lack of clarity within organisations about the role of CIO (Peppard et al., 2011; Peppard, 2010). In many cases members of the TMT still regard IS as a hygiene factor (Peppard, 2010; Willcocks & Sykes, 2000), and consequently view the CIO as being primarily concerned with technology and operational processes (Peppard et al., 2011; Peppard, 2010). The CIO also continues to struggle to provide measurable evidence of the value of IS (Fiegener & Coakley, 1995; Peppard, 2007). All of the above can result in a failure on the part of the CIO to create a shared vision of IS across the organisation, which in turn can lead to a failure on the part of senior management to engage with IS during strategy formation (Jones et al., 1995), which can contribute to or reinforce a negative perception of IS and create a vicious circle of dissatisfaction and disengagement on both sides (Peppard, 2010), resulting in sub optimal investment in IS, and sometimes outright failure (Kaarst-Brown, 2005; Willcocks & Sykes, 2000). These revelations regarding the possible connection between the role of the CIO, and IS underperformance prompted a review of extant literature on IS failure so as to develop a more detailed understanding of the phenomenon, and the role of the CIO therein.

Although there is no widely accepted explanatory model of IS failure (Sauer, 1993b), or indeed even an agreed definition of the concept (Lyytinen & Herschein, 1987; Nakamura & Kijima, 2011), IS failure is a recurring theme in both academic and practitioner literature since the beginning of the computer age (Avots, 1969; Powers & Dickson, 1973). Studies indicate that it is widespread and is costing industry in the tens of billions of US$ per annum. Studies of IS failure indicate an outright failure rate of IS projects of between 18% (Eveleens & Verhoef, 2010) and 50% (McDonagh, 2001). In addition many projects not considered to be outright failures fall far below expectations (Bloch et al., 2012). Despite over 50 years of study into the phenomenon, and in spite of the maturity of software development tools and project management methodologies, the rate of IS failure remains alarmingly high. Mahaney & Lederer (1999) propose that

failure has become an accepted aspect of IS implementations, an ominous proposition given the ever increasing complexity of IS (Koh et al., 2011) and its growing importance in maintaining competitive superiority (Piccoli & Ives, 2005). Gartner estimate that total global spend on IS for 2014 will be $3.8 trillion. Even a conservative estimate of the percentage of this amount that is spent on underperforming IS represents a significant figure, which is a motivation and justification for continued inquiry in this area (Drevin, 2008).

Having reviewed both sets of literature it is of note that the role of CIO in relation to IS failure is not explored in any level of depth in either the CIO or IS failure literature. In fact there is a dearth of literature which provides any explanation about the relationship between IS failure and the role of CIO. This research presents an opportunity to address this gap and in the process transcend the boundary of two essentially discrete, yet inherently connected academic silos (IS failure and the CIO) by undertaking a novel study that connects the two (Dempsey & McDonagh, 2014a). The effective execution of such a study will not only make a significant contribution to academia but also offer a basis for both informing and transforming professional management practice.

From a *theoretical perspective* the research presents a novel process based theoretical framework on the role of the CIO during the course of IS failure. The framework deepens and extends our understanding of the role of CIO by placing the study in the context of a unique setting of a failing IS initiative. To date little theoretical development has been undertaken in this area, despite calls in the literature.

From an *empirical perspective* the research addresses a gap in current academic literature by transcending the boundary of two essentially discrete, yet inherently connected, academic silos (IS failure and the CIO), thereby adding to the body of knowledge in both domains, by presenting a novel study that connects and explains the relationship between the two. This approach is consistent with the principles of the professoriate which emphasises both the scholarship of discovery and the scholarship of integration (Boyer, 1990), by presenting a holistic view of both the process of failing, and the role of the CIO therein.

From a *methodological perspective* the research adds to the growing body of interpretive, longitudinal, process studies in the domain of IS failure. Using a case study as an overarching methodology for the conduct of the inquiry combines two research approaches (process inquiry and the case method). Conducting a role based study in a real life case setting facilitates a deeper explication of the dynamics of the

performance of a role (in this case the CIO) over time, and how the performance of the role both affects, and is affected by, the context in which it is performed.

From a *practitioner perspective* the research presents a unique real life case of IS failure and the role of the CIO therein. Case study is not only a research method but is also a powerful learning instrument (the case method), used in many of the world's leading business schools as a way to explore high risk phenomena in a safe, risk free, environment. This is particularly relevant today for certain sectors of the economy, such as government, where IS underperformance continues to be a regular and costly phenomenon (House of Commons, 2011; McDonagh, 2014) and the role of CIO is less mature than the private sector (Lawry & Waddell, 2008).

1.3 Research Methodology

Having established a research question - *'How does the role of the Chief Information Officer (CIO) influence IS failure outcomes?'* - based on a review of literature in the IS failure, and CIO domains, and analysed the range of philosophical positions, along with associated data gathering and analysis methods, it was decided to adopt a qualitative / interpretivist approach as the most suitable strategy to undertake this research. The interpretive approach is well suited to research that is exploratory in nature (Walsham, 1995b), and is unique in its ability to address issues of description, interpretation and explanation (Bluhm et al., 2011), in the context of socially constructed organisational settings. In particular, because IS developments are complex, protean, social phenomena (Wastell & Newman, 1993) narratives of IS failure tend to be multi-stranded stories of experiences and reactions that lack collective consensus (Dalcher & Drevin, 2003). They can therefore be best understood by focusing on the complexity of human sense making and decision making (Cunliffe, 2010) through the interpretation of social constructions such as language, shared meanings, documents, tools and other artefacts. The adoption of an interpretivist approach in turn indicates that a qualitative approach to data gathering and analysis is appropriate.

Having reviewed a range of research methodologies it was decided that a process inquiry is the most appropriate for the conduct of the research on the basis that IS failure is a temporally evolving process (Sauer, 1993b; Sauer & Davis, 2009; Wilson & Howcroft, 2002), and IS failure is also a process (Wilson & Howcroft, 2002). A process inquiry facilitates a focus on behaviour in organisations, and sequences of events, activities and actions, which unfold over time and in context (Hinings, 1997; Langley & Tsoukas, 2010; Pettigrew, 1997). As contextual understandings are best achieved by

direct, first-hand knowledge of a research setting it was also decided to undertake the process inquiry in a real life case setting.

1.4 Thesis Structure

The thesis is divided into eight chapters as outlined in Figure 1 below.

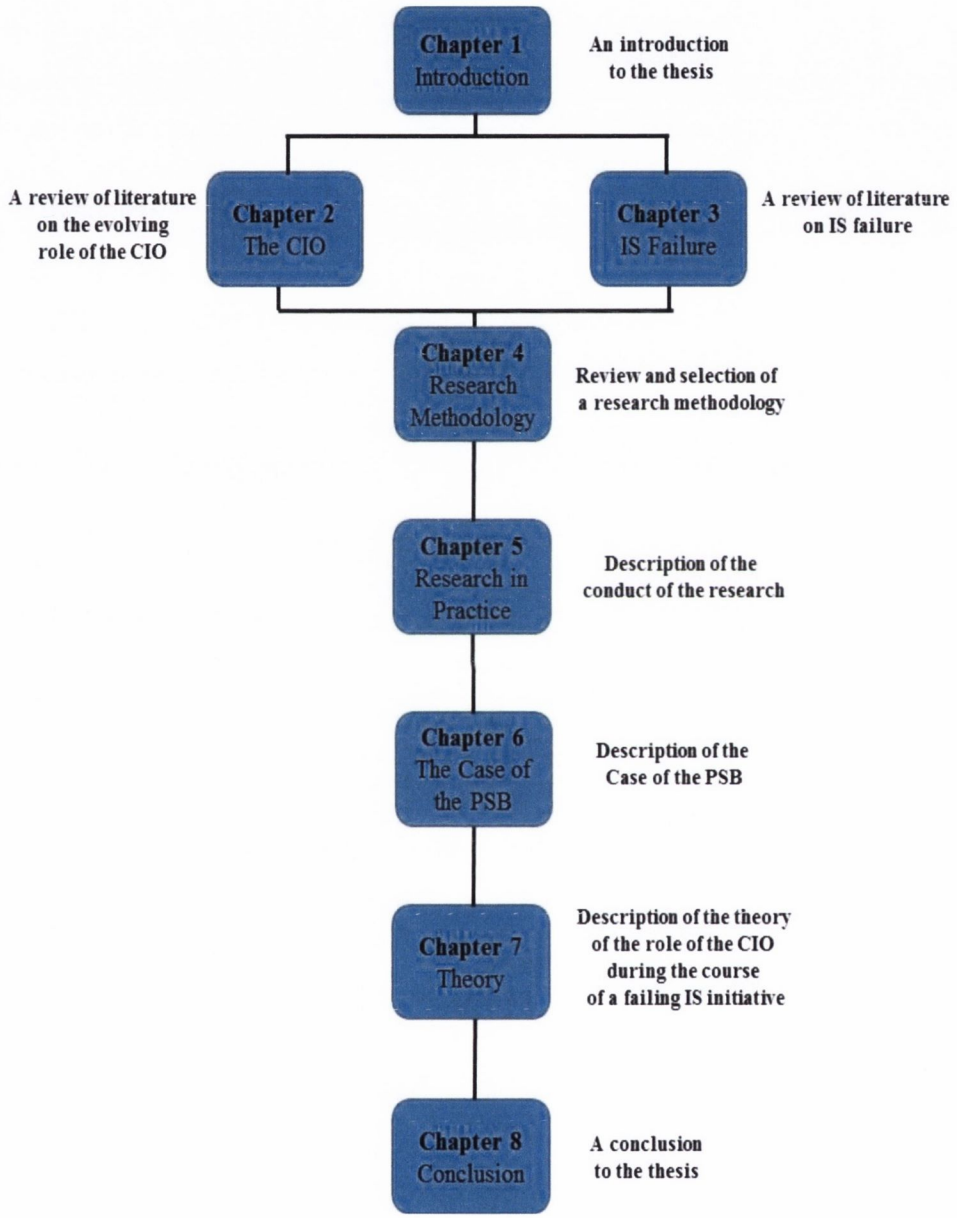


Figure 1 - Structure of the Thesis

Chapter 1 is an introduction to the research study which introduces the topic of the research and presents the structure of the thesis for the reader. Chapter 2 presents a

comprehensive review of the evolving role of the CIO in the context of three technological eras: the mainframe era (1960's-early 1980's); the distributed era (late 1970's – mid 1990's); and the web-based era (mid 1990's – today), along with the factors that influence the performance of the role. The review reveals an underlying theme suggesting that the high rate of failure of IS initiatives is in some way attributable to a failing in the performance of the role of the CIO. Chapter 3 then explores the theme of IS failure by presenting a comprehensive review of literature in this domain. The chapter examines the nature of IS, IS deployment, and IS failure, and presents a range of common failure conditions grouped around three spheres of influence over IS project outcomes as: *process driven; content driven;* and *context driven* (Yeo, 2002). In conclusion the chapter notes a dearth of empirical research in both the CIO literature and the IS failure literature which provides any explanation about the relationship between IS failure and the role of CIO, and proposes to fill this gap by conducting research into the role of the CIO during IS failure. Chapter 4 then examines the broad spectrum of research philosophies and concludes that a qualitative/interpretive process inquiry in a case based setting is the most appropriate methodology for the conduct of the research. Chapter 5 describes the selection of the case of the Public Services Broker (PSB), a failed IT enabled public service modernisation initiative, as an appropriate case for the conduct of the research, and justifies the selection of a single case design on the basis that every IS failure is unique in some fashion, and therefore provides a novel setting for a study of the role of the CIO. The chapter then describes how the research was conducted and details the process of data analysis which resulted in the conception of a theoretical framework consisting of four distinct dimensions of failure, in the context of six distinct phases representing the development and failure of the selected case, which forms the backdrop for the study of the CIO role. Chapter 6 presents a detailed case history of the Public Services Broker. Chapter 7 then describes in detail the theory of the role of the CIO during IS failure, compares the findings with extant literature in both domains, and presents implications of the emergent theory for both academia and practice. Chapter 8 provides a conclusion to this thesis by assessing the achievement of its aims, the limitations of the current study, and suggests avenues for further study.

1.5 Conclusion

This opening chapter describes the background to, and justification for, undertaking this research, along with the contributions it will make from a theoretical, empirical, methodological, and practical perspective. The chapter then briefly describes the

research methodology and the goes on to provide a brief outline of the structure and content of each of the remaining chapters 2 to 8.

Chapter 2

The Evolving Role of the Chief Information Officer (CIO)

Chapter 2 – The Chief Information Officer

> *The immutable fact is that the management team of any business ... will have new tools, new problems, and new opportunities as a result of future developments in information technology"* (Diebold, 1965, p.82).

2.1 Introduction

The title Chief Information Officer (CIO) was coined by Synnott & Gruber (1981). They define the CIO as a senior executive with responsibility for establishing corporate information policy, standards, and management control of all corporate information resources. As the most senior IS role in the organisation, the CIO plays an essential role in the deployment of IS to meet the strategic objectives of the organisation. The role has evolved significantly since first coined, reflecting the growing importance of IS during the last 30 years. The role has been described as that of a business strategist, integrator, relationship architect, utility provider, information steward, and educator (Smaltz et al. 2006), and one that requires a thorough knowledge of the interconnection of the information flows of the business (Benjamin, et al., 1985), along with an enterprise-spanning viewpoint to rival that of the Chief Executive Officer (CEO) (Lepore, 2000; Thomas, 1990).

The CIO role is also one of many contradictions. On one hand it is postulated that the CIO is a logical choice to succeed the CEO (Chatterjee et al., 2001) because of the enterprise-wide perspective required of the role. There has been a growing tendency among organisations to appoint a CIO and Chatterjee et al. (2001) found that the announcement of the appointment of a CIO can positively affect the market value of an organisation. On the other hand the CIO role has also been described by Forbes as *"the number one worst job in America"* (Karlgaard, 2002). There have been many highly publicised accounts of the vulnerability of the CIO position in the practitioner press (e.g. www.cio.com) and Karimi, et al.(1996) state that there is a higher than average dismissal rate, and shorter tenure for IS leaders, compared to other top executives. Capella (2006) suggests that the turnover rate of CIOs is twice that of Chief Financial Officers (CFO) and CEOs, and proposes that the CIO has only 100 days[2] to prove his or her value to the organisation and senior management.

[2] An unofficial but widely used benchmark for proof of effectiveness in a new role including that of president of the USA.

Despite the increasingly strategic nature of the CIO role there exists a polarised view among senior organisational managers who see IS as either an enabler of strategic opportunity or a significant consumer of resources that offers little measurable evidence of value (Peppard, 2010). The CIO must operate as a business leader with special responsibility for IT and not an IT leader who is delivering to a business (Peppard, 2010) however the CIO often struggles in his/her efforts to create a shared vision across the organisation so as to leverage the deployment of transformational technologies and systems, whilst simultaneously *"keeping the lights on"* (Peppard et al., 2011, p. 33).

This chapter presents a comprehensive review of literature on the role of the CIO. Section 2.2 describes the methodology used to conduct the literature review. Section 2.3 describes the evolving role of the CIO through three technological eras: mainframe era; distributed era; and web-based era as defined by Ross & Feeny (2000), describing the CIO role in the context of the range of technology and business/organisational changes which shaped the role during each era. Having constructed a role profile for the CIO of today Section 2.4 then considers a range of personal and organisational factors which influence the performance of the role, concluding that organisational and situational factors play a significant part in the execution of the CIO role. Section 2.5 offers a critique of extant literature on the CIO role, noting that much of the literature is anecdotal or prescriptive in nature (Armstrong & Sambamurthy 1999; Smaltz et al. 2006), with limited empirical work examining the prescriptions made (Smaltz et al 2006). In particular the literature has left a number of areas, such as the role of the CIO in the IS implementation process, and the relationship between IS failure and the role of CIO largely unexplored, which represents a significant gap that warrants further investigation considering that the CIO has ultimate responsibility for creating value for the organisation through the deployment of IS. Section 2.6 concludes the chapter with a brief summary of findings.

2.2 Literature Review Methodology

The review of literature for this chapter was conducted using the Business Source Complete (EBSCO) database which is available through the Trinity College Library. The decision to use this database was made on the basis that EBSCO is renowned as a source of full text journals (3812 in total, of which 1984 are peer-reviewed) in all disciplines of business, including IS, and also includes additional full text, non-journal content such as conference proceedings and industry reports. The database includes

all of the top 20 ranked IS journals, including the Association for Information Systems (AIS) senior scholars' basket of journals consisting of eight top ranking journals in the IS field.

The database was searched for academic papers with the words 'CIO' or 'Chief Information Officer' in the document title, returning 306 papers of which 157 related directly to the subject matter. This set was used as the basis for the literature review and was augmented by additional references contained in selected papers, along with additional material relating to the evolution of the computer and its application in business. Non-academic material was also consulted including reports of the large consulting houses, and two of the leading monthly CIO practitioner publications; CIO Magazine (www.cio.co.uk) and CIO Insight (www.cioinsight.com). All material is stored, organised, and categorised using the Mendeley document reference manager system.

A full bibliography of material referenced for this chapter is summarised by method in Table 1 below:

Survey	36
Conceptual Paper	27
Interview	20
Case Study	16
Article	15
Book (or book chapter)	11
Other	9
Field Study	5
Literature review	5
Total	**144**

Table 1 - Summary of Reviewed Material on the CIO

2.3 The Evolution of the CIO Role

Ross & Feeny (2000) developed a model which they used to chart the changing role of the CIO since the early days of IS deployment. The model describes three technological eras: *the mainframe era* (1960's - early 1980's); *the distributed era* (late 1970's – mid 1990's); and *the web-based era* (mid 1990's – today). This model provides a useful framework for describing the evolving role of the CIO as it reflects

clear advances in both technology, and the application of technology in the organisation, which provides a useful backdrop for an evaluation of how these changes impacted upon the role of CIO.

2.3.1 The Mainframe Era (1965 - 1980)

2.3.1.1 The Technology

The earliest computers, developed in the 1950's, were strictly used as scientific tools and code breakers. During the 1960's the commercial world began to recognise the potential of these super calculating engines to offer economies of scale for the organisation (Dearden & Nolan, 1973) by automating routine and previously manual clerical functions such as payroll and general ledger (Dearden & Nolan, 1973; Diebold, 1965; Lee, 1964; Synnott & Gruber, 1981). The computer hardware of the era was a large, complex, and expensive piece of machinery, called a mainframe, which typically required a controlled environment in which to operate. The computer industry at this time was dominated by a small number of suppliers (Johnson, 2002) with IBM being the dominant supplier of mainframe systems and related services (Ross & Feeny, 2000). By the late 1960's most large corporations had acquired mainframe systems and Diebold (1965) predicted that the introduction of the computer could have as significant an impact on the makeup of the organisation as did the introduction of the assembly line.

During this period applications evolved from primarily financial systems to a range of transaction based systems such as production planning and control (Ross & Feeny, 2000). The emergence of data base applications towards the end of the 1970's (Dearden & Nolan, 1973; Nolan, 1976; Synnott & Gruber, 1981) facilitated more complex systems, supporting simulation modelling and on-line query systems, which impacted many parts of the organisational value chain (Gibson & Nolan, 1974; Johnson, 2002). The notion of an integrated management information system (MIS) also began to emerge at this time (Johnson, 2002).

2.3.1.2 The Organisational Context

Computer systems were initially organised under the department in which they were championed and/or deployed (Gibson & Nolan, 1974; Ross & Feeny, 2000). In many cases this was the Finance department (Romancjuk & Pemberton, 1997; Ross & Feeny, 2000), which resulted in the dominance of this department in the early management of the computer function (Nolan, 1976). Over time the computer department began to assume a more dominant role in the organisation as a whole,

resulting in the establishment of a separate DP department, along with an elevation in status (Gibson & Nolan, 1974). With a few exceptions (Dean, 1968) computer facilities became centralised operations, staffed by computer specialists (Diebold, 1965; Synnott & Gruber, 1981), resulting in a low level of regular contact with the business, including the user areas.

At this time business executives were enthusiastic about the potential of computer systems as a cost cutting tool (Ross & Feeny, 2000) leading to a proliferation of controls designed to contain runaway computer budgets and projects (Gibson & Nolan, 1974). Investment in computer technology quickly became based on a return on investment (ROI) assessment (Ross & Feeny, 2000). Over time many organisations began to realise that although the new systems offered efficiency, in terms of processing routine data, they were costly, both in terms of the computer equipment itself, and the labour costs associated with the growing requirements for specialist systems personnel (Dearden & Nolan, 1973; Gibson & Nolan, 1974; Synnott & Gruber, 1981), a situation which was exacerbated by the unexpected cost of on-going maintenance of the systems (Synnott & Gruber, 1981).

Organisations at this time were inexperienced in the deployment of computer systems and often considered the technology to be an end in itself (Gibson & Nolan, 1974; Wetherbe, 1985; Zani, 1970). Early development effort was concentrated on making the systems work, rather than rationalising and optimising the processes they automated (Synnott & Gruber, 1981). System applications therefore tended to be developed in isolation with little regard to other, possibly related, applications. These *"islands of automation"* (McFarlan, 1971, p.84) resulted in fragmentation and duplication of interrelated data (Synnott & Gruber, 1981; Zani, 1970), duplication of effort, and failure to exploit opportunities to integrate systems (Nolan, 1976).

Dearden & Nolan (1973) and Martin (1982) noted the advent of steering committees to provide organisation-wide input to the IS planning process, however both McFarlan (1971) and Nolan (1976) noted the difficulty for steering committees in making broad policy for a very technical and jargon laden area, the underlying complexities of which were foreign to its members.

2.3.1.3 The Role of the DP Manager[3] in the Mainframe Era

The head of the computer function was initially called the DP manager. Appointment of early DP managers was usually on the basis of technical expertise, or experience of the functional area where the computer system was initially deployed (Ives & Olson, 1981). In a study of 15 DP managers in large US organisations Martin (1982) found that most had a long employment with the organisation before taking up the position. The key tasks demanded of the DP manager were to manage the DP department and deliver new systems on time and budget (Martin, 1982; Ross & Feeny, 2000). The typical reporting arrangement for the DP Manager was to a head of function (often Finance or Admin) or one level below (Ives & Olson, 1981; Martin, 1982).

Even then there was significant confusion about the role of the DP manager (Rockart, et al., 1982). Wetherbe (1985) identified an expectation gap on the part of management that the computer systems would provide all the information they need when they need it to monitor organisational operations and forecast future operations. The reality was somewhat different. DP management inexperience was often the result of the rapid promotion of technically focused individuals who had little management experience and who could not adequately function at senior level (Wetherbe, 1985). During the 1970s dismissals among DP managers were common (Nolan, 1973; Nolan, 1976; Ives & Olson, 1981). Turnover rates were as high as 50% in 1972 (Wetherbe, 1985). Nolan (1973) puts this down to a combination of organisational expectations and DP management inexperience.

Ives & Olson (1981) noted that although there were many descriptions and prescriptions for the role of the DP manager (Dean, 1968; Dearden & Nolan, 1973; McFarlan, 1971) very little empirical research had been undertaken. They undertook an observational study of 6 DP managers over a 3-4 day period and concluded that the role of the DP manager was that of a functional manager who spends a great deal of time planning the overall strategy for the computer department. Ross & Feeny (2000) describe the role as that of a senior or middle manager reporting to an established functional head - *"an operational manager in a specialist domain"* (p. 390). Ives & Olson (1981) also note that only a very small portion of contacts by the DP department are with users *"at any level"* (p. 61), including functional management at their own level. This is corroborated by Couger et al. (1979) who found that DP managers possess characteristics more similar to those of their subordinates than of their

[3] The DP Manager (Data Processing Manager) was the prevailing title of the head of the computer function during the mainframe era and will be used as the most appropriate title in this section. The title changed to Management Information Systems Manager (MIS Manager) towards the latter part of the era, later becoming the Chief Information Officer (CIO) during the early 1980s.

managerial peers. DP Managers, during this period, spent much of their time in their own offices, frequently in one-on-one discussions with immediate subordinates (Ives & Olson, 1981). Contact with superiors was infrequent and typically in a support role rather than a partnership with a strategic agenda (Martin, 1982). Dean (1968) noted that at this time the main interface with senior management was of a budgetary nature.

The dominance of IBM as both a supplier of technology and trusted partner at senior organisational level meant that they could almost dictate the pace and direction of applications development and procurement strategy (Ross & Feeny, 2000), thereby creating a heavy reliance on the part of the DP manager (Ives & Olson, 1981). IBM became a *"safe choice"* (Ross & Feeny, 2000, p.389) for DP management and sales presentations were frequently treated by DP managers as opportunities to diffuse knowledge throughout their organisations (Couger et al., 1979; Wetherbe, 1985).

Towards the end of the Mainframe era there was a growing realisation of the importance of the role of the DP manager (Ives & Olson, 1981). Increasingly, the emphasis of the role moved from personal technical aptitude to effective management and communication ability (Nolan, 1976; Ross & Feeny, 2000), from efficient to effective management of the computer resource (Nolan, 1976), from manager to change agent (Cross et al., 1997; Rockart et al., 1982; Wetherbe, 1985), and from functional manager to participative manager (Rockart et al., 1982). Toward the end of the era, some companies had begun to appoint as IS leaders proven managers from elsewhere in the business (Ross & Feeny, 2000).

2.3.1.4 The Transition to the Distributed Era

Towards the end of the mainframe era in the early 1980s a number of changes occurred which shaped the transition into a new era of computing which Ross & Feeny (2000) describe as the distributed era. Among the many changes were: (1) the growing dissatisfaction within the organisation with the 'ivory tower' nature of the computer department, along with the inflexibility associated with the complex systems, and the long lead times to implement requested modifications (Synnott & Gruber, 1981); (2) the advent of the mini-computer and later in the 1980s the personal computer (Benjamin et al., 1985; Johnson, 2002); (3) the enhanced sophistication and ease of use of computer applications and telecommunications capabilities (Rockart et al., 1982); (4) the growing understanding within the organisation of the strategic nature of IT as a corporate asset (Romancjuk & Pemberton, 1997); and (5) a realisation of the skill sets required to leverage the resource (Johnson, 2002).

Nolan (1973) in Benjamin et al. (1985) describes this transition as a period of technological discontinuity characterised by a migration from a traditional centralised DP infrastructure to a user-dominated one.

2.3.2 The Distributed Era (1980 - 1995)

2.3.2.1 The Technology

The arrival of the mini-computer towards the end of the 1970s heralded a change in the way computing capability was deployed in the organisation (Johnson, 2002; Ross & Feeny, 2000). The mini-computer was a smaller, cheaper, and more versatile machine than the mainframe, which required much less stringent environmental conditions and specialist staff. This made it more easily deployed throughout the organisation, including the user community (Johnson, 2002; Rockart et al., 1982; Ross & Feeny, 2000; Synnott & Gruber, 1981). The relative ease of deployment, and the on-going frustration with the 'ivory tower' position of the DP department, ensured that the mini-computer rapidly gained position among the user community. For example Ives & Olson (1981) found that users had begun to acquire their own mini-computers. The arrival of the personal computer in the early 1980's (Johnson, 2002; Rockart et al., 1982; Ross & Feeny, 2000) made computing capability even more assessable to the user community and solidified the notion of 'end user computing' (Janson, 1989).

The increasing sophistication of telecommunication systems, along with the proliferation of data communications standards, allowed systems to be linked in a networked configuration, facilitating the spanning of traditional organisational boundaries (Feeny et al., 1992; Ross & Feeny, 2000), further enhancing their utility and spread within the organisation (Johnson, 2002; Ross & Feeny, 2000). The integration of IS and communications technology (referred to as ICT) also enabled the use of office automation tools, including intra-office e-mail and diary management systems, which further eroded the 'ivory tower' position of the DP department (Synnott & Gruber, 1981). The emergence of electronic data interchange (EDI) standards facilitated electronic commerce between organisations (Ross & Feeny, 2000).

During the distributed era there was a rapid increase in the range and sophistication of packaged software, both for end-user and enterprise applications (Davenport & Short, 1990; Doll, 1985; Ross & Feeny, 2000). The rapid advancements in 4th Generation languages and database applications led Dearden (1987) to predict the demise of the MIS department in favour of total end user control. Janson (1989) however described the many pitfalls associated with placing the user in the locus of control and concluded

that off the shelf software, coupled with user only deployment, is not a suitable model for systems of strategic importance due, in many cases, to the lack of technical savvy within the user departments, and the absence of a proper support facility within the IS department. Janson (1989) concluded that a more effective approach would be to organize the DP department around the task of providing the user with a technological infrastructure that ensures the greatest possible user discretion in the deployment of information resources, a position also endorsed by Rockart et al. (1982).

The proliferation of new development methodologies, integrated package suites, and emerging technologies led to a significant reduction in the dominance of IBM as a supplier and the emergence of other key providers in the industry (Ross & Feeny, 2000). The increasing complexity and rising costs of IT technology led to an increase in outsourcing of computer development and operation to external 'expert' providers (Lacity & Hirschheim, 1994; Rockart et al., 1982; Ross & Feeny, 2000). Outsourcing was typically sold on the promise of lower costs (due to economies of scale and increased efficiency) however many companies learned that outsourcing IT en-masse significantly diluted the unique organisational competency afforded by in-house expertise. Many organisations failed to realise the promised cost savings and increased service levels that the new technology deployment promised (Lacity & Hirschheim, 1994), and over time became far more selective in their decisions to outsource (Lacity et al., 1996; Ross & Feeny, 2000).

The arrival of Enterprise Resource Planning (ERP)[4] systems, supplied by a number of emerging key players such as SAP and Oracle (Rockart, Earl, & Ross, 1996; Ross & Feeny, 2000) held the promise of enabling organisations deploy computer systems in an integrated fashion and at an organisation-wide level, spanning many of the primary and support activities of the value chain (McFarlan, 1984; Porter & Millar, 1985; Ross & Feeny, 2000). The persuasive role of many of the large consulting houses, along with the growing acceptance of outsourcing, and the need to fix the impending Y2K[5] situation were often key factors in the uptake of such systems during this period (Ross & Feeny, 2000).

2.3.2.2 The Organisation

By the commencement of the Distributed Era management had already begun to recognise the strategic potential of IT and had begun to look to the IT department for

[4] An ERP system is a packaged software system that can provide a totally integrated solution to the IS needs of an organisation (Nah & Lau 2003)

[5] Y2K was the term given to the problem which could arise as a result of the transition from AD 1999 to 2000 whereby, computer systems, software, and chips using two digits to represent the year (i.e., 99 for 1999) might interpret 2000 as 1900.(Ho & Smith 2000)

solutions to business problems (Johnson, 2002). The writings of McFarlan (1984) and Porter & Millar (1985) helped to highlight the strategic significance of IS and its role as a competitive weapon (McFarlan, 1984; Porter & Millar, 1985; Ross & Feeny, 2000). Advancements in ICT were facilitating linkages both inside and outside of the organisation, expanding traditional organisational boundaries (Ross & Feeny, 2000). IS facilitated the automation of production and administrative processes, the co-ordination of linkages within the value chain, and horizontal expansion of the value chain into supplier and buyer value chains (McFarlan, 1984; Porter & Millar, 1985). IS altered the structure of many industries, creating competitive advantage by lowering cost, enhancing differentiation, changing scope of operation, and spawning new businesses (McFarlan, 1984; Porter & Millar, 1985). Examples of such transformations included the implementation of JIT processes in the Japanese car manufacturing industry (Johnson, 2002; Ross & Feeny, 2000), backward integration of airline reservation systems into booking agents (Feeny et al., 1992; Jones et al., 1995), and the provision of 24 hour banking services through the use of ATMs and data communications technology (Rockart et al., 1982). IT also created opportunities for expanding the scope of the business through globalisation and for collaboration through the use of voice and data conferencing systems.

In line with the predictions of McFarlan (1984) and Porter & Millar (1985) organisations soon began to see the relevance of aligning IS and business strategy (Benjamin et al., 1985; Earl, 1993; Rockart et al., 1982; Ross & Feeny, 2000). However the increasing importance to the business of a robust and coherent IS infrastructure in support of business strategy often contrasted with the situation on the ground, where multiple technical architectures had come into use (Applegate & Elam, 1992; Moynihan, 1990; Rockart et al., 1996). The rush to develop more and more systems led to a chaotic growth in the *"islands of automation"* (McFarlan, 1971, p. 84) which was crippling many companies' efforts (Johnson, 2002) and leading to burgeoning IT costs and tumbling systems reliability (Ross & Feeny, 2000). The proliferation of end user systems highlighted a need for greater integration and collaboration across the organisation in order to manage the growing complexity required to capitalise on the strategic and competitive opportunities enabled by the technology (Rockart & Short, 1989). Recessionary pressures also reinforced the urgent need, in the minds of executives, for IT activities to be rationalised and IT costs to be brought under control (Ross & Feeny, 2000).

The changing nature of competition forced organisations to innovate and therefore, rather than automate existing business processes (Rockart & Short, 1989), which had evolved within a functionally driven business structure, many firms chose to re-design their processes to take advantage of the capability of new technology (Ross & Feeny, 2000), and the changing environment (McFarlan, 1984; Porter & Millar, 1985). Many organisations undertook a program of business process re-engineering (BPR)[6] (Davenport & Short, 1990) as it coincided with the implementation of ERP applications. Many organisations however failed to understand the fundamental organisational change required for the successful implementation of these new systems and viewed technology as the 'silver Bullet' (Brooks, 1987; Lyytinen & Robey, 1999) with which to effect the necessary organisational transformation, often with disastrous consequences. This situation was exacerbated by the tendency to outsource (Johnson, 2002; Ross & Feeny, 2000), which frequently resulted in the abdication of control to 'expert' systems integrators (Ross & Feeny, 2000), external to, and with little insight of the workings of the organisation.

2.3.2.3 The Role of the CIO in the Distributed Era

Acknowledging the rapid changes in technology and the business environment, along with the increased IS sophistication of the user community, Rockart et al. (1982) presented a somewhat prescient perspective on the evolution of the role of the senior IS executive. They proposed that in order to meet the challenges presented by technical and organisational trends the person should be a business orientated general manager with a thorough understanding of technology, requiring the same skill-sets as other senior executives. Specifically they proposed that the role would be one of diminished line responsibility with an emphasis on strategic IS planning, human resource management, and technology leadership. Ives & Olson (1981) also predicted that the role of the IS manager *"will evolve from a fairly low level, relatively unimportant service function, to an important instrument of organizational change and profit making"* (p. 61).

The title Chief Information Officer (CIO) was coined by Synnott & Gruber (1981) and quickly became synonymous with the role responsibilities described by Rockart et al. (1982) and Ives & Olson (1981). The use of 'chief' in the CIO title suggested that the role was now that of a senior executive team member, however the reality was that the title CIO was often used to describe the most senior IS executive, regardless of

[6] Business Process Re-engineering (BPR) is the development of a new, process-centred business organisation for the purpose of achieving significant improvement in performance.

position within the organisation. Boyle & Burbridge (1991) describe the spectrum of role responsibilities of the senior IS executive during this period as follows:

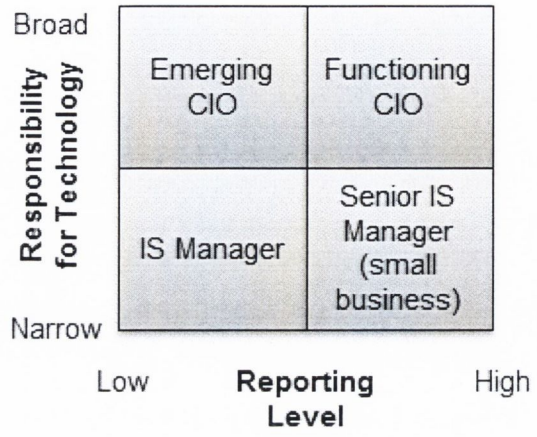


Figure 2 - Role Responsibilities of Senior IS Executives during the Distributed Era (Adapted from Boyle & Burbridge (1991))

Grover et al. (1993) noted the significant growth in the number of senior IS executive positions in the period 1983-1993 while Stephens (1993) noted that changes in rank and salary of the IS executives reflected a growing acceptance of the importance of the role. A study by Benjamin et al. (1985) of 20 CIOs from major companies confirmed that the changes predicted by Rockart et al. (1982) were actually happening, and at a faster pace than originally anticipated.

There are many descriptions of the emerging role of the CIO during the distributed era (Applegate & Elam, 1992; Grover et al., 1993; LaRosa, 1985; Stephens, 1993) which can be synthesised into three main themes as follows: strategic responsibilities; organisational responsibilities; and technology leadership responsibilities.

Strategic Responsibilities

The increasingly strategic nature of information systems elevated the position of the IS function, and hence the CIO, to a strategic level within the organisation (Earl & Feeny, 1994; Rockart et al., 1982). Senior management looked to the CIO to provide transformational leadership to spread the use of IT throughout the organisation (Ferreira, 1979; Rockart et al., 1982) and to bridge the gap between organisation strategy and the use of IT (Benjamin et al., 1985; Earl, 1993; Earl & Feeny, 1994; Stephens et al., 1992). The results of a range of studies on the role of the CIO during

the distributed era indicate that the role had indeed become more strategically focused (Applegate & Elam, 1992; Grover et al., 1993; LaRosa, 1985; Stephens, 1993).

To fulfil the expectations of the role and promote the value of a strong partnership between the IS function and the organisation it was proposed that the CIO should engage at the most senior organisational level in order to create a shared vision among the top management team (Earl & Feeny, 1994, 2000). Through dialogue with the CEO and other executives the CIO could understand the business, sense the impending changes and maintain the relevance and timeliness of the IS effort in support of the business. The CIO could also fully understand the strategic connection between information flows and the business (Rockart et al., 1982), a prerequisite to successful alignment of business and IS strategic planning (Earl, 1993).

The rise of BPR, often driven by organisational realignment and/or the implementation of ERP systems across the organisation, further elevated the role of CIO. It was expected that the IS function would not be a passive developer of applications but would drive the associated organisational change (Earl & Feeny, 1994; Fiegener & Coakley, 1995). There was an expectation that the CIO would be instrumental in driving business transformation because of his/her unique understanding of the connections and interrelationships between functions and organisational units, and the absence of allegiance to any historic power bases in the organisation (Earl & Feeny, 1994).

Organisational Responsibilities

During the distributed era the CIO had a diminishing direct line responsibility for the deployment and operation of IS systems. As the role became more strategic the CIO had to be proactive in transferring accountability for the management and operation of the IT effort, including management of operations and software development (Benjamin et al., 1985; Rockart et al., 1982). A key organisational responsibility for the CIO was therefore the recruitment and development of a professional IT organisation that was technically proficient and business focused (Ross & Feeny, 2000).

The role of the CIO was by now heavily oriented toward facilitating and promoting change and increasing adaptive capabilities across the organisation (Cross et al., 1997; Fiegener & Coakley, 1995). The CIO became active in driving the necessary change in support of business integration enabled by IS. He/she also became active in driving and supporting integration of the IS function into the line, and promoting co-operation between the business, and the IS function (Davenport & Short, 1990; Ross

& Feeny, 2000). The CIO also had to assume responsibility for co-ordinating dispersed technologies and applications (Boyle & Burbridge, 1991) across the organisation.

Technology Leadership

One of the expectations of the CIO in the distributed era was to manage the proliferation of information technology throughout the organisation (Ferreira, 1979). The planning role of the CIO thus shifted from narrow centralised DP planning to enterprise-wide computer architecture planning in support of the greater distribution and complexity of processing environments of the era (Benjamin et al., 1985).

To facilitate this expanded role the CIO was expected to continuously monitor the technology landscape to identify existing and future capabilities, to design and implement a standardised corporate IT architecture, and maintain high levels of service across the technology platforms within the organisation (Boyle & Burbridge Jr., 1991; Rockart et al., 1982; Ross & Feeny, 2000). It was expected that the CIO should operate as *"the corporate 'gate-keeper' for new technology and the evaluation of this technology"* (Rockart et al., 1982, p.5).

The CIO had responsibility for maximising the IT budget and in doing so they had to balance the effective use of internal IT resources alongside the deployment of outsourced services in a way that maximised the efficiency of the overall effort, without compromising the effective capability of the IS function (Benjamin et al., 1985; Earl & Feeny, 2000).

2.3.2.4 Transition to the WEB-based Era

Many studies undertaken during the distributed era confirm that the senior IS executive role underwent significant transformation and elevation during the period. Given that the strategic importance of IT only emerged during this time the role of CIO could be considered an entirely new senior executive position. Citing Tom Friel, managing partner at recruitment company Hendrick & Struggles Inc., Marcia Blumenthal stated that it takes about 10 years for a new executive position to establish itself in an organisation (Blumenthal, 1990). On this basis it can be inferred that the role of CIO was in a transition period for the entire duration of the distributed era. This is borne out by a range of issues that were characteristic of the era and which are discussed below.

The success of the CIO position was often heavily determined by the culture of the organisation (Benjamin et al., 1985; Karimi et al., 1996; Rockart et al., 1996; Watson, 1990). In many cases there existed a 'knowledge gap' (Fiegener & Coakley, 1995)

among the executive team about the nature of IS resulting in a failure on the part of senior management to accommodate the emerging role (Fiegener & Coakley, 1995).

Alongside the organisational 'knowledge gap' there existed a 'credibility gap' on the part of the CIO (Fiegener & Coakley, 1995) as many found it difficult to make the transition from functional manager to executive manager. Many CIOs lacked the skill-set necessary to operate at senior level and lacked key personal attributes such as leadership capability, and ability to influence at senior level (Fiegener & Coakley, 1995). For example failure to convince how the IS function adds value may further entrench an existing prejudice of IS as a cost rather than a strategic asset (Earl & Feeny, 1994; Fiegener & Coakley, 1995). In many cases a combination of organisational and behavioural barriers contributed to a failure on the part of the CIO to create a shared vision of the role as an enabler of business transformation (Earl & Feeny, 1994) and consequently a failure to align business and IT strategies.

In a study of 60 IS leaders Earl & Feeny (1994) found that the most appropriate background for a potential CIO was that of a seasoned IS professional, preferably with a systems analysis and development background. Fiegener & Coakley (1995) however, suggested that the promotion of internally orientated, less 'well-connected', and technically focused individuals was a major contributory factor to the lack of peer acceptance. It was noted however that in many cases the appointment of business, rather than technical orientated individuals to the CIO position could result in bad decisions (often based on fads of the day) because of a lack of understanding of the technology (Johnson, 2002).

The escalating demand for IS applications also contributed to dysfunctional IS deployment. For example the rise of multiple technical architectures totally contradicted the business requirements for a robust and coherent IT infrastructure (Ross & Feeny, 2000). Furthermore the failure of many BPR initiatives, accompanied by misguided ERP implementations, added to the escalating cost of IS, and often had a damaging effect on the reputation of the IS function.

In reality the CIO role was an emerging one and many mistakes were made. A 1990 Business Week article, "CIO is Starting to Stand for Career is Over," reported that the CIO dismissal rate had doubled during 1989 to 13%, compared with 9% for all top executives, and that only a handful of CIOs had ever gained real power in their companies (Rothfeder & Driscoll, 1990). A study of 14 companies by Boyle & Burbridge (1991) found that only two had CIO titles. A survey by Information Week in 1999 found that only 78% of CIOs see understanding their company's business strategy as

important (Chabrow, 1999). The above results suggest that although the CIO role had evolved notionally since the beginning of the computer era the reality was that the role had far from matured at both a personal and organisational level.

2.3.3 The Web-based Era (1995 – present)

2.3.3.1 The Technology

The web-connected era began during the mid-nineties with the commercial introduction of the public Internet (Ross & Feeny, 2000), and was driven by the innovation of web browsing applications which facilitated the retrieval and display of multi-media content in real time. The Internet rapidly became a virtual world where data could be exchanged between all connected devices in a flexible and cost effective way. The relative simplicity of the open TCP/IP[7] standard, in contrast to the proprietary technology of the mainframe and distributed eras, simplified engineering complexity and lowered the cost of inter-connecting disparate computer systems, resulting in rapid up-take of the new inter-networking technology.

The wave of excitement created by the possibilities of the new Internet technology, coupled with the ready availability of venture capital during the period 1995-2000 led to a sharp rise in new business start-ups (often referred to as dot-coms) who sought to take advantage of the internet as a route to market (Ross & Feeny, 2000). The warning by Porter (2001) that the rollout of any new important technology can create market signals that may be unreliable proved to be the prescient. Whilst a new means of conducting business (e-commerce) had emerged, the fundamentals of competition remained unchanged. Profit projections, based largely on hype and overconfidence in the potential of the new technology as a route to market, resulted in many flawed business models and many investors at the time were willing to overlook traditional company performance metrics in favour of the optimism created by the possibilities of the new technology (Malone, 2004; Porter, 2001). The subsequent collapse of the bubble (the dot-bomb) occurred during 2000-2001 resulting in the widespread failure of internet based companies and technology suppliers alike. Following this many companies learned to harness the potential of the new technology by realigning business models to incorporate the internet as a complement rather than a replacement to their overall route to market strategy (Earl & Feeny, 2000; Porter, 2001, 2008).

[7] TCP/IP - Transmission Control Protocol / Internet Protocol

Since 2002 the advances in Internet technology and applications have rapidly changed the structure and boundaries of many industries (Porter, 2008). For example e-mail, and the extension of the IP protocol to include the transport of voice (VOIP), have significantly changed the structure of the traditional postal and telephony industries, and Apple Inc. has significantly altered the music distribution landscape with the introduction of its i-tunes application (Porter, 2008).

The dominant Internet technology suppliers of the web connected era are the internet service providers (Renesys, 2013), and inter-networking technology companies (Burt, 2012). HP is the largest supplier of PCs (Epstein, 2014), Intel remains the dominant supplier of microprocessors (Team, 2012), and Microsoft remains the dominant supplier of PC operating systems (Reisinger, 2011). The last five years has also seen a phenomenal rise in the use of handheld devices such as smart phones and tablets, along with a plethora of 'mobile app' service providers for these products. The main ERP systems suppliers have retained a dominant position throughout the web-connected era as have the dominant consultancy houses.

Secure connection tunnelling over the public internet has deepened the convergence of information and communications technology, altering geographic scope and creating an increasingly flat world (Dutta, 2012). This has resulted in new opportunities for remote working, collaboration, and workflow management on an unprecedented scale (Luftman & Derksen, 2012). This convergence looks set to continue with the growth in network capacity (bandwidth), and advances in cloud technology (CT) (Buyya, et al., 2009; Marston, et al., 2011). The close integration of smart devices (including TV and mobile devices) with the cloud is also changing the way consumers transact business, pushing the boundaries of both space and time (Dutta, 2012).

The Internet continues to redefine relationships between consumers and enterprises, and citizens and the state, creating unprecedented opportunities for business and governments to increase productivity and well-being. This optimism must however be counter-balanced by an awareness of the risks associated with a global, open standards, communications platform in terms of individual rights, privacy, security, and the growing threat of cybercrime (Marston, et al., 2011).

2.3.3.2 The Organisation

ICT (including the internet) is now viewed as a platform for enhanced automation, decision-making empowerment, control and coordination, and industry transformation (Armstrong & Sambamurthy, 1999; Smaltz et al., 2006). The global competitive environment had forced organisations to change how they operate and are managed in

four ways: (1) by redesigning organisational processes across the value chain (BPR); (2) by re-engineering back office processes; (3) by re-engineering managerial information flows to support a mix of centralisation and de-centralisation; and (4) by re-designing network processes to extend the value / supply chain to both customer and supplier. All of the above require major process change and are heavily reliant on ICT (Rockart et al, 1996).

In addition to being an enabling technology, supporting the above initiatives, the internet is also a disruptive technology. It has changed the structure of most industries by re-aligning the competitive environment (Earl & Feeny, 2000; Porter, 2001, 2008), altering the balance of threats and opportunities, and creating additional opportunities for strategic differentiation (Seely-Brown & Hagel, 2003). The internet has made IT a fundamental component of the operation of most organisations. Today many strategic issues faced by an organisation are either triggered by ICT or have consequences for it (Earl & Feeny, 2000). Furthermore ICT is almost always on the critical path of a business change programme (Earl & Feeny, 2000). The accepted wisdom now is that irrespective of the ubiquity of the platform the insight required to harness the potential of ICT is a profound catalyst for the creation of strategic differentiation (DeJarnett et al., 2004; Piccoli & Ives, 2005; Seely-Brown & Hagel, 2003; Tan, 2006), the differentiation being not in the IS itself, but the new practices it enables. The experience of the dot-com crash was a clear indicator that decoupling the application of technology from organisational strategy is not a sustainable business model.

Business and IS Alignment

The importance of aligning IS and business strategy that was mooted during the distributed era (Benjamin et al, 1984; McFarlan, 1984; Porter & Millar, 1985) became accepted wisdom during the web-based era (DeJarnett et al., 2004; Li et al., 2006; Piccoli & Ives, 2005; Porter, 2001; Ross & Feeny, 2000). The Internet opened new opportunities for achieving, or strengthening, a distinctive strategic position by: (1) providing new opportunities to tailor the value chain in a unique way, rather than having to conform to the rigid structures imposed by many ERP systems (DeJarnett et al., 2004; Porter, 2001); (2) to accumulate asset stock by building specialised ICT infrastructure and specialised repositories of customer data (Piccoli & Ives, 2005); and (3) create customer switching costs through innovative technology deployment (Piccoli & Ives, 2005). The shorter application development timeframes however also made it harder for companies to sustain operational advantages (Porter, 2008). The web emphasised the need for alignment, leadership, and IT knowledge and reinforced the

requirement to have IT placed on the strategic agenda and have it managed as such, underscoring the importance of the CIO role.

There are numerous examples of the transformative power of the integration of IS and business strategies such as the cases of Wal-Mart (Glazer, 1991) and Dell (Middleton, 2004; Piccoli & Ives, 2005). In all cases success is based on a combination of a sound business strategy focused on the creation of economic value, and the smart application of internet technology to enhance the strategic initiative. However Seely-Brown & Hagel (2003) state that many organisations fail to see the strategic importance of IS and insert it into their businesses without changing their practices for exploiting the new capabilities. They also fail to understand the potential IS offers to extend business innovation beyond the confines of the organisation (e.g. relationship building, not just transaction cost reduction), and do not recognise that the strategic impact of ICT investments comes from the cumulative effects of sustained innovation and not just one off initiatives.

Strategic Agility

The need for sustained competitive advantage is producing unprecedented pressures for most companies to continuously innovate with regard to both product / service offerings and business processes in an effort to build barriers to competitive erosion (Piccoli & Ives, 2005). Dynamic capability is an antecedent of firm performance (Sambamurthy et al., 2003), and the ability to respond to unpredicted changes in the market is becoming a key factor in firm survival (Phillips & Wright, 2009). One of the primary vehicles through which firms are able to implement strategic business initiatives in response to ever-changing market conditions is their capability to effectively apply ICT (Chatterjee et al., 2001; Phillips & Wright, 2009; Rockart et al., 1996). Competitors can eventually copy most IS applications therefore real competitive advantage is gained through a continuous cycle of IS innovation which both drives and is driven by the strategic/competitive goals of the organisation (Ross, 1996; Sambamurthy et al., 2003). The value-added role of IS lies in enabling a business infrastructure that shapes a firms' capacity to launch frequent and varied competitive actions, and the strategic impact of IS investments comes from the cumulative effects of sustained initiatives to innovate (Seely-Brown & Hagel, 2003). Continuous innovation within an overall strategic plan is key (Sambamurthy et al, 2003; Seely-Brown & Hagel, 2003)

IS Organisational Structures

By the time the Web-era emerged, most firms had recentralised responsibility for a standardised and enterprise-wide IS infrastructure (Ross & Feeny, 2000). As time has progressed however the more traditional centralised/decentralised models of IS governance, are being supplanted with more sophisticated federal organising structures that disaggregate specific IS management activities (Smaltz et al., 2006) ensuring corporate-wide IS synergy is maintained, whilst leveraging the opportunity for business units to manage their own IS initiatives (Luftman & Ben-Zvi, 2011; Luftman & Derksen, 2012; Rockart et al., 1996; Weill et al, 2002).

2.3.3.3 The Role of the CIO in the Web-based Era

The growing importance of the role of CIO that was mooted during the distributed era became widely accepted during the web-based era as technology, and in particular the Internet, became more deeply embedded as a key component in the pursuit of competitive advantage (Earl & Feeny, 2000; Peppard et al., 2011; Porter, 2001). The importance of aligning business and IS strategy emphasised the need for an IS executive with the necessary skills and attributes to operate at strategic level within the organisation, who could champion the role of IS as an integral part of its overall strategy (Applegate & Elam, 1992; Ross & Feeny, 2000; Smaltz et al., 2006). Studies by Stephens et al. (1992) and Gottschalk (2002) confirmed that the CIO role had indeed evolved from that of a functional role, as originally described by Ives & Olson (1981), to that of a strategic role. The period since the early 1990s has also seen a dramatic rise in the number of CIO appointments (Chatterjee et al., 2001) and a corresponding rise in the reporting level of CIOs as shown below.

CIO Reports to:	2011	2005	1992	1983	1968
CEO	49%	43%	27%	na	na
CFO	32%	22%	44%	20%	57%
COO	12%	21%	17%	na	na
Other	7%	15%	19%	20%	43%

Table 2 - Reporting levels of CIOs (Applegate & Elam, 1992; Benjamin et al., 1985; Luftman & Be Zvi, 2011).

Some authors suggest that the CIO role has evolved to the extent that next to the CEO or COO it may be the most critical to the organisation because the role requires knowledge that spans both the organisation and the collaborative space outside of the organisation, with clients and suppliers, to ensure the effective integration of the information that drives the business (Karahanna & Watson, 2006; Thomas, 1990). It has also been suggested that the uniqueness of the IS speciality (Grover et al., 1993) and the breath of organisational knowledge required differentiates the CIO role from that of other senior executives (Lepore, 2000; Thomas, 1990). An opposing viewpoint proposes that the ubiquitous nature of IT has commoditised the senior IS role and that IS strategy is now the responsibility of all senior management with specialist IS functions being managed by functional positions such as Chief Technical Officer (CTO) and Chief Knowledge Officer (CKO) (Denford & Dacin, 2009; Menz, 2011; Remenyi et al., 2005). These dichotomous positions suggest that the role is still not clearly understood and may be still evolving. In fact some authors propose that the role of CIO remains an ambiguous one (Peppard et al., 2011; Preston et al., 2008; Remenyi et al., 2005).

There are many descriptions of the CIO role. Based on the work of Mintzberg, (1980) and subsequent work by McCall & Segrist (1980), Grover et al. (1993) identified six roles that apply to the CIO which are described below:

Leader	Motivates, trains, and resources
Spokesman	Communicates information and ideas outside of the IS function
Monitor	Scans internal and external environment for changes in technology and competition
Liaison	Establishes personal network of external relationships
Entrepreneur	Identifies business needs and develops solutions. Is a change agent
Resource Allocator	Allocates human, financial, material, information and other resources

In a study of CIO effectiveness Smaltz et al. (2006) found six prominent roles for the CIO: business strategist; integrator; relationship architect; utility provider; information steward; and educator.

A number of more recent studies have highlighted a dual aspect to the CIO role with the role being described in terms of fulfilling both a *demand side* (shaping and delivering the business strategy by exploring IS enabled innovations, and aligning IT strategy with the business strategy) and a *supply side* (managing the IS function including sourcing and development to meet known business needs) (Chen et al., 2010; Chew, 2011; Mark & Rau, 2007; Smaltz et al., 2006; Sojer et al., 2005). Mark & Rau (2007) state that organisations that are switching to the demand-supply model enjoy significant gains in productivity and prioritization of investments resulting in a decrease in organisational complexity, improved perception of IS, and better return on investment in IS. Peppard (2010) reminds us that supply-side is equally important due to the criticality of IS operational performance to the success of the organisation.

A profile for the CIO role based on a synthesis of nine empirical papers on the role of CIO and five conceptual papers is presented below. The role profile suggests six key areas of competency and is consistent with the roles as described by Grover. The full analysis of each paper along with an additional five conceptual papers may be found in Appendix 1.

CIO roles as Described by Grover (1993)	Description of Role	Role Profile Based on Empirical Studies	Empirical Studies
Strategist (Entrepreneur)	Identifies business needs and develops solutions. Is a change agent	• actively contribute to business strategy formation • understand organisational information flows • solve business problems through the use of IS • enable an agile and flexible organisation	Applegate & Elam, 1992; Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Rockart et al., 1982; Tagliavini & Moro, 2003; Weiss & Anderson Jr, 2003; Willcocks & Sykes, 2000
Business Innovator (Entrepreneur & Spokesperson)	Identifies business needs, develops solutions and communicates information and ideas outside of the IS function	• promote and support the creation of business value through IS innovation across the organisation value chain • leverage technology for business advantage • manage risk sharing between the business and IS • enable an agile and flexible organisation through business process innovation	Applegate & Elam, 1992; Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Rockart et al., 1982; Tagliavini & Moro, 2003; Weiss & Anderson Jr, 2003; Willcocks & Sykes, 2000
Enterprise IS Architect (Resource Allocator)	Allocates human, financial, material, information and other resources	• set IS policy for the organisation • maintain an agile IS infrastructure for competitive positioning • use of IS to increase organisational efficiency • maintain enterprise-wide IS standards • build and maintain IS resilience in support of business continuity • certify enterprise IS security	Applegate & Elam, 1992; Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Rockart et al., 1982; Weiss & Anderson Jr, 2003; Willcocks & Sykes, 2000
Inspiring IT Manager (Leader)	Motivates, trains, and resources	• recruit and develop a professional IT organisation • ensure adequate staffing to meet operational performance targets • support staff training and development (IT and business skills) • set and manage IT budget • manage project lifecycle for large scale implementations • manage IS contracts	Applegate & Elam, 1992; Peppard et al., 2011; Peppard, 2010; Rockart et al., 1982; Tagliavini & Moro, 2003; Weiss & Anderson Jr, 2003; Willcocks & Sykes, 2000
Relationship Manager (Liaison)	Establishes personal network of internal and external relationships	• educate and create a shared understanding and vision with the TMT • manage relationship with functional managers • manage relationship with internal and external customers • manage relationship with external vendors • manage external relationship in the wider business and IS community (including consultants)	Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Rockart et al., 1982; Tagliavini & Moro, 2003; Weiss & Anderson Jr, 2003; Willcocks & Sykes, 2000
Environmental Scanner & Information Broker (Monitor)	Scans internal and external environment for changes in technology and competition	• Scan the external technology environment to identify possible technology revolutions • Scan the business environment for possible innovation opportunities	Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Rockart et al., 1982

Table 3 - Role Profile of the Modern CIO

The role profile above is also consistent with the *demand side* (strategist, business innovator, relationship manager and *supply side* (enterprise IS architect, inspiring IT manager, environmental scanner and information broker) model as described above. It

is also supported by a number of recent practitioner reports on the CIO role. For example Lundberg (2008) proposes a classification of the role of CIO that acknowledges its functional and strategic component along with a transformational component in co-operation with senior functional management as follows: *Function Head* focused on running the IS organisation, achieving operational excellence, and providing reliable, effective services (inspiring IT manager); *Leader of Transformation* focused on creating change through process transformation in partnership with business functions (business innovator, enterprise IS architect, and environmental scanner and information broker); and *Business Strategist* focused on driving strategy for competitive advantage through internal and external activities (strategist, relationship manager). Acknowledging the CIO role as multifaceted and complex, requiring diverse capabilities to address the strategic and operational need of the organisation and the demands of stakeholders Gould (2013) proposes a categorisation of four key characteristics of the role of CIO. These are: *Catalyst* (business innovator and enterprise IS architect); *Strategist* (strategist and relationship manager); *Technologist* (enterprise IS architect, and environmental scanner and information broker); and *Operator* (inspiring IT manager).

2.3.3.4 The Future for the Role of CIO

Section 2.3 has described the evolution of the CIO role over three eras; (1) the *mainframe era*, characterised by an IS function that is both technically and inwardly focused building functional systems that run on large proprietary mainframes, and a head of function (the DP manager) acting in a functional / specialist capacity; (2) the *distributed era*, characterised by the arrival of mini and personal computers shifting the locus of control of IS away from the DP department and into the organisation, creating a fragmented and somewhat chaotic IS governance regime and a large increase in IS spend with the strategic nature of the role of the IS manager (now referred to as the CIO) only beginning to evolve; (3) the *Web-based era* characterised by a focus on IS as a strategic tool, the increasing scale, scope, and complexity of IS within the organisation, and the elevation of the CIO role to that of a senior executive with responsibility for IS strategy and leader of transformation.

The CIO role continues to evolve as advances in hardware and software technologies relentlessly drive a global digitised economy that is pushing the boundaries of both space and time (Dutta, 2012), and changing the way business and consumers transact business (Arthur, 2011). This creates ever more demands on the CIO who must continuously innovate to create value in the digital market place whilst balancing the

ever present threats to privacy, security and cybercrime (Marston et al., 2011; Weill & Woerner, 2013).

Clearly the environment within which the CIO operates plays a crucial role in the success of the organisation in optimising IS value however the CIO role remains an ambiguous one for many organisations (Peppard et al., 2011; Preston et al., 2008; Remenyi et al., 2005). This ambiguity is rooted in the fact that the requirements of the role are influenced by the criticality of information and technology for competitive differentiation for the organisation, and the maturity of its information leadership capabilities, both of which are strongly influenced by the digital literacy of the executive team. Evidence also persists that the knowledge and credibility gaps, which were symptomatic of the fledgling nature of the role when conceived, are still factors affecting the ability of some CIOs to elevate the IS function as an equal partner with the business (Leidner & Mackay, 2007; Preston & Karahanna, 2005; Watts & Henderson, 2006). For many CIOs technology continues to be a comfort zone, and making the transition to business strategist remains difficult (Karahanna & Watson, 2006). There is a continuing lack of IS literacy among senior organisational executives, as evidenced by the prevailing lack of clarity within organisations about the role of CIO (Peppard et al., 2011; Peppard, 2010), and the failure to link CIO compensation to business results (McAteer & Elton, 2000). In many cases members of the TMT still regard IS as a hygiene factor (Earl & Feeny, 2000; Peppard, 2010; Willcocks & Sykes, 2000) and consequently view the CIO as being primarily concerned with technology and operational processes (Peppard et al., 2011; Peppard, 2010). The CIO also continues to struggle to provide measurable evidence of the value of IS (Fiegener & Coakley, 1995; Fonstad, 2011; Gottschalk, 1999; Peppard, 2007).

As long as the issues described above remain it is likely that they will impact on the effectiveness of the CIO in the performance of the role, and consequently on the organisations' ability to maximise the value of IS. This situation may resolve itself over time as a new generation of senior executives, with a greater understanding of IS, replace existing executive teams, and the ever increasing importance of IS make active engagement an imperative for all senior executives.

The following section will discuss the range of organisational issues that influence the role of CIO, along with some of the challenges faced by CIOs in the performance of the role.

2.4 Factors Influencing the Performance of the CIO Role

2.4.1 The influence of CIO Leadership Capabilities on the Role of CIO

The entrepreneurial, innovation, and change roles described earlier suggest a CIO leadership capability that is consistent with Bass' definition of transformational leadership. That is, the capability to produce performance beyond ordinary expectations by transmitting a sense of mission, stimulating learning experiences, and driving new ways of thinking by changing the organisation culture (Bass, 1990). For example Ashkenas et al. (1998) in Roepke & Ferratt (2000) underscores the key role of leadership as an enabler of organisational change. CIO Leadership must also build and empower an IS function that supports the IS requirements of the organisation in an agile yet cost efficient manner (Kohli & Johnson, 2011; Mark & Rau, 2007; Sambamurthy et al., 2003; Weill et al., 2002).

A number of studies suggest a positive relationship between CIO leadership capability and IS and organisational performance. Preston, et al. (2008) found that the CIO's strategic decision making authority and leadership capability collectively have a significant impact on the contribution of IS to an organisation's performance. They also found that CIOs who scored highly on strategic decision making authority and leadership capability demonstrated the highest in terms of political savvy and communications skills, integration with the senior executive team, strategic IS vision, and dedication of resources to IS. Chen et al (2010) found that CIO structural power is a key predictor of strategic IS leadership thereby providing further empirical support to the notion that a higher level of CIO seniority and influence could be critical and necessary for the creation of competitive advantage through IS investments.

Although the CIO role is clearly articulated by the academic community (if not always understood at an organisational level) Chen et al. (2010), Karahanna & Watson (2006), and Peppard et al. (2011) state that the concept of CIO leadership capability has not been well developed and is under researched. Karahanna & Watson (2006) however identify a number of indicators of CIO leadership capability that contribute to effectiveness and organisational impact. These are: (1) CIO skills and personal characteristics; (2) the contribution to IS and business strategy alignment; and (3) the extent of the relationship between the CIO and other senior executives. The concept of CIO leadership capability is discussed in the context of the above indicators in the next sections of this chapter.

2.4.1.1 CIO Competencies and Antecedents of CIO Role Effectiveness

Studies of CIO role effectiveness highlight the range of competencies required to fulfil the role encompassing social, political, business, and IS intelligence (Karahanna & Watson, 2006). Peppard (2010) identifies six competencies (leadership, being a visionary, a strategic thinker, a relationship architect, a politician, a deliverer), and four personal attributes (communication and influencing skills, commercial acumen, networking skills, and people management skills) which are necessary to fulfil the CIO role.

Armstrong & Sambamurthy (1999) found that CIOs' business and IS knowledge are positively related to synergistic participation in formal and informal interaction with senior executives and have a significant effect on IS assimilation throughout the organisation. Smaltz et al. (2006) found a positive correlation between CIO capabilities (political savvy, communications ability, strategic business knowledge, strategic IT knowledge) and CIO role effectiveness. Li et al. (2006) found a positive correlation between the educational level, openness, and extraversion of the CIO and the organisations innovative use of IS. Preston et al. (2008) found that organisational climate, organisational support for IS, CIO structural power and partnership with the senior management team were all positively correlated to CIO strategic decision making authority, which in turn is positively correlated to IS contribution to the performance of the organisation. Chun & Mooney (2009) found a positive relationship between business systems thinking, relationship building, and leadership, and the ability to persuade and lead at executive level. Carter & Grover (2011) found that the performance of the CIO as a business technology strategist is facilitated by the formal power vested in the CIO. Preston et al. (2008) highlight the contribution of CIO strategic leadership capability to organisation performance.

The results of these studies highlight a broad range of competencies and attributes, and in particular the importance of competencies that are beyond the technology domain. Peppard (2010) however questions the study of personal attributes (or competencies) as antecedents to CIO role effectiveness because many of the attributes are generic and apply to all senior executives. In addition appropriate competencies may be influenced by the specific requirement of a particular appointment (Chun & Mooney, 2009).

2.4.1.2 The Role of the CIO in Strategic IS Alignment

Strategic IS alignment has been defined as the fit between the priorities and activities of the business and those of the IS function (Chan, 2002; Hirschheim & Sabherwal,

2001). In a study of eight organisations Chan (2002) found that the three critical preconditions for alignment are: (1) business and IS plans are closely linked; (2) IS personnel participate in business planning; and (3) CIO and CEO have a strong working relationship.

Strategic Alignment has been linked to superior IS performance (Chan, 2002; Preston & Karahanna, 2009), has been shown to enhance both IS success and organisational success (Chan, et al., 1997; Chan et al., 2006), and has also been linked to organisational agility (Chan et al., 2006; Piccoli & Ives, 2005; Sambamurthy et al., 2003; Weill et al., 2002). Strategic Alignment has traditionally been one of the key issues facing IS management (Chan, 2002; Hirschheim & Sabherwal, 2001), and its importance continues to grow in parallel with the increasing influence of IS in business strategy (Chan et al., 2006; Rockart et al., 1996). Hirschheim & Sabherwal (2001) also note the dynamic and emergent nature of alignment and emphasise the importance of re-aligning IS strategy as business strategy changes, and the importance of the role of CIO in maintaining this congruence.

Stephens & Mitra (1995) describe participation in strategic planning as the defining responsibility of the CIO. Preston & Karahanna (2009) emphasise the importance of the role of the CIO in creating a convergent strategic vision within the organisation, a position echoed by Reich & Benbasat (2000) who indicate that building a shared understanding between business and IS executives is one way of strengthening alignment. Keen (1991) in Johnson & Lederer (2003) highlights the importance of effective communication between the CEO and CIO as a key precursor to alignment. Chan et al. (2006), also found that a shared knowledge between business and IS executives had the most consistent effect on alignment. Tan & Gallupe (2006) found that a higher level of shared cognition, 'cognitive commonality', of business and IS executives is positively related to a higher level of alignment. The importance of the CIO in building both formal and informal relationships outside of the IT organisation is emphasised (Stephens & Mitra, 1995) as is the importance of informal organisational structures in bringing together the socio-technical systems to facilitate the process of alignment (Chan, 2002).

Alignment is increasingly a two way process whereby business strategy influences IS strategy and IS strategy influences the business (Hirschheim & Sabherwal, 2001; Rockart et al., 1996), however Chan (2002) states that some firms continue to struggle with successfully aligning IS and business strategy resulting in low return on IS

investments, failure to identify high potential IS applications, and difficulty in turning good ideas into action.

Preston & Karahanna (2009) describe six mechanisms which the CIO can utilise to create a shared vision of strategic alignment: adaption of a shared business language; formal access to the executive team; adoption of an educational leadership approach; nurturing of common interests with the executive team; developing strategic business knowledge; and engendering trust with the executive team. All of the mechanisms emphasise the importance of the relationship between the executive team and the CIO in attaining alignment.

2.4.1.3 The Role of the CIO as a Senior Organisational Executive

The importance of the role of senior organisational management (henceforth called the top management team, TMT) in the successful deployment of IS has been acknowledged for some time (Doll, 1985; Glennon, 1978; Nah et al., 2003; Rockart & Crescenzi, 1984; Young & Jordan, 2008) as has the importance of the CIO in creating a shared vision as a precursor to successful IS and business strategy alignment (Chan, 2002; Preston & Karahanna, 2009; Tai & Phelps, 2000). Furthermore it has been shown that the CIOs' participation in business planning is positively associated with top management participation in IS resource allocation (Kearns & Sabherwal, 2007).

Definitions of the Top Management Team

There are a range of definitions of what constitutes the top management team (TMT) of an organisation (Menz, 2011; Preston & Karahanna, 2005; Carpenter & Fredrickson, 2001; Carpenter & Geletkanycz, 2004). For the purpose of this discussion I will assume Menzs' description of the TMT as comprising the team that can be described collectively as senior executives within the organisation who are involved in strategic leadership and decision making, and are responsible for one or more functional areas in their organisations.

The seminal work on top management teams by Hambrick & Mason (1984), based on the theory of bounded rationality (Cyert & March, 1963), proposed that TMT members may fulfil the common strategic leadership role differently. This implies that the actual composition of the TMT matters (Menz, 2011), and that when considering TMT actions and outcomes one must be cognisant of both individual and group behaviour (Hambrick, 2007). Jarvenpaa & Ives (1991) highlight the difference between executive participation, which is *actual* behaviour such as planning, development, and implementation, and executive involvement which is a *psychological state* reflecting perceptions and attitudes concerning their role in an organisation's success.

The Role of the CIO as a Member of the TMT

Tagliavini & Moro (2003) propose that the rank of the CIO in the organisational hierarchy could be an important factor affecting the success of IS and its use as a strategic, weapon. The critical role of the CIO in the alignment of IS and business strategy suggests that the CIO should be a member of the TMT (Rockart et al., 1996), and research has confirmed a growing trend in this regard (Chatterjee et al., 2001; Gottschalk, 1999), however there remains a debate about the importance of the reporting level and rank and of the CIO.

On one side of the debate is the argument that distance from the CEO is an indicator of the value placed by the organisation on IS and the CIO (Gupta, 1991; Watson, 1990). Raghunathan & Raghunathan (1989) found that the position of the IS manager in the organisational hierarchy affects the way certain aspects of IS are emphasised and that only direct reporting of the CIO to the CEO made a significant difference to the IS planning effort. Gottschalk (1999) also found that a higher CIO reporting level was associated with enhanced IS plan implementation. In contrast Armstrong & Sambamurthy (1999) did not find the CIOs' reporting level to be significant.

The counter argument is that membership of the TMT rather than direct reporting is the most important factor (Chan, 2002; Earl & Feeny, 1994; Feeny et al., 1992). Leidner & Mackay (2007) found that CIOs believed that their ability to foster change was greatest when they reported to someone who believed in the importance of IS, even if that means reporting to a level below the CEO. Smaltz et al. (2006) also found that CIO's reporting relationship with the CEO was not a significant factor in engagement, thereby confirming earlier findings of Armstrong & Sambamurthy (1999) that frequent, rich, and trusting interactions between the CIO and the entire TMT are more important than reporting level.

CIO Relationship with the Top Management Team (TMT)

Jarvenpaa & Ives (1991) found that that TMT involvement in IS is a function of: (1) executive participation in IS planning; (2) organisational conditions; and (3) TMT background. There are many examples of successful CIO engagement with the organisation, and in particular the TMT, during the web based era which have resulted in positive outcomes (Kohli & Johnson, 2011; Preston & Karahanna, 2005). However despite the increasing elevation of the CIO role there is still evidence of the organisational 'knowledge gap' and 'credibility gap' (Fiegener & Coakley, 1995) that manifested during the distributed era (Leidner & Mackay, 2007; Preston & Karahanna, 2005; Watts & Henderson, 2006). For many CIOs technology remains the comfort zone

and some still find the transition to business strategist difficult to make (Karahanna & Watson, 2006). Stephens (1993) proposes that these gaps, may be exacerbated by the specialist nature of IS, and its isolation from the rest of the organisation. Furthermore Gupta (1991) notes that the perspective of IS management is often different from that of executive management, a condition referred to as a 'cultural gap' by Peppard & Ward (1999).

There is a continuing lack of IS literacy among other members of the TMT, and in particular about the role of the CIO in creating value. For example Peppard et al. (2011) notes an inconsistent use of the CIO title and an unclear distinction between the roles of corporate CIOs and business CIOs, McAteer & Elton (2000) state that CIO compensation is generally not linked to business results, which is corroborated by Peppard (2010) who found a mismatch between stated responsibilities of CIOs and expressed performance metrics.

In many cases members of the TMT still regard the CIO as being primarily concerned with technology and operational processes (Peppard et al., 2011; Peppard, 2010). IS is seen as a hygiene factor and only becomes an issue of importance when it stops working or goes over budget (Earl & Feeny, 2000; Peppard, 2010; Willcocks & Sykes, 2000). IS continues to be viewed as a cost rather than a strategic asset (Peppard, 2010; Willcocks & Sykes, 2000) and the CIO also continues to struggle to provide measurable evidence of the value of IS (Fiegener & Coakley, 1995; Gottschalk, 1999). The above are perhaps indicative of a continued reluctance on the part of some of some CIOs to step out of their comfort zone and engage in meaningful business dialogue with the rest of the TMT.

Previous research has suggested that successful involvement of the TMT is linked, with a two-way relationship between the CEO and CIO (Feeny et al., 1992; Jones et al., 1995). Feeny et al. (1992) state that CEO attitude to change is also a predictor of successful TMT participation. Earl & Feeny (2000) highlight the importance of the CEO-CIO relationship but caution about the range of attitudes (archetypes) which CEOs may have and the need for the CIO to both recognise each archetype and act accordingly.

An example of negative perceptions and poor relationship with the TMT, and their effect on the evolution of the corporate IT function and the role of the CIO at Texaco since 1957, is given in (Hirschheim, 2003). This account is in stark contrast to the account of the successful transformation of the IS function at British Petroleum (BP) over a 6 year period beginning in 1989, the result of a close working relationship and shared vision between the CIO and CEO (Cross et al., 1997).

Preston & Karahanna (2005) found that convergence among the TMT (including the CEO) is positively influenced by the formal position of the CIO, the extent to which the CIO undertook to educate other members of the TMT, and the use of a shared language across the TMT. Their findings indicate the positive impact of CIO educational endeavours on creating shared understanding, and identify seminars as an effective way to educate the TMT regarding IS matters and to foster realistic expectations of the capabilities of IS. The findings also suggest the need for the CIO to reduce the level of technical speak and converse in business terms which are more understandable to his/her peers. Watts & Henderson (2006) also note the value of formal IT education through forums, the dissemination of material on technology, and regular presentations about technology. They also state that a key element of the knowledge transfer is the use of a common language.

Rogers & Kincaid (1981) indicate the value of frequent communication in the attainment of a shared understanding and vision, common definition of situations, building consensus, and relationship development. Daft & Lengel (1984) in Johnson & Lederer (2003) state that ambiguity may be high among managers from different functional areas of an organisation because their frames of reference differ, thereby indicating a need for frequent communication to foster convergence among the TMT. Face to face and telephone communication are considered to be the richest (Johnson & Lederer, 2003), and most effective (Watson, 1990) modes of communication. Studies by Johnson (2007) and Johnson & Lederer (2003, 2005) found that frequent communication between an organisation's CEO and CIO predicted greater convergence about the future role of IS.

Watts & Henderson (2006) indicate the pivotal role the CIO can play in fostering an innovative IT climate by networking with peers, providing leadership and motivation, creating a shared vision of the future, and creating a learning environment. The findings corroborate previous studies by Feeny et al. (1992) on the power of informal contact with peers to surface and debate new ideas before formal presentation, and by Armstrong & Sambamurthy (1999) on the value of networking to sustain commitment, and shared knowledge among the TMT. In addition they found that CIO networking with peers increased conflict resolution and the ability to influence.

2.4.2 The Influence of Organisational Mandate on the Role of CIO

Peppard et al. (2011) found that the appropriate role for a CIO is determined by: (1) the chosen strategy of the organisation and, in particular, the role that information and technology play in competitive differentiation; and (2) the level of information capability

within the organisation. Both of these contingencies are also influenced by the digital literacy of the CEO and executive team (Peppard et al., 2011), the information orientation of the organisation (Kettinger & Zhang, 2011), and industry and country context (Smaltz et al., 2006). Banker et al. (2011) state that the CIO reporting structure should align with the organisations strategic positioning (differentiation or cost leadership) regardless of whether IS plays a strategic role in the organisation.

CIO responsibilities have diversified to such an extent that organisations may have different authority profiles and positioning in the organisation for the CIO (Peppard et al., 2011). In a study based on interviews with 3,000 CIOs carried out in 2011 IBM found that effective CIOs are ones who know and deliver on a mandate that is defined by the predominant goals of the enterprise (Horan, 2011). They identified four different organisational mandates (leverage, expand, transform, pioneer) each in turn requiring a different set of role responsibilities for the CIO.

In view of the contingent nature of the CIO role Peppard et al. (2011) makes 5 recommendations to help in clarifying the most appropriate role of CIO for optimising value from the IS function. For the organisation these are: (1) create a clear, unambiguous statement of the role of CIO for the organisation; (2) ensure that the CIO role is congruent with the expectations of the senior management team; and (3) improve the digital literacy of the senior management team. For the CIO these are: (4) ensure that the CIO aligns his/her understanding and expectations with that of the senior management team; and (5) actively manage CIO role evolution to a more strategic level if appropriate.

2.4.3 Conclusion

This section has shown that CIO leadership capability is a key determinant of organisational performance (Preston et al., 2008) and identifies a number of indicators that contribute to effectiveness in this regard, including skills and personal characteristics, contribution to IS and strategy alignment, and relationship building with the TMT (Karahanna & Watson, 2006). The studies in each area suggest that all of these indicators are linked by the ability of the CIO to effectively engage at a strategic level within the organisation. The CIO must have the necessary personal skills and characteristics to credibly engage with, and influence, the TMT, regardless of the reporting structure of the IS function in the organisation. Failure to show the necessary leadership capabilities in this regard can result in suboptimal alignment between the business and IS and may prolong the existence of the knowledge, credibility and cultural gaps, preserving the notion of the IS function as a deliverer of projects rather

than a strategic partner to the organisation. Success in this area can also have the effect over time of elevating both the digital literacy within the organisation and the strategic role of IS, which may result in increased information capability, and performance for some organisations.

2.5 Agenda for Further Inquiry

The description of the CIO role across the three technology eras has shown that the role has evolved significantly since the early days of computing in the 1960s, and continues to evolve as IS continues to transform the practice of enterprise (King, 2011).

Extant literature on the CIO falls into four broad strands: (1) CIO role profile studies (Grover et al., 1993; Lundberg, 2008; Peppard et al., 2011); (2) CIO competency studies (Chun & Mooney, 2009; Karahanna & Watson, 2006; Smaltz et al., 2006); (3) the CIO as a member of the TMT (Chatterjee et al., 2001; Leidner & Mackay, 2007; Tagliavini & Moro, 2003); and (4) the role of the CIO in strategy alignment (Chan et al., 2006; Chan, 2002; Stephens et al., 1995). It is argued that much of the literature on the CIO is anecdotal or prescriptive in nature (Armstrong & Sambamurthy, 1999; Ives & Olson, 1981; Preston et al., 2008; Smaltz et al., 2006; Stephens et al., 1992), with limited empirical work examining the prescriptions made (Smaltz et al 2006). It is also argued that the focus on CIO competencies in the literature is misplaced because the type of competencies specified (e.g. strong business leadership with a commercial focus driving change and innovation) are generic and apply to all senior executives (Peppard, 2010). Research on the role of CIO tends to be represented more in the practitioner domain. For example Peppard (2010) states that *"all the major consultancies have produced reports on the role of the CIO"* (p. 73), and also notes the proliferation of books on the role, in far greater numbers than that of any other senior executive role. Many practitioner studies are annual or biannual surveys of the challenges faced by CIOs (e.g. CIO Magazine's "Annual State of the CIO" survey). These are useful in themselves as they usually incorporate large pan global sample bases, however they are narrow in focus and do not elaborate on the body of academic literature in the domain. This gap is filled somewhat by journals such as the Harvard Business Review, and MIS Quarterly Executive, which are both practitioner and academically focused.

Academic studies on the CIO role focus mainly on the strategic nature of the role and the construction of generic role and competency profiles, along with issues that CIOs face, at the expense of a broader base of research. For example Chen et al., (2010), Karahanna & Watson (2006), and Peppard et al. (2011) state that the concept of CIO

leadership capability has not been well developed and is under researched. The demand-side of the CIO role is also under represented. For example Enns (2001) states that literature has not explored the role of the CIO in the IS implementation process, and Woolridge et al. (2007) acknowledges gaps in existing research on the role of the CIO in projects, and call for further study in this area. Peppard (2010) also suggests that there is perhaps too much attention being placed on the individual incumbent in the CIO role and not enough on the environment within which the CIO operates. This is confirmed by the fact that most empirical studies are of the survey/interview type with very few actual examples relating to the performance of the role in real life settings. Continuing this narrow research focus could leave academia mired in a research agenda that attempts to define or explain a role that continues to evolve, at the expense of a broader set of knowledge about how the role is actually performed. For example although the literature emphasises the need for the CIO to engage with senior and functional management there is little research on how CIOs actually perform this task. There is a similar dearth of research on how the CIO leverages the relationship with the TMT, how CIOs cope with balancing the demand-side supply-side agenda, what are CIOs doing to narrow the knowledge, credibility and cultural gaps, and what is being done to address the on-going perception of IT as a cost rather than a valuable organisational asset.

Furthermore there is an underlying theme in the CIO literature that suggests that the high rate of failure of IS initiatives is in some way attributable to a failing in the performance of the role of the CIO. For example the limited understanding of the strategic nature of both IS and the role of the CIO can lead to a failure on the part of senior management to engage with IS during strategy formation (Jones et al., 1995), under resourcing of the IS function (Kaarst-Brown, 2005; Willcocks & Sykes, 2000), an over reliance on external consultants (McAteer & Elton, 2000; Willcocks & Sykes, 2000), a demand by the business for rapid deployment of applications to support business growth (Johnson, 2002), a difficulty in assessing and prioritising IS investments (Karahanna & Watson, 2006), and the creation of silo projects which are not integrated into an overall plan (Kaarst-Brown, 2005). The net effect of this is that often IS engages only in the implementation phase of IS initiatives (Jones et al., 1995), resulting in a lack of preparedness for the associated organisational change (Willcocks & Sykes, 2000), implementation cost overruns, or outright failure (Kaarst-Brown, 2005; Willcocks & Sykes, 2000), which in turn reinforces a negative perception of IS and creates a *"vicious circle"* of dissatisfaction and disengagement on both sides (Peppard, 2010, p. 87).

Although these difficulties are acknowledged in the CIO literature there is a dearth of empirical studies which explain the relationship between IS failure and the role of CIO, the most senior IS official. This represents a significant gap in knowledge which suggests a need for further inquiry to increase our understanding of the nature of IS underperformance and failure, and the role of the CIO therein. It is proposed therefore to undertake a study of IS failure with a view to understanding this phenomenon in detail and to evaluate what further insight, if any, it offers on the role of CIO. This is addressed in Chapter 3.

2.6 Conclusion

This chapter presents a review of the evolution of the role of the CIO in the context of three technological eras, the mainframe era, the distributed era, and the web-based era, as presented by Ross & Feeny (2000).

The review has shown that the role of CIO emerged from that of a functional role during the mainframe-era, began a transition to a more strategic position during the distributed-era, and has matured during the course of the web-based era in terms of scope and complexity. Technology is now an integral part of the strategic fabric of the organisation (DeJarnett et al., 2004; Porter, 2001), underscoring the importance of the CIO role in creating strategic value through the innovative use of technology (Peppard, 2007). Studies indicate that the evolving CIO role encompasses three main responsibilities; *technology leadership, senior functional management,* and *strategic management*, which are described in detail in this chapter.

The extent to which each of the responsibilities is dominant is influenced by a range of organisation and contextual factors such as the organisation mandate for the role, maturity of IS in the organisation, the attitude of the organisation, and especially senior management, to the role of IS in the organisation, and the capacity of the CIO to fulfil the responsibilities of the role.

The extant literature broadly supports the notion of the CIO role as that of a senior organisation executive. The literature also suggests however that there may exist a cultural gap between the IS function and the rest of the organisation, resulting from the techno-centric focus of IS, which is compounded by a lack of IS literacy among senior managers, and a general lack of understanding of the CIO role. This gap may result in a failure on the part of the organisation to fully understand or measure the value of IS, leading to an over emphasis on cost containment. The cultural gap may also be a contributory factor in the failure of IS initiatives which further exposes the CIO role to

frequent criticism, and contributes to an overly negative view of the role that may not apply to other senior management positions (Cramm, 2008).

Finally it was also found that the body of literature on the role of the CIO is narrowly focused on role profile and competencies, tends to be anecdotal or prescriptive in nature, and lacks depth in relation to how the role is actually performed. It was also found that despite the frequent association of the CIO role with IS failure there is a dearth of empirical studies which explore this subject, prompting a decision to undertake further inquiry in the area of IS failure which is addressed in Chapter 3.

Chapter 3

IS Failure

Chapter 3 – IS Failure

> *There is nothing ... more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things* (Niccolo Machiavelli, 2006)

3.1 Introduction

The previous chapter highlighted an underlying theme in the CIO literature which suggests that the high rate of failure of IS initiatives is in some way attributable to a failing in the performance of the role of the CIO. The CIO literature does not however explore this theme in any detail therefore it was decided to undertake a review of literature in the IS failure domain to examine if this gap is addressed.

This chapter examines the concept of failure in general and IS failure in particular, including how IS failure is defined, what are its main causes, and whether there are specific characteristics of IS which make them prone to failure. The chapter examines a broad range of literature on the cause of IS failure and identifies three overarching risk categories that may negatively influence the outcome of an IS initiative. In doing so the chapter also seeks to examine what role the CIO plays in relation to IS failure and in particular when an IS initiative is in jeopardy.

Section 3.2 describes the methodology used to conduct the literature review. Section 3.3 explores the concept of failure in general. Section 3.4 describes the nature of IS initiatives and explores a range of unique features of IS which may increase the risk of failure. Section 3.5 explores the range of stakeholders who may impact and be impacted by an IS initiative, and the effect of stakeholder influence on such initiatives. Section 3.6 explores the type of studies in the field of IS failure and makes a case for both factor analysis and process studies of the IS failure phenomenon. Section 3.7 presents a synthesis of the literature on IS failure based on the 3 spheres of influence over IS project outcomes, proposed by Yeo (2002), Wallace et al. (2004), and Kappelman et al. (2006), and presents a framework which includes an appraisal of the potential CIO role in relation to the main failure factors identified. Section 3.8 provides a rationale and justification for further study into IS failure taking the lens of what role the

CIO plays during a failing IS initiative. Finally section 3.9 provides a brief summary of the chapter along with a summary of the proposed research undertaking.

3.2 Literature Review Methodology

The review of literature for this chapter was also conducted using the Business Source Complete (EBSCO) database, available through the Trinity College Library. All three keywords 'information', 'system', 'failure' proved too general to search on individually therefore a search was made for a full match on the term 'information system failure' in the document title. This returned a total of 38 peer reviewed papers of which 27 were deemed appropriate for the research. A detailed review of the reference section of each paper revealed a rich set of additional material relevant to the IS failure phenomenon. Much of this material did not specifically refer to IS failure in the title although the subject matter was relevant (e.g. governance, escalation, IT enabled change etc.). This resulted in an additional 50 papers giving a total set of 87 papers which was further augmented during the course of the literature review resulting in the use of 213 papers in total, which are summarised by method in Table 4 below. All material is stored, organised, and categorised using the Mendeley document reference manager system.

Case Study	59
Survey	54
Conceptual Paper	33
Other	29
Book (or book chapter)	20
Interview	11
Experiment	7
Total	**213**

Table 4 – Reviewed Literature on IS Failure

3.3 A Discussion on the Concept of Failure

Failure is a complex concept having a range of types and meanings. There is no generally agreed account of the nature of failure (Sauer, 1993b). For example Collins

English Dictionary (Collins, 2014) provides the following list of definitions of the word failure:

> *(1) the act or an instance of failing, (2) a person or thing that is unsuccessful or disappointing, (3) non-performance of something required or expected, (4) cessation of normal operation; breakdown, (5) an insufficiency or shortage, (6) a decline or loss, (7) the fact of not reaching the required standard, (7) act or process of becoming bankrupt or the state of being bankrupt.*

Quoting the definition used by the Technical Council on Forensic Engineering of the American Society of Civil Engineers Henry Petroski describes failure as *"... an unacceptable difference between expected and observed performance"* (Petroski, 1996, p. 51).

The above definitions suggest that failure, in its simplest form, can be described in terms of a comparison of an outcome with an ideal, or goal, where the output in some way falls short of the ideal. In this case failure is an observation about something and not the thing itself. The definition above also suggests that failure may be a process, something that can happen temporally, as in the case of becoming bankrupt, a decline, or other act of failing.

Nakamura & Kijima (2011) identify three failure models: (1) *simple linear system failure (the domino effect)* where a small change causes a reaction leading to further reaction along a chain, as in the fall of a line of dominos; (2) *complex linear system failure (the Swiss cheese effect)* an alignment of a number of factors leading to failure; and (3) *non-linear (systemic) failure* where a number of unseen factors coalesce, resulting in failure. Failures are usually found to be multi-causal, arising from complicated, interactive, and interdependent chains of prior activities or events. The chain of events that precedes a failure will usually not be a simple linear one as failures are typically the outcome of a concatenation of unforeseen or unpredictable prior conditions and circumstances (Bignell & Fortune, 1984; Sauer, 1993b). Failure of an endeavour is often embedded in a wider system (Eitel, 2004).

Failure is a social construct (Bovens & Hart, 1996 in Goldfinch, 2007). The assessment of an outcome as failure is dependent on the values of the person or group making the assessment, what standards are applied to the assessment, and what qualities are regarded as significant (Bignell & Fortune, 1984). An outcome can be viewed as a either a success or failure depending on the expectations of diverse groups (stakeholders) with different agenda (Bijker et al., 1987; Hillson, 2011; Wilson & Howcroft, 2000, 2002). These values may change with the time and context of the

judgement, and the viewpoint taken (Bignell & Fortune, 1984). Assessment of failure is therefore subjective and context dependent and is also dependent on the power of the evaluator (Imamoglu & Gozlu, 2008; Wilson & Howcroft, 2000, 2002). However as we will see later IS failure, in the main, is considered in a less subjective manner and there are numerous examples of its occurrence and causes.

Failure is a natural by-product of the innovation process (Sauer, 1993b). All innovative endeavours are gambles that ultimately lead to a successful or unsuccessful outcome (Cook, 2000), therefore a healthy attitude to failure and uncertainty may be vital to an organisation's capacity to create and innovate. However failure can also have real and drastic consequences (Kletz, 2001). Success is usually considered to be simply the opposite of failure however the relationship between success and failure is more complex. Firstly, failure starts where success ends and therefore defines the limits of success. Secondly, success often follows failure as it frequently occurs after other options have been tried and failed.

3.4 Information Systems and Failure

IS failure is a recurring theme in both academic and practitioner literature since the beginning of the computer age (Avots, 1969; Bostrom & Heinen, 1977a; Powers & Dickson, 1973; The Standish Group, 1995). Despite this IS failure continues to be a persistent phenomenon (McDonagh, 2014; McDonagh & Coghlan, 2006; Sauer, 1999; The Standish Group, 2013). IS failure does not necessarily imply only technical failure. Even if a system performs as its designers intend it may not meet expectations. For example it may not be used as intended, or used at all (Wilson & Howcroft, 2002), or it may not increase worker productivity or deliver other gains expected, such as return on investment (Goldfinch, 2007). Some systems deemed to be an initial success may have long term negative consequences (Larsen & Myers, 1999).

Wilson & Howcroft (2000, 2002) found that an IS project outcome can be attributed as both a success and a failure and that this attribution may change over time. For example Imamoglu & Gozlu (2008) found differences between IT workers and organisational executives in how success and failure are attributed. Huang et al. (2003) showed, in the case of the development of an internet banking system, how initial failure can be an intermediate step to success and how success may be attributed for reasons quite outside of the technical success of the project.

The next section examines the nature of IS deployment, discusses some unique features of IS and failure, examines the many definitions of IS failure, and how prevalent IS failure is.

3.4.1 The Nature of IS Deployment

IS deployment is a process (Sauer, 1993b; Sauer & Davis, 2009; Wilson & Howcroft, 2002) which typically follows a progression of steps from the initial concept to commission, acceptance, and use. The IS implementation process tends to follow one of two methods, viz the software life cycle method (SLC), or the agile software development method. The SLC method describes the process of building information systems in a deliberate and structured way by following a set of phases of development that are typically carried out sequentially, with the input of each phase arising from the output of the previous phase as depicted in Figure 3 below.

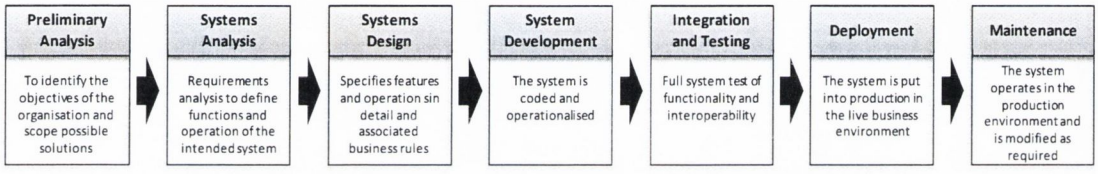


Figure 3 - The Software Development Life Cycle (adapted from IEEE/EIA Standard 12207.0-1996)

The engineering orientated linear approach of the SLC does not however suit all IS implementations. For example in situations where there is a high degree of volatility in the environment or where requirements are ambiguous an emergent development model may be more appropriate. Such agile software development models support rapid and incremental system development using prototyping, often through collaboration (Boddy et al., 2009; Lyytinen, 1987). Over the last 15 years many applications, which would previously have required purpose-built systems, can now be acquired as standard packages (often called enterprise software). In such cases deployment of the IS is predominantly about the integration of the system into the organisation, and the associated organisational change, rather than software development (Sauer & Davis, 2009).

The sophistication and enterprise spanning nature of modern IS often dictates a lengthy implementation period and there are a range of different project management methodologies in use today such as PMBOK[8], PRINCE2[9] and a range of more flexible

[8] PMBOK - Project Management Body of Knowledge – The Project Management Institute
[9] PRINCE2 - Projects in Controlled Environments V2 – UK Office of Government Commerce (OGC)

approaches to software development known collectively as Agile (Fowler & Highsmith, 2001), which offer a framework to aid in the planning and execution of IS implementation. It is usual for most non-trivial IS implementations to utilise such a methodology. Although there are differences among the methodologies they all focus on a core set of planning and management guidelines aimed at improving project management, to reduce overall risk of project failure. Despite the sophistication of systems development methodologies and the increase in professionalism of the project management discipline the impacts and outcomes of introducing a new IS cannot generally be accurately predicted at the project's outset, as the system may be interpreted and used in diverse ways during the development period as well as throughout its operational life (Orlikowski et al., 1995). Furthermore, examining the behavioural dynamics of systems development Wastell & Newman (1993) found that system development is a complex, protean, social phenomenon where conflict is endemic and simple prescriptions such as 'get top management support', or the call for user involvement grotesquely oversimplify the complex and somewhat chaotic realities of actual systems work (Luna-Reyes et al., 2005). It has also been shown that projects with a short timeframe, or those broken into small incremental steps have a higher success rate (Taylor, 2000; The Standish Group, 2011).

An IS deployment typically represents a strategic change intervention (Yeo, 2002) designed to specify and effect the required change (Ward & Elvin, 1999). IS deployment is usually a catalyst for organisational change (Doherty & King, 2005), therefore managing an IS implementation is not just a technical challenge, as described above, but also an organisational one (Boddy et al., 2009; Ward & Elvin, 1999), because the technical aspect of the innovation is inseparable from the social, behavioural, and political context in which most IS are deployed (Boddy et al., 2009; Fortune & Peters, 2005; McDonagh, 2001; Sauer, 1993b). Effective technology transfer often requires adaptation of work practices, invention, reorientation, and organisational change far beyond what is initially apparent (Bostrom & Heinen, 1977b; Southon et al., 1997) therefore a change in the IS component can impact on, and can be impacted by the other inter-related organisational components as shown in Figure 4 below (Keen, 1981; Luna-Reyes et al., 2005; Southon et al., 1997). This is known as the socio-technical systems view (Doherty & King, 2005; Sauer & Davis, 2009). Studies indicate that the failure to predict adaptive processes among the organisational components described is a significant contributory factor to IS failure (Boos et al., 2013; Doherty & King, 2001).

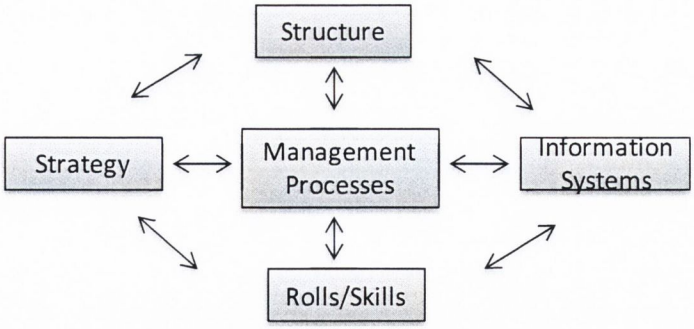


Figure 4 - IS Organisational Fit Framework (adapted from Southon et al., 1997)

Findings suggest that organisations are not systematic in their use of purpose-built socio-technical approaches to IS implementation (Doherty & King, 2005). In fact the strong engineering culture of IS personnel has meant that systems development is still largely viewed as a technical and engineering endeavour (Clegg et al., 1997) which can be managed by rational principles of engineering, rather than in terms of business factors and processes (Sauer, 1999). Organisational issues tend to be addressed as they emerge, which is often during or after system implementation (Boos et al., 2013; Doherty & King, 2005). Socio-technical theory predicts that optimising only the technical system or optimising only the social system will lead to information systems failure (Sauer & Davis, 2009).

3.4.2 Some Unique Features of IS and Failure

Failure is an inherent aspect of complex technological and organisational systems (Cook, 2000; Sauer, 1993b). For example consider the 1986 disaster at the Chernobyl nuclear plant (Hawkes et al., 1987; Anspaugh et al., 1988), the space shuttle Challenger disaster (Faynman, 1988), the loss of NASA's Mars Climate Orbiter (Sauser et al., 2009), and the Bhopal chemical plant accident (Kletz, 2001).

Failure is also an inherent feature of IS (Nelson 2007). IS are both innovative and inherently complex (Brooks 1987). Unlike hardware, software is an intangible and abstract entity, therefore human cognitive limitations, exacerbated by bounded rationality and the tendency to satisfice, can lead to fallible decision making during specification and design, which can impact on the accuracy of software, resulting in failure (Sauer, 1993b). Furthermore, unlike the construction of a bridge or other such engineering endeavour, information systems can have a very large impact on the

socio-technical equilibrium within organisations (as already described) and therefore much more forces of work against the system may come into play (Bostrom & Heinen 1977a). The typical lifespan of an IS innovation means there is usually a degree of uncertainty about what the final outcome will be, how the process of constructing the product will progress in the face of possible unforeseen situations (Boddy et al., 2009; Sauer, 1993b), and the potential for late detection of problems (Al-ahmad et al., 2009). The number of stakeholders affected by an IS initiative makes it difficult to satisfy all expectations (Boddy et al., 2009; Sauer, 1993b). Finally companies continue to inject technology without making the necessary organisational changes (Markus & Robey, 1988; Sauer, 1993b). IS projects are mostly technology led, and many organisations lack an integrated approach to organisational and technical change, and often design the social system around the technology (Clegg et al., 1997; Marchland & Hykes, 2006).

3.4.3 Defining IS Failure

IS project failure has been defined as any project that is set to support the operations of an organisation by exploiting the resources of information technology that fails to deliver the intended output within the originally allocated cost, time schedule, or initially-approved functionality, as well as the project comfortably satisfying the stakeholders and being accepted and largely used by the end users after deployment (Al-ahmad et al., 2009). The concept of IS project failure has not been well defined in project management literature and there is no universally agreed definition (Al-ahmad et al., 2009; Hyvari, 2006; Sauer, 1993b). Robinson (1994) points out that a project's failure or success is typically defined in relation to a particular group (stakeholders) with its own set of roles, goals, interests, and expectations, which are assessed in the context of an organisation and its political and social environment.

Wilson & Howcroft (2002) describe IS failure as a process not an event. Based on a review of studies by Drummond (1996), Dutton et al. (1995), Flowers (1996), Fortune & Peters (2005), Lyytinen & Herschein (1987), Jones (1995), Mitev (2000), Morris (1996), and Sauer (1993b) they constructed a set of descriptions of how IS failure is conceptualized and note the subjectivity of the definition of failure across the studies. They also propose that in many cases a failure evaluation is merely an exercise whereby 'failure factors' are assigned to fit analysis of an outcome that has already been deemed a failure. They argue that given the diverse descriptions of failure almost any project is vulnerable to the attribution of failure, and indeed in many cases could be

deemed a success depending on the criteria used in the evaluation, and the 'power' of the evaluator. It may be almost impossible therefore to find agreement about whether a project has succeeded or failed, however to paraphrase Brennan & Goldberg (1964) 'we tend to know it when we see it'

Based on a survey and classification of the empirical literature on IS failure Lyytinen & Herschein (1987) identified four distinct types of IS failure: (1) *Correspondence Failure:* the system does not 'co-respond' to predefined design objectives; (2) *Process Failure:* a failure to produce a system at all or failure to produce a system within planned budgets and timeframe; (3) *Interaction Failure:* failure of the system to meet the needs of its users evidenced by the level of use and the degree of user satisfaction with the system; and (4) *Expectation Failure:* the inability of an IS to meet a specific stakeholder group's expectations.

Expectation failure extends beyond the inability of an IS to meet design specifications to a more holistic view of an inability to meet the expectation of groups (Yeo, 2002). Sauer (1993b, p. 23) criticises this concept which he says can *"in principle accommodate any kind of shortcoming in an information system".* The basis of his criticism is that failure is highly subjective and some expectations are less reasonable than others. He also points out that some stakeholders have greater capacities to achieve desired ends than others. Failure to achieve your own interests when you are powerful is very different from failure when you are powerless. Sauer (1993b) however acknowledges that the concept of expectation failure is useful as it highlights the relevance of different stakeholder groups, makes clear that failure is an evaluation rather than a description, and points out that the satisfaction of interests may vary in degree over time.

Sauer (1993b) proposes an alternative definition of IS failure which is consistent with IS deployment as a process unfolding in a complex web of social action. He proposes a model which he describes as a triangle of dependences among (1) *the project organisation* (who develop and maintain the IS); (2) *the supporters* (stakeholders who support the IS in the expectation that it will serve their purposes); and (3) *the information system itself.* Success or failure of the system depends on the support each leg gives to the other along with the effects of exogenous factors such as cognitive limits, the environment, organisational politics, structure, and history. In this model failure occurs when the level of dissatisfaction with a system is such that there is no longer enough support to sustain it. Failure in this case is terminal, and is usually referred to as project abandonment (Ewusi-Mensah & Przasnyski, 1994; Pan, 2005).

This terminal view of failure is not inconsistent with the failure as a process concept as termination is the end result of a failing entity. Sauer's approach also supports the notion that failure of an IS initiative can happen long after the system is successfully implemented from a project management perspective.

For the purpose of this inquiry Saur's definition has been taken as the most appropriate as it describes failure as a process that may unfold over time, encompasses the assessment of all stakeholders, may happen even after successful implementation, and results in an abandonment or partial abandonment of the system, all of which are clearly identifiable states that may reasonably be associated with accepted explanations of failure. The definition excludes the abandonment of a system that is no longer considered fit for purpose because it has reached some predefined and natural end of life condition, having largely and successfully delivered on its purpose over its lifetime.

3.4.4 How Prevalent is IS Failure

IS failure is a recurring topic of interest among the practitioner community as well as the academic community. A well-known, and much cited, series of studies on IS failure have been produced by the Standish Group since 1994. The reports, called the CHAOS reports (The Standish Group, 1995), identify two types of project failure: *failed projects* are those cancelled before completion, and *challenged projects* which are projects completed over budget or time estimates and with fewer features and functions. *Successful projects* are defined as those completed on time, within budget, and with all features and function as originally specified. Over the course of 9 such studies, summarised below in Table 5, between 1994 and 2012 the reports present an outright failure rate of between 18% and 40% with a success rate of between 16% and 39%. The level of outright failure has been decreasing overall since 2000, possibly indicating the increasing level of professionalism among the project management discipline, and the growing understanding and explicit management of organisational issues related to IS deployment (Doherty & King, 2001).

Year	Successful %	Challenged %	Failed %
1994	16	53	31
1996	27	33	40
1998	26	46	28
2000	28	49	33
2004	29	53	18
2006	35	46	18
2008	32	44	24
2010	37	42	21
2012	39	43	18

Table 5 - Chaos Project Resolution Results 1994 – 2012

Although the CHAOS reports have received an amount of criticism for the use of very narrow definitions of success and failure (Eveleens & Verhoef, 2010), how the survey results are used to produce the overall success/failure rates (Vessey, et al., 2005), and inconsistency with the findings of other contemporary studies (Jørgensen & Moløkken, 2006), they remain the most cited figures on IS success/failure within the academic arena (Sauer & Davis, 2009).

Other studies on project failure rates provide a wide range of figures indicating the difficulty in measuring a concept that is not fully defined and universally agreed. For example an analysis of 27 sources of evidence on the rate of IS failure by McDonagh (2001) concluded that 50% of IT initiatives fail or are completely abandoned while another 40% are delivered late and over budget. A study on 5,400 IS projects across a range of industries by McKinsey & Company in collaboration with the University of Oxford (Bloch, et al., 2012) suggests that half of all large IT projects (defined as those with initial price tags exceeding $15 million) run 45 percent over budget and 7 percent over time, while delivering 56 percent less value than predicted. A study of 1,471 IS projects at Harvard University (Flyvbjerg & Budzier, 2011) identified an average cost overrun of 27% for large IS projects. The study also found that one in six of the projects studied had a cost overrun of 200%, on average, and a schedule overrun of almost 70%, highlighting the potentially terminal level of risk of large IS initiatives, a fact that is not surfaced when reviewing average figures alone. The Panorama Group have conducted an annual survey on the rates of IS failure over the past four years. During this period, approximately 59% of projects have exceeded their planned budgets, 53% of projects have exceeded their planned durations and 56% of respondent

organisations have received less than 50% of the measurable benefits they anticipated from their ERP software initiatives (Panorama, 2013).

Although the studies cited above indicate different rates of failure they all suggest that IS failure remains a significant issue. It is impossible to place a value on the total cost of IS failure because of the lack of a definitive definition, and the fact that not all IS failures get into the public domain. Gartner estimate that total global spend on IS for 2014 will be US$3.8 trillion (Gartner, 2014). Even a conservative estimate of the percentage of this amount that is spent on underperforming IS represents a significant amount. This alone is a motivation and justification for the continued study into the area of failed IS initiatives (Drevin, 2008).

3.5 Information Systems and Stakeholders

Freeman (1984) in Achterkamp & Vos (2008, p. 750) defines a stakeholder *as "any group or individual who can affect or is affected by the achievement of the organization's objectives..."* With regard to information systems, Dix et al. (2004) in Fowler & Horan (2007) define four categories of IS stakeholder: *Primary stakeholders*: the stakeholders who actually use the system, whose needs are usually predominant; *Secondary stakeholders* who do not directly use the system, but receive output from it, and provide input for it; *Tertiary stakeholders* who do not fall into either of the first two categories but are directly affected by the success or failure of the system in some way; and *Facilitating stakeholders* who are involved with the design, development, and maintenance of the system.

Information systems impact on a large body of stakeholders, both internal and external to the organisation. The impact of stakeholders on large scale projects is well documented (Pan & Flynn, 2003; Pan, 2005; Yuttapongsontorn et al., 2008). Sauer (1993b) points out that IS failure is relative to different stakeholder interests and that stakeholder interests and stakeholder power can change over time. Yuttapongsontorn et al. (2008) propose that organisations are more likely to successfully implement complex technology projects if they understand stakeholders' expectations and the interplay among stakeholders, and that organisations are more likely to achieve success with innovative projects when they define stakeholders in terms of their power over strategic objectives.

Many projects fail because of inadequate management of the sometimes hidden and conflicting agenda of various project stakeholders (Bourne & Walker, 2005). The Taurus project at the London Stock Exchange offers a clear example of project failure

due to the political rivalry among its stakeholders who had conflicting interests (Nelson, 2007). Pouloudi (1999) argues for the development of a more holistic view of the stakeholder concept to develop a more thorough understanding. Pardo & Scholl (2002) stress the need to identify stakeholder needs up front and work with them throughout the development and implementation process. Sutterfield et al. (2006) proposes the inclusion of a stakeholder management strategy when undertaking project risk assessment and management.

3.6 An Overview of Studies in IS Failure

Our understanding of IS risk and failure has been hampered by the lack of validated instruments for measuring and prioritising risks, and the lack of theory to explain the linkages between project risk and project performance (Wallace et al., 2004b). Sauer (1999) identifies a number of difficulties in researching IS failure. Firstly, as stated above, the concept of IS failure has not been well defined and there is no universally agreed definition (Al-ahmad et al., 2009; Hyvari, 2006; Sauer, 1993b). Secondly the study of IS failure raises a number of difficulties, including the difficulty in developing theory, because of the need to combine technical, human, and organisational characteristics associated with the phenomenon, and the absence of explanatory theories of failure from other fields (Sauer, 1999).

Notwithstanding this there exists an extensive body of literature on IS risk, failure and success, built up over the last 50 years. Studies are broadly of the following types:

- conceptual papers on IS risk, failure, and success
- studies on IS risk factors (risk analysis)
- studies on IS failure factors (factor analysis)
- studies on critical success factors (CSF) for IS initiatives
- case studies of actual failed or successful IS initiatives

Studies of IS failure fall broadly, although not exclusively, into two categories viz. factor analysis studies and process studies. Factor analysis studies attempt to explain, and sometimes rank in importance common factors that contribute to IS failure. Process studies examine the process by which IS have failed by examining sequences of events, activities and actions, which unfold over the duration of the process, leading to the failure outcome. Both types of study offer valuable insight into the phenomenon of IS failure.

Factor analysis is a useful method of studying IS failure as it exposes many of the important issues that have contributed to IS failure in the past, and the difficulty in

addressing them (Goldfinch, 2007). Factor analysis studies fall into two main categories, those that attempt to analyse in detail a particular factor which led to failure e.g. escalation of commitment (Keil, 1995), failure to learn from failure (Lyytinen & Robey, 1999), failure of governance (Avison et al., 2006), and those that identify and attempt to prioritise lists of critical failure factors based on perceived importance (Al-ahmad et al., 2009; Kappelman et al., 2006; Schmidt et al., 2001).

Failure factor research has been criticised because of the lack of a standard naming convention for failure factors leading to ambiguity and difficulty in comparing studies (Al-ahmad et al., 2009), and in building a cumulative knowledge base on IS failure; the lack of consensus on the rank of importance of factors; the tendency to view implementation as a static process instead of a dynamic phenomenon, thereby ignoring the potential for a factor to have varying levels of importance at different stages of the implementation process (Larsen & Myers, 1999); failure to identify relationships among the factors (Ginzberg, 1981); and a focus on project factors at the expense of broader contextual factors (Bussen & Myers, 1997; Nandhakumar, 1996). Furthermore factor analysis, while possibly useful in explaining failure in retrospect provides little guidance in how to avoid it (Goldfinch, 2007).

Despite the limitations described above IS failure factor analysis is a useful method for building a set of factors that are a vital input to project risk analysis (Imamoglu & Gozlu, 2008), both at the commencement of an IS initiative and throughout its lifetime, with the caveat that it is not possible to list a definitive set of 'risk/failure' factors, or indeed a list of critical success factors that will provide a certain recipe for implementation success. Even in those (rare) cases in which there is total agreement on the goals of an implementation, there exists no simple formula for success (Berg, 2001; Sauer, 1993b).

Process studies of IS failure present an analysis of one or more failed initiatives, usually over the entire course of the initiative (Drevin, 2008). Process studies of IS failure differ from factor analysis studies because in addition to describing the causes of failure they go further by placing the causes within the context of the IS development (Sauer, 1993b), and attempt to unearth the complex social and political web in which IS initiatives are undertaken (Markus & Robey, 1988), thereby offering a richer explanation in terms of both agency and context (Pettigrew, 1997). By facilitating a more incisive study of the process of failure over the entire course of the initiative process studies offer richer explanations of causal links than factor studies (Sauer, 1999), and a better explication of how IS affects, and is affected by, the people who

use it (Nandhakumar, 1996). Process studies usually employ a real life case to build the narrative of failure thereby providing an impact free surrogate for costly experience (Sauer, 1993b) in understanding the process of failure (Nandhakumar, 1996). Although process research is more appropriate to the complexity of IS failure it also has limitations in terms of the complexity of analysis and theoretical foundations and the lower amount of accumulated research when compared with factor analysis studies (Sauer, 1999).

Although there is no grand theory of IS failure the study of IS failure has usefully employed a number of theoretical lens for the study of the phenomenon. The most widely used are: S*tructuration* based on the analysis of the effect of both structure and agency on the IS failure phenomenon (Giddens, 1986); *Technology Acceptance Model* (Davis et al., 1989; Davis, 1989) which models how users come to accept and use a technology; *Social Construction of Technology* (Bijker et al., 1987; Bijker & Law, 1992) postulates that the ways a technology is used and evaluated cannot be understood without understanding how that technology is embedded in its social context; and *Escalation of Commitment* (Staw & Ross, 1987; Staw, 1981) a model of escalating commitment to a chosen course of action.

3.7 A Study of Factors that Contribute to IS Failure

This section examines in detail the recurring themes that dominate the literature on IS failure as main contributory factors to the phenomenon. Cognoscente of the socio-technical nature of IS initiatives as described previously the section examines the technical, process, and organisational aspect of IS failure as described in the literature over the last fifty years. In discussing the dominant contributing factors and themes to IS failure it is recognised that each IS deployment is unique in both its execution and context and therefore the impact of any factor should be considered within the scope of its impact relevant to a given situation.

Flowers (1996) in Yeo (2002) describes the performance of IS developments as a function of managing a range of critical failure factors that may be broadly grouped as the conduct of the IS implementation project along with the organisational and people contexts within the domain of influence of the IS project (Yeo, 2002). Specifically there have been a number of studies which have attempted to synthesise previous studies or expert opinion on IS failure to build a categorisation of failure factors. These are shown in Table 6 below.

Study	Outcome
Barki et al. (1993)	Utilising a literature review of IS risk literature and data collected in a survey of 120 projects identified five IS project risk categories as: technological newness, application size, lack of expertise, application complexity, and organisational environment.
Schmidt et al. (2001)	Utilising a Delphi study of expert panels in three countries (Finland, Hong Kong, and United states) identified a set of 54 risk/failure factors which they group into fourteen categories: corporate environment, sponsorship/ownership,relationship management,project management, scope, requirements, funding, scheduling, development process, personnel, staffing, technology, external dependencies, and planning.
Baccarini et al. (2004)	Utilising a literature review of IS risk identified a list of eight IS failure categories: commercial and legal, economic, human behaviour, political (corporate) circumstances, technology and technical issues, management activities and controls, individual activities, and project and technical management.
Kappelman et al. (2006)	Utilising a literature review of IS failure along with a group of 17 IS project management experts builds a list of 53 early warning signs of IS project failure. A secondary study utilising 55 experienced IS project managers ranked the resulting factor table to produce a list of the twelve dominant failure factors as: lack of top management support, weak project manager, no stakeholder involvement, weak commitment of project team, lack of knowledge and skill-set among the project team, over-scheduling of subject matter experts, lack of documented requirements, no change control process, ineffective schedule planning and/or management, communication breakdown among stakeholders, reassignment of resources to a higher priority project, lack of a business case for the project.
Al-ahmad et al. (2009)	Utilising a literature review to develop a taxonomy of the root causes of IS failure consisting of: project management factors, top management factors, technology factors, organisational factors, complexity factors, and process factors.

Table 6 - IS Failure Factor Analysis Studies

The table illustrates the lack of consistency in the analysis of factors leading to IS failure. However they all acknowledge both the importance of good practice in planning and managing the IS deployment process, and a range of people and organisational factors external to the project that can influence the outcome.

Yeo (2002) identifies three spheres of influence over IS project outcomes as: (1) *process driven issues* such as business/IS planning, project planning, project management and control; (2) *content driven Issues* such as technology, business process design, system design, and professional knowledge and skill-sets; and (3) *context driven issues* such as organisation culture and politics, corporate management, politics, and users. These spheres of influence are broadly in line with the people,

process, and project risk categories noted by Kappelman et al. (2006). Wallace et al. (2004) identified six risk categories for IS projects (organisation environment risk, user risk, project requirements risk, project complexity risk, project planning and control risk, and project team risk) which they consolidated into three higher order subsystems of IS project risk (social subsystem risks, project management risks, and technical subsystem risks). Although different in approach each of the studies acknowledge three similar overarching spheres of influence on the outcome of an IS project. These studies provide a useful framework for a more detailed study of IS failure as they embody a wide range of project, process, people and organisational/contextual factors that may impact on the outcome of an IS initiative.

Furthermore the study by Wallace et al. (2004) found a link between all spheres of influence such that social subsystem risk influences technical subsystem risk which in turn influences the level of project management risk, and ultimately project performance thereby indicating a systematic connectedness among all spheres of influence.

Synthesis of the three studies is shown in Tables 7, 8, and 9 below and will be used as the template for a more detailed description of IS failure in Sections 3.7.1, 3.7.2, and 3.7.3.

Subsystems of IS Project Risk	Risk Categories	Symptoms of Failure Associated with the Risk	Possible Consequences / Outcomes	CIO Role
Technical Subsystem Risk (Wallace et al, 2004) / Content Driven Sphere of Interest (Yeo, 2002) / Project Risks (Kappleman et al., 2006)	**Project Complexity (Wallace et al., 2004)** *the project is large or comparatively complex*	technical complexity of the system (scale, scope, number of interfaces)	increases the overall risk of an initiative by exacerbating cognitive limitations due to complexity - increases training requirements	Environmental scanner / IS architect / Inspiring IT manager
		organisational complexity of the system (number of system interfaces, number of internal and external stakeholders, geographical span)	failure to understand the complexity of organisational interfaces leads to socio-technical issues - may have cultural implications and/or failure to manage all stakeholders leading to lack of buy-in or low user acceptance	Business Innovator / Relationship Manager / IS architect / Inspiring IT manager
		new or immature technology	increases uncertainty - increases training requirements - exacerbates cognitive limitations	Environmental scanner / IS architect / Inspiring IT manager
		lack of experience with the technology	exacerbates cognitive limitations - increases training requirements	IS architect / Inspiring IT manager
	Requirements Risk (Wallace et al., 2004) *requirements of the system not clearly defined or understood*	requirements unclear or defined incorrectly	creates an unknown end point - increases ambiguity, cognitive limitations, and ability to accurately assess required resources including costs - encourages gold plating - inability to lock down the system specification leads to scope creep	Strategist / Business Innovator / Relationship Manager / IS architect /Inspiring IT manager
		changing requirements	indicative of a failure to lock down requirements leading to scope creep - increases cognitive limitations - inability to accurately assess required resources including costs - creates an atmosphere of uncertainty	Strategist / Business Innovator / Relationship Manager / IS architect / Inspiring IT manager
		poor technical / BPR design integration	project seen as an IT project not a business change project (magic bullet) - failure to get engagement from all stakeholders - socio-technical issues emerge during or after implementation	Strategist / Business Innovator / Relationship Manager / IS architect

Table 7 - Subsystem (Content) of IS Project Risk/failure (Kappelman et al., 2006; Wallace et al., 2004; Yeo, 2002)

Subsystems of IS Project Risk	Risk Categories	Symptoms of Failure Associated with the Risk	Possible Consequences / Outcomes	CIO Role
Project Management Risk (Wallace et al, 2004) / Process Driven Spheres of Interest (Yeo, 2002) / Process Risk (Kappleman et al., 2006)	**Project Planning (Wallace et al., 2004; Yeo, 2002)** *Inadequate planning and support of the project at strategic and/or tactical level*	misalignment of business and IS planning	IT not integrated with business planning and strategy formation leading to misaligned systems or IT silo (stovepipe) projects - poor return on IS investments - IS function isolated from the rest of the organisation	Strategist / Business Innovator / Relationship Manager / IS architect
		inadequate planning of the project (business case, financial and other resource requirements), milestone planning, estimating, technical planning	can lead to the three classic failure symptoms - over time / over budget / does not meet requirements	Strategist / Relationship Manager / IS architect
		Project support (top management, steering committee, champion)	failure to secure initial support from the business and maintain support and ownership among multiple stakeholders throughout the project - failure to keep projects on the business agenda - can lead to poor governance and risk sharing with the business	Relationship Manager / IS architect
	Project Management (Yeo, 2002) *management of the project is not appropriate*	lack of project management methodology	project managed on an ad-hoc basis without proper milestones and monitoring arrangements - lack of accountability for project delivery	IS architect / Inspiring IT manager
		Project Manager is ineffective	Can be fatal to an otherwise well planned initiative	IS architect / Inspiring IT manager
		Ineffective communication	communication channels not clear between all stakeholders resulting in isolation, loss of interest, stakeholder dissatisfaction, poor governance and accountability	IS architect / Inspiring IT manager / Relationship manager
	Project Control (Wallace et al., 2004; Yeo, 2002) *inadequate organisational oversight of the project*	Poor project governance	project slippage in time and budget - poor accountability and responsibility - fault attributed to IT department project management	IS architect / Relationship manager
		escalation of commitment to a failing project	failing projects allowed to continue leading to time and cost overruns and eventual project closure	IS architect / Relationship manager
	Project Team Risk (Wallace et al., 2004) *Ineffectiveness of the project team*	lack of experience within the project team	poor team performance - failure to adhere to standards - inability to deal with complexity - poor relationships with users	IS architect / Inspiring IT manager
		inadequate specialist skills to meet requirements	failure to meet technical requirements of the project - inappropriate task assignment - delay	Inspiring IT manager
		Inadequate training	poor performance - failure to adhere to standards - IT (not business) focus	Inspiring IT manager
		Poor relationship between the IS department and the rest of the organisation	friction between the IS function and the business - creates an 'us and them' situation - can endorse the credibility gap - poor requirements analysis - bad working practices	IS architect / Inspiring IT manager / Relationship manager

Table 8 - Management (Process) Subsystem of IS Project Risk/failure (Kappelman et al., 2006; Wallace et al., 2004; Yeo, 2002)

Subsystems of IS Project Risk	Risk Categories	Symptoms of Failure Associated with the Risk	Possible Consequences / Outcomes	CIO Role
Social Subsystem (Wallace et al., 2004) Context Driven Sphere of Interest (Yeo, 2002) People Risks (Kappelman et al., 2006)	Organisational Environment (Wallace et al., 2004) . *the impact organisational factors on an IS initiative*	organisational culture	new systems can surface dysfunctional aspects of different organisational cultures (e.g. operator Vs engineering Vs executive)	Strategist / Business Innovator / Relationship Manager
		organisational politics	shifting balance of power created by IS may lead to power struggles and resistance	IS architect / Relationship manager
		resistance to change	may result in reluctance to use an IS or sabotage resulting in partial or total failure	IS architect / Relationship manager
		failure to learn from failure	lack of accountability - poor embedded learning culture leads to repeated failure - can promote poor governance of IS initiatives	IS architect / Relationship manager
	Users (Wallace et al., 2004; Yeo, 2002) *the impact of people on IS initiatives*	user resistance	resistance can manifest in reluctance to engage, negative attitudes, or lack of commitment to the development and use of the system or in lack of support for the system (including at senior management level). Can be the result of poor training or engagement at the project outset	IS architect / Inspiring IT manager / Relationship manager

Table 9 - Subsystem (Context) of IS Project Risk/failure (Kappelman et al., 2006; Wallace et al., 2004; Yeo, 2002)

3.7.1 Technical Subsystem (Project) Risk/Failure Factors

This section examines the IS project risk/failure factors of complexity and project design.

3.7.1.1 Complexity

As already stated all innovative projects are risky. Much of the risk associated with IS projects is as a result of the inherent complexity and scope of influence of modern systems (Goldfinch, 2007; Southon et al., 1997). Complexity arises for technical reasons such as size, scale, scope and number of system interfaces (Aloini et al., 2007; McAfee, 2002; Nandhakumar, 1996), and organisational reasons such as the number of internal and external stakeholders and geographical span (Yuttapongsontorn et al., 2008). Complexity due to project size and scope may be exacerbated by the use of immature technology or lack of experience with it (Schmidt et al., 2001; Yeo, 2002). For example the case of the failure of the baggage handling system at Denver International Airport was in part due to a lack of experience with complex technology (Keil & Montealegre, 2000).

Complexity issues present a fine balance between organisational agility and the inherent risk of complex IS deployment. An essential ingredient to this process is both an understanding, and ownership, of the risks of innovation among all stakeholders, not just the IS function. The previous chapter indicated the possible consequences of abdicating responsibility for IS deployment to the IS function alone therefore it is an essential requirement of the CIO role not just to promote innovation but to provide the necessary leadership when required, to secure the necessary ownership and engagement from all stakeholders. In addition the CIO must ensure that the necessary IS architecture can support the proposed innovation and that complexity issues are addressed through adequate recruitment and training programmes within the IS function.

3.7.1.2 Requirements Risk

The importance of clearly and unambiguously defining the requirements of an IS initiative cannot be over emphasised as a lack of clarity or misunderstanding in this regard will greatly increase the risk associated with the endeavour because of the resulting ambiguity surrounding the resources required to complete the project (Schmidt et al., 2001; Wallace et al., 2004), or even how the project might look on completion. A realistic approach to requirements specification is also necessary to guard against 'gold plating' (Nelson, 2007). Failure to freeze requirements also presents a risk to project outcome as it may lead to changing requirements over the course of the project and 'scope creep' (Kreps &

Richardson, 2007; McAfee, 2002; Umble, 2003) whereby the scope of the project evolves (usually expands) over the course of the initiative. Scope creep increases ambiguity by creating uncertainty in terms of resource requirements and the eventual product outcome. The CIO must therefore ensure that best in class standards are specified and maintained as part of IS policy for the organisation. These standards of course must apply to all stakeholders, should be agreed as part of an overall organisation-wide IS policy, and should be incorporated as a fundamental requirement for all IS initiatives.

Competitive agility, including business process agility, is a key factor in sustaining competitive advantage (Phillips & Wright, 2009; Sambamurthy et al., 2003), and as noted in Chapter 2, IS is almost always on the critical path of a business change programme (Earl & Feeny, 2000). The delivery of IT enabled change initiatives is a shared responsibility between the organisation and the IS function (McDonagh, 2014), and given the strategic nature and importance of such endeavours, it is expected that joint ownership of, and significant engagement during such initiatives would occupy a key position on the agenda of all relevant senior executives. It is also expected that as the most senior IS executive the CIO would play a key leadership role in IT enabled change programmes. The topic of organisational resistance to IS enabled change is discussed in more detail in section 3.7.3.3 of this document along with its significance in the success or failure of IS initiatives, however given the strategic importance of this topic, and its relevance to the CIO role, there is a noticeable absence of research on this topic in either the CIO or IS failure literature, other than some references to the negative outcomes associated with the 'magic bullet' fallacy (Markus & Benjamin, 1997), and the isolation of the IS function and its relegation to the implementation phase of IS enabled change initiatives because of the knowledge, credibility, and cultural gaps as discussed in Chapter 2 (Fiegener & Coakley, 1995; Peppard & Ward, 1999; Willcocks & Sykes, 2000).

3.7.2 Project Management (Process) Risk Factors

This section examines the process driven risk/failure factors of project planning, project management, and project control issues, along with issues relating to project personnel.

3.7.2.1 Project Planning

Alignment of Business and IS Planning

The importance of aligning IS and organisational strategic planning has already been discussed in Chapter 2, Section 2.4.1.2, along with its significance in enabling

organisational agility (Chan et al., 2006; Piccoli & Ives, 2005; Sambamurthy et al., 2003; Weill et al., 2002). Failure to align IS strategy with organisation strategy can significantly increase the risk of IS failure due to under resourcing of the IS function (Kaarst-Brown, 2005; Willcocks & Sykes, 2000), an over reliance on external consultants (McAteer & Elton, 2000; Willcocks & Sykes, 2000), a demand by the business for rapid deployment of applications to support business growth (Johnson, 2002), a difficulty in assessing and prioritising IS investments (Karahanna & Watson, 2006), and the creation of silo projects which are not integrated into an overall plan (Kaarst-Brown, 2005).

The importance of the CIO in the strategic planning process has been highlighted (Stephens & Mitra, 1995), including nurturing a convergent strategic vision and a shared knowledge/understanding between business and IS executives (Reich & Benbasat, 2000), and gaining approval among the executive team (Marchland & Hykes, 2006). As the most senior IS official responsibility lies with the CIO to create an innovative IS climate in support of IS and business strategy alignment. Watts & Henderson (2006) indicate the pivotal role the CIO can play by networking with peers, providing leadership and motivation, creating a shared vision of the future, and creating a learning environment, however there is a dearth studies of how this is carried out.

Project Planning

The project planning phase is concerned with producing a viable project plan that will address the business and technical objectives of the project (Cleland & Ireland, 2008). Project planning involves estimating the resources required to meet the objectives of the project and setting out how these resources will be deployed (Shaul & Tauber, 2012). The planning phase of a project is a critical stage in the entire IS implementation process (Ginzberg, 1981; Sutterfield et al., 2006) as mistakes made at this point may develop into larger problems later in the project. McConnell (1998) and Markus et al. (2000) state that the importance of the planning phase is often unacknowledged in less successful ERP adoptions, and Jones (2004) found that failed IS projects, almost always have planning failures. Project planning should include an assessment of risks and dependencies across the lifetime of the project (Bloch et al., 2012; Schmidt et al., 2001), and should be accompanied by a project charter, which clearly states the scope, objectives, and participants in a project, provides a preliminary delineation of roles and responsibilities, outlines the project objectives, identifies the main stakeholders, and defines the authority

of the project manager (Glaser, 2004). The project charter serves as a reference of authority for the duration of the project.

There are numerous potential project planning pitfalls. For example Kappelman et al. (2006) identifies lack of documented requirements and/or success criteria, ineffective schedule planning, and poor resource planning as three key early warning signs of project failure. Schmidt et al. (2001) identifies improper definition of roles and responsibilities, poor risk management, choosing the wrong development strategy, unclear or misunderstood project scope and objectives, bad estimation, and artificial deadlines as key project planning risks.

Development of an individual project plan is the responsibility of the project manager however it is the responsibility of the CIO to ensure that each project is part of an overall IS strategy and that it is aligned with the overall strategic objectives of the organisation as described above. The project plan should also conform to the overall standards as set out in the organisation's IS policy, and have the required support throughout the lifetime of the project as discussed below.

Project Support

Sauer (1993b) states that the IS project development organisation rarely if ever commands sufficient support on its own, therefore the support of people and groups external to the project organisation will need to be garnered and maintained over the life of the initiative. The influence of stakeholder groups has already been discussed in Section 3.5 of this chapter. The IS project should also have additional organisational support in the form of senior management commitment, an executive steering committee, a business sponsor, a business owner, and a project champion. These are discussed below.

Senior Management Commitment

Senior management commitment is a key precursor of IS success (Doll, 1985; Ginzberg, 1981; Glennon, 1978; Kappelman et al., 2006; Kearns, 2007). Young and Jordan (2008) provide evidence that commitment of senior management is a 'meta-factor' that encompasses other IS success/failure factors, and Schmidt et al. (2001) describe it as a risk factor that overshadows all others. Kearns (2006) however found that senior management commitment is often weak or non-existent. Commitment must be maintained over the lifetime of the initiative (Schmidt et al., 2001), however the knowledge gap (Fiegener & Coakley, 1995) identified in Chapter 2, may result in a waning of involvement

with an IS initiative once the project has been approved and commenced - leaving the *"technology to the technologists"* (Clegg et al., 1997, p. 861). Senior management may also fail to maintain support for IS initiatives at functional levels in the organisation (Enns, 2001).

Executive Steering Committee

The project steering committee provides overall guidance and management oversight of the project. Executive steering committees have been viewed as an effective way to get top management involved in IS planning, ensure a fit between IS and corporate planning, improve communications between top management and mid-level user management, and engender a positive effect on user attitudes towards information systems (Doll, 1985; Gupta & Raghunathan, 1989). It has been found that firms with successful IS development efforts made more effective use of executive steering committees (Doll, 1985; Karimi & Bhattacherjee, 2000).

Steering committees however are prone to certain problems such as dominance by IS personnel, and being forced to deal with operational rather than control or strategic planning issues (Bartis & Mitev, 2008). In some contexts, political and other organisational factors may seriously affect steering committee structure and conduct (Bartis & Mitev, 2008; Drury, 1984).

Executive Sponsor

The executive sponsor has overall accountability for the success or failure of a project (The Standish Group, 2012), and usually represents the area of the organisation that is the major recipient of the benefits of the initiative (Glaser, 2004; PMI, 2013; Turner, 2009). In addition to securing the necessary funding and other resources for the project the business sponsor has responsibility for obtaining buy-in from key constituents, and removal of obstacles to project timeline and deliverables. Crawford & Brett (2001) found that despite the acceptance of a need for a project sponsor the role remains ambiguous leading to confusion about how the sponsor may contribute to the outcome of a project. They also highlight the risk of changing the business sponsor over the lifetime of the project as this can result in a loss of focus and a reduced level of ownership.

Business Owner(s)

Business owners generally have day to day responsibility for a function or department. Their responsibilities for IS projects include securing the necessary functional resources for the project and removal of business obstacles to its implementation (Glaser, 2004).

Project Champion

Beath (1991) defines the project champion(s) as individual(s) who actively and vigorously promote a vision for the use of information technology, and act as transformational leader(s) who inspire others to transcend self interest in support of the IS initiative. Project champions can make a significant contribution to the successful outcome of a project (Esteves & Pastor, 2002), however Turner (2009) cautions about unchecked champions and leaders who may create an unsupportable level of hype and false optimism, particularly at the early stages of a project.

As already discussed in section 3.4.1 IS deployment is an innovative and protean process (Wastell & Newman, 1993), that requires backing from a range of stakeholders and supporters over the lifetime of the initiative, even after its implementation (Sauer, 1993b). Gaining initial commitment is part of the project planning process, however this will need to be maintained over the duration of the initiative. The longitudinal nature of IS initiatives suggests that there will be deviations from what was initially planned and agreed as the project progresses, and support structures may change over the course of the initiative. The socio-technical nature of IS initiatives predicts that unplanned issues may be non-technical, and external to the project organisation, therefore new support may have to be garnered in response to unplanned issues and opportunities which will arise after project initiation.

Furthermore much of the critical support areas are at senior levels within the organisation and although it will be shown in section 3.7.2.3 that the project manager should have the necessary authority to act at this level the reality suggests that this is not always the case (Bourne & Walker, 2005). This indicates a leadership and relationship management role for the CIO as the most senior IS executive in maintaining support for the project at all levels of the organisation, and in particular if a project is going into jeopardy.

Although support is a key contributor to project success (Sauer, 1993b; Sauer & Davis, 2009) and senior management support is highlighted as critical to IS initiatives (Young & Jordan, 2008), there is very little in the IS literature about how support is garnered and

maintained over the course of an IS initiative, and in particular what role the CIO plays in this regard.

3.7.2.2 Project Management

Project management is key to the successful outcome of a project (Verner & Evanco, 2005). Effective project management (and the role of project manager) is a recurring theme across the IS failure / success literature (Baccarini et al., 2004; Havelka et al., 2004; Hyvari, 2006; Kappelman et al., 2006; Verner & Evanco, 2005) and is further evidenced by the vast range of professional courses and accreditations in the field, the range of project management methodologies, and the existence of the Project Management Institute (PMI)[10], a global association for the project management profession with more than 700,000 members worldwide.

Project Management Methodologies

Whilst it is obvious that to commence a large IS deployment without some form of operational template or methodology is folly, the effectiveness of formal IS development methodologies has not been tested, and the level of usage is unclear. For example it has been found that organisations tend to tailor methodologies to the needs of the prevailing development environment and that they are usually documented as a broad set of activities and objectives rather than specifying the exact manner in which development should take place (Fitzgerald, 1997). Furthermore methodologies cannot provide tools for dealing with organisational issues as they emerge outside of the narrow technical focus of the project (Doherty & King, 1998), although this is changing somewhat with the increased use of Agile methodologies (Wang et al., 2012).

3.7.2.3 The Project Manager

The project manager plays a pivotal role in the success/failure of IS initiatives (Baccarini et al., 2004; Havelka et al., 2004; Hyvari, 2006; Kappelman et al., 2006; Verner & Evanco, 2005). The IS project manager role encompasses a broad range of skills which transcend scheduling and budgetary control. Project managers must possess a range of intellectual, social/emotional, and management competencies (Geoghegan, 2008). They must have the ability to act in a leadership capacity by providing motivation and direction to the project team under times of extreme pressure (Geoghegan, 2008; Sumner et al., 2006). They must have the ability to deal with complexity, and changing requirements which are

[10] http://www.pmi.org/

an inherent part of IS implementation, and the ability to manage a range of stakeholders at all levels within and outside the organisation (Bourne & Walker, 2005; Hyvari, 2006). Verner & Evanco (2005) found that a broad background is a more useful attribute than expertise in any particular technical area. Although some technical competence is helpful, managerial and interpersonal skills are more important. Hyvari (2006) and Sutterfield et al. (2006) also highlight the importance of good communication skills, however Turner & Muller (2005) propose that project managers tend to prefer task-orientated to people orientated leadership styles which may militate against the softer skills required for the job. This is compounded by the fact that the common appraisal system for project managers tends to focus on short term criteria of time and budget (Wateridge, 1998). Despite the high profile of the project management discipline and the increasing professionalism of the project management role poor project management remains a major cause of IS failure (Shaul & Tauber, 2012).

The credibility and professionalism of IS personnel is a key influence on the credibility of the IS function as a whole therefore recruitment and development of a professional IS organisation is a key role of the CIO. This applies particularly to the project manager, given the complexity and importance of the task of implementing an IS initiative, and the need to function at senior levels within the organisation. The success or failure of an IS initiative ultimately rests on the shoulders of the project manager. McAfee (2002) highlights the importance of the project manager having the necessary authority profile above other stakeholder groups, however it has been found that issues relating to the impact of IS on the organisation are not always within the scope of IT managers to resolve (Berg, 2001). For example project managers may not have the capacity to effectively manage the sometimes hidden and conflicting agenda of the various project stakeholders (Bourne & Walker, 2005). Citing the case of an ERP implementation at Cisco Systems, Turner & Muller (2005) describe how a failing project had to be rescued by the CIO and VP of manufacturing assuming project leadership roles. This suggests a role for the CIO as the most senior IS executive, however, yet again, there is a dearth of literature on this topic, or indeed the relationship between project managers and the CIO in general.

Ineffective Communication

Managing an IS project is a co-operative endeavour involving a range of stakeholders who are both internal and external to the project organisation. Communication within the project organisation (collaboration) is an obvious vital element of the innovation process. Equally

so is communication outside of the boundary of the project organisation because of the need to maintain support for the project across the range of stakeholders involved as discussed above. Sauer (1993a) identifies a number of different types of support that require communication across the range of stakeholders, including mediation between the project organisation and other sources of support (power-brokering), promotion of the social legitimacy of the system across the organisation, and garnering and maintaining commitment to the project organisation from all stakeholders. Clearly the project manager has a role to play in maintaining support for the project internally and externally, however (Enns & McDonagh, 2012) state that true alignment is reflected in the level of ownership of a project indicating the importance of the CIO role in maintaining relationships during the project life cycle and the role that effective communications plays therein.

3.7.2.4 Project Control

Project Governance

Project governance is the organisational structure through which the objectives of the project are set and monitored on behalf of its stakeholders (Turner, 2006). Project governance is concerned with the performance of the IS initiative in terms of its overall business objectives (strategic, financial, contractual etc.), and oversight of the project itself (Avison et al., 2006) involving a set of relationships between the project organisation, its sponsor, its owner, and other stakeholders (Turner, 2006). Good governance provides for the effective monitoring of key project performance indicators and is supported by timely and accurate status reporting. Effective governance has been shown to be effective in the success of IS projects, if accompanied by proactive strategic guidance, participatory team building, and top management commitment (Bernroider, 2008). Large IS initiatives rarely proceed exactly as planned (Oz, 1994), therefore an effective governance structure is essential throughout the lifetime of the project. Governance is typically undertaken by the project steering committee however Avison et al. (2006) states that governance is the responsibility of all stakeholder management, including senior management. Lack of proper governance is cited regularly as an IS risk factor (Avison et al., 2006; Keil & Mähring, 2010). This can be the result of the steering committee being too focused on operational issues (Bartis & Mitev, 2008; Drury, 1984) or a lax management attitude towards, or awareness of IS.

The issue of IS governance regularly features in practitioner surveys as a key management priority (DeHaes & Van Grembergen, 2005), and is a topic in the project management literature (Abednego & Ogunlana, 2006; Turner, 2006), however, although alluded to, it is largely ignored in the IS failure literature (Avison & Wilson, 2002) as a research topic, and in particular in relation to the role of senior management throughout the lifetime of the initiative, and the role of the CIO as both a senior executive and leader of the IS function.

Escalation of Commitment

Escalation of commitment is a term used to describe a phenomenon where a project appears to take on a life of its own with continued and sometimes escalated support from individuals or the organisation as a whole. Keil et al. (1994) describes escalation as a three phase process of *drifting, treating symptoms, and rationalizing continuity*. A survey by Keil & Mann (2000) found that 30-40% of all IS projects exhibit some degree of escalation, with an average escalation time of 21 months.

Staw & Ross (1987) in Keil et al. (1994) present a model of project escalation in terms of four contributory factors: *project factors* such as the perceived cost/benefit of the final product or when setbacks are perceived as temporary and/or, surmountable; *psychological factors* such as the level of personal responsibility assumed by managers as well as the psychological and cognitive biases that can affect the way messages are perceived or processed; *social factors* such as competitive rivalry and the need for external justification; and *organisation factors* such as the political environment. All four factors were identified in the study of the CONFIRM project (Oz, 1994) by Keil et al. (1994) and in a longitudinal study of an IS project by Newman & Sabherwal (1996). Wang & Keil (2007) found a high level of escalation associated with the effect of sunk costs in IS projects.

Project escalation can be exacerbated by the reluctance on the part of organisation members to transmit unwelcome but valuable information on the status of a project, often referred to as whistle blowing or the 'mum effect' (Keil & Mann, 2000). The mum effect is influenced by organisational climate (whether reporting bad news is likely to result in reward or punishment), and information asymmetry (whether hiding bad news is likely to be possible over time) (Keil & Mann, 2000; Keil et al., 2004; Tan et al., 2003). Tan et al. (2003) found that certain (geographic) cultures have a greater propensity to report bad news. A related phenomenon, called the 'deaf effect', is where management fail to act on

information reported to them or downplay the seriousness of problems reported to them (Keil & Mann, 2000; Keil & Robey, 2001; Montealegre & Keil, 2011).

De-escalation of commitment is defined as the process of breaking out of the cycle of escalating commitment, usually triggered by senior managers, internal auditors, or external consultants (Keil & Robey, 2001). Using a longitudinal case study of the baggage handling system at Denver International Airport (Keil & Montealegre, 2000) present a model of de-escalation as a four stage process: (1) problem recognition; (2) re-examination of prior course of action; (3) search for an alternate course of action; and (4) implementing an exit strategy.

Escalation of commitment is a psychological condition and managers, executives, and steering committees sometimes have a tendency to become trapped in failing courses of action because the uncertainty and ambiguity of the situation makes it difficult to assess what is going on and to take the necessary actions to curb the escalation (Keil & Mähring, 2010). Furthermore as will be shown in Section 3.7.3 there are a range of cultural and political motivations (some covert) that may be contributory factors in the escalation phenomenon. This suggests a need to have intervention systems embedded in the governance process, with a decision structure, based on guiding metrics and checkpoints that is external to the normal project management and control process. However, as stated above, the role of governance is largely ignored in the IS failure literature (Avison & Wilson, 2002), as is the role of the CIO in its detection or intervention.

3.7.2.5 Project Team Risk

Project team risk is a recurring theme in IS failure literature. Team risk/failure factors include lack of experience or skill set, insufficient/inappropriate staffing (Aloini et al., 2007; Kappelman et al., 2006; Schmidt et al., 2001; Umble, 2003), and poor relationship between the IS function and the rest of the organisation.

Deficiencies in the project team

Lack of experience within the project team is an obvious risk factor in any type of project, as a weakness at any particular point within the project organisation creates a weakness in the innovation process chain. Lack of experience relates to any project organisation individual or group (right up to the project leader) and can lead to failure to achieve planned milestones in the project and/or conflict between the project organisation and other parts of the organisation.

Recruitment and development of a professional IS organisation is the responsibility of the CIO. Failure in this regard can create a very negative perception of the IS organisation, exacerbate existing negative stereotypes, and reinforce the credibility gap at functional levels across the organisation (Peppard, 2010) .

Poor Relationship Between the IS Function and the Business

Team risk factors could of course apply to most engineering projects and indeed broader endeavours. A concept that appears to be unique to information systems is the relationship between the IS specialist group/project team and the rest of the organisation. IS development is a social process and is highly dependent on a good working relationship between IS personnel and the rest of the organisation (Senn, 1978), however Bostrom & Heinen (1977a) attribute many of the problems and failures of IS to the way IS designers view organisations, and the function of an IS within the organisation. This somewhat unique frame of reference (deeply rooted in theory X or machine theory) may lead to faulty design choices and failure to perceive better design alternatives, which may ultimately lead to IS problems and failures.

The divide also reinforces the notions that IS personnel have a problem solving (rather than business focused) mind-set, a penchant for change for the sake of change, failure to consider manual alternatives, suffer from complexity syndrome, and have a fetish for acronyms (Senn, 1978). Argyris (1971) states that IS specialists are not equipped to cope with the emotional problems caused by the systems they create. Confirming these findings White & Leifer (1986) found that IS personnel perceive neither management support nor user involvement as critical to the successful development of a system. A case study by Linberg (1999) found that the IS development team viewed a successful project in terms of quality, cost, effort, and scheduling, with no reference to meeting business objectives. The study also revealed that the IS development team maintained a high level of job satisfaction despite their failure to meet the schedule and cost goals of the project.

The us/them attitude between the organisation and IS project teams creates a power asymmetry between users and developers which can distort free and open user-developer communication (DeBrabander & Edstrom, 1977; DeBrabander & Thiers, 1984) in (Gallivan & Keil, 2003), which can manifest in apparent agreement on system specifications, with a subsequent divergence of user behaviour at a later stage, resulting in low user acceptance and possibly outright failure of a system.

Clearly the professionalism and business acumen of IS personnel is a key determinant of its standing within the organisation as a whole highlighting the importance of the recruitment and training process. It is vital that IS personnel also receive proper training in the business, not just IS, and are given opportunities to engage with the organisation at a business level. It is incumbent on the IS function to build proper relationships with the rest of the organisation to break negative stereotypes and engender an atmosphere of cooperation much as in the way the CIO needs to build relationships with his/her peers as a precursor to convergence and strategic alignment.

3.7.3 Context Driven Failure factors

This section considers the context driven factors that contribute to IS failure. Context factors are largely concerned with organisational and people issues relating to IS initiatives. The socio-technical nature of IS deployment has already been discussed in section 3.4.1 in terms of the potential impact of misalignments of technology, tasks and users. This section discusses some of the more general organisational and people factors that are a feature of all organisations and, unlike the technology and process spheres of influence which relate directly to a specific project, have the capacity to influence the trajectory of any organisational endeavour in unpredictable ways. The potential impact of contextual factors on IS deployment are the most difficult to surface and address as they can impact a situation overtly or covertly, and at any point during the lifetime of the project.

The effect of factors beyond the technical boundaries of the IS project on the outcome of IS initiatives was recognised quite early in the study of IS failure. For example Lucas (1975, p. 6) in Bostrom & Heinen (1977a, p. 18) states *"it is our contention that the major reason most information systems have failed is that we have ignored organisational behaviour problems in the design and operation of computer-based information systems"*. Ackoff (1967) stated that organisational issues such as structure, the decision making process, and the failure to properly evaluate and control IS has resulted in IS implementations not meeting expectations, and in some cases failing completely. Silva & Hirschheim (2007) argue that a full understanding of the process of IS implementation must include not only technical aspects but also the social dynamics of an organisation; specifically core values, distribution of power, and mechanisms of control.

IS implies a different design for an organisation where competence is more important than power, and collaboration and interdependence are more important than competition, which

can result in fear and resistance on the part of individuals and groups (Argyris, 1971). Acknowledging Willinsky (1967) Mason & Mitroff (1973, p. 483) note the tendency of organisational structure to cause *"information pathologies"* such as secrecy, blocking, and leaks, which may be surfaced by the introduction of an new IS (Argyris, 1971).

Lunt & Barclay (1988) propose that organisations tend to make the decision to invest in new technology on an economic/technical basis with little attention paid to the potential impact of the technology on people and management. Organisations do not pay sufficient attention to the potential impact of new technologies on organisational structures and processes. In particular the impact of new technology on work practices and individual job design is largely ignored in practice. Users are trained how to operate the technology rather than in how to do the job better (Clegg et al., 1997). They also point out the level of fragmentation within organisations which gives rise to territorial and political battles which can seriously thwart an IS initiative that attempts to co-ordinate organisational functions.

Organisational alignment, where the organisation's key goals are understood and supported by employees, is instrumental in promoting creativity and innovation and is therefore a key enabler of change (Middleton, 2004). Organisational characteristics, such as free expression, questioning, participation in the definition of goals, innovation, and intrinsic satisfaction from the work itself, are all found to be positively associated with successful project outcomes (Gray, 2001).

3.7.3.1 Information Systems and Organisational Culture

There is no universal agreement on the definition of organisational culture (Henrie & Sousa-Poza, 2005). Sauer (1993b, p. 46) describes organisation culture as *"deeply embedded social structures or norms that may influence organisational activity even though they are not instrumental to any particular organisational task"*.

Schein defines culture as: *"a set of basic tacit assumptions about how the world is and ought to be that a group of people share and that determines their perceptions, thoughts, feelings, and, to some degree, their overt behaviour"* (Schein, 1996, p. 11). He proposes that an organisation has three distinct cultures: an *operator* culture; an *engineering* culture; and an *executive* culture; and that these three cultures have different perspectives which are often not aligned. For example the operator culture has a tendency to thwart management's effort to improve productivity and therefore can be resistant to change, engineering culture seeks to design humans out of the system, and the executive culture

tends to be preoccupied with key stakeholders, such as investors and the board, and is much focused on financial matters.

The deployment of an IS can surface many of the dysfunctional aspects of the different culture types. For example IT specialists (engineering) attempt to build the most technically excellent system with minimum 'human' aspects; users (operators) tend to oppose change to existing practice; and senior management impose tight budget and time constraints in order to minimize the financial risk involved. The misalignment of cultures can have a large impact on the outcome of an IS development by imposing unrealistic time/budget constraints or creating conflict among various stakeholder groups.

Harrington & Guimaraes (2005) found a strong relationship between absorptive capacity of an organisation (managerial knowledge and knowledge transfer) and IS implementation success. Communication is critical in fostering holistic perspectives within an organisation to create shared values leading to better co-operation and self-management during large project developments. This suggests a key evangelist role for the CIO in promoting the value of IS across the organisation and in creating a shared vision to foster consensus and collaboration at all levels. For example Infinedo (2007) found a positive relationship between cultural attributes such as co-operation, collaboration, and consensus and the successful implementation of an ERP system. Bradley et al. (2006) found that the quality of IT planning had a greater impact on IS success in organisations with an entrepreneurial culture. Unfortunately the role of the CIO in creating the positive predispositions was not addresses in either of these studies.

3.7.3.2 Information Systems and Organisational Politics

Organisational power is an attribute of individuals or subgroups within an organisation which enhances the capability to achieve desired outcomes in the face of opposition or resistance to these outcomes (Markus, 1983). Organisations are political entities because different interests develop on the basis of both vertical (interests at different hierarchical levels) and horizontal (different group and individual interests) levels (Davenport, 1994) in (Warne, 1998). A balance of power will develop over time as a function of how the organisation is structured and how it operates. There are a number of sources of power such as position (e.g. the CEO), expertise (e.g. technical specialists), and access to information (e.g. the financial department). Power can be exercised in both overt and covert ways (Markus, 1983).

The introduction of an IS can change the political structure and hence the balance of power within an organisation (Robey et al., 1989). For example Argyris (1971) identifies the psychological effects of MIS on senior managers in organisations and the consequent resistance that can arise. Beynon-Davies (1999) describes how a protracted climate of conflict between management and trade unions impacted on the failure of the London Ambulance Service System. Doolin (2004) describes the ability of doctors to thwart the implementation of a computer system by challenging its validity or using it to argue for more resources.

Even if factors generally identified as determinants of project success are present the effect of political manoeuvring on the part of individuals or groups can still cause a project to fail. Resistance to an information system that is based on politics will persist in spite of time and/or technical improvements as long as the conditions which gave rise to the resistance persist (Warne & Hart, 1996).

3.7.3.3 Information Systems and Organisational Change

Information systems create change in organisations (Gale, 1968, p. 54). Kelly (2003) in Al-ahmad et al. (2009, p. 96) argues, rather provocatively, that *"...there is no such thing as a computer project. There are business change projects that involve IT".* Change often leads to human resistance due to factors internal to the person or group, factors inherent in the application or system, or factors relating to the interaction of people and the system. The greater the implied change the more likely the resistance (Markus, 1983). As already described one of the reasons IT-enabled change often leads to failure is that many organisations believe that IT is a 'magic bullet' which can effect change by itself, and this restricts their efforts to manage the inevitable change associated with the implementation of the IS system (Markus & Benjamin, 1997). New information systems often just reinforce existing structures (Gauld, 2007) as they cannot alone accomplish the task of radical organisational change (Markus, 1983). Traditional models for managing technology based change treat change as a sequential series of predefined steps that are bounded within a specified time and are therefore ineffective because change, as with an IS initiative, is complex and can only be fully understood during the actual implementation process (Orlikowski & Hoffman, 1997).

A new IS also frequently results in the realignment of the company's traditional authority lines (Gale, 1968), may prescribe a division of roles and responsibilities at variance with

existing ones, and may structure patterns of interaction that are at odds with the prevailing organisational culture (Markus, 1983). The greater the implied change, the more likely the resistance. Ein-Dor & Segev (1978) identify controllable and uncontrollable variables that impact on an organisation's ability to implement an IS and propose that any project or system is doomed to failure unless the uncontrollable part of the environment becomes more benevolent, thereby confirming the primacy of organisational factors as a cause of IS failure.

Levasseur (2010) proposes that collaboration and two way communication between the business and the IS function is essential to the success of IT enabled change initiatives. A study of an ERP implementation at Dell Computers (Ash & Burn, 2003) found that a participative style with an evolutionary approach to the management of the change process contributed to a successful implementation. Neither of these studies examined what role the CIO might play in such initiatives.

3.7.3.4 Failure to Learn

Learning from failure is part of the innovation process as its purpose is to ensure that mistakes are not repeated. It is a key tenet of the engineering discipline (Abdel-Hamid & Madnick, 1990; Boddie, 1987; Kasi et al., 2008), however post-mortems of failed IS initiatives are not widespread (Ewusi-Mensah & Przasnyski, 1995), a factor which is cited as a major obstacle to improving project performance (Abdel-Hamid & Madnick, 1990).

Attitude to IS failure is a complex issue (Iacovou & Dexter, 2005) rooted in organisational and personal structures and processes (Lyytinen & Robey, 1999), including organisational concern about image (Drevin, 2008; Iacovou & Dexter, 2005), organisational power structures (Lyytinen & Robey, 1999), the natural human desire to put past problems behind (Boddie, 1987), and memory decay or selective recall (Pan et al., 2007). There are also challenges to conducting post mortems because of self-serving patterns of attribution whereby people tend to discount their own role in failure and point to external forces (Standing et al., 2006). Organisations tend to focus on success therefore failures tend to get wiped from organisational memory out of fear they will recur. Failures may also precipitate disciplinary actions in which guilty parties are punished (Lyytinen & Robey, 1999), which creates a climate of disincentive to learn. Furthermore there are no legal requirements to conduct post-mortems of IS failures except for government systems that are subject to national audit controls.

Lyytinen & Robey (1999) state that the absence of a proper learning culture can lead to the development of organisational myths, or pathologies, which may perpetuate learning failure by preventing proper reflective discourse about failure. Failure to confront IS failure can lead to a situation where it becomes an accepted part of the organisation culture and organisations begin to 'learn to fail' (Lyytinen & Robey, 1999), a situation that is reflected in the assertion by Mahaney & Lederer (1999) that failure has become an accepted aspect of IS initiatives.

Post-mortems are particularly appropriate for the study of IS failure because the socio-technical nature of such endeavours means that the causes of failure are not readily apparent and must be extracted from deep within the project experience. Post-mortems, if conducted correctly, are excellent tools for exposing organisational issues that are not readily apparent such as cultural issues, resistance to change, and covert political manoeuvring as described in the previous sections. Furthermore the presence of a robust governance system that includes a formal project review system may deter some of the more covert tactics that can derail some otherwise well-managed projects.

Post-mortems of failed IS initiatives is the responsibility of the business and not just the IS function as the findings from post-mortems, if carried out by IS personnel, may have techno-centric attribution characteristics whilst overlooking potentially more important organisational factors (Lyytinen & Robey, 1999; Standing et al., 2006). It is expected that given the pervasiveness of IS across the organisation post-mortems of IS failure should be carried out at senior level. This suggests a key role for the CIO in developing IS policy which embeds a learning culture throughout the organisation.

3.7.3.5 User Resistance to IS Initiatives

The pervasiveness of IS in the organisation today suggests that IS users are found at all levels and functions within (and increasingly outside) an organisation. Lack of user involvement with, and user commitment to, the development of an IS appear frequently as risk/failure factors in IS development projects (Aloini et al., 2007; Barki et al., 1993; Kappelman et al., 2006; Schmidt et al., 2001)

Much of the empirical research on user involvement examines its effect on IS success. Early research in this area indicated a positive relationship between participation in the analysis and design of an IS and acceptance and use of the IS. User involvement in the development of IS enhance both system usage and the user's satisfaction with the system

which leads to greater system use (Baroudi et al., 1986). Realistic expectations also enhances satisfaction with, and use of, a system (Ginzberg, 1981; Igersheim, 1976; Senn, 1978), but not necessarily user performance (Szajna & Scamell, 1993).

Barki & Hartwick (1989) make a distinction between *user participation* (involvement in the system development process) and *user involvement* (a psychological state representing the relevance of a system to the user), with participation leading to involvement, and involvement mediating the relationship between participation and system use (Hartwick & Barki, 1994). A study by Sabherwal & Chowa (2006) found positive relationships between user participation and system quality, user satisfaction, and perceived usefulness. They did not however establish a positive relationship between user participation and system use.

Jiang et al. (2001) were unable to show a direct relationship between user non-support and project performance. They did however show a direct positive relationship between user partnering and project success. He & King (2008) propose that user participation may not be sufficient to achieve significantly improved IS outcomes and that different strategies should be employed based on the specific goals of IS projects. This is borne out by the study of the CONFIRM system failure (Gallivan & Keil, 2003) which describes a project that failed despite high levels of user involvement. Warne (1998) identified user groups as a major source of conflict due to political motivations. This level of conflict is often invisible to IT specialists (Celjo et al., 2011).

User involvement is a complex issue and the research results are not definitive. Evidence shows a positive relationship between user participation and project success and use of the system however the link between user involvement and IS acceptance is less strong.

3.7.4 Conclusion

Section 3.7 of this chapter has described the range of risk/failure conditions that may apply to an IS initiative in the context of three spheres of influence: project, process, and organisation and people. It is important to note that the factors have been presented individually however, as stated in Section 3.3, the chain of events that proceeds a failure is not usually a simple linear one, as failures are typically the outcome of a concatenation of unforeseen or unpredictable prior conditions and circumstances (Bignell & Fortune, 1984; Sauer, 1993b), and are often embedded in a wider system (Eitel, 2004). It is apparent also that Wallace's assertion that the spheres of influence have a systematic connectedness is

valid as it can be intuitively reasoned that, for example, complexity (a technical risk factor) could scupper even a well planned and executed project (a process risk factor) or that political manoeuvring (a context risk factor) could negatively influence the effective governance of a project.

The importance of organisational factors relating to IS initiatives has also emerged from this review. The socio-technical theory of IS implementation inextricably links IS deployment with organisational change (Doherty & King, 2005). It proposes that the very act of implementing an IS creates an imbalance in the equilibrium of a previously stable organisation system, and it has been shown that, unlike technical and process factors, which are far more tangible, easy to plan for and identify, and manageable, it is the socio-technical conditions that create the biggest problems, because they are impossible to predict, can surface at any time during the project, and can be caused or exacerbated by internal cultural and political systems acting either overtly, or covertly, and may have a unique set of precursors and outcomes. Socio-technical theory predicts that optimising only the technical system or the social system will lead to information systems failure (Sauer & Davis, 2009). Managing an IS implementation is therefore not just a technical challenge, but also an organisational one (Boddy et al., 2009; Ward & Elvin, 1999), because the technical aspect of the innovation is inseparable from the social, behavioural, and political context in which most IS are deployed (Boddy et al., 2009; Fortune & Peters, 2005; McDonagh, 2001; Sauer, 1993b). Furthermore the IS system must also be acceptable to the user community; a process that is also fraught with danger.

3.8 An Agenda for Further Study

Chapter 2 described the emerging role of the CIO and in doing so highlighted many of the challenges that CIOs face, and which appear to continue to dog the CIO role. A key issue is the perceived existence of 'gaps' between the IS function in general (and the CIO in particular) and the rest of the organisation. These 'gaps' were described by Fiegener & Coakley (1995) as the *'knowledge gap'* between the executive team and the function of IS in the organisation and the *'credibility gap'* affecting the CIOs ability make the transition from functional manager to executive manager, on equal terms with the rest of the executive team. Peppard & Ward (1999) also note the existence of a *'cultural gap'* between the IS function and the rest of the organisation suggesting that the perspective of IS management is often different from that of executive management.

Furthermore Chapter 2 described an underlying theme in the CIO literature suggesting that the failure of IS initiatives may in some way be attributable to a failing in the performance of the role of the CIO (Jones et al., 1995; Kaarst-Brown, 2005; Karahanna & Watson, 2006; Willcocks & Sykes, 2000), and which may also be contributing to the enduring problem of IS underperformance and failure (Peppard, 2010). Studies on the CIO and IS failure propose that the limited understanding of the strategic nature of both IS, and the role of the CIO, can lead to a failure on the part of senior management to engage with IS during strategy formation (Jones et al., 1995), under resourcing of the IS function (Kaarst-Brown, 2005; Willcocks & Sykes, 2000), an over reliance on external consultants (McAteer & Elton, 2000; Willcocks & Sykes, 2000), a demand by the business for rapid deployment of applications to support business growth (Johnson, 2002), a difficulty in assessing and prioritising IS investments (Karahanna & Watson, 2006), and the creation of silo projects which are not integrated into an overall plan (Kaarst-Brown, 2005). The net effect of this is that often IS engages only in the implementation phase of IS initiatives (Jones et al., 1995), resulting in a lack of preparedness for the associated organisational change (Willcocks & Sykes, 2000), and resulting in implementation cost overruns or outright failure (Kaarst-Brown, 2005; Willcocks & Sykes, 2000), which in turn reinforces a negative perception of IS and creates a *"vicious circle"* of dissatisfaction and disengagement on both sides (Peppard, 2010, p. 87). There is however no empirical evidence to support these propositions.

Extant IS failure literature also pays very little attention to the role of the CIO in relation to IS failure. However the primacy of organisational issues in IS failure, and the fact that IS initiatives are an organisational responsibility, not just an IS one, suggests that there is a need for an active oversight function, with both the technical and organisational acumen, to identify issues as they arise, along with the necessary authority to address them. Emergent organisational issues are not always within the scope of IT managers to resolve (Berg, 2001). For example project managers may not have the capacity to effectively manage the sometimes hidden and conflicting agenda of the various project stakeholders (Bourne & Walker, 2005), as evidenced in the case of an ERP implementation at Cisco Systems (Turner & Muller, 2005). Similarly project steering committees may be dominated by IS personnel, may be too focused on operational issues, have a lax management attitude towards, or awareness of IS, and lack political clout (Bartis & Mitev, 2008; Drury, 1984); and have a tendency to become trapped in failing courses of action (Keil & Mähring, 2010).

Logic would suggest that ultimate responsibility for ensuring the success of every IS initiative rests with the CIO. As the most senior organisation executive, with specific responsibility for IS, the CIO should have the necessary organisational and business competencies, and position within the organisation, to identify and address complex IS issues as they arise. Gauld (2007) highlights the need for continuity throughout an IS implementation and the requirement for the presence of a CIO to oversee problems and provide direction. His study also suggests that the lack of involvement of senior IS personnel can result in abdication of control to external consultants and major decisions being relegated to the board who may be unable to deal with the politics of change associated with an IS initiative. This theme however is not explored in any level of depth in extant IS literature. In fact there is a dearth of empirical research in both the CIO literature and the IS failure literature which provides any explanation about the relationship between IS failure and the role of CIO. This represents a significant gap in research given that the CIO is the most senior IS official in the organisation, and is ultimately responsible for the successful deployment of IS, the failure of which remains a persistent and costly phenomenon.

A study of the role of the CIO over the course of a failing IS initiative presents an opportunity to transcend the boundary of two essentially discrete, yet inherently connected academic silos by undertaking a novel study that connects the two. This approach is consistent with the work of the professoriate which emphasises both the scholarship of discovery and the scholarship of integration (Boyer 1987). Such a study would yield a holistic view of both the process of failing and the role of the CIO therein. Supported by a strong research design, the effective execution of such a study will not only make a significant contribution to academia but also offer a basis for both informing and transforming professional management practice.

On the basis of the above I propose a research question that addresses both the phenomenon of IS failure and explores the role of the CIO therein as follows:

'How does the role of the CIO influence IS failure outcomes?'

3.9 Conclusion

This chapter presents a comprehensive review of literature on IS failure. Having analysed the nature of failure in general the chapter then seeks to understand the nature of IS failure and finds that the nature of IS development is such that it is usually a catalyst for

organisational change (Doherty & King, 2005), therefore managing an IS implementation is not just a technical challenge, but also an organisational one (Boddy et al., 2009; Ward & Elvin, 1999), because the technical aspect of the innovation is inseparable from the social, behavioural, and political context in which most IS are deployed (Boddy et al., 2009; Fortune & Peters, 2005; McDonagh, 2001; Sauer, 1993b). This so called socio-technical theory of IS implementation (Doherty & King, 2005) predicts that optimising only the technical system or the social system will lead to information systems failure (Sauer & Davis, 2009).

Having defined IS failure the chapter finds that IS initiatives may be even more prone to failure than other project based endeavours. The unique, innovative, and complex nature of IS developments means that most projects are subject to unanticipated problems (Sauer, 1993b; Turner & Müller, 2003; Turner, 2009) which can negatively impact on the outcome of such endeavours. Mahaney & Lederer (1999) suggest that because IS failure is an enduring problem many IS professionals now accept it as inevitable.

Having briefly reviewed the relationship between IS initiatives and the many stakeholders that may be impacted the chapter then examines the types of research in IS failure and notes the dominance of both factor and process based studies. The chapter then describes a range of common factors that influence the outcome of an IS initiative using a framework based on studies by Yeo (2002), Wallace et al. (2004), and Kappelman et al. (2006) which is presented in Tables 7, 8 and 9 of this chapter.

The literature proposes that unlike process and content driven factors which tend to be more tangible, easy to plan for and identify, and manageable, context driven issues tend to create the biggest problems, because they are difficult to predict, can surface at any time during the project, and can be caused or exacerbated by internal cultural political systems acting either overtly, or covertly, and may have a unique set of precursors and outcomes. The fact that organisational issues may surface at any time during a project suggests that it is not sufficient for an IS initiative to have the necessary support at commencement of the project, there is also a need for an active oversight function with the technical and organisational acumen to identify issues as they arise, along with the necessary authority to address them, which may not be within the capability of IT managers or steering committees to resolve (Bartis & Mitev, 2008; Berg, 2001; Bourne & Walker, 2005; Drury, 1984; Turner & Muller, 2005).

Logic would suggest that, as the most senior organisation executive, with specific responsibility for IS, the ultimate responsibility for ensuring the success of every IS initiative rests with the CIO. However it was found that this theme is not explored in any level of depth in extant IS literature. In fact there is a dearth of empirical research in both the CIO literature and the IS failure literature which provides any explanation about the relationship between IS failure and the role of CIO. A study of the role of the CIO over the course of a failing IS initiative presents an opportunity to address this gap, thereby transcending the boundary of two essentially discrete, yet inherently connected academic silos by undertaking a novel study that connects the two. On the basis of this the following research question was proposed as a guide for the conduct of inquiry.

'How does the role of the CIO influence IS failure outcomes?'

Chapter 4

Research Methodology

Chapter 4 – Research Methodology

"The practice of research is best informed by a theory of method which clarifies and makes explicit the range of guiding assumptions shaping the conduct of that research" (Pettigrew, 1997, p. 342).

4.1 Introduction

The research design is an overall plan of how a research undertaking is conducted to meet the objectives of the researcher (Saunders, et al., 2009). Eisenhardt & Graebner (2007) state that *"sound empirical research begins with strong grounding in related literature, identifies a research gap, and proposes research questions that address the gap"* (p. 26). Bryman (2007) highlights the importance of the research question as a point of orientation linking the researcher's literature review to the kinds of data that will be collected. A research project *"is built on the foundation of its research questions"* Blaikie (2007, p. 2), therefore reflection on the research question enables the researcher to determine the appropriate research strategy and methodological choices (Flick 2009).

Bryman (2007) however also found that the position of the research question as the foundation of the research design is not universal among researchers. Other factors include level of comfort with a particular methodology; predilection of the researcher; the geographic location of the research; the need to get the attention of policy makers; and funding and publication considerations.

Guided by the many prescriptions regarding the role of the research question (Blaikie, 2007; Flick, 2009; Stew, 1996; Saunders et al., 2009), I propose that my primary choice of research design and methodology will be guided by my research question which is:

'How does the role of the CIO influence IS failure outcomes?'

In so doing however I acknowledge that research questions often reflect the researchers biography and personal interests (Flick, 2009). I am therefore cognisant of the possible influence of 30 years of practical experience in the field of IS along with the influence of my inherent ontological and epistemological positions. I also acknowledge, and to an extent

am guided by, the existing body of research in the field of IS, along with its associated research design and methodologies.

This Chapter describes and evaluates the range of epistemological and ontological positions one should consider when conducting research, and evaluates the suitability of different positions for the study of IS. Section 4.2 describes the evolving nature of the IS discipline, analyses the nature of research in IS from a paradigmatic perspective, and highlights the debate surrounding the need for a theoretical core to further legitimise the discipline. The debate around rigor versus relevance in IS research is also explored. Section 4.3 discusses and evaluates the spectrum of research philosophies and associated ontological and epistemological positions. It also examines quantitative and qualitative research methods, and justifies the selection of a qualitative/interpretive approach for the conduct of my research. Section 4.4 examines the suitability of a process inquiry for collecting and analysing data to answer the research question. Section 4.5 evaluates the use of the case study as an appropriate approach / setting for the conduct of a process inquiry, and concludes that it is appropriate as it supports the longitudinal study of phenomena related to IS failure. Section 4.6 describes a framework for the conduct of the chosen research design; including planning, design, preparation, data collection, data analysis, and reporting of research findings. Section 4.7 considers three other qualitative methodologies, and concludes with the justification of a processual research methodology as the most appropriate to answer my research question. Section 4.8 provides a conclusion to this chapter and reinforces the suitability of my chosen research methodology.

4.2 The field of IS as a Research Domain

4.2.1 The IS Discipline

The field of Information Systems has been defined as *"concerning both the management of information technology and the use of information technology for managerial and organisational purposes"* (Zmud, 1995, p. xxi). Lee (2001, p. iii) states that *"research in the information systems field examines more than just the technological system, or just the social system, or even the two side by side; in addition, it investigates the phenomena that emerge when the two interact"*

Over the last quarter of a century the IS discipline has made significant progress towards acceptance within the academy (Sidorova, et al., 2008), however there continues to be

significant debate regarding the status of the IS discipline, particularly when compared with other academic disciplines. There has been much rhetoric over the years regarding both the identity and legitimacy of the IS discipline (Agarwal and Lucas Jr, 2005; Banville and Landry, 1989; Lyytinen, 1999) and much of this revolves around two central themes: **the-nature-of–the–discipline** (the scope and content of the IS discipline and the important issues which the discipline should address), and **the-logic-of-the-core** (the debate about the necessity for the IS discipline to have a theoretical core) (Weber, 2006).

4.2.1.1 The Nature of the IS Discipline and the Quest for Identity

Benbasat and Zmud (2003) propose that in order to achieve status and recognition the IS discipline should also have a dominant design (agreement on the phenomena about which knowledge is developing); cognitive legitimacy (general taken-for-granted acceptance); and socio-political legitimacy (acceptance by key stakeholders). Confirming progress toward the acceptance of (M)IS as a legitimate academic discipline over the years Culnan and Swanson (1986) and Cheon, et al. (1992) have found that MIS is increasingly being viewed as a distinct field with its own cumulative tradition". Banville and Landry (1989) describe the field of MIS as a **fragmented adhocracy**: high on strategic task uncertainty (loosely coupled schools of thought); low on functional dependence (low dependence on standard topics and methods of knowledge production); and low on strategic dependence (weak need for co-ordination of research strategies). This definition is supported by Swanson & Rammilier (1993) in Robey (1996) who found a variety of thematic areas and contributing disciplines in a study of 397 papers submitted to the Information Systems Research (ISR) journal during its first five years of operation.

Taylor et al. (2010) caution that a discipline that is fragmented risks disintegration, although they point out that fragmented adhocracies may be a normal state of development for social science disciplines. The degree of diversity (fragmentation) in the IS discipline has however been viewed by some as problematic (Benbasat and Weber, 1996; Robey, 1996) as it may contribute to the lack of a distinct identity and a low level of intellectual contribution to other fields. Robey (2003) however cautions against *'the lure of a dominant paradigm'* (p. 353) as it would threaten the rich diversity that has characterised IS research since its inception, and inhibit its ability to change in response to environmental conditions.

4.2.1.2 The Argument for a Core for the IS Discipline

Benbasat and Zmud (2003) raised concerns about the lack of a distinctive core in IS research and propose a greater focus on the IT artefact which they conceptualise as the application of IS to enable or support some task(s), embedded within a structure(s), that itself is embedded within a context(s). They propose that the boundaries of the field be set more firmly so that greater attention is given to this IT artefact rather than structure, context or other phenomena. Galliers (2003) contends that the IT artefact concept is Khunian in nature which assumes one view of the field where *"the whole is no greater than the sum of its parts"* (p 346) and is therefore denying the future development of the IS field, a position echoed by Banville and Landry (1989) and Agarwal and Lucas (2005). DeSanctis (2003) argues that the movement of focus away from the IT artefact may be a reflection of the further maturing of the field and the influx of a new generation of members whose interests lie beyond those of the original IS research community.

On the other hand Weber (2003) believes that the identity of a discipline is established through the contributions it makes to theory and that the absence of a theory of the core of the IS discipline will leave the discipline with a *"boundaries problem"* (p. ix). Lyytinen and King (2006) however assert that legitimising the field through the sole pursuit of a core theory is misplaced. They suggest an alternative model of disciplinary legitimacy grounded in three principals: the salience of the issues studied; the production of strong results; and the maintenance of plasticity; which have sustained the growth of the IS field over three decades, and can continue to improve its legitimacy for the foreseeable future. This position is echoed by Klein and Hirschheim (2008) who suggest that the IS field can be best understood as a diverse set of constituencies, or communities of practice and knowing (CoP&K), who interact in a complex process of knowledge creation and dissemination.

4.2.1.3 Conclusion.

Despite the continued debate about identity of the IS discipline it appears to continue to thrive and grow. In an analysis of research papers published over a 22 year period from 1985 through 2006 in three of the top IS research journals Sidorova, et al. (2008) identified five core research areas: (1) information technology and organisations; (2) IS development; (3) IT and individuals; (4) IT and markets; and (5) IT and groups. Taylor et al. (2010) found that the IS field has sustained a focus on research within three subfields over a 20 year period from 1986 to 2005: (1) a thematic miscellany of research on

development, implementation, and use of systems in various application domains; (2) IS strategy and business outcomes; and (3) group work and decision support. They also found that the field has retained a high degree of strategic task uncertainty (loosely coupled schools of thought) and a low degree of functional dependence (the extent of technical and procedural coherence), however the presence of strong clusters of foundational authors representing persistent centres of influence indicate a move towards the development of a high degree of strategic dependence (the dependence of researchers on each other) and hence the move towards what they describe as a **polycentric oligarchy**.

4.2.2 Research Approaches in IS

Diversity in approaches to research in IS is considered a good thing. For example Mingers (2001) proposes that different research methods (especially from different paradigms) focus on different aspects of reality and therefore provide a richer understanding of a research topic, and Chan (2000) states the need for a variety of measures and more balanced perspectives using *"hard and soft measures"* (p. 232) for the study of IS.

A number of studies on research approaches in IS have been undertaken, a representative sample of which is presented in Table 10 below.

Study	Hamilton & Ives (1982)		Orlikowski & Baroudi (1991)		Vessey et al (2002)		Chen & Hirschheim (2004)		Palvia et al (2004)		Williams et al. (2009)	
Number of Journals Studied	15		4		5		8		7		Focus on adoption and diffusion	
Country of Publication	USA		USA		USA		Europe (4) / USA (4)		USA		Multiple	
Years	1970 - 1979		1983 - 1988		1995 - 1999		1995 - 1999		1998 - 2003		1985 - 2007	
Research Method	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Case Studies	63	39.6	21	13.5	67	13.7	407	36	128	8.7	46	15.3
Field studies	42	26.4	76	49	131	26.8	-	-	104	7.1	11	3.7
Survey							464	41	294	19.9	173	57.5
Laboratory Experiments	28	17.6	42	27.1	93	19.1	204	18	152	10.3	3	1
Field Tests	26	16.4	4	2.6	-	-	23	2	43	2.9	2	0.7
Action Research	-	-	1	0.6	-	-	34	3	-		1	0.3
Other	-	-	11	7.2	197	40.4	-	-	753	51.1	65	21.5
Total	**159**	**100**	**155**	**100**	**488**	**100**	**1131**	**100**	**1474**	**100**	**301**	**100**

Table 10 - Studies on Research Approaches in IS

The table shows a diverse range of methodologies in use with Case Study, Field Study, Survey and Laboratory experiment being the dominant research methods.

A number of other interesting facts emerge from the studies. For example the study by Orlikowski & Baroudi (1991) found that over 90% of studies were cross sectional/single snapshot and that almost 97% represented a positivist epistemology, with the remaining 3% reflecting an interpretive epistemology. They cautioned that a single research perspective for studying IS phenomena is unnecessarily restrictive. The study by Vessey et al. (2002) also note the low number of interpretive studies at 4.7% and suggest that editorial policies may have played a significant role in the nature of articles published during this period. Chen and Hirschheim (2004) found that, despite greater attention being been paid to paradigmatic and methodological issues, positivist research still dominates published empirical research (81%). In particular, US journals, as opposed to European journals, tend to be more positivist, quantitative, cross-sectional and survey oriented. With respect to research design, survey research is still the most widely used method (41%), although case studies have gained substantial recognition (36%).

Chen and Hirschheim (2004) suggest that if the field of IS is to truly embrace pluralism, it will have to find ways to fundamentally change the publication practices of the journal system, and the current academic tenure and promotion system, which pose considerable obstacles for the acceptance of alternative paradigms. In support of this (Walsham, 1995b) in Robey (1996) proposes that mainstream US journals were only starting to change from an explicit positivist philosophy, unlike many European journals that were willing to publish interpretive papers.

To illustrate this point a study by Palvia et al. (2007) of 435 articles published in *Information & Management* (I&M), a North American publication, over a 7 year period from 1998 – 2005 found that qualitative research is still pitifully small at 0.21%. The dominance of the positivist paradigm in US journals is further demonstrated by Williams et al. (2009) who found that positivism is the dominant research paradigm at almost 75% with the majority of studies employing survey methods. Interpretivist research methods were used in just 14% of papers. The quantitative-qualitative split was found to be 64.8% and 22.6% respectively although the authors accept that the findings may be due to the type of journal in which this topic is typically published.

The I&M profile is in contrast to the study by Dwivedi and Kuljis (2008) of 305 articles in the European Journal of Information systems (EJIS) which found that case study (includes case study and interview) is the dominant methodology at 39.8%, with surveys accounting for 16.6%. The dominant research paradigm in EJIS is interpretative at 64.9% with positivist at 34.4% and the dominant research approach is qualitative at 64.3% with quantitative at 30.2%. A further study by Avison et al. (2008) of 548 contributions in *Information Systems Journal* (ISJ), another European publication, found that qualitative methodologies outnumber quantitative methods by a factor of 2:1 however these figures are influenced by the publishing philosophy of ISJ as an outlet for interpretive rather than positivist and qualitative rather than quantitative research. Table 11 below provides an overview of methodological and paradigmatic diversity in IS research in both the USA and Europe.

Methods	**US Journals**	**European Journals**
Quantitative	71%	40%
Qualitative	20%	49%
Mixed	9%	11%
Paradigms	**US Journals**	**European Journals**
Positivist	89%	66%
Interpretivist	11%	34%

Table 11 - Overview of methodological and paradigmatic diversity (Becker & Niehaves, 2007 adapted from Chen & Herischheim 2004).

4.2.3 Rigor and Relevance in IS Research

Rigor denotes a structured and controlled way of planning, carrying out, analysing, evaluating and producing research, independently of the research method used (Fällman & Grönlund, 2002). Relevance may be defined as the act of making efforts into research issues that are of concern to a perceived audience (Fällman & Grönlund, 2002), providing a synthesis of an existing body of knowledge, producing articles that stimulate critical thinking, and producing implementable research findings (Benbasat et al., 1999). There is a consensus that academic research in IS follows a rigorous tradition (Benbasat, Zmud et

al., 1999; Davenport and Markus, 1999; Robey and Markus, 1998), however there has been significant debate over the issue of relevance.

As an applied discipline that continues to lead transformational efforts in our societies (Lyytinen, 1999), the IS research community has yet to prove its efforts in terms of relevancy (Desouza et al., 2006). Senn (1998) asserts that a sizable portion of the practitioner community does not value academic IS research whereas non-academic research and recommendations are widely sought from specialist consulting organisations. Pearson et al. (2005) found that IS practitioners: (1) do not know where academic research is published; (2) find the literature dated; (3) find the research difficult to read; and/or (4) find the recommendations to be of little value. These findings are echoed by Recker et al. (2009) for both government and society. Some hybrid business-academic publications (such as the Harvard Business Review and the Sloan Management Review) tend to be valued by practitioners but are less so by academics (Davenport and Markus, 1999). IS professionals are more inclined to read studies that: (1) are shorter; (2) use more exhibits; (3) use everyday language; (4) have less discussion of related literature; (5) have less discussion of a study's methods; (6) have more contextual description; and (7) are more prescriptive (Benbasat et al., 1999).

It is often argued that relevancy and rigor are at opposite ends of a continuum (Senn, 1998), however Robey and Markus (1998) state that this dichotomous position need not be and that it is not only possible, but highly desirable, for IS research to fulfil the twin directives. As an applied discipline IS research should *"reverberate"* (Desouza et al., 2006, p. 9). To achieve this the research focus should be on topics that have been agreed in consultation with all stakeholders (Benbasat et al., 1999), with appropriate applicability checks as part of the research process (Rosemann & Vessey, 2008), and seek to emulate inquiry in the professions (Lee, 1999). Robey and Markus (1998) make four recommendations for achieving this: (1) employ practitioner sponsorship as a mechanism to ensure that research outputs meet the needs of those who pay; (2) use research practices from fields other than the social sciences, (e.g. policy and education studies); (3) modify the style of the resulting research reports to appeal to the intended audience; and (4) look for alternatives to academic journals as outlets.

Despite the rhetoric the rigor - relevance debate is unlikely to be resolved in the near future (Kieser & Leiner, 2011). The issue is central to the broader field of management science as it is predicated on the fundamental differences between the objectives of the

academic and the practitioner communities; the former being concerned with generating theories and methodologies based on the use of scientifically approved methods (Kieser & Leiner, 2009), and the latter being focused on making decisions in response to organisational conditions, in an often intuitive fashion, which they do not consider inferior to scientific-rational decision making (Kieser & Leiner, 2009). This fundamental difference means that it may be impossible to integrate the communication between both systems (Kieser & Leiner, 2011; Kieser & Leiner, 2009) without addressing fundamental philosophical, theoretical, and empirical challenges (Vo et al., 2012).

4.3 Philosophical Approaches to Research in IS

4.3.1 The philosophy of Being and Knowing

When undertaking research the researcher must fully comprehend his/her philosophical position in terms of the nature of the world and how knowledge is obtained, because this in turn will influence the research strategy employed and, to a large extent, the methods chosen to undertake the research (Saunders et al., 2009). A researcher must be able to defend the positions taken in relation to alternative choices that could have been made (Johnson & Clarke, 2006) in (Saunders et al., 2009), and justify the subsequent knowledge claims (Weber, 2004). There are two philosophical dimensions which are essential to the research process and which form the bedrock of all research philosophies: *ontology* and *epistemology*. Ontology is concerned with assumptions researchers make about the nature of the world. Epistemology is concerned with what constitutes acceptable knowledge and how this knowledge is obtained.

4.3.1.1 Ontology

There are two fundamental dimensions of ontology; objectivism and subjectivism. Objectivism posits that the world (including social entities) exists in reality external to the researcher. Subjectivism posits that phenomena are created from the perceptions and consequent actions of social actors, i.e. reality is socially constructed and can be perceived differently by different people. For example objectivists would view 'organisation culture' as something an organisation has whereas subjectivists would view 'organisation culture' as something an organisation is as the result of a process of continuous social engagement (Saunders et al., 2009).

4.3.1.2 Epistemology

Epistemology is concerned with what constitutes acceptable knowledge in a field of study and how this knowledge is obtained (Becker & Niehaves, 2007). There are a range of epistemologies, some of which differ fundamentally and some that are merely extensions or derivations of others. The main epistemologies to be found are objectivism, positivism, realism, rationalism, and interpretivism.

Objectivism proposes that knowledge originates from two sources: sensation and reflection. Sensations from a separate and external reality enter the mind and are transformed into complex ideas through reflective operations (Slife & Williams, 1995). Positivism adapts the 'scientific method' of hypothesis testing for generation of knowledge. Realism There are two types of realism. *Direct realism* says that what we experience portrays the world accurately. *Critical realism* argues that what we experience are sensations which are manipulated by our own senses sometime after the initial sensation is perceived. Rationalism is based on the assumption that the source of all true knowledge is logical thinking or reasoning (Slife & Williams, 1995). Interpretivism assumes that knowledge can only be created and understood from the point of view of the individuals who live and work in a particular culture or organisation and the meanings they attach to that context. Knowledge is based on the experience of a particular situation and our understanding of others is filtered through our own experiences.

Ontological and epistemological positions are not opposite ends of a dimension. They should be considered as existing on a subjective-objective continuum which facilitates convergence and divergence of philosophical positions (Burrell & Morgan, 1979).

4.3.2 Research Philosophies/Paradigms

Research philosophies and research paradigms are often used synonymously and are taken as being the same for the purpose of this review. All research philosophies have an underlying ontology, epistemology (Burrell & Morgan, 1979), and the role that personal values play in the research process (Saunders et al., 2009). Different research philosophies are likely to incline (and in some cases determine) the type of research methodology one chooses (Burrell & Morgan, 1979).

Saunders et al. (2009) describe four research philosophies as follows: Positivism: based on the ontological assumption that reality is external, objective, and independent of social actors. The epistemological view is that only observable phenomena can provide credible

data and facts with a focus on causality and law like generalisations. Realism: reality is objective and exists independently of human thoughts (realism) but is interpreted through social conditioning. Observable phenomena provide credible data and facts (realism) or create sensations which are open to (mis)-interpretation (critical realism). Interpretivism: Reality is socially constructed, subjective, and subject to change. Epistemology is based on subjective meanings and social phenomena. Research is value bound with the researcher an integral part of what is being researched. Data collection techniques are mostly qualitative. Pragmatism: the most important determinant of the type of research undertaken is the research question.

Orlikowski & Baroudi (1991) propose three research paradigms for the study of IS. This categorisation was subsequently adapted by Chen & Hirschheim (2004) for their analysis of IS research and by Cecez-Kecmanovic et al. (2008), and will be used in the following section to describe appropriate types of research methods for the study of IS and the relationship between research paradigm and research method.

Before describing the three research paradigms as proposed by Orlikowski & Baroudi (1991) it is important to differentiate between quantitative research and qualitative research and the data gathering and analysis techniques which are particular to each as they are referred to in the context of the paradigms as described later in Section 4.3.4.

4.3.3 Research Methods

4.3.3.1 Quantitative research

Quantitative research is the investigation of phenomena via statistical, mathematical, and computational techniques. It is very much aligned with scientific enquiry or 'abstracted empiricism' (Silverman, 1998) and the positivist research paradigm described below. The aim of quantitative research is to classify features, count them, and construct statistical models in an attempt to explain what is observed (Kaplan & Duchon, 1988). All phases of the study are carefully designed before data is collected, as the researcher typically knows what they are looking for. Quantitative researchers tend to take a nomothetic or etic stance which distances them from that which they are researching, and seek to make generalisations from the research findings (Denzin & Lincoln, 2000). The research instruments typically used are survey questionnaires for collection and analysis of data relating to a large sample, and laboratory experiments designed to test the relationship among pre-defined variables in a controlled environment (Chen & Hirschheim, 2004).

4.3.3.2 Qualitative Research

Qualitative researchers study phenomena in their natural settings attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them (Denzin & Lincoln, 2000). The goal of qualitative research is to study the meaningful social world (Silverman, 1998), by investigating the perspectives and behaviour of the people in social situations, along with the context within which they act (Kaplan & Maxwell, 2005). Unlike the quantitative research method qualitative research can employ a wide range of interconnected interpretive practices in order to get a richer understanding of the subject matter (Denzin & Lincoln, 2000). To accomplish this, qualitative research is conducted in natural settings and uses data in the form of words rather than numbers. Qualitative data are gathered primarily from observations, interviews, and documents, and are analysed by a variety of systematic techniques (Gerring, 2004; Yin, 2009). Qualitative methods are primarily inductive. Qualitative research can be positivist, interpretive, or critical (Klein & Myers, 1999), and therefore the choice of a specific qualitative research method is independent of the underlying philosophical position adapted.

4.3.4 Research Paradigms in IS Research

4.3.4.1 The Positivist Paradigm

Ontologically, positivist IS researchers assume an objective physical and social world that exists separately from those who observe it (Weber, 2004) and whose nature can be relatively un-problematically apprehended, characterised, and measured (Orlikowski & Baroudi, 1991). Researchers assume that human action is intentional and rational, or at the least, boundedly rational, that humans interact in relatively stable and orderly ways, and that conflict and contradiction are not endemic to organisations and society. The epistemological belief of the positivist perspective is concerned with the empirical testability (verification or falsification) of theories, known as the hypothetic-deductive method of scientific explanation, which almost exclusively uses the quantitative research method along with its criteria of validity, rigor, and reliability (De Villiers, 2005).

Despite the popularity of positivist research in the IS field there has been some criticism of the approach. For example Kaplan and Duchon (1988, p. 572) state that the "*stripping of context buys 'objectivity' and testability at the cost of a deeper understanding of what actually is occurring*". Myers (1994) states that positivist assumptions are invalid when they are applied uncritically to social reality because the relationships between people, organisations and technology are not fixed but constantly changing, and therefore the

natural science model ignores the fact that people are active makers of their physical and social reality.

4.3.4.2 The Interpretivist Paradigm

Ontologically, interpretivism asserts that reality, as well as our knowledge of it, are social products and hence incapable of being understood independent of the social actors (including the researchers) that construct and make sense of that reality (Orlikowski & Baroudi, 1991). The world is not conceived of as a fixed constitution of objects, but rather as *"an emergent social process as an extension of human consciousness and subjective experience"* (Burrell & Morgan, 1979, p. 253). From an epistemological perspective the interpretive paradigm is premised on the belief that social process cannot be fully known through the hypothetico-deductive method of positivism but only through an understanding of the social process, which in turn requires immersion inside the world of those being studied (Orlikowski & Baroudi, 1991). Interpretive methods of research in IS are aimed at producing an understanding of the process whereby the IS influences and is influenced by the context (Klein & Myers, 1999). Research data is value bound because the researcher interacts with the human subjects, thereby influencing the perceptions of both parties (Walsham, 1995b). Interpretive research is becoming increasingly accepted in IS research (De Villiers, 2005) although positivism still remains the dominant research paradigm (Chen & Hirschheim, 2004).

4.3.4.3 The Critical Research Paradigm

Whereas the positivist and interpretivist perspectives are content to predict or explain the status quo, the critical perspective is concerned with critiquing existing social systems and revealing any contradictions and conflicts that may exist within their structures (Orlikowski & Baroudi, 1991). Ontologically critical philosophy proposes that social reality is historically constituted, and hence that human beings, organisations, and societies are not confined to existing in a particular state. Every situation has unfulfilled potential, and people, by recognising these possibilities, can act to transform their material and social circumstances. The epistemological belief of the critical perspective is that knowledge is grounded in social and historical practices (Chua, 1986) in (Orlikowski & Baroudi, 1991). Critical research in the IS field is centred around the social and political impacts of technology (Doolin, 1998) and attempts to describe, explain, and criticise how the development and use of IS in organisations and society (in the pursuit of efficiency, rationalisation, and progress) has also led to an increase in social control and domination,

with potential detrimental consequences for many stakeholders, and society as a whole (Cecez-Kecmanovic et al., 2008)

The research methods of choice for the critical paradigm are long-term historical studies and ethnographic studies of organisational processes and structures. The main data collection methods are qualitative although quantitative may also be used where appropriate. Kvasny & Richardson (2006) note a slow but sustained growth in interest in the critical research approach although this is questioned by Kieser & Leiner (2011).

4.3.4.4 Selection of a Research Approach

In recognition of the increasing sophistication and ubiquity of IS in the organisation there is a growing acceptance that the traditional positivist approach to the study of IS is unnecessarily restrictive and that other approaches to inquiry, based on qualitative and interpretive stances, are also required to inform studies of the relationships between IS, people, and organisations (Bluhm et al., 2011; Lincoln & Guba, 1985; Orlikowski & Baroudi, 1991). The last 10 years has seen a significant growth in the body of qualitative studies as researchers seek to fill knowledge gaps that other methods do not facilitate (Bluhm et al., 2011; Lincoln & Guba, 1985). This has contributed to the near standardisation of many qualitative research methods (Bluhm et al., 2011), which in turn has overturned some of the positivist based criticism regarding issues of validity.

The choice and adequacy of a chosen method of inquiry embodies a variety of assumptions regarding the nature of knowledge and the methods through which that knowledge can be obtained, as well as a set of root assumptions about the nature of the phenomena to be investigated (Cunliffe, 2010; Morgan & Smircich, 1980). The choice of method of inquiry is also influenced by the research question (Hamilton & Ives, 1982; Leavy, 1994; Wilson, 2011; Yin, 2009). My research is concerned with the role of CIO during a failing IS initiative. It was shown in Chapter 3 that an IS initiative is a complex process where the technical aspects are inseparable from the social, behavioural, and political context in which the IS are developed and deployed (Boddy et al., 2009; Fortune & Peters, 2005; McDonagh, 2001; Sauer, 1993b). It was also shown in Chapter 3 that the concept of failure is a social construct (Bovens & Hart, 1996 in Goldfinch, 2007) whose meaning can be interpreted in many ways (Bignell & Fortune, 1984).

Having analysed the range of philosophical positions, along with associated data gathering and analysis methods, it is my intention to adopt a qualitative / interpretivist approach as

the most suitable strategy to answer my research question. The interpretive approach is well suited to research that is exploratory in nature (Walsham, 1995b), and is unique in its ability to address issues of description, interpretation and explanation (Bluhm et al., 2011), in the context of socially constructed organisational settings. In particular, because IS developments are complex, protean, social phenomena (Wastell & Newman, 1993) narratives of IS failure tend to be multi-stranded stories of experiences and reactions that lack collective consensus (Dalcher & Drevin, 2003), they can be best understood by focusing on the complexity of human sense making and decision making (Cunliffe, 2010) through the interpretation of social constructions such as language, shared meanings, documents, tools and other artefacts. Interpretivist research in IS is now a well-established part of the field (Walsham, 2006). The adoption of an interpretivist approach in turn indicates that a qualitative approach to data gathering and analysis is appropriate.

It has been stated in Chapter 3 that IS deployment is a process (Sauer, 1993b; Sauer & Davis, 2009; Wilson & Howcroft, 2002), and that IS failure is also a process (Wilson & Howcroft, 2002) therefore it is appropriate to investigate the utility of a process inquiry approach to answer my research question as the failure of an IS initiative is a central component of the study. This is undertaken in Section 4.4 below.

4.4 Processual Research

Process research is the dynamic study of behaviour in organisations, focusing on sequences of events, activities and actions, which unfold over time and in context (Hinings, 1997; Langley & Tsoukas, 2010; Pettigrew, 1997). Process studies address questions about temporally evolving phenomena, that is of things not being but rather in the making (Ferlie & Mcnulty, 1997; Langley & Tsoukas, 2010).

Mohr (1982) illustrates the nature of process studies by highlighting the difference between variance models and process models. A variance model provides explanations of phenomena in terms of a deterministic causation relationship (outcome) among dependent and independent variables in which X implies Y. A process model on the other hand views outcomes as discontinuous phenomena, or changes of state, rather than variables that can take on a range of values. Thus in a process model X does not imply Y, but rather Y implies X. Process theories provide explanations in terms of patterns in events, activities, and choices over time (Mohr, 1982) and unlike variance models emphasise necessary causality rather than necessary and sufficient causality because the impact of any event

will depend on what precedes it and what follows it. Thus variance models are appropriate for a static worldview whereas process models are most appropriate for a dynamic worldview of things in the making (Langley & Tsoukas, 2010). Table 12 below illustrates the difference between variance and process models.

Variance Model	Process Model
Deals with variables	Deals with events rather than variables
Fixed entities with varying attributes	Entities participate in events and may change over time
Outcome will occur when necessary and sufficient conditions are present	Outcomes may not occur even when conditions are present
Emphasis on immediate causation	Explanations are layered and incorporate immediate and future causation
Time is immaterial to the consequences	Time ordering is crucial for the outcome
Attributes have a single meaning over time	Entities, attributes, and events may change in meaning over time
Generality depends on uniformity across contexts	Generality depends on versatility across cases

Table 12 - Differences between Variance and Process Models (adapted from Mohr (1982), Markus & Robey (1998), Van de Ven & Poole (2005)

Process models are typically multi-directional rather than linear (Tsoukas & Chia, 2002), cumulative and non-reversible (Sztompka, 1993) in (Pettigrew, 1997), reflecting social processes which are inherently discontinuous (Markus & Robey, 1988), and open ended. Pettigrew (1997) uses the metaphor of a river basin with many streams (processes) shaped by its flow over different terrain (context). Process models may incorporate several different types of effects into their explanations, including critical events and turning points, factors that influence the sequencing of events, and contextual and other factors that influence the direction of change and causal influence (Van de Ven & Poole, 2005). Process models have a lower capability to explain variance but provide richer explanations

of how and why outcomes occur (Markus & Robey, 1988) by untangling the history that altered the trajectory of events (Shaw & Jarvenpaa, 1997), and identifying multiple intersecting conditions that link context and process to outcomes (Pettigrew, 1997).

4.4.1 The Ontological Assumptions of a Process Worldview

Sztompka (1993), in Pettigrew (1992) provides a list of ontological assumptions which are relevant for scholars of process. These are:

Social reality is not a steady state but, rather, a dynamic process:

A process orientation prioritises activity over product, change over persistence, novelty over continuity, and expression over determination (Langley & Tsoukas, 2010). Process employs the language of verbs (becoming) rather than nouns (being) to explain the origins, event sequences, and outcomes of phenomena (Pettigrew, 1987) in terms of *"What was there-then, is included in what is here-now"* (Langley & Tsoukas, 2010, p. 10). The process approach does not deny the existence of events, states, or entities, but seeks to reveal the complex activities and transactions that take place and contribute to their constitution.

The social process is constructed

The social process is created by human agents (individually or collectively) through their actions and interactions (Pettigrew, 1992; Sztompka, 1993; Tsoukas & Chia, 2002). Human agency is continuously influenced by rules and norms that are made relevant by the actors themselves through a dynamic process of adjustments to social conditions. In this way organisational rules are constantly adjusted, modified, or even ignored in the carrying out of actual organisational tasks (Tsoukas & Chia, 2002). This is further influenced by differences in power, knowledge, and other resources (Pettigrew, 1992). Events are also socially constructed and may be individually interpreted (Peterson, 1998) leading to different understanding and interpretation of event sequences and outcomes.

Social life is a process of structural emergence via actions which occur in the context of encountered structures

Action occurs in the context of encountered structures, which it shapes in turn, resulting in the dual quality of structure (as both shaping and shaped) and the actors (as both producers and products) (Sztompka, 1993) in (Pettigrew, 1992), (Pettigrew, 1997; Pettigrew, 1987). Tension between actions and structures is the ultimate moving force of

process (Sztompka, 1993) in (Pettigrew, 1992) which ultimately links processes to outcome (Pettigrew, 2012).

The interchange of action and structure occurs in time and is cumulative,

Time is an integral part of a process orientation as time sets a frame of reference for what changes are seen and how those changes are explained (Pettigrew, 1987). Process models treat time as always shaping the emerging future (Pettigrew, 2012) by its location in the process sequence, and the multiple levels of changing contexts in which the process is embedded (Langley & Tsoukas, 2010; Pettigrew, 2012).

A process worldview occupies a broad ontological spectrum thereby offering a variety of conceptual frameworks for the conduct of processual studies. For example Langley (2009) identifies *weak process* where emphasis is placed on the change and development of existing entities from one state to another (i.e. being) and *strong process* where things are subordinated to processes that contribute to constituting and reproducing the organisation as a stable entity. Similarly Shaw & Jarvenpaa (1997) found that many process models are hybrid constructions that use both variables and events and can address a wide range of questions incorporating both variance and process worldviews.

4.4.2 The Use of Process for the Study of IS Phenomena.

Van de Ven and Poole (1995) propose a typology of four approaches for studying organisational change. The typology incorporates a variance or process epistemological position and an ontological position of an organisation as either a noun (an entity), or a verb (a process of organising) as depicted below. They state that approach III *"process studies of organising by narrating emergent actions and activities by which collective endeavours unfold"* (p. 520) is a suitable approach for the study of the emergence and impacts of new technology..

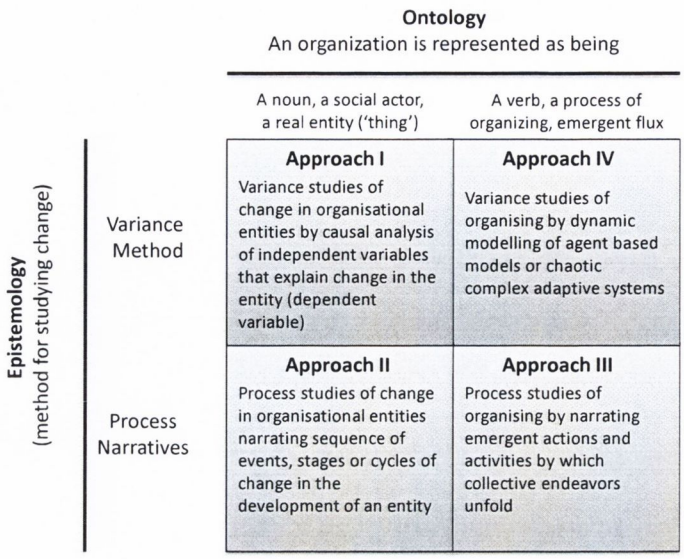


Figure 5 - Approaches for Studying Organisational Change (Adapted from Van de Ven & Poole (2005))

Process inquiry is particularly suited to the study of IS development and implementation because of the temporally evolving, longitudinal and creative nature of such processes, which typically involve a broad range of complex activities and transactions undertaken by actors, and which are subject to a range of contextual factors that contribute to the outcome. Shaw & Jarvenpaa (1997) present a range of IS studies which indicate the suitability of process orientated methodologies to the study of phenomena related to IS development which I have extended, based on my review of IS literature, and presented as Appendix 2.

Process methodologies are particularly suited to the study of phenomena related to IS failure. IS failure factor studies focus either on a single failure factor, or present failure factors as a ranked list. No single failure factor is sufficient to explain variability in performance (as in the role of the CIO) (Pettigrew, 2012) therefore unless you also look at the process of failure it is not possible to gain an understanding of the complex interaction of actors, events, contexts and the emergent conditions that influence the trajectory over time, and their impact on the object of inquiry. The study of the process of IS failure provides a focal point for the study of the role of the CIO, providing an insight which could not be completely explicated using variance type methodologies in a 'hands-off' fashion.

There are also limitations to process studies. Some of these limitations such as the mostly ideographic nature of process studies resulting in a lack of generalisability and the possible effects of researcher bias will be addressed in Section 4.5 and 4.6. Pettigrew (1990) cautions about the amount of data that a process study can gather and warns about the danger of *"death by data asphyxiation"* (p. 281). Shaw & Jarvenpaa (1997) also point out the need to show in a convincing manner how the data was analysed, highlighting all assumptions and exploring possible areas of bias.

4.4.3 Conclusion

Process research has crystallised as a field of knowledge since first developed in the 1970s (Ferlie & Mcnulty, 1997; Hinings, 1997), and is used to study a range of organisational phenomena such as change, innovation, accountability, and technology implementation. "*Time is an inescapable reality*" (Langley & Tsoukas, 2010, p. 10) therefore process studies offer a rich contribution to our understanding of the world that is unavailable from more traditional research methods that tend to either ignore time completely, express it as a variable (e.g. dynamic, stable), or reduce its role to a comparison of quantitative relationships over a longitudinal timeframe (Langley & Tsoukas, 2010; Langley, 2008; Pettigrew, 1990).

As it is very appropriate for the study of emerging actions and outcomes in context, process inquiry is particularly suited to the study of the emergence and impacts of new technology (Van de Ven & Poole, 2005). Process knowledge is also highly relevant to practice (Hinings, 1997; Langley & Tsoukas, 2010), and is seen as problem solving (Hinings, 1997), and many process studies have been motivated by a desire for a better understanding of events leading to a positive or negative outcome (Langley & Tsoukas, 2010), which further confirms its appropriateness as a suitable research approach to answer my research question. Process research also supports longitudinal research that is both retrospective and real time (Pettigrew, 1997), has a strong connection with qualitative/interpretive research (Hinings, 1997; Langley & Tsoukas, 2010; Langley, 2008), and frequently employs case study investigations (Hinings, 1997; Radeke, 2010), and in particular longitudinal case studies, which facilitate inquiry over the entire duration of the IS failure (Wilson & Howcroft, 2002). In support of this Pan, et al. (2008) call for more longitudinal studies on project failures, especially those that involve in-depth case studies, in order to provide a deeper understanding of the dynamics of this phenomenon in various contexts.

Although process orientated inquiry has some drawbacks it is my contention that most of these are also applicable to other forms of qualitative research. In fact the use of a process lens, with an emphasis on action and events over time and in context, imposes a focus and a rigor on data collection that some other qualitative methodologies do not. Many of the practical difficulties in conducting a process inquiry can be reduced by the use of a systematic methodology to guide the conduct of the inquiry, which can also provide the necessary tools and frameworks to underpin rigor and accuracy in the research process. The use of a case study methodology is well proven for the study of phenomena related to IS and provides such a framework for the conduct of a process inquiry. Furthermore contextual understandings are best achieved by direct, first-hand knowledge of a research setting (Orlikowski & Baroudi, 1991; Van Maanen, 2011) thereby indicating the suitability of the case study approach for carrying out the research. The case study method is discussed in Section 4.5 below, along with its appropriateness and utility for the conduct of a process inquiry.

4.5 Case Study Research

Yin, (2009, p. 18) defines a case study as: "*... an empirical enquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident*". This suggests that case study is particularly relevant to the study of organisational phenomena (such as IS) which are inherently bound to the organisational context in which they occur. Wilson (2011) states that a case study is a choice of what is to be studied rather than a methodological choice however there is no standard definition of a case study (Benbasat et al., 1987; Gerring, 2004).

Case study may be of the descriptive, exploratory, or explanatory type (Yin, 2009), i.e. it can be used to provide descriptions of phenomena, develop theory, and test theory (Darke et al., 1998; Eisenhardt, 1989). An analysis, by Dube & Pare (2003), of 185 case studies in 7 leading IS journals between 1990 and 1999 found that 61% were descriptive, 30% were exploratory, and 9% were explanatory. Further emphasising the versatility of case research Cavaye (1996) states that the method can be undertaken using a positivist or interpretive stance, be deductive or inductive, can utilise quantitative or qualitative methods, and can investigate one or multiple cases. Typically the goal of data collection in case research is not quantification or even enumeration but rather description,

classification (typology development), theory development, and limited theory testing (Bonoma, 1985).

The case study approach is appropriate when the phenomenon of interest can be studied in its natural settings (such as within an organisation), with a focus on contemporary events. Research phenomena not supported by a strong theoretical base may be fruitfully pursued through case research as natural settings can be fertile ground (context) for generating theories. Case studies are therefore well suited to answering 'what', 'why', and 'how' questions because these deal with operational links and processes which can be traced over time rather than with frequency or incidence (Benbasat et al., 1987; Kaplan & Maxwell, 2005). Case research is therefore useful when a phenomenon is broad and complex, where the existing body of knowledge is insufficient to permit the posing of causal questions, when a holistic, in-depth investigation is needed, and when a phenomenon cannot be studied outside the context in which it occurs (Benbasat et al., 1987; Bonoma, 1985; Yin, 2009)

Case studies may be longitudinal in nature (Burch, 2001; Pettigrew, 1990; Ployhart & Vandenberg, 2010), which concerns the collection and analysis of data over time, which may be used to link the content, context, and processes of change over time. Pettigrew (1990, p. 271) reminds us that *"truth is the daughter of time"* and also that time is not just a neutral chronology of events but, in many cases, is an organisational social construction as in the example of the development cycle of a new car, or the process of taking a new drug to market. As explained in Chapter 3 time is also a critical factor in the process of IS development.

The value of the case-based approach for qualitative/interpretive research is that because the subject is studied within its real life context the researcher has access to a broad range of primary and secondary qualitative data (Kaplan & Maxwell, 2005). In particular interviews allow the researcher to access multiple perspectives regarding the events, situations, actions, processes, and outcomes which have, or are, taking place, and elicit their views and aspirations within this context (Kaplan & Maxwell, 2005; Walsham, 1995a, 2006).

Despite the growing popularity of case study research a range of concerns have been voiced about the method including: the lack of a scientific approach including experimentation, lack of rigor in the research process, researcher bias influencing the

study, lack of generalisability of research findings, and the massive overhead in terms of time taken and amount of data produced (Yin, 2009). These concerns are noteworthy however they often reflect the reality of poorly conducted research rather than an inherent flaw in the case study method. Judging the case study method using only the scientific approach unnecessarily limits its use and applicability (Walsham, 2006), as a phenomenon may not always be usefully studied outside of its natural setting, and may not be amenable to quantification (Bonoma, 1985), or generalisation in the nomothetic sense (Gerring, 2004; Hinings, 1997; Lee, 2003). It is also possible to generalise case study findings to other settings and test predictions (Lee, 1989; Markus & Robey, 1988). The overheads of time and data volume can easily be justified in terms of the rich data and insight produced by case based research.

4.5.1 Use of Case Study for Qualitative/Interpretive Research in IS

Case-based qualitative research now has a strongly established pedigree in the business field and since the early 1990's some of the most influential research in the area of business studies has been qualitative and case based (Leavy, 1994). Eisenhardt and Graebner (2007, p. 26) propose that, *"building theory from cases is likely to produce theory that is accurate, interesting, and testable".*

Case study research is the most widely used qualitative method in IS research (Darke et al., 1998), its popularity due mainly to the indivisible connection between IS and the context in which it is implemented and deployed (Benbasat et al., 1987; Markus & Robey, 1988), as already discussed above and in Chapter 3. Case study allows the researcher to open the 'black box' of IT in order to better understand how it affects and is affected by the people who use it (Benbasat et al., 1987; Leavy, 1994) and capture *"such dynamic, changing conditions",* Pare (2004, p. 234).

Benbasat et al. (1987) state that the rapid pace of change in the IS field makes case study highly appropriate for gaining valuable insights in this area. They note a range of case study literature relating to IS, and in particular, a predominant theme of IS implementation, including the possible causes of success or failure. They argue that since the process of implementation takes place over time, is a complex process involving multiple actors, and is influenced by events that happen unexpectedly, a case study methodology is well-suited to identifying key events and actors and to linking them in a causal chain, thereby indicating a close fit between case study and process inquiry. Doolin (1993) states that

because IS development is a complex, protean, social phenomenon conflict is endemic and therefore the rational-technical view of systems development presented in most textbooks is a caricature, and that simple prescriptions grossly oversimplify the actual realities of systems work, a point which I have already argued in Chapter 3 in relation to IS failure factor analysis.

Longitudinal case studies facilitate the study of change over time and at different stages of an IS development (Newman & Sabherwal, 1996) making them highly applicable to the study of phenomena related to the process of IS failure (Wilson & Howcroft (2002, p. 239). In support of this Pan, et al. (2008) call for more longitudinal studies on project failures, especially those that involve in-depth case studies, in order to provide a deeper understanding of the dynamics of this phenomenon in various contexts.

The case study method is very well suited to the conduct of a process inquiry as it presents an opportunity to study a complex phenomenon, such as a failed IS initiative, in its real-life context, thereby providing a rich source of data that is the foundation of a process inquiry. Longitudinal case study facilitates inquiry over the entire duration of the IS failure thereby offering a complete and holistic process view which will facilitate the development of novel theory that will make a contribution to the body of knowledge in the domains of both IS failure and the role of the CIO (Dempsey & McDonagh, 2014b). The case study method also provides a well-documented set of tools and procedures for the conduct of the case study and for managing the resulting body of data, which provides an ideal framework for the conduct of a process inquiry, as it forces a rigor at all stages of the inquiry, which in turn will strengthen the research findings. This approach is well established and supported within the academic community as indicated by the process studies listed in Appendix 2, of which over 80% use the case study method.

It is now appropriate to consider how a rigorous process inquiry is conducted using the case study method. This is discussed in Section 4.6 below.

4.6 Conducting a Process Orientated Study in a Case Based Setting

Having attended to the initial decisions regarding the use of a qualitative/interpretive process orientated study in a case based setting as an appropriate approach to answer my

research question consideration will now be given to how the research will be conducted to fit with the chosen research methodology.

Benbasat et al. (1987: p. 383) states that *"A case study should be more than an exercise in storytelling or an opinion piece; it should adhere to certain rules of procedure"*. A research design is a plan of the logical sequence that connects the empirical data to a study's initial research questions, and ultimately to its conclusion, such that the reader is able to follow the derivation of any evidence from initial research questions to the conclusions of the study (Wilson, 2011; Yin, 2009). The researcher must describe in detail how the research was conducted and how the results were arrived at, and present a coherent, persuasively argued point of view (Walsham, 1995b). Sufficient evidence for the research result must be presented along with consideration of alternative interpretations of the data (Benbasat et al., 1987; Dube & Pare, 2003; Walsham, 2006; Yin, 2009) and the case overall.

Yin (2009) describes case study research as a linear but iterative process with six key components which are: plan; design; prepare; collect; analyse; and report. This method is also supported by other exponents of the case method (Carroll & Swatman, 2000; Pare, 2004), and is depicted in Figure 6 below:

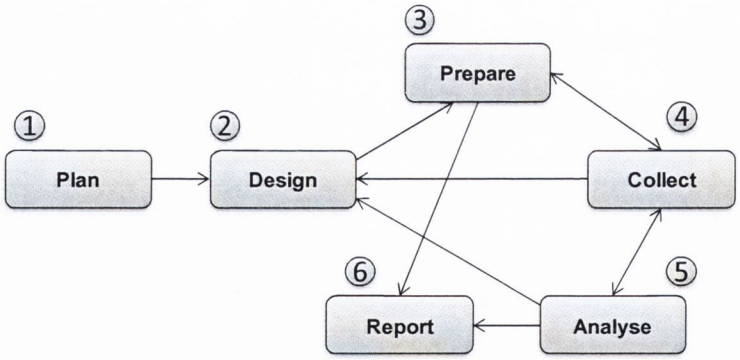


Figure 6 - Case Study Research Method (adapted from Yin (2009) Pare (2004) Carroll & Swatman (2000))

Although depicted as six discrete steps the research process is both iterative and systematic, often requiring a return to previous stages as new data or concepts emerge. This model is congruent with the inductive-deductive cycle described by (Pettigrew, 1997) for the conduct of a process inquiry as depicted below.

research question → related themes and questions → preliminary data collection → early pattern recognition → early writing → disconfirmation and verification → elaborated themes & questions → further data collection → additional pattern recognition → more refined study vocabulary and research questions

Figure 7 - Inductive-Deductive Cycle (Pettigrew, 1997)

Each stage of the research process is now discussed.

4.6.1 Stage 1 - Plan:

This stage is mainly concerned with deciding on the most appropriate research strategy to answer the research question(s) including an assessment of one's own ontological and epistemological position, and the use of any guiding theory. This stage has already been conducted in Sections 4.3, 4.4, and 4.5 above concluding with the selection of a qualitative process inquiry in a case based setting as the most appropriate method of inquiry to answer the research question.

4.6.2 Stage 2 - Design:

The case study design is concerned with ensuring that the inquiry is conducted in a systematic manner which will increase the overall quality and robustness of the research findings. This stage is concerned with selecting the appropriate unit of analysis, selecting the appropriate case design, and addressing the issues of validity and reliability of the research including potential sources of bias.

4.6.2.1 Selecting a Unit(s) of Analysis in Case Study Design

When undertaking case based research it is essential to correctly chose the unit of analysis for study. (Miles & Huberman, 1994; Yin, 2009). Gerring (2004, p. 342) defines a unit of analysis as "*a spatially bounded phenomenon observed at a single point in time or*

over some delimited period of time". The unit of analysis should be a concrete real-life phenomenon (e.g. individuals, groups, an entire organisation, a project, or a decision) rather than an abstraction (Benbasat et al., 1987; Yin, 2009), and must provide sufficient breadth and depth of data to allow the research question to be answered (Darke et al., 1998).

Careful selection of the unit of analysis is critical as it essentially defines the boundary of what is to be studied, how the study relates to the broader body of knowledge in the research domain (Dube & Pare, 2003), and the potential generalisability of resulting theory (Pare, 2004; Yin, 2009), which in turn influences the research design and data collection strategy (Yin, 2009). The unit of analysis is not always obvious (Yin, 2009) and during the course of the research it was found that some authors (e.g. Darke et al. (1998), Miles & Huberman (1994)) use the term synonymously with 'case', whereas others (e.g. Pare (2004), Yin (2009)) make a clear distinction between both.

The appropriate unit of analysis is generally determined by the research question(s) (Benbasat et al., 1987; Pare, 2004). My research question - *'How does the role of the CIO influence IS failure outcomes?'* - indicates two main areas of enquiry (1) the role of the CIO, and (2) how the role is influenced during the course of a failing IS initiative. As the resulting theory from my inquiry will relate directly to the role of the CIO it is appropriate that the CIO be selected as the unit of analysis. The inquiry must also take account of the context of a failing IS initiative thereby indicating this as the appropriate case setting for the inquiry. This satisfies Gerring's definition because the role of CIO is a spatially bounded phenomenon (as indicated in Chapter 2) and the failing IS initiative provides the delimited timeframe within which to focus the inquiry.

4.6.2.2 Selecting the Appropriate Case Design

A primary decision in designing case study is the choice between multiple-case and single-case design. That is between the analytic and generalisability benefits of replication of a multiple-case design and the depth and richness of data associated with a single-case design.

Single-case studies allow in-depth analysis of one setting with regard to a large number of aspects, facilitating a broad and detailed analysis of organisational dynamics, and the production of the rich descriptions favoured by interpretive researchers (Doolin, 1993). The single-case design is recommended when (a) it represents an opportunity to confirm,

challenge, or extend existing theory (Yin, 2009), (b) it represents a rare or unique circumstance (Siggelkow, 2007), (c) is a representative or typical case (Yin, 2009), (d) is revelatory in some way (Darke et al., 1998), or (e) is longitudinal (Yin, 2009). Single-case design is most useful at the outset of theory generation and late in theory testing (Benbasat et al., 1987). *Multiple-case* designs allow for cross case analysis and comparison and the investigation of a particular phenomenon in diverse settings (Darke et al., 1998). Multiple-case designs are desirable when the intent of the research is description, theory building, or theory testing. A multiple-case design usually sacrifices detail and richness of description for the opportunity to undertake cross case analysis and comparison and the investigation of a particular phenomenon in diverse settings (Darke et al., 1998; Doolin, 1993). Both single- and multiple-case designs may incorporate a single or an embedded set of units of analysis for each case (Yin, 2009).

Both single- and multiple-case research designs have advantages and disadvantages. Evidence from multiple cases is often considered more compelling and therefore more robust (Yin, 2009). Multiple cases support replication design whereby cases can be chosen to confirm similar outcomes ("literal" replications) or contrasting outcomes ("theoretical" replication) (Pare, 2004; Yin, 2009), resulting in a theoretical framework which can be used to generalise to new cases in a similar way to experimental science. It should be noted however that the nomothetic nature of experimental science (i.e. positivism) cannot be directly correlated with the interpretivist approach to research. Interpretivism does not emphasise generalisability (Maxwell, 2002) or the striving for universal laws, therefore a single setting is also a legitimate area of inquiry which, for example, is much used in ethnographic studies (Lee & Baskerville, 2003), where the main aim is to develop thick description, i.e. to generalise within a case and not across cases. Lee (1989) states that generalisability simply refers to theory that has been tested and confirmed in a variety of situations regardless of the methodology used.

Single-case design does not facilitate cross-case generalisation however thick description is often the objective of a case study. For example (Leavy, 1994) cites the field of biology where the intensive study of a single digestive system would not raise any concerns about the generic value of the insights to be gained. Flyvbjerg (2006, p. 228) states that knowledge is more than statistical significance and *"formal generalisation is overvalued as a source of scientific development, whereas the force of example is underestimated"*. Furthermore a multiple case design may not be possible in the case of a rare or revelatory

case. Pettigrew (1985, p. 242) states that *"even single case studies are capable of developing and refining generalisable concepts and frames of reference"*, however Aaboen et al. (2012) cautions that a single case may become too context-specific, which may limit the possibility to generalise to other settings. A single case study should therefore contain sufficient within-case variation such as different episodes or phases in the history of the process or organisation under study (Leavy, 1994) and utilise multiple sources of evidence (Yin, 2009).

Both single- and multiple-case designs are well established in the study of IS. For example in a survey of papers in 4 leading IS journals and one leading annual conference between 1981 and 1985 inclusive Benbasat et al. (1987) found that both design types were utilised. Dube & Pare (2003)'s analysis of 185 case studies, referred to earlier, found that 60% were of the single-case design and 40% were multiple-case design although only 22% of all cases surveyed provided a rational for the choice. My review of the literature on IS failure found that out of a total of 59 case studies 45 (76%) used a single-case design and 14 (24%) used multiple-case design. The rationale for the selection of single- Vs multiple-case design was not addressed in any study, an issue supported by Benbasat et al. (1987) who found that *"The unit of analysis ... was not provided in many of the published works ... a problem consistent with the lack of clear research objectives .... and probably an outcome of it."* (p. 380). This issue is also highlighted by Dube & Pare (2003) who found that only 8% of cases clearly specified the unit of analysis

4.6.2.3 Validity, Reliability, and Objectivity of Qualitative Research

The quality of scientific research is measured against a set of long standing and well defined criteria: *construct validity* which is concerned with identifying the correct operational measures for the concepts being studied; *internal validity* which is concerned with identifying and eliminating spurious relationships; *external validity* which is concerned with finding the domain to which a study's findings can be generalised; and *reliability* which is concerned with demonstrating that the operations of a study can be repeated with the same results and that sufficient steps were taken to minimise error and bias. Merrick (1998) proposes an additional criterion of *objectivity* which concerns the extent to which research findings can actually be supported by the data.

Validity and reliability are equally important in qualitative studies (Runeson & Höst, 2009), however it is argued that criteria applicable to the scientific method are inappropriate for

qualitative research because of the different epistemological and ontological assumptions (Hammersley, 1992) in (Whittemore et al., 2001), the contextual and subjective nature Kahn (1993), and the level of subjectivity and creativity (Whittemore et al., 2001).

Lincoln & Guba (1985) in Whittemore et al. (2001) developed four validity criteria for qualitative research that parallel the quantitative criteria, and which remain as the standard for assessing the quality of qualitative research. *Internal validity* is paralleled by *credibility* which may be attained by (1) prolonged engagement facilitating persistent observation; (2) triangulation of data sources to increase accuracy; (3) engaging with others throughout the research process; (4) continuous revision of hypotheses based on findings; (5) setting aside data for checking against findings, and (6) checking constructs with stakeholders. *External validity* is paralleled by *transferability* which involves providing sufficient thick description to enable other researchers to adequately evaluate whether findings might be transferable. *Reliability* is paralleled to *dependability* which may be achieved by provision of an audit of the research process, much like a fiscal audit. *Objectivity* is paralleled by *conformability* which is the extent to which the research product can be supported by the data and is internally consistent.

Yin (2009) summarises a set of tactics for increasing validity and reliability of case research. However (Lincoln et al., 2011) assert that social scientists rely increasingly on the experiential, the personified, and the emotive qualities of human experience which contribute the narrative quality to a life. Yin's tactics have therefore been combined with Lincoln & Guba's (1985) credibility, transferability, and dependability criteria for qualitative research, and applied to process inquiry to provide a guiding approach to meeting the necessary validity criteria based on what is useful, and what has meaning in terms of a process worldview (Guba & Lincoln, 2005) The resulting framework is shown in Table 13 below.

Validity Criteria (Yin, 2006)	Validity Criteria (Lincoln & Guba, 1985)	Case Study Tactic	Phase of Research	Relevance of Case Study Tactics to Process Inquiry
Construct Validity	N/A	• use multiple sources of evidence • establish chains of evidence • have key informants review draft case study report	data collection data collection composition	Multiple sources of evidence may be used to confirm actions, events, and outcomes facilitating the construction of verifiable process chains (cause and effect) using visual mapping and other techniques. Process narratives may also be used to confirm findings with informants
Internal validity	Credibility	• do pattern matching • do explanation building • address rival explanations • use logic models	data analysis data analysis data analysis data analysis	Failure outcomes may be explained using chronological mapping to explicate the process of failure and verified by the construction of alternative explanations to test plausibility of findings. Findings may also be compared with previous research findings as a further test of credibility or novelty.
External validity	Transferability	• use theory in single cases • use replication logic in multiple case studies	research design research design	Depends on the type of inquiry and the potential for generalizing from the findings, whether a guiding theory is used for the inquiry and the number of cases. Process inquiry in IS failure often relies on a single case of IS failure because of difficulties in access to multiple cases at any one time.
Reliability	Dependability	• use case study protocol • develop case study database	data collection data collection	The case study protocol should specify how the process inquiry is to be conducted and specify how data will be stored using the case study database. Data analysis tools should also be explained including the use of any software tools.

Table 13 - Application of Positivist and Qualitative Validity Criteria for the Conduct of a Process Inquiry (adopted and expanded from Yin 2009, Lincoln & Guba 1985)

In addition to the above considerations Merrick (1998) proposes that the researcher must pay attention to the issues of *Trustworthiness* (how one approaches, collects, analyses, interprets, and reports data and findings), *Reflexivity* (the researcher being an integral part of the setting, context, and culture s/he is attempting to represent), and *Representation* (how the research is reported by the researcher).

Trustworthiness also encompasses efforts to reduce or at least make explicit sources of bias in an interpretive inquiry. Robson (2002) in Saunders et al. (2009) describes two types of bias: (1) *subject bias* whereby the subject's response is influenced due to a personal bias or external influence; and (2) *observer bias* whereby the interpretation of the research is influenced by the bias of the researcher. Walsham (2006) cautions that neutrality, on the part of the researcher, is not the same as unbiased. Merrick (1998) acknowledges the reflexive nature of qualitative research and proposes that the commitment to revealing potential sources of bias reinforces the shift from truth to understanding.

The challenge of ensuring the quality of qualitative research must be continually addressed during all phases of the research process including data collection, data analysis, theory development, and writing of the research report (Runeson & Höst, 2009; Yin, 2009).

4.6.3 Stage 3 - Prepare:

Thorough preparation is a key precursor to the conduct of an inquiry. The preparation stage should include attention to the issues of ethical behaviour for the conduct of the inquiry, and the preparation of a case study protocol to guide the research process.

4.6.3.1 Ethical Considerations

A fundamental principal of a research programme is that it should not subject the research subject(s) to embarrassment, harm or any other material disadvantage (Saunders et al., 2009). The researcher must therefore consider a range of ethical issues relating to the conduct of their research programme.

In addition to the overarching principles not to plagiarise, fabricate or falsify data, research procedures, or data analysis Diener & Crandall (1978) in Bryman & Bell (2011) identify four main areas of ethical behaviour for consideration: *Harm to Participants:* the researcher must take all reasonable precaution to ensure that participants are not harmed or adversely affected as a result of participation in the research. This includes maintaining confidentiality of records and anonymity of subjects if so requested. *Informed Consent:* the consent of each participant must be gained on the basis that the purpose and nature of the research has been explained to them leaving them free to choose whether or not to be involved and to terminate their involvement at any time if desired. Written consent should be sought as far as possible. *Invasion of Privacy:* The researcher at all times must respect

the right to privacy of all subjects and respect their personal values and sensibilities. *Deception:* The researcher must ensure that no concealment or deception is carried out during the course of the research.

4.6.3.2 Developing a Case Study Protocol

The case study protocol is a comprehensive set of guidelines that describes the procedures for conducting the research, the type of data to be collected, and the guidelines for data analysis (Maimbo, 2003; Runeson & Höst, 2009; Yin, 2009).

The case study protocol is a very valuable instrument as it sets out in some detail how the case study will be conducted. There is no standard format for the case study protocol however Maimbo (2003) provides a useful template of such an instrument consisting of six key Sections as follows: (1) a preamble outlining the purpose of the protocol; (2) a description of the research project and the case research method; (3) a detailed description of general procedures for conducting each case, including contacts and timing; (4) a description of the research instruments such as interview guidelines, questionnaires etc.; (5) guidelines for data analysis, and (6) a template letter of invitation to participants (Maimbo, 2003; Runeson & Höst, 2009).

The use of a case study protocol helps the researcher to consider all issues relevant to their research which in turn contributes to more rigorous research that has greater internal and external validity (Maimbo, 2003) and reliability (Yin, 2009).

4.6.4 Stage 4 – Collect Data:

The outcome of the data collection phase of a case study is a well organised and categorised set of case data (Darke et al., 1998). Case based research uses a range of data sources: (1) written documents such as memoranda, newspaper clippings, and formal reports; (2) archival records (including financial reports); (3) interviews; (4) direct observation; (5) participant observation; and (6) physical artefacts (Darke et al., 1998; Yin, 2009).

The primary source of data in a qualitative interpretive case study is the interview (Pan & Tan, 2011; Yin, 2009) which is also well established in the field of IS research (Schultze, 2011). Yin (2009, p. 106) describes interviews as *"guided conversations rather than structured queries"* where the stream of questions is fluid rather than rigid. This makes interviews very suitable for qualitative, interpretive studies as, if skilfully executed, they

bring us closer than any other method to an intimate knowledge of people and their social world (Hermanowicz, 2002), and facilitate the search for meaning, intentionality, and context, all of which are major objectives of qualitative research (Hermanowicz, 2002; Schultze, 2011). Yin (2009) identifies two types of interview: an *in-depth interview* where, in addition to the facts of the matter the researcher can ask questions so as to elicit opinion and insight relating to the topic at hand; and a *focused interview* which, as the name suggests, is designed to focus on particular facts using a specific set of questions, usually to corroborate previous information.

For the conduct of process orientated research data collection focuses on collecting data relating to the process models' main components, vis. event sequence data, causal and consequential factors, and the identification of relationships among these components as shown in Figure 8 below.

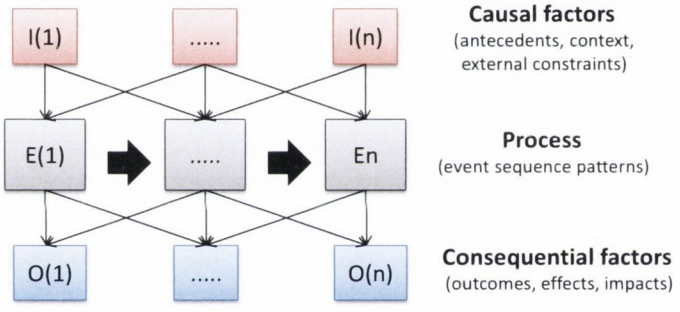


Figure 8 - Process Model (Adapted from Radeke (2010))

Pettigrew (1990, p. 277) states that data collecting should be *"processual, comparative, pluralist, historical, and contextual"*. Poole et al. (2000) presents five strategies to focus the data collection process: (1) identify events and event types; (2) characterise and classify event sequences and their properties; (3) identify dependencies in the sequences identified; (4) evaluate the data in the context of the outcome if possible; and (5) identify coherent patterns that integrate the narrative and provide explanation.

4.6.4.1 Organising Research Data

Yin (2009) proposes that the benefits from the six sources of evidence as described above can be maximised by following three principles of data collection: (1) use multiple sources of information, (2) use a case study database, and (3) maintain a chain of evidence. Radeke (2010) also proposes the explication of the data collection procedure to enhance the quality of the research and reliability of findings.

4.6.4.2 Multiple Sources of Information

A major strength of case study inquiry is the use of multiple primary and secondary data sources. This provides a rich pool of data which can be combined to corroborate findings rather than relying on a single source (Mathison, 1998; Yin, 2009). Such triangulation of data facilitates the development of *"converging lines of enquiry"* (Yin, 2009, p. 115) and mediation of conflicting accounts (Pan & Tan, 2011), which in turn supports a more convincing narrative, and ultimately increases the reliability and validity of research findings (Dube & Pare, 2003; Kaplan & Maxwell, 2005; Yin, 2009).

4.6.4.3 Use of a Case Study Database,

A case study database may be used to organise and document the collected case study data (Dube & Pare, 2003). Use of a case study database provides a single repository of case material which provides evidence supporting the case narrative and findings, which is accessible for review. Yin (2009) proposes a categorisation for the initial classification system incorporating four main areas: (1) personal case study notes; (2) case study documents; (3) tabular and quantitative materials; and (4) narratives. As the inquiry progresses this classification system may be extended and elaborated so as to develop a well organised, categorised, easily accessed, and complete set of records to support research findings. A computer system may be designed to support the case study database. The subsequent availability of this database as a reference will contribute substantially to the reliability of the research outcome.

4.6.4.4 Maintaining Chains of Evidence.

Throughout the research process it is vital to maintain chains of evidence to support the research findings. Each chain of evidence must be designed in such a way that it will allow an external observer trace the steps taken from the initial research question to the research conclusions. The chain of evidence will include sufficient cross-referencing to

methodological procedures carried out, and the resulting evidence leading to the research findings.

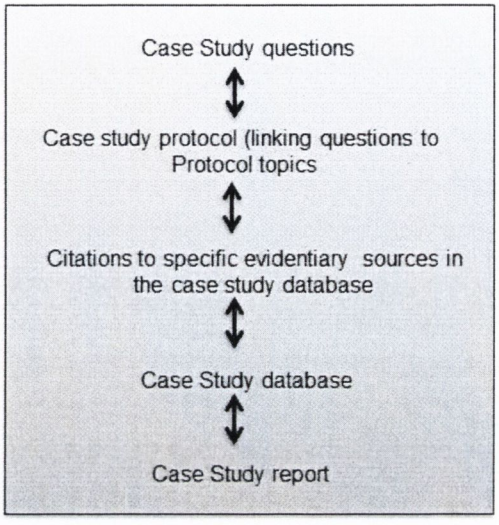


Figure 9 - Research Chain of Evidence (Adapted from Yin, 2009)

The construction and maintenance of a chain of evidence is greatly supported by the use of the case study database with appropriate referencing, and further enhances the validity and reliability of the research findings.

Explication of the data collection procedure is best achieved by the use of the case study protocol document (Yin, 2009) which states the procedures for data collection along with general rules to be followed. Documenting the actual research procedures enhances reliability of research findings.

4.6.5 Stage 5 – Analyse Data (Theory Development):

The purpose of theory is to describe and explain connections among phenomena (Sutton & Staw, 1995). Process models emphasise a dynamic view of phenomena (Radeke, 2010) which typically consist of three main components: the process itself; causal factors; and consequential factors (Radeke, 2010) as already depicted in Figure 8 above. The purpose of process theory is to move beyond a description of the components by explaining the connections among them, the underlying mechanisms that drive them, including action

and context, and their relationship to certain outcomes or consequential factors (Gregor, 2006; Hinings, 1997; Radeke, 2010). Gregor (2006) describes *theory for explaining* as process type theory suitable for bringing about an altered understanding of how things are or why they are as they are. She notes that this type of theory is favoured by interpretivists, and has led to important new insights into phenomena related to IS.

4.6.5.1 Data Analysis - the Inductive-Deductive Process

Data forms the foundation of theoretical development however it does not in itself constitute a theoretical contribution (Gregor, 2006; Sutton & Staw, 1995). Data describe which empirical patterns were observed, theory explains why these patterns were observed. Moving from data to theory is a creative process which uses a combination of induction and deduction to develop plausible explanations for temporal dynamics (Kaplan & Maxwell, 2005; Langley & Tsoukas, 2010; Miles & Huberman, 1994). This creative process is called abduction.

The strength of analysis in interpretive research is derived from the strength of the explanation of the phenomena based on the interpretation of the data (Darke et al., 1998). Eisenhardt (1989) proposes that induced theory is likely to be empirically valid when it is tightly linked to the data, a view supported by Walsham (1995a) who emphasises the importance of detailed descriptions of how findings were derived. Data analysis should be both systematic and disciplined, and should display a logical pattern of thought processes and assumptions that result in sufficient evidence for the research outcome (Walsham, 1995a), along with consideration of alternative interpretations and reasons for rejection. Carroll and Swatman (2000) note that the main difficulty when employing qualitative research is demonstrating the linkage between the data collected and conclusions drawn.

Analysis of case study evidence is one of the least developed aspects of case study research (Yin, 2009). Similarly there are no fixed recipes for undertaking process research (Pettigrew, 1997). Miles & Huberman (1994) propose a framework for analysing qualitative data which is applicable for both case study and process as it is consistent with Pettigrew's description of the cycle of induction and deduction for the conduct of processual research described above.

They describe data analysis in the context of three phases: *data reduction, data display, and conclusion drawing and verification*. **Data Reduction:** is the first step in organising and distilling the mass of raw data into some meaningful form. This involves an iterative

process of selecting, simplifying, abstracting, and transforming the data without diluting any of its embedded richness. This process requires an intuitive input from the researcher to assess what data should be emphasised. This usually involves some combination of deductive and inductive analysis and should also be guided by the research question. The outcome of this stage is a set of initial categorisations which form the input to the second stage of data display. **Data Display:** further synthesises the data to produce an organised, compressed assembly of information that facilitates conclusion drawing. The data at this stage is usually presented as a combination of text and diagrams, including process charts, which allow the researcher to discern systematic patterns and interrelationships. At this stage additional higher order categories or themes may emerge. **Conclusion Drawing and Verification:** conclusion drawing involves stepping back to consider what the analysed data mean with regard to the research question. Emergent conclusions need to be revisited, crosschecked, and tested for plausibility, and confirmability so as to ensure the validity of research findings. The conclusion must be credible, defensible, warranted, and able to withstand alternative explanations.

4.6.5.2 Strategies and Tools for Data Analysis and Sense-making

The complexity of process research has led to several efforts to offer heuristics and systems to aid the researcher in tackling process studies. These are discussed below:

Narrative

Abbott, (1990) in Pentland (1999) states that description is an essential first step in developing a process theory. Process research usually results in an account that weaves disparate accounts and perspectives from various voices and data sources into a narrative that relates to the research question (Langley, 1999). Hirschheim & Newman (1987) argue that the use of narrative, among other methods, offers considerable scope in interpreting the social actions that are embodied within IS.

Pentland (1999) describes a number of properties of narrative that exist in any set of data as follows: (1) s*equence in time*; (2) *focal actor or actors;* (3) *identifiable narrative voice;* (4) *canonical or evaluative frame of reference;* and (5) o*ther indicators of content or context.* Creation of a narrative based on these properties assists with the data reduction stage of data analysis (Miles & Huberman, 1994) by indicating patterns in the data (Pettigrew, 1997), facilitating initial identification of key themes and categories.

Pentland (1999) describes the structural characteristics of a process narrative in terms of four layers, with each layer presenting a deeper explanation of the processes driving the surface story or narrative as shown below:

Level	Type	Definition	Example
1	**Text**	The telling of a story by a specific narrator	The textual description of an event or action
2	**Story**	A version of a Fabula from a specific point of view	A CIOs own version of their role in the governance of an IS project
3	**Fabula**	A generic description of a particular set of events and their relationships	How the IS project was actually governed. Who did what
4	**Generating Mechanisms**	Underlying structures that enable or constrain the Fabula	Overall IS development and governance process

Table 14 - Structural Characteristics of a Process Narrative (Adapted from Pentland (1999))

The fabula at level 3 is an objective version (or construct) of the basic events and characters required to uniquely identify a particular story. In order to get to the fabula the researcher must penetrate the surface structures at levels 1 and 2 and to provide theoretical explanation one needs to also identify the generative mechanisms that enable and constrain the fabula. The generating mechanisms of level 4 represent deep structure in narrative as they explain the underlying motors that drive the process.

Mechanisms

Van de Ven & Poole (1995) identified four basic generative mechanisms, each type representing fundamentally different event sequences to explain how and why changes unfold. The four mechanisms are: (1) *Life Cycle Process Theory:* the developing entity has within it an underlying form, logic, program, or code that regulates the process of change and moves the entity from a given point toward a subsequent end that is prefigured in the present state; (2) *Teleology Process Theory:* the developing entity is purposeful and adaptive. It socially constructs an envisioned end state and selects a course of action from alternatives. Purpose or goal guides the movement of an entity; (3) *Dialectic Process Theory:* the developing entity exists in a pluralistic world of colliding events or contradictory

values that compete with each other for domination. Stability and change are explained by reference to the balance of power between opposing entities; (4) *Evolution Process Theory:* change proceeds in a continuous process of variation as in evolution. Van de Ven & Poole (1995) propose that all specific theories of organisational change and development can be built from one or a combination of the four basic types.

Probing deeper into the fabula and motors is the equivalent to the data display stage of analysis as described by Miles & Huberman (1994). This step goes beyond data reduction to provide an organised, compressed assembly of information, that allows the analyst discern patterns and interrelationships and build causal maps (Whetten, 1989). At this stage higher order categories emerge from the data that go beyond the process of data reduction. Finally the researcher can proceed to conclusion drawing – stepping back to consider what the analysed data mean and their implications for the research question.

Other Tools

In addition to narrative there are a range of other strategies for analysing process data.

Langley (1999, p. 694) proposes seven generic strategies for sense making from process data. The seven strategies are narrative, quantification, alternate templates, grounded theory strategy, visual mapping, temporal bracketing, and synthetic. These are described in Table 15 over. Each of the strategies described have different strengths and weaknesses and may be combined in any fashion depending on their utility to the researcher.

Strategy	Description	Strengths	Weaknesses	Specific Data Needs	Conceptual Products
Narrative Strategy	Reconstitution of events into an extended verbal account or "thick description"	Enables accounts that reflect ambiguity and nuance. Offers insight based on sense of familiarity. Often useful as an initial step in analysis.	Narratives may read as descriptive, particularistic and hard to generalize. Not always easy to generate a clear conceptual contribution.	One or a few rich cases. Can be helped by comparison.	meanings, mechanisms
Quantification Strategy	Coding of events into quantitative categories analyzed using statistical methods	Enables testing of relationships among temporal phenomena to produce general models	Forces simplification of complex data into the abstract categories needed to allow statistical treatment. Loss of richness	Needs many similar events for statistical analysis: one or few dense cases is best	patterns, mechanisms
Alternate Templates Strategy	Confronting data with several theoretical frames to produce multiple narratives or test alternate theories	Different lenses may generate different insights providing a more complete explanation. Or, multiple lenses may enable the rejection of less accurate theories.	It may be difficult to integrate the insights from different theoretical lenses without loss of parsimony.	One case is enough. Degrees of freedom come from multiple templates.	mechanisms, meanings
Grounded Theory Strategy	Deriving theoretical insight from detailed coding of incidents and relationships among emerging categories	Generates theory that is closely and deeply connected to concrete observed phenomena	A bottom-up process that can result in a very locally valid theory. Sometimes one may miss the forest through detailed focus on the trees.	Needs detail on many similar incidences. Could be different processes or individual-level analysis of one case	meanings, patterns, mechanisms
Visual Mapping Strategy	Representation of processes using diagrams, tables and other visual displays	Deals well with time, relationships. Enables the representation of large amounts of data parsimoniously while retaining some richness.	Cannot capture certain types of data very well (e.g., emotions, subtle ambiguous phenomena etc). Attends to surface patterns more than deeper explanations.	Needs several cases in moderate level of detail to begin generating patterns (5-10 or more).	patterns
Temporal Bracketing Strategy	Generating units of analysis in the form of time periods or phases for which data are compared,	Enables study of structuration processes in which actions from one period contribute to modifying the structures that will affect actions in future periods.	Determining transition points in temporal evolution is critical to effectively using this strategy. Clear temporal breakpoints may not always exist	One or two detailed cases is sufficient if processes have several phases used for replication	mechanisms
Synthetic Strategy	Comparing processes as wholes across cases to detect similarities and differences	A useful strategy for detecting common features in processes and for understanding differences and their antecedents or consequences	Needs clear process boundaries. Tends to compress processes into variables. May result in variance theory, not process theory	Needs enough cases (5+) to generate convincing relationships. Moderate level of detail needed.	patterns, predictions (variance)

Table 15 - Strategies for Analysing Process Data

There are a range of software applications which may be used to help researchers organise and analyse qualitative data. Typical features of such applications include the ability to classify, sort and arrange information and examine relationships in the data. The researcher can also test theories, identify trends and cross-examine information in a multitude of ways using search and query functions. The applications can also be used to build a body of evidence to support the research findings. Software analysis tools can facilitate the development of theory, however they are merely tools to support manipulation of the qualitative data. They cannot replace the insight and abductive reasoning required to produce process theory, a creative process that is impossible to program according to a set of formal procedures.

4.6.6 Stage 6 – Report Findings:

The purpose of the case study report is to describe and analyse the case. For multiple-case design the report will also include a cross case analysis (Yin, 2009). Although reporting is depicted as the last element of the case study process it is recommended that it should be given explicit attention throughout the earlier phases of the case study (Yin, 2009), and should be commenced before data collection and analysis have been completed in order to facilitate continued refinement (Yin, 2009).

A good case report should be interesting and engaging (Darke et al., 1998). It must contain sufficient evidence to support the research findings and should be complemented by a case study database as described in Section 4.6.4 (Yin, 2009). Although there are a range of guidelines on how to structure a case study report (Blonk, 2003; Pratt, 2008; Yin, 2009) there is no set standard (Pettigrew, 1997; Yin, 2009). This is also the case for reporting process studies (Shaw & Jarvenpaa, 1997). It is recommended however that the format and content should be consistent with comparable studies (Darke et al., 1998), and should be appropriate for the intended audience. To demonstrate validity the case report must describe in detail how research results were arrived at, and must present a coherent and persuasively argued point of view (Walsham, 1995b). Sufficient evidence for the research results must be provided and alternative interpretations must be rejected with clear reasons (Darke et al., 1998). The validity of the findings must also be demonstrated by providing appropriate chains of evidence and multiple sources for the evidence. The issue of researcher bias should also be addressed.

Lincoln & Guba (1985) describe four criteria which address the quality of case reports as: *resonance:* a fit between the report and the underlying research paradigm; *rhetoric:* well organised and written with an internal consistency and logic containing no loose

ends; *empowerment:* raises consciousness so as to evoke and facilitate action; and *applicability:* the extent to which inferences can be drawn by the reader.

Finally the report should be regularly reviewed during the writing phase, by a range of appropriate people, including informants (Darke et al., 1998; Yin, 2009) who should be encouraged to challenge findings and assumptions as this will enhance overall accuracy and validity.

4.7 Consideration of Other Qualitative Methodologies

Having established the suitability of a process inquiry using a case study method for the conduct of my research it was felt appropriate to investigate the suitability of other qualitative research methods. Three alternative research approaches are considered below.

4.7.1 Ethnography

Ethnographic research is an in-depth research method stemming from the discipline of social and cultural anthropology, particularly the work of Malinowski (Myers, 1999). Ethnography is a most in-depth research method as it requires the researcher to immerse him/herself in the daily life of the people they study and seek to place the phenomena studied in their social and cultural context (Locke, 2011; Myers, 1999). Rooted firmly in the inductive approach, and adapting a flexible and somewhat unstructured research design, the researcher attempts to suspend his/her own terms of reference and allow themselves to be led by the social setting to new and unexpected insights (Schultze, 2000). Ethnographic research is somewhat similar to case study research in terms of studying a phenomenon in context, however it differs in two main respects: (1) participant observation is the primary source of data (Locke, 2011; Watson, 2011); and (2) it requires that the researcher fully immerse him/her-self in the life of the social group under study in order to provide detailed observational evidence (Myers, 1999; Van Maanen, 2011; Yin, 2009).

Ethnography has become widely used in the study of IS (Beynon-Davies, 1997; Myers, 1999; Schultze, 2000) as it facilitates discovery and the capture of meaning in relation to how people interact with technology on a daily basis. This indicates its applicability to both research and practice in IS (Beynon-Davies, 1997; Harvey & Myers, 1995; Van Maanen, 2011; Watson, 2011). A major drawback to ethnographic studies in business in general however is the need for access as a full time member of the social context in which the research is being carried out (Myers, 1999; Saunders et al., 2009). In

addition ethnographic research takes considerable time to complete the fieldwork and to analyse and write up the material (Myers, 1999).

The applicability of ethnography to the study of IS, and its focus on human and social context, suggests that this method may be a suitable candidate for my research, however there are a number of aspects that limit its suitability to answer my research question. These are: (1) ethnographic research focuses more on the behaviour and thoughts of people and less on the sequence of actions and events that shape an IS initiative; (2) the requirement for real-time immersion limits the choice of subject to an active IS development where the outcome is by default unpredictable; and (3) the nature of failure and its impact on the duration of IS initiatives means that the research timeframe is unpredictable and therefore not suited to a time-bound research undertaking.

4.7.2 Action Research

Action research originates from the work of Kurt Lewin, of the University of Michigan, in the mid 1940's (Coghlan, 2011; Lewin, 1947). Action Research is research in action, concerned with the resolution of organisational issues (Saunders et al., 2009). Action Research is a two stage process consisting of: (1) *a diagnostic stage,* involving collaborative analysis of the social situation by both the researcher and the research subjects, leading to the formulation of theories concerning the nature of the research domain; followed by (2) *a collaborative change programme* and evaluation of the outcome (Baskerville & Pries-heje, 2000; Baskerville & Wood-Harper, 1996; Saunders et al., 2009). It contends that complex social processes are best studied by introducing changes into these processes and observing the effects of the changes.

Action research is interpretive in nature as the researcher is part of the study through intervention (Baskerville, 1999; Coghlan, 2009) and the use of qualitative data is also indicated (Baskerville, 1999). Unlike other forms of academic research Action Research seeks to create organisational change (Avison et al., 2001; Baskerville & Pries-heje, 2000; Coghlan, 2009), and simultaneously study the process (Avison et al., 2001; Coghlan, 2009) making it highly appropriate for the study of IS (Baskerville & Pries-heje, 2000), and the impact of new technologies in an organisation (De Villiers, 2005). The method produces highly relevant research results because it is grounded in practical action, aimed at solving an immediate problem situation, while at the same time informing theory (Baskerville, 1999). However Baskerville & Pries-heje (2000) and Coghlan (2011) point out that Action Research studies have gained only limited

attention in the literature, a point also indicated by Chen & Hirschheim (2004) and shown in Table 10 of this chapter.

One of the main limitations of action research is its consultancy-like approach which can give rise to a relationship between the researcher and the 'client' which diminishes the researcher's ability to control the process and the outcome of the research (Baskerville, 1999). Another limitation is that the collaborative nature of the research can lead to blurring of authority structures within the project, resulting in diminished control over the research (Avison, et al., 2001).

Having evaluated the suitability of Action Research for my research I conclude that it would not be suitable for the following reasons: (1) my research on the role of the CIO is exploratory in nature. It seeks to investigate what role the CIO actually plays and therefore does not purport to influence behaviour in any way, i.e. my research agenda is enquiry (diagnosis) not intervention (treatment); (2) an Action Research agenda is typically set by the client and not the researcher (Coghlan, 2009) which is contrary to the basis of my research, which has emerged from a research question arising from a review of extant literature; (3) the use of an Action Research methodology is most suitable at the commencement of a change initiative, however the success or failure of an initiative cannot be determined at commencement, thereby making a deterministic path through the research process extremely hazardous; and (4) during my search for a suitable case for my research no opportunity to engage on a collaborative basis emerged.

4.7.3 Grounded Theory

The grounded theory methodology first emerged in the 1960s with the publication of a book on the method by Glaser and Strauss (Glaser and Strauss, 1967). This work has become the seminal reference point for carrying out this type of research. Grounded theory is an interpretive research approach in which theory and models are generated inductively from the analysis of contextual data, leading to the discovery of concepts and hypotheses (De Villiers, 2005).

The grounded theory approach involves a number of stages from data gathering to theory development. Data Collection begins as soon as the research commences and all data is relevant at this stage. The data is ordered and analysed using a method called the constant comparative method (Goulding, 2002) which involves comparing the data in search of emerging patterns and themes. This process is called theoretical sampling. Data from interviews, observations, and other sources is analysed using coding techniques called open coding, axial coding, and selective coding which seek to

iteratively group the data into higher order categories. Theoretical saturation occurs when theoretical constructs fit with existing data and the comparison of theoretical constructs with new data does not yield any new insights (Gasson, 2004). It is at this point that theory emerges from the data (Strauss and Corbin, 1998).

Grounded theory is well represented in the area of IS research (De Villiers, 2005; Loonam & McDonagh, 2010; Pozzebon et al., 2011) however Urquhart et al. (2010) and O'Reilly et al. (2012) point out that many studies use the Grounded Theory tenet of constant comparison as a data analysis and coding technique but do not adhere to the other four fundamental principles of the methodology (theoretical coding, theoretical sampling, theoretical saturation, and theoretical sensitivity).

As an interpretive research method grounded theory would be suitable for the conduct of my research as it facilitates the development of theory by induction, and is well represented in the field of IS research. However the central role of time in process orientated inquiry and the specific focus on actions and events unfolding over time indicates that a process inquiry is the most suitable to answer my research question which involves the study of a phenomenon (the role of CIO) that is inextricably connected to a process (IS failure) over time. Although Grounded Theory offers a well-structured approach to data analysis and theory generation there are other equally well established methods such as that presented by Miles & Huberman (1994), that offer comparable data reduction techniques, and which are very applicable to the conduct of a process inquiry.

Finally my preference of a process orientated inquiry rather than Grounded Theory is further justified by the widespread use of this method for the study of phenomena related to IS development and implementation (Shaw & Jarvenpaa, 1997)

4.8 Conclusion

This Chapter set about exploring the range of research possibilities that would be appropriate to answer the research question - *'How does the role of the CIO influence IS failure outcomes?'* Having explored the nature of the IS discipline and the rigor versus relevance debate surrounding academic research in the IS field it was noted that the high degree of diversity in the field indicates that a thorough analysis of the spectrum of philosophical and research appropriate to the discipline should be undertaken before deciding on the most appropriate research design.

Having analysed the spectrum of philosophical paradigms in terms of ontology and epistemology, including the three paradigms of positivist, interpretivist, and critical as

indicated by Orlikowski & Baroudi (1991) for the study of IS, along with quantitative and qualitative research methods and associated data gathering and analysis methods, a decision was made to adopt a qualitative / interpretivist approach as the most suitable strategy to answer my research question. The adoption of an interpretivist approach also indicates that a qualitative approach to data gathering and analysis is appropriate as the study does not seek causal factors based on independent and dependent variables, but rather seeks to enlighten. Because IS failure is a temporally evolving process the suitability of a process orientated approach for data gathering and analysis was then investigated and found to be highly suitable because of its focus on behaviour in organisations, and sequences of events, activities and actions, which unfold over time and in context (Hinings, 1997; Langley & Tsoukas, 2010; Pettigrew, 1997). As contextual understandings are best achieved by direct, first-hand knowledge of a research setting the suitability of a case study approach was then investigated and found to be highly appropriate to the study of IS phenomena (Orlikowski & Baroudi, 1991; Van Maanen, 2011) and for answering 'what', 'why', and 'how' type research questions (Benbasat et al., 1987; Kaplan & Maxwell, 2005). The choice of a process orientated study in a case based setting is further justified by the number of existing studies in IS that have adapted a similar approach. A six stage research framework adapted from Yin (2009), Pare (2004), and Carroll & Swatman (2000) was then described as a suitable approach for the conduct of the study. Finally three alternative qualitative research approaches: Ethnography, Action Research, and Grounded Theory, were also investigated but were rejected on the grounds that they do not fully meet the objectives of my research.

Chapter 5

Research in Practice

Chapter 5 – Research in Practice

It is a capital mistake to theorize before you have all the evidence. It biases the judgment.

(Sherlock Holmes in a Study in Scarlett Part 1, chap. 3, p. 27)
(Conan-Doyle, 2011)

5.1 Introduction

Chapter 4 provided a detailed analysis of the research philosophies and methodologies appropriate to the study of the field of IS. Based on this analysis I chose to adopt a qualitative, interpretive approach as the most appropriate to answer my research question, and decided on the use of a processual methodology, within a longitudinal case-based setting as the most appropriate research design.

This chapter describes how the research strategy was executed to answer the research question - *'How does the role of the CIO influence IS failure outcomes?'* - which was developed after a review of pertinent literature on both the role of the CIO (Chapter 2), and IS failure (Chapter 3).

This chapter describes the research process and presents an insight into the practicalities of carrying out a qualitative / interpretivist inquiry using a processual methodology within a longitudinal case-based setting. Section 5.2 of this chapter highlights the demands of case-based inquiry on the researcher and identifies many attributes required for the role. Section 5.3 describes the decisions made in relation to whether to use a single or multiple case design for the purpose of my research, the rational for the particular method and case chosen, and considerations relating to the chosen case. Section 5.4 describes the initial preparation for conducting the research, including access negotiation, preliminary background data gathering, and the use of a case study protocol to guide the investigation. Section 5.5 describes the practice of primary and secondary field data collection, along with the use of a case study database for organising case data. Section 6.6 provides a detailed description of how the case data was analysed, and presents a theoretical framework based on this.

5.2 The Skill of a Good Researcher

Yin (2009, p. 68) states that the demands of a case study on the intellect, ego, and emotions, *"are far greater than those of any other research method"* and goes on to describe personal attributes which contribute to the skill of a case-based researcher. These are as follows:

1. An ability to ask good questions
2. Being a good listener, not trapped in personal ideologies and preconceptions
3. Being adaptive and flexible to new situations over the course of the study
4. Having a firm grasp on the issues being studied
5. Being sensitive to contradictory evidence

Although I am a novice academic researcher I have over 30 years' experience as a practitioner in the field of Information and Communications Technology (ICT). I have worked in the areas of IT engineering, systems analysis, data networking, ICT consultancy, and sales management and training. In particular my roles as a systems analyst (8 years) and ICT consultant (10 years) have involved requirements analysis and specification, systems design, research into new technology innovations, and specification and design of bespoke networking solutions for clients, which have contributed to the honing of my skills as described by Yin (2009) above.

In Chapter 4 I acknowledge that topics of research often reflect the researchers biography and personal interests (Flick, 2009), and the potential for bias that practitioner experience invariably instils in an individual. Cognisant of this I have endeavoured to include as much review as possible into both the conduct and output of my research throughout the research process, and have encouraged a range of appropriate contributors to challenge my work, particularly in regard to assumptions and bias that I may unconsciously carry.

5.3 Selection of a Case for My Research

5.3.1 Single case Vs Multiple Case Design

A primary decision in designing case study inquiry is the choice between multiple-case and single-case design. The advantages and disadvantages of both methods have already been presented in Chapter 4.

Before a decision was made regarding the most appropriate type of inquiry, consideration was also given to some issues surrounding the topic of inquiry. Firstly the

context of the study relating to IS failure may limit the availability of suitable research opportunities. Drevin (2008) highlights the difficulty in gaining access to data on IS failure as people and companies may wish to hide such incidents. This is due to negative emotions generated by the amount of psychological ownership participants invest in projects, and the negative emotions which can be attached to a failed endeavour (McGrath, 1999; Shepherd & Cardon, 2009). When project failures are emotionally painful they are less likely to be discussed, which in turn can lead to a failure to learn from failed IS projects (Abdel-Hamid & Madnick, 1990; McGrath, 1999; Shepherd & Cardon, 2009). Although there is an expansive body of case research in the field of IS failure there is little explication about how access for such research is negotiated, and in particular the level of rejection that may have been encountered. Mark Keil, a prominent academic in the field of IS failure, states that: *"Given the sensitivity that surrounds most failing projects ... the researcher may seldom have the opportunity to structure the type of multiple case-study design that would be desirable. Instead, one must sometimes follow a more opportunistic approach even if that means settling for a single case study"* (Keil, 1995, p. 447). Secondly, as described in Chapter 3, large IS initiatives tend to be complex and of a longitudinal nature. This limits the scope for an individual researcher due to the time required and the amount of data involved. This complexity however also offers the opportunity to present an empirically rich and unbroken case narrative that is not possible from multiple-case research (Eisenhardt & Graebner, 2007).

On the basis of the above a decision was made to undertake a single-case design. This decision is consistent with my chosen research strategy and will facilitate a qualitative/interpretive process inquiry. The potential of a rich in-depth longitudinal study of this kind, to add significant theoretical insight, should not be underestimated due to the rarity of the opportunity to study such a phenomenon.

5.3.2 Identification and Selection of the Research Candidate Case

The selection of a research candidate is influenced by the appropriateness of the case to the research topic and the research question (Pan & Tan, 2011; Pettigrew, 1990). Siggelkow (2007) also makes a compelling argument for choosing an interesting case, however pragmatism would suggest that a 'talking pig' does not present itself very often. Notwithstanding this, as already stated in Chapter 3, each case of IS failure is unique in some fashion and will therefore provide a unique setting for a novel study on the role of the CIO.

Based on my research question a set of selection criteria was drawn up in order to evaluate suitable candidates which is shown in Table 16 below:

Criteria	Desirable Attributes	Rationale
IS Type:	• A large enterprise wide or cross departmental IS initiative which has been deemed a failure by the organization, or which has delivered significantly less functionality than originally planned. • a lengthy development cycle involving a sizable project team	• Large system increases the complexity, length of time to develop, and the number of stakeholders thereby increasing the potential for multiple potential failure conditions spanning the three spheres of influence over the outcome of an IS initiative, offering a rich pool of longitudinal data.
IS Status:	• Further development of the initiative has ceased or the initiative is deemed to be in the terminal stages of failure.	• Conforms with Sauer's description of IS failure as occurring when the level of dissatisfaction with a system is such that there is no longer enough support to sustain it.
Organization Type:	• A large private or public sector organization. • National or international • Multiple stakeholders (internal / external) • Preference for mature IS function with IS personnel operating at senior level • One or more CIOs (or equivalent) in office	• This is considered the most likely candidate to meet the preferred conditions of the IS Type as described above
Access:	• Information regarding the failed initiative must be significantly in the public domain and/or the organization is willing to engage in the research process	• Need to ensure that sufficient data is available for the successful conduct of the research

Table 16 - Research Candidate Selection Criteria

The search for a suitable research candidate was undertaken by trawling popular practitioner journals and web sites, discussions with a number of CIOs that are known to the researcher, and discussions with academic staff within Trinity College. Discussions with a number of CIOs in the private sector indicated a level of reticence about discussing specific cases of IS failure due to perceived commercial sensitivity and internal corporate policy relating to the disclosure of information. This level of privacy does not apply to the same extent in the public sector because of stringent public management accountability regulations, strict regulations in relation to governance, the existence of audit functions such as the Comptroller and Auditor General, and the publication of Value for Money and other such reports. Based on this, and cognisant of the scale of IS development undertaken within the public sector, a search was conducted into cases of IS failure within the public service, in Ireland and

the UK, which had been the subject of published audit reports. Three potential research candidates emerged from this search as follows:

The Public Sector Broker (PSB): The PSB was part of an Irish government strategy to modernise and improve the quality of service delivered to customers of the Irish Public Service. The PSB was intended to deliver an ICT services platform, crossing traditional departmental boundaries, and consolidating all the necessary data to progress public sector transactions for the individual and business community. The PSB initiative was conceived and initiated by the Dept. of An Taoiseach[11] and the Dept. of Finance, however the planning and delivery of the initiative involved many stakeholder organisations, within and external to, the Public Sector; some with dedicated IS departments headed by CIO equivalents. The PSB was delivered four years late in a significantly scaled-back form and was eventually closed in 2008 (Nolan, 2010).

NOMIS: In June 2004, the newly-created National Offender Management Service (NOMS), then part of the British Home Office, initiated the National Offender Management Information System project (C-NOMIS) to implement a single offender management IT system across prison and probation services (The Comptroller and Auditor General, 2009). The C-NOMIS was intended to support a new way of working, known as end-to-end offender management, and to replace existing prison inmate and local probation area offender case management systems with one integrated system, allowing prison and probation officers, and others, to access shared offender records in real time. The system was scheduled for completion by January 2008 with an approved lifetime cost of £234 million to 2020. In 2007 however a National Audit Office investigation found that £155 million had already been spent on the project and it was two years behind schedule (BBC News, 2009). In January 2008, work began on a re-scoped programme with an estimated lifetime cost of £513 million and a delivery date of March 2011 (Ritter, 2009).

UK NHS Patient Care Record System: Central to the National Programme for IT in the UK NHS Programme, is the creation of a fully integrated electronic care records system to enable the rapid transmission of information between different parts of the NHS. A report by the National Audit Office (NAO) in 2011 found that although some care records systems were in place, progress against plans has fallen far below expectations (The Comptroller and Auditor General, 2012b). There have been delays in software development and delivery, difficulties in implementing standard systems

[11] The Department of the Prime Minister of Ireland.

across the NHS, and contractual issues that have led to one supplier exiting the programme, and the contract for another being terminated. Based on progress to date the NAO has stated that the £2.7 billion spent to date (2011) does not represent value for money, and that they had no confidence that the remaining planned spend of £4.3 billion will be different. A further report by the House of Commons Public Accounts Committee in July 2013 highlights on-going shortcomings in the delivery of the systems, the uncertainty surrounding future costs, and difficulties in renegotiating contracts with one of the major providers due to failure on the part of the Department of Health to meet its own contractual obligations (House of Commons, 2013).

Contact was initiated with relevant parties in all of the candidate sites. Initial contact regarding the PSB was made by my supervisor to two senior public servants who are past pupils of Trinity College, and who were directly involved with the PSB initiative. Both parties expressed enthusiasm about the research on the basis of the value such a study would yield in relation to the management of large IS initiatives. Contact with UK Civil/Public Service was initiated by the researcher by e-mail followed by a teleconference with the Director for Home Affairs and Justice Value for Money Department at the National Audit Office. The reaction to my proposed research was positive and it was noted that a recent report (The Comptroller and Auditor General, 2009) of the UK National Audit Office had made a specific recommendation regarding the role of the government CIO in the assurance of large scale IT programmes, however it was also stated that a recent report had been presented by the Comptroller and Auditor General in relation to assurance for major projects (National Audit Office, 2010), and on that basis it was suggested that a study with an Irish context would provide additional value over and above that which had already been published.

Based on the above discussions a decision was made to select the Public Service Broker (PSB) for the purpose of my research. The suitability of the case for the research topic is enhanced by the fact that there exists a very good professional relationship between Trinity College and the Irish Public Sector. Furthermore the Irish Government recently announced a renewed focus on the subject of e-government, indicating a renewed interest in electronic service delivery, and a commitment to the creation of a new e-Government strategy (Kennedy, 2011).

5.3.3 Considerations for Inquiry into the PSB

Understanding IS failure is a complex activity. Furthermore, obtaining information on IS failure and the contextual circumstances surrounding it can be problematic as different stakeholders may disagree about what went wrong, may have a certain bias because

of the emotive effect of failure, and may attribute different reasons when reflecting on events (Wilson & Howcroft, 2000, 2002). Fincham (2002) states that the narrative perspective can provide a fully interpretive understanding of success and failure, particularly in regard to initiatives which include systems development, because it can incorporate the multiple and often conflicting views and perspectives of stakeholders, along with the associated rich contextual information.

A key challenge in the selection of the PSB as my case research subject is that the PSB initiative was disbanded in 2008 since which significant organisational changes have taken place, including reassignment or resignation of key informants. Ruspini (2000) reminds us that the researcher must take account of the changes that invariably happen over the course of a longitudinal study and must take care to apply a set of rules as to how these changes are incorporated into the study so as to ensure high quality and consistency of the data used for the research.

5.4 Initial Preparation

5.4.1 Access Negotiation and Preliminary Meetings

In selecting an appropriate research candidate one should be mindful that gaining access to an organisation for research purposes is not a trivial exercise. For example Pan & Tan (2011) note the low rate of success for unsolicited requests for research purposes to organisations. Pettigrew (1990) proposes a strategy of 'planned opportunism' which involves the selection of a candidate site based on criteria which include, among other things, chance and opportunism.

Pan & Tan (2011) highlight the importance, and good practice, of having an endorsement from a benefactor and/or an institution with recognised credentials (e.g. a recognised academic institute). The School of Business at TCD has had a long and fruitful relationship with the Irish Public Service over many years. Contact was initiated with two senior public servants who were directly involved with the PSB initiative, a senior project manager, and a senior organisational change manager. Pan & Tan (2011) recommend that the first interview should take place with an informant who can provide an overview of the phenomenon under study, and who can identify other key people involved. Preliminary meetings were arranged between the researcher and both parties, the purpose being to obtain an overview of the case history of the PSB, identify the relevant parties involved in the initiative, and obtain documentation (internal and external) relating to the case.

5.4.2 A Review of Relevant Background Material

A number of key reports and project reviews were used to provide an overview of the PSB initiative over its 9 year life cycle, and provide an assessment of the outcome of the initiative. The following reports were selected for initial study on the basis that they are official publications, they provide the complete history of the PSB project from beginning to end, and contain detailed discussion and analysis of the PSB based on a comprehensive investigation with the cooperation of multiple stakeholders. These were:

Implementing the Information Society: A Framework for Action: published in December 1998 by the Interdepartmental Implementation Group on the Information Society includes the idea of *"seamless, client-centred electronic interaction with public administration"* (p. 29) taken to be a reference to tying all services together through a common interface such as the PSB (Department of An Taoiseach, 1998a).

New Connections: published in March 2002 this was the second and more ambitious government action plan for implementing the information society. *New Connections* confirmed the Public Services Broker (PSB) as the framework for integrated service delivery through a single point for access to all on-line public services (The Information Society Policy Unit, 2002).

Comptroller and Auditor General Special Report 58 – e-Government: published in October 2007 a comprehensive review and report on the e-Government programme including the PSB (C&AG, 2007).

Ireland: Towards an Integrated Public Service: a comprehensive report published by the OECD in 2008 which analyses the success and challenges of Public Service reform in Ireland since the mid-1990s (OECD, 2008).

The four publications above in conjunction with the two initial fact finding interviews confirmed the applicability of the PSB as a suitable research subject to answer my research question and assisted in constructing the case study protocol which is shown in Appendix 3 and discussed briefly in section 5.4.3 below.

5.4.3 Structuring the Investigation

The use of a case study protocol is recommended for the conduct of a case-based inquiry (Maimbo, 2003; Runeson & Höst, 2009; Yin, 2009). The case study protocol is a comprehensive set of guidelines that describes the procedures for conducting the

research, the type of data to be collected, and the guidelines for data analysis, and therefore is a valuable instrument for setting out how the case study is to be conducted.

A Case Study Protocol was constructed for this body of research and appears in Appendix 3. In addition to a description of the case and the primary purpose of the research the Case Study Protocol includes guidelines for the type of evidence to be collected, primary data collection procedures (including an interview protocol), and additional protocols relating to ethics and the use of a case study database.

5.5 Field Data Collection

Data collection over the course of the research was a rigorous process of collecting a rich set of both primary and secondary data, with the aim of building a well organised and categorised set of case data (Darke, Shanks et al., 1998). For the conduct of a processual inquiry Pettigrew (1990) states that data collecting should be *"processual, comparative, pluralist, historical, and contextual"*. Data collection therefore was focused on event sequence data, as well as causal and consequential factors, the identification of relationships among these components, and contextual factors relating to the unfolding events. The selection of data sources also took into account the longitudinal nature of the PSB (Radeke, 2010).

Case-based research uses a range of data sources: (1) written documents such as memoranda, newspaper clippings, and formal reports; (2) archival records (including financial reports); (3) interviews; (4) direct observation; (5) participant observation; and (6) physical artefacts (Darke, Shanks et al., 1998; Yin, 2009). Multiple sources of evidence provide a rich narrative and facilitate data triangulation, which in turn will strengthen the reliability and validity of the resultant theory (Dube & Pare, 2003; Yin, 2009).

5.5.1 Primary Data Collection

The primary source of data in a qualitative interpretive case study is the interview (Pan & Tan, 2011; Yin, 2009). The use of interviews is also well established in the field of IS research (Schultze, 2011). Preliminary investigations however also indicated the existence of a number of reports and evaluations of the PSB initiative which the researcher considers to be primary data as explained below. These are presented in chronological order of publication:

Modernising Service Delivery: A Blueprint for Development and Change: A report by an external consultant following a 1 year consultation with the Reach Agency featuring dialogue with a wide range of individuals and groups throughout the Irish

public service and beyond. The report highlighted a number of organisational issues that may negatively impact on the Government's strategy of service modernisation which included the deployment of the PSB (McDonagh, 2004).

Evaluation of Donegal Integrated Service Delivery Project: This report represents the culmination of an extensive evaluation exercise, examining progress of the Donegal ISD Project. The project was a partnership initiative involving Donegal County Council, Comhairle, the Department of Social and Family Affairs, Donegal Citizens Information Service, FÁS and the Health Service Executive (Fitzpatrick Associates, 2006).

Comptroller and Auditor General Special Report 58 – e-Government: described in Section 5.4.2 above (C&AG, 2007).

Reach Board (3rd Reach Board) Review of the Reach Project (2008): a government initiated full review of the Reach project which assessed and made recommendations on the continued validity of the PSB, the appropriateness of the chosen technology platforms in the light of advances in technology, and the adequacy of governance and resourcing arrangements (The 3rd Reach Board, 2008).

Ireland: Towards an Integrated Public Service: described in Section 5.4.2 above (OECD, 2008)

VFM Report 65 of the Comptroller and Auditor General – Public Service Case Studies: a 20,000 word transcript of the value for money hearing of the Public Accounts Committee (PAC) into the Comptroller and Auditor General Special Report 58 – e-Government (as listed above). The hearing was attended by the three departments with overall responsibility for the development of e-Government and the PSB; Dept. An Taoiseach, Dept. Finance, and Dept. Social and Family Affairs (DSFA) who were subject to examination by the committee on the findings of the report (Public Accounts Committee, 2007).

The Dynamics of Collaboration in IT-enabled Change: The Case of IT: a doctoral thesis submitted to the University of Dublin, Trinity College examining the effectiveness of collaborative engagements during the development of an IS (the case of the PSB). The thesis contains a significant amount of background information on the PSB project and incorporates the results of interviews with 26 informants (Nolan, 2010).

Because these documents represent formal, professional investigations into the PSB, and are based on extensive investigative work incorporating a comprehensive set of

archival data, extensive interview programmes, and investigative workshops, with a wide-ranging set of PSB stakeholders, their use alongside interview material was considered essential to building a comprehensive and rich picture of the PSB initiative. This strengthens the overall reliability of the findings as the reports tend to be more formal and less personalised than interview data, and are subject to rigorous review internally before publication, and externally by the public following publication. Use of this material also provided a rich pool of material for data triangulation, both among themselves, and for corroborating interview data. The wide chronological span of the publications (2004 – 2010) also yields an interesting picture of the PSB at different stages of the initiative, a key ingredient in a process inquiry. Details of the research methodology utilised for each study is provided in Appendix 4.

5.5.1.1 Interviewing

Yin (2009, p. 106) describes interviews as *"guided conversations rather than structured queries"* where the stream of questions is fluid rather than rigid. This makes interviews very suitable for qualitative, interpretive studies as (if skilfully executed) they bring us closer than any other method to an intimate knowledge of people and their social world (Hermanowicz, 2002), and facilitate the search for meaning, intentionality, and context; all of which are major objectives of qualitative research (Hermanowicz, 2002; Schultze, 2011)

Yin (2009) identifies two types of interview: an *in-depth interview* where, in addition to the facts of the matter the researcher can ask questions so as to elicit opinion and insight relating to the topic at hand, and a *focussed interview* which, as the name suggests, is designed to focus on specific facts using a specific set of questions, usually to corroborate previous information.

Interviewing is a skill that must be learned over time. There are many prescriptive texts about how to conduct good interviews (Pan & Tan, 2011; Saunders et al., 2009; Yin, 2009; Kvale, 1996) however Hermanowicz (2002) cautions against rigidly following an interview methodology as this can make the experience overly procedural at one end or totally unstructured at the other, and proposes that the art and science of the interview process should be carefully balanced.

Cognisant of the above precautions three overarching principles informed the conduct of each interview: (1) *personal awareness and conduct*, preparation for the interview, conduct during the interview, including an assessment of one's own bias; (2) *ethics of interviewing,* paying particular attention to the issues of informed consent,

confidentiality, and consequences; and (3) *recording and transcription*, including seeking permission to record the interview. A detailed guideline for interviewing is contained in section 3 of the Case Study Protocol in Appendix 3. In addition an individual interview protocol was drawn up for each interview a sample of which is shown in Appendix 5.

Prior to commencing the interview stage of the inquiry the key reports described in 5.4.2 above were consulted to provide a complete overview of the PSB initiative over its 9 year life cycle. The internet also provided a rich source of secondary data to augment the reports. Following this review initial meetings were arranged with two senior public servants who were directly involved with the PSB initiative, a senior project manager, and a senior organisational change manager. These interviews provided additional insight into the PSB initiative and the personnel involved that were not contained within the reviewed documentation. The interviewees helped in the construction of an organisation chart of the PSB including the key personnel involved, and agreed to arrange contact with a number of key personnel, and also provided contact information (phone numbers and e-mail) for other potential respondents. They also contributed or made the researcher aware of additional secondary documentation relevant to the case. Based on the initial interviews a stakeholder diagram was constructed for the PSB showing the key entities involved, the relevant personnel, and the relationship(s) among them. This is shown in Appendix 6. A follow up meeting with one of the initial interviewees was conducted to confirm the accuracy of understanding of the PSB and to insure that no false assumptions or conclusions had been drawn at this stage.

Based on the initial interviews and the resulting relationship diagram a list of candidate interviewees was drawn up and contact was initiated by the researcher, either by phone or by e-mail. A number of candidates declined to be interviewed citing various reasons including unwillingness to be associated with the project, fear of comments getting into the public domain, and loss of memory relating to the project. This was despite assurances given by the researcher about confidentiality, including an offer to draw up non-disclosure agreements. This was not unexpected and did not impact on the overall richness of the data collected, or the integrity of the investigation, as those who agreed to partake were very candid during the interview process. Furthermore the interview data was supplemented by the rich data provided by the official studies on the PSB as described above.

A total of 11 respondents agreed to be interviewed in person. The interviews were conducted either at the premises of the interviewee, in Trinity College Dublin, or in a venue chosen by the interviewee (e.g. hotel). Interviews ranged in length from one to two hours.

Interviewee Type	Number
Senior Government Officials	8
IT / Project managers	2
External Consultants	3
Dáil Deputy	1

Table 17 – Interviewees by Type

A further three respondents agreed to discuss the PSB initiative by telephone and e-mail correspondence and are included in table 17 for completeness. All of the three provided similar narratives to those provided in face to face interviews and also contributed significant additional data regarding the management of projects in general in the public service, and the PSB in particular, including details about the termination of the PSB initiative. The spectrum of role responsibilities among the interviewees provided a comprehensive perspective on the entire PSB initiative from a technical, project, departmental, senior management, and government perspective. No interviewees were available from Propylon or CMG Admiral as the personnel involved with the PSB have since moved on, and attempts to trace them were unsuccessful. This did not in any way impact upon the quality of primary data as both consultancies were engaged during the early stages of the project to provide technical assistance and therefore did not significantly impact upon the trajectory of the PSB initiative over its lifetime. A redacted list of all 14 primary respondents is provided in Appendix 7.

A further source of direct first-hand account of the PSB initiative was taken from the report of the inquiry of the Public Accounts Committee (VFM Report 56 of the Comptroller and Auditor General) and direct quotations from this inquiry have been included in Chapter 6 (The Case of the Public Services Broker), and Chapter 7 (Towards a Theory of how the Role of the CIO Influences IS Failure Outcomes) as primary data. All quotations attributed to respondents at the PAC inquiry are represented by a respondent number followed by PAC, e.g. (R16 PAC) to delineate them from those interviewed for this research.

Interviews were conducted in accordance with the guidelines for interviewing as set out in the case study protocol (Appendix 3), and interview protocol (Appendix 5), including personal awareness and conduct before, during, and after the interview, and ethical considerations relating to the conduct of interviews. In line with the research protocol interviews were recorded where permission was granted. Two interviewees refused permission to record the interview on the grounds that they still worked in the ICT industry and did not wish for anything said at the interview to be presented as a direct quotation. In these cases the researcher took notes during the interview, which were then typed and referred back to the interviewee for correction in the event that an error in interpretation was made, or a comment was considered, in hindsight, to be potentially over inflammatory. All recorded interviews were transcribed and offered to each respondent for review and correction. Surprisingly most respondents did not express a wish to see the transcripts but did express an interest in seeing the completed case report due to their on-going interest in the PSB as an interesting case, along with the lessons that may be learned for future IS developments.

As the research approach is a process based inquiry the main objective of each interview was to secure a narrative from each interviewee of the trajectory of the PSB initiative, including their involvement, the involvement of other key personnel, and contextual factors surrounding the initiative. Therefore the opening question (following preliminaries) focused on the interviewee's account of the PSB initiative from their perspective and their role therein. Each interview was allowed to flow at the pace of the interviewee with the interviewer presenting prompts to continue, or questions of clarification only when considered appropriate. A set of prompter questions were developed prior to each interview which were considered to be relevant to the role of the interviewee, however these were only used when required, or if the researcher considered that additional valuable insight could be obtained. As the number of interviews increased a number of recurring themes began to emerge which were also included in each interview guideline to elicit additional insight if required, but only used if the subject had not been addressed during the interview. Towards the close of the interview each respondent was asked the question "what would you do differently if starting again?" which often yielded further insight into the failure, or confirmed previous accounts.

Cognoscente of the potentially emotive nature of the topic of failure, and the historical nature of the PSB case, the researcher took a number of steps to identify potential sources of inaccurate, anecdotal, or bias laden commentary. Firstly each piece of data

was checked against other sources, and consistency checks were carried out against the published reports described above. Secondly following each interview the researcher recorded a brief commentary about the interview, with a particular emphasis on the position of the interviewee, a sample of which is provided in Appendix 8. Later transcribing the commentary allowed the researcher to also reflect on his own bias relating to the interview. Thirdly the recorded interviews were listened to several times to identify any inappropriate commentary such as laughter or sarcasm when describing an incident or person. Fourthly the transcripts of each interview were read several times to further check for any inconsistency in the commentary. Lastly a number of follow up phone and e-mail conversations were conducted to clarify issues, seek additional information, test assumptions, and generally maintain contact for any future inquiry relating to the research.

An advantage of this rigorous approach was highlighted by the emergence of an interesting pattern regarding the attribution of 'blame' for the failure. Internal stakeholders tended to attribute 'blame' for the failure of the PSB on the project and support personnel, whereas external stakeholders focused more on the failure by the government to set up the project correctly.

5.5.2 Secondary Data Collection

In addition to the collection of primary data a range of secondary data was gathered over the course of the research. A total of 146 secondary data items were referenced during the research, not including a significant number of websites. Secondary data consisted of official government plans relating to the Information Society and the PSB including reviews of various government modernisation initiatives. Additional documentation related to EU Information Society initiatives, Irish Government modernisation, Social Partnership agreements, strategic plans relating to government departments and local government, department of Finance directives on capital appraisal, and a range of reports and academic studies on performance indicators relating to government in general, and service modernisation in particular. A list of secondary data in included as Appendix 9.

Much of the secondary documents were in the public domain. Other material, such as internal reviews of the PSB and technical specifications, was provided by interview candidates. The internet also proved to be a rich source of data, providing a range of material relating to the development of e-Government in Ireland and worldwide, and the PSB in particular.

Secondary data was used to inform both the construction of interview questions, as a source of additional rich data, and to support data triangulation facilitating the development of chains of evidence.

5.5.3 Organising Research Data

Data was organised through the use of a case study database which is described in the Case Study Protocol in Appendix 3. The case study database provided a single repository of all case material which can be easily referenced in support of the research findings. The case study data base was constructed as a hierarchical folder structure in Microsoft Windows 7. The database comprised of four first order folders containing: (1) **Case Protocol** (documents relating to the conduct of the case including the research protocol and interview protocols); (2) **Secondary Documents** (containing 146 documents categorised into 28 sub-folders based on source/origin of document; (3) **Fieldwork** (interview protocols, interview audios, interview transcripts, case notes, respondent communication); and **Data Analysis** (The case of the PSB in nVIVO, tabular data, process diagrams). Folders were further sub-categorised, as required, to facilitate easy migration around the case study database.

5.6 Data Analysis

5.6.1 Use of Data Analysis Software.

The software tool NVivo V.10 was utilised during the data reduction phase of the data analysis. NVivo enables one to collect, organise and analyse content from interviews, focus group discussions, surveys, audio, social media, videos and webpages. It provides a central repository for qualitative research data and facilitates structuring and exploration of the data. It is the leading software for analysing unstructured data, with over 1.5 million users in 150 countries. It is not however intended to provide analysis intelligence which is the role of the researcher.

5.6.2 The Coding Process.

5.6.2.1 Data Reduction

Firstly all of the interview transcripts, participant correspondence, and relevant sections of the primary data reports were analysed on a line by line basis and coded into NVivo. This resulted in the creation of 173 nodes (or codes) containing a total of 972 text blocks. A sample page of coding using NVivo is shown in Appendix 10. Moving towards the data display phase of data analysis the data was then analysed in a two stage process to identify: (1) the process of failure; and (2) the characteristics of the process of failure. These are described below.

5.6.2.2 Data Display - Stage 1

The first stage of the data display phase of data analysis focused on identifying key events, actions, and outcomes, and arranging them in a chronological order so as to develop a picture of the PSB initiative as it evolved over time. An ***event*** was defined as a discrete identifiable occurrence - *"the committee signed off on 30th May"*, an **action** as something that someone does *"I approached Jim Duffy and asked him to engage"*, and an **outcome** the result of an action(s) or an event(s) - *"6 responses were received to the tenders"*. An initial trawl of the 972 data blocks resulted in the identification of 414 actions, events, and outcomes which were chiefly the result of the semi-structured approach adopted to interviewing which allowed a narrative of events relating to the PSB to unfold, and helped to identify key events and decision points.

An iterative analysis of each of the 414 blocks of data resulted in the identification of key events which were critical to the progress of the PSB initiative, and represented defining moments in its life cycle. Further iterations resulted in the emergence of six key phases/stages which were bounded by an event or decision without which the next phase/stage of the development would not have occurred, and which represented a key failure point. The six emergent phases/stages are: *genesis; initiation & conceptualisation; design; development; operation; and termination*. A scheme of temporal bracketing, based on the six key phases/stages, was then used to bracket the 414 events into an appropriate stage/phase. This process is summarised in Figure 10 below. A sample of the temporal bracketing mechanism used is provided in Appendix 11.

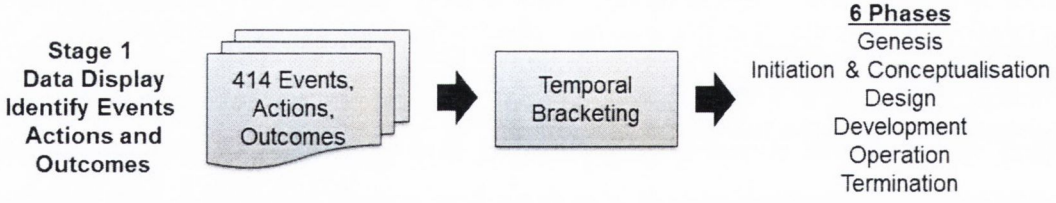


Figure 10 - Stage 1 Data Display – Identification of six chronological phases

It is noted that the six emergent phases/stages are analogous to the *Teleology Process Theory* (Van de Ven & Poole, 2005) which describes a generating mechanism whereby the developing entity is purposeful and adaptive. Purpose or goal guides the movement of the entity in a similar way to an IS deployment therefore it is not surprising that the

emergent phases/stages are also analogous to the waterfall model of the software development life cycle (SDLC) as described by Boehm (1987), Taylor (2000) and others whereby the IS is built in a deliberate and structured way by following a set of phases of development, that are typically carried out sequentially, with the input of each phase arising from the output of the previous phase. As further corroboration it is noted that the SDLC approach is often associated with the construction of large, pre-planned systems, and is a preferred approach of many government IS functions (House of Commons, 2011), including the Government of Ireland (R9). The six phases/stages are described below.

Genesis: This phase represents the initial seeds of an innovation initiative. The phase typically consists of the development of an innovation concept, garnering of support for the proposition, and successfully presenting a successful case (backed by the necessary support) to proceed to either a further stage of refinement, or design. In the case of the PSB this phase is bounded by the publication in December 1998 of the report *Implementing the Information Society In Ireland: A Framework for Action* (Department of An Taoiseach, 1998a) which first described the efficiencies that could be derived by having a *"common access interface for use by citizens in availing of public services and accessing information"* (p. 5). The phase closes with government endorsement in May 2000 for the development of the PSB, and the assignment of responsibility to the Reach Agency to deliver the project.

Initiation and Conceptualisation: This phase represents the formal initiation of an innovation project in order to confirm feasibility of the original concept, assign responsibility for the project, and to ensure all necessary support and resources are in place. In the case of the PSB this phase covers the period from the assignment of responsibility for developing the PSB to the Reach Agency in May 2000, to the delivery of an initial proof of concept of the PSB system in August 2001.

Design: This phase represents the stage where a full conceptual design of the original concept is completed. In the case of the PSB this phase represents the period from immediately after the delivery of the proof of concept in August 2001 to the selection in December 2003 of a partner to construct the PSB system based on the architectural model of the PSB that had been developed during this phase.

Development: This phase represents the translation of the conceptual design from the previous phase into a working solution. In the case of the PSB this phase brackets the period from the award of the contract to Bearing Point in December 2003 to the release of the PSB system in December 2005.

Operation: This phase represents the operational phase of the developed artefact whereby the value gained from the resources expended in prior phases begins to be realised. In the case of the PSB this phase covers the Period from December 2005, when the PSB system went live, to June 2007 when, on foot of the Government decision of 6th March 2007 (S 180/20/10/0466) a reconstituted Reach Board (the 3rd Reach Board) was established to undertake a comprehensive review of the PSB.

Termination: Termination represents the process of abandonment of an innovation. Project abandonment can occur for a range of reasons including the natural end of life of an innovation. In the case of the PSB this phase covers the period from the establishment of the reconstituted Reach Board (the 3rd Reach Board) to the closure of the PSB on 1st April 2008.

5.6.2.3 Data Display - Stage 2

Having identified six key phases/stages of the PSB initiative the next stage of data analysis (Data Display – Stage 2) involved a second pass of the primary data in order to gain an insight into the failure process as it related to the PSB with a view to identifying a set of defining characteristics of the failure as they related to the development process, along with the associated person or entity involved. Each of the 173 nodes (which had already been reduced from the 972 text blocks) were re-analysed with a particular emphasis on failure and its primary causes. All 7 primary data documents (as described in section 5.5.1 above) were also re-read along with each interview transcript in order to develop a holistic picture of the failure process with a view to identifying key themes which could provide direction for this stage of data display. This proved very fruitful as a number of key failure themes began to emerge out of this exercise. Firstly the flawed nature of the original vision for the PSB was regularly cited, in both the interview transcripts and the reports on the PSB outcome, as a cause of its ultimate closure. The vision also underwent a series of changes over the life of the PSB as the complexity of the original vision began to surface a number of technical and organisational difficulties which resulted in the final product falling far short of the original vision. Secondly the capability of the Reach Agency and its Director, the CIO, was a recurring theme in the narrative of the causes of failure. Both of these themes were used as guiding foci which could aid in further analysis of the data.

Each of the 173 nodes from the initial data reduction stage underwent a further process of rigorous scrutiny which involved quite a significant amount of re-positioning of the

data involving disassembling, consolidating, restructuring, and renaming as appropriate. This was the most intensive part of the analysis phase which resulted in the 173 nodes (972 text blocks) being reduced to 85 themes which are described as 3rd order themes. A further round of consolidation reduced the number of themes to 38 (2nd order). Using the two overarching themes as described above the concept of '**Vision**' and '**Execution Capability**' emerged as possible key characteristics of failure (1st order). It was quickly identified that 18 of the 38 2nd order themes could easily be aligned with these two 1st order themes. Figure 12 below describes the mapping of the 3rd and 2nd order themes to the emerging characteristic Execution Capability.

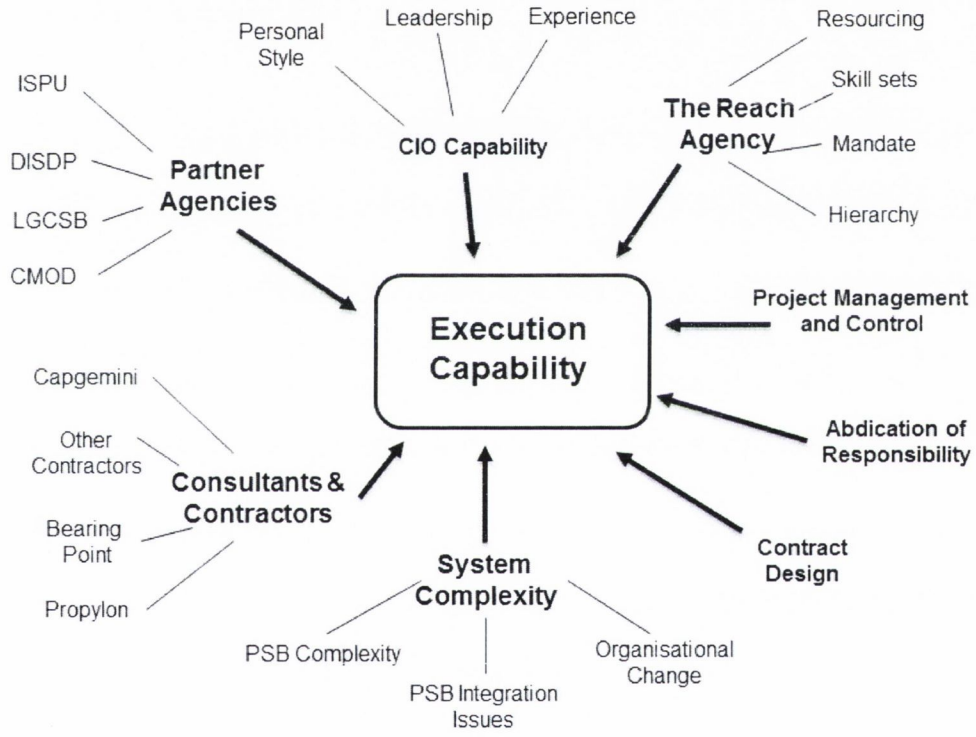


Figure 11 - Mapping of Themes to the Execution Capability Dimension of Failure.

The final phase of stage 2 – data display involved the identification of an additional two 1st order themes which could be aligned with the remaining 19 2nd order themes. These were labelled **Support** and **Governance.**

For the complete description of the matching of 3rd and 2nd order themes to the emerging themes please refer to Appendix 13.

The data display – phase 2 process is shown in Figure 11 below.

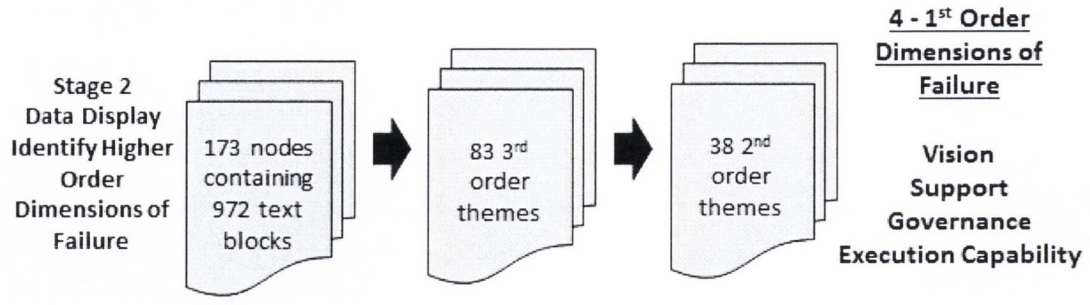


Figure 12 – Data Display Stage 2 - Emerging Higher Order Themes and Dimensions

The four emergent dimensions of failure are: *vision; support; governance; and execution capability*. As a test to the validity and comprehensiveness of the four dimensions each was compared with the subsystems of IS project risk as described by Wallace et al. (2004), Yeo (2002) and Kappelman et al. (2006), which were described in detail, and summarised in Tables 7, 8, and 9 of Chapter 3. It was found that each emergent dimension of failure could be matched with a symptom of failure as described by the subsystems of project risk (refer to Appendix 12), thereby indicating the reliability of the four dimensions as comprehensive, overarching constructs with which to conduct an inquiry into IS failure. The four dimensions of are further supported by links to extant literature as described below.

Vision: Vision describes the concept of the initiative, what the system is required to achieve for the organisation. Vision includes an understanding, not only of the required functionality of the system, but broadly how it will be achieved, including an evaluation of the impact of the system on the current equilibrium of the organisation along with a plan for how organisational change, if necessitated by the introduction of the vision, will be managed (Boddy et al., 2009; Doherty & King, 2005; Ward & Elvin, 1999). Vision also entails ensuring that the system concept is aligned with the overall strategy of the organisation in the achievement of its goals (Chan et al., Sabherwal, & Thatcher, 2006; Piccoli & Ives, 2005; Sambamurthy et al., 2003; Weill).

Support: Support is another key requirement for most organisational initiatives. In fact as described in Chapter 3 Sauer (1993b) incorporates the notion of support as vital to the endurance of an IS, describing IS failure as the absence of enough support to

sustain it. Support may come in many forms and from many sources over the lifetime of an IS, and may be formal or informal, overt or covert. For example overt support may be evidenced in the form of senior management commitment (Doll, 1985; Ginzberg, 1981; Glennon, 1978; Kappelman et al., 2006; Kearns, 2007), commitment of stakeholder groups (Pardo & Scholl, 2002; Sutterfield et al., 2006), and the presence of project support in the form of executive steering committees (Doll, 1985; Karimi & Bhattacherjee, 2000), a business sponsor (The Standish Group, 2012), a business owner (Glaser, 2004), and a project champion (Esteves & Pastor, 2002). Covert support may take the form of unrecognised escalation of commitment to a failing entity (Keil et al., 1994). Maintenance of support over the duration of the IS initiative is key to its survival, therefore the management of relationships is vital.

Governance: Broadly speaking IS governance is the mechanism used to develop, direct, and control IS strategy and resource allocation for an organisation (Campbell et al., 2009). It is the responsibility of senior executive management and ultimately aims to extract strategic value by ensuring high level controls are in place to achieve and sustain benefits. Project governance is the organisational structure through which the objectives of the project are set and monitored on behalf of its stakeholders (Turner, 2006). Project governance is concerned with the performance of the IS initiative in terms of its overall business objectives (strategic, financial, contractual etc.), and oversight of the project itself (Avison et al., 2006), involving a set of relationships between the project organisation, its sponsor, its owner, and other stakeholders (Turner, 2006).

Execution Capability: Execution capability centres on the capability of the organisation to execute the vision. It is a key ingredient in the framework because without the necessary capability to execute the vision all other components may be irrelevant. Execution capability does not only apply to the project organisation but any individual or group who may influence the outcome of the initiative. Execution capability is impacted by technical and organisational complexity (Goldfinch, 2007; Southon et al., 1997), poor planning (Bloch et al., 2012; Cleland & Ireland, 2008; Schmidt et al., 2001), inadequate resourcing (Kaarst-Brown, 2005; Willcocks & Sykes, 2000), and the capability of the people charged with responsibility for delivering the vision (Aloini et al., 2007; Kappelman et al., 2006; Schmidt et al., 2001; Umble, 2003).

6.2.4 The Emergent Theoretical Framework

Combining the four dimensions of failure with the six phases of the initiative results in a two dimensional framework which will be used to form the backdrop to the performance of the CIO role, which is central to the emergent theory of how the role of CIO influences IS failure outcomes. The theory, along with the associated theoretical framework will be described in detail in Chapter 7.

Phase / Failure Dimension	Genesis	Initiation / Conceptualisation	Design	Development	Operation	Termination
Vision						
Support						
Governance						
Execution Capability						

Figure 13 - Two Dimensional Framework of how the Role of CIO influences IS Failure Outcomes

5.7 Conclusion

This chapter presents an account of the conduct of the research to answer the research question. Having argued for the appropriateness of a single case study setting for the research the rationale for the selection of the case of the Public Services Broker (PSB) was then explained. Following this the chapter then went on to describe the initial stages of the inquiry including access negotiation, preliminary meetings with two senior public servants, who were directly involved with the PSB initiative, and a review of four important reports that were published either prior to or during the lifetime of the PSB initiative. Collection of primary and secondary field data was then described along with how the collected data was organised using a Case Study Database. Finally the data analysis phase was presented in detail describing a two stage process. Stage one constructed a longitudinal chronology of the PSB initiative by identifying events, actions, and outcomes, consistent with a processual world view, which culminated in

the identification of six distinct phases/stages of the PSB initiative. Stage two then analysed a total of 972 data blocks which, through an iterative process of induction and deduction, culminated in the identification of four higher order dimensions of failure. The four dimensions were combined with the six phases of the PSB initiative to develop a theoretical framework to explain how the Role of CIO influences IS Failure Outcomes.

Chapter 6

The Case of the Public Services Broker (PSB)

Chapter 6 – The Case of the Public Services Broker

…. for whatsoever a man soweth, that shall he also reap

(Galatians 6:7, King James Bible)

6.1 Introduction

The Public Services Broker (PSB) was a visionary concept to provide access to public services for personal and business customers through a single point of entry, which would also enable the delivery of integrated services through the use of protected data vaults to store customer data. The PSB concept was both broad and ground breaking as it encompassed not just the provision of enabling technology, but implied structural changes within the Public Service to enable the provision of integrated services using cross-departmental systems and data. Furthermore the PSB was envisaged as a technical architecture which would position Ireland at the forefront of e-Government delivery within the European Community (EU).

The PSB project was initiated in 2000, went live in 2005, and was finally abandoned in 2008. It cost €37m (not including ongoing running costs of c. €14m per annum) in the period 2000 to 2005 against an initial estimate of €14m. Primary responsibility for the delivery of the PSB initiative was assigned to the Reach Agency, a unit within the Department of Social and Family Affairs (DSFA), however the Department of Finance and the Department of An Taoiseach[12] also played key roles over the course of its lifespan. A number of other departments also played significant roles during periods of its lifetime.

This chapter tells the story of the PSB initiative from its genesis and inception in 2000 to its closure in 2008. The chapter is divided into 7 sections as follows. Section 6.2 provides an overview of the function and structure of the Irish Public Service. Section 6.3 provides an account of the public service modernisation agenda that pervaded the 1990s, including the birth of the Information Society. Section 6.4 describes the background to the development of the initial concept of a Public Services Broker, the role of other government departments and agencies in its conceptualisation, and describes in detail the main actors in its development. Section 6.5 describes the PSB development process in terms of 6 distinct phases/stages: Genesis; Initiation and

[12] Department of the Prime Minister

Conceptualisation; Design; Development; Implementation; and Termination. Section 6.6 presents a brief conclusion to this chapter.

A Note on Referencing: *Chapter 6 and 7 presents direct quotations from interviewees. To protect individual identity the respondents are represented by numbers e.g.* ***(R7)*** *represents Respondent 7 as listed in the case study database. Direct quotations are also attributed to attendees at the Committee of Public Accounts debate into the Value for Money Report 56 of the Comptroller and Auditor General (Public Accounts Committee, 2007). In these cases the respondents are represented by numbers followed by PAC, e.g.* ***(R16 PAC)****.*

6.2 The Irish Public Service

Ireland is a parliamentary democracy with powers and functions set out in the constitution of 1937 entitled Bunracht Na hEireann (*Bunreacht Na hEireann - Constitution of Ireland*, 1937). The main organs of the Government, as set out in the Constitution, are: *The Legislature*: or the National Parliament, called the Oireachtas, comprising the President, Dáil Éireann and Seanad Éireann, which has sole and exclusive power of making laws for the State; *The Government or Executive:* comprising the Department of State, Dáil Éireann, The Taoiseach, The Tánaiste, and Minister for Finance, who are collectively responsible for the Departments of State administered by its members, and also responsible to Dáil Éireann; *The Judiciary:* with responsibility for administering justice through the courts. The Constitution also provides for the Office of *Attorney General*, the legal advisor to the Government, and a national auditor, the Comptroller and Auditor General. *The President* is the Head of State and exercises and performs the powers and functions conferred on him/her by the Constitution, and by law.

The Government is comprised of not less than seven, and not more than fifteen Ministries (Departments), each headed by a Minister, who meet and act as a collective authority.

The administrative structure of government departments is as follows:

- *Minister:* Responsible for policy direction of a department.
- *Minister of State:* Responsible for direction of certain policy areas within a department.
- *Secretary General:* Administrative head of a department.

- *Assistant Secretary General:* Top manager responsible for certain policy areas within a department.
- *Principal Officer:* Manager responsible for managing a main structural unit within a department.
- *Assistant Principal:* Manager responsible for assisting the Principal in managing a main structural unit within a department.
- *Other Civil Servants:* advisors, specialists, experts, inspectors, and other grades.

Source: (Government of Ireland, 2008).

The Civil Service of Ireland consists of approximately 37,000 employees in the Departments of State, as well as a small number of core state agencies such as the Office of the Revenue Commissioners, the Office of Public Works, and the Public Appointments Service (An Introduction to the Irish Civil Service, 2008). The Civil Service is charged with assisting members of the Government in making policy and executing policy decisions.

The Public Service comprises all bodies that are directly or indirectly controlled by a government department or office, or by a local authority (CSO, 2013). In addition to the Civil Service the Public Service also consists of the Defence Forces, Garda Síochána[13], Health Service Executive (HSE), Institutes of Technology, Local Authorities, Education (excluding private institutions) and Semi-State bodies (Hunphreys & Gorman, 1987). There are over 140 agencies alone in the Central Government sector (CSO, 2013). The total number of employees in the Irish Public Service, including semi state bodies, is currently 377,300 (CSO, 2013).

The primary function of the Public Service is to serve the public. Efficiency and effectiveness in the provision of such services has been a growing issue for governments in general over the past 30 years, driven to some extent by the increasing profile of the New Public Management (NPM) agenda of the 1980s, and 1990s, which proposed an increase in market orientation in the Public Service to increase cost efficiency without impacting on other objectives (Hood, 1991, 1995). In addition the dramatic rise in the sophistication of Information and Communication Technology (ICT), the increase in the use of personal computing, both at work and in the home, and the arrival of the Internet, have all contributed to a growing awareness of the potential of

[13] The Irish Police Force

ICT for the provision of effective and efficient government services to the public (Dunleavy et al., 2005).

6.3 Public Service Modernisation and the Birth of the Information Society.

6.3.1 The Recognition of the Need for Change

During the early stages of the 1990's there was a growing awareness of the need for stabilisation and recovery of the Irish economy after the recession of the 1980's (Rhodes & Boyle, 2012), and for change in the way Government enacted its business. In February 1994 the then Government of Ireland launched the ***Strategic Management Initiative*** **(SMI)** with the objective of presenting public service management with an opportunity to make a substantial contribution to national development, through the provision of services to the public, which were both excellent in quality and effective in delivery (Department of An Taoiseach, 1998b; OECD, 1999; PA Consulting Group, 2002).

Responsibility for directing and leading the SMI programme was shared between two interdepartmental groups of secretaries general; a Co-ordinating group, and an Implementation group. The Co-ordinating group included representatives from civil service management, the unions and private sector, with some academic input. The Implementation group included all secretaries general, and was given the mandate to drive forward the change programme envisaged by the SMI, and report regularly to Government through the Co-ordinating Group (Boyle & Humphries, 2000).

In May 1996 the second report of the Co-ordinating group entitled ***Delivering Better Government*** **(DBG)** set out an expanded framework and presented a vision for the civil service built around six key organisational themes, which included greater openness and accountability, a mission of quality customer service, and the efficient and fair operation of simplified regulations (Department of An Taoiseach, 1996; PA Consulting Group, 2002). Within Government departments, these developments were to be underpinned by organisational improvements in human resource management, financial management and enhanced information systems management.

In May 1997, as part of the SMI Programme, a new ***Quality Customer Service*** **(QCS)** Initiative was launched to promote a wider and more co-ordinated adoption of improved customer service standards by civil service departments (Chatrie & Wraight, 2000; Humphreys, 2001). Each government department was required to produce a two-year Customer Action Plan indicating how they intended to improve the delivery of quality customer service in the areas for which they were responsible. In autumn 1999 the Government established a new high-level QCS Working Group.

All of the modernisation initiatives described above were facilitated by the enactment of a set of enabling legislation including the *Public Service Management Act 1997*, the *Freedom of Information Act 1997*, the *Electronic Commerce Act 2000*, and the *Copyright Act 2000*, and were underpinned by a series of partnership agreements between the Government and the Social Partners (The Irish Congress of Trade Unions, The Federation of Irish Employers, The Construction Industry Federation, and farming organisations), the purpose of which was to promote and maintain co-operative, rather than confrontational working arrangements in an effort to progressively stimulate the economy towards greater prosperity and social inclusion.

A key finding of the DBG report was the failure in most government departments to avail fully of the opportunities presented by ICT to re-design long-standing work processes, reporting arrangements and information management practices. The DBG report recommended that *"the use of information technology in the civil service be reviewed with a view to maximising the benefits to be achieved, and to ensure that its use is driven by business priorities and needs"* (p. 52). The report contained no specific reference to e-Government, however it suggested that particular consideration should be given to the then emerging implications of the Information Society for the civil service. The role of ICT as a key enabler of the Information Society and e-Government became a prevalent, and increasingly important, theme of each partnership agreement beginning with *Partnership 2000 (1997 -2000)* (Government of Ireland, 1997). The growing awareness of the potential of ICT, and an Information Society, led to the establishment of an Information Society Steering Committee in March 1996 (Chatrie & Wraight, 2000; McCaffrey, 2007), which played a major role in promoting the Information Society and e-Government. The Irish Information Society Programme is described in Section 6.3.2 below.

6.3.2 The Information Society

6.3.2.1 The Global and European Context

The rapid advances in ICT in the 1990s, and in particular the increase in the use of personal computers in the home, as well as business, along with the increasing realisation of the potential of the emerging internet, resulted in a growing global awareness of the potential of ICT in providing government services (The European Commission, 1994). It was recognised that the provision of government services electronically presented a number of tangible opportunities to advance efficiency and social inclusiveness. It was also acknowledged that there was a wide disparity of capability on a global basis to implement such capability, often referred to as the 'digital divide' (OECD, 2005).

The e-Europe initiative was launched in 2000 by the European Commission to accelerate Europe's transition towards a knowledge-based economy, as well as to realise the potential benefits of increased growth, more jobs, and better access for citizens to the services of the information age, guided by three overarching objectives:

- to bring every citizen, home and school, every business and administration into the digital age, and online;
- to create a digitally literate Europe, supported by an entrepreneurial culture, ready to finance and develop new ideas;
- to ensure the whole process is socially inclusive, builds consumer trust and strengthens social cohesion.

Source: (CIPP, 2012).

The European Council held in Lisbon on 23/24 March 2000 set the ambitious objective that the EU would become the most competitive and dynamic economy in the world. It recognised an urgent need for EU member states to exploit the opportunities of the new technology and, in particular, the internet. An e-Europe action plan was launched in June 2000 which included three main objectives: (1) a cheaper, faster, secure internet; (2) investment in people and skills; and (3) stimulation of internet use by providing on-line access to Government services (Council of the European Union, 2000). It was proposed that all three objectives would be fully met by the end of 2002. A key element of this plan was the introduction of a process to benchmark, on an annual basis, the extent to which a specific set of 23 services for citizens and for businesses was available on-line in each member state. The Government recognised that this benchmarking process could become an important yardstick of Irish

performance and international competitiveness. Ireland became a keen enthusiast of this programme as it was compatible with its own strategy in this area - *Ireland had a reputation for being a high-tech country and ... a lot of what we were doing was really just to reinforce that image* (R4). In time Benchmarking would have a significant influence on the trajectory of the PSB initiative (R4).

Achieving a high score in the benchmarking process was therefore seen as an important goal (R1; R5; R7). The *e-Europe 2002* action plan was succeeded by the *e-Europe 2005* action plan, which was designed to further the vision to make the EU the most competitive and dynamic knowledge-based economy by 2010 (Council of the European Union, 2002).

6.3.2.2 The Irish Context

Having emerged from severe economic recession during the 1980s Ireland, described by the Economist as the poorest of the rich in 1988 (The Economist, 1988), had achieved a remarkable turnaround in the economy during the 1990s, driven in the main by a range of Government stimulus packages and Partnership Agreements with the trade union movement. By 1997, when Ireland again featured on the cover of the Economist, this time as "Europe's shining light" (The Economist, 1997), the Irish Government was running a budget surplus which would continue in all but one of the next ten years (O'Leary, 2010). This period, often referred to as the 'Celtic Tiger' years, presented government departments with an unprecedented increase in budget allocations, which in turn facilitated the pursuit of transformational objectives that would have been impossible in less bountiful times – *"we were interested in joined up public services at the time the Celtic Tiger was in full swing - the biggest difficulty was getting your budget spent during the year"* (R8).

By the mid-1990s Ireland was ranked in the lower half of OECD countries on a number of key telecommunications infrastructure and service parameters. There was a low level of awareness about ICT in certain sectors of Irish society, and in some regional areas (Chatrie & Wraight, 2000). Investment in ICT in education and training was insufficient. There were emerging skill shortages in ICT, and very few citizen centred public services. However the increasing prosperity during the 1990's, alongside the modernisation agenda under the SMI/DBG/QCS programmes created the momentum to follow the European information society agenda. Ireland's information society agenda essentially underpinned many elements of its national policy agenda such as increasing overall competitiveness, development of high tech, high value industries,

and reducing the effect of Ireland's peripheral position with respect to the rest of Europe (Circa, 2002).

6.3.2.3 The Information Society Commission (ISC)

Following a series of publications on the potential of the digital age in creating an information society, which would provide equal participation for all citizens (Forfas, 1996; McGovern, 1996), the then Minister for Enterprise and Employment established an Information Society Steering Committee in March 1996 (Chatrie & Wraight, 2000; Circa, 2002; McCaffrey, 2007). In December 1996 the steering committee issued a report entitled ***"Information Society Ireland: Strategy for Action"*** which set out a strategic vision of the transformational possibilities of ICT for Ireland (Chatrie & Wraight, 2000;. Preston, 1997). One of the principal recommendations contained in the report was the establishment of an Information Society Commission (ISC) as an advisory body comprising key experts from the public and private sector. The ISC was established in May 1997 (Chatrie & Wraight, 2000) for an initial three year period. The main functions of the Commission were to:

- provide advice and guidance to the Government on policy to ensure that Ireland develops to its full potential as an information society;
- conduct research and benchmark Ireland against other countries in its development as an information society;
- promote awareness and understanding of the opportunities presented by ICT to both business and the general public.

The ISC comprised of 10 people from the private and public sector and reported directly to An Taoiseach[14]. The Commission produced two reports in its first three years of existence. The first report entitled ***First Report of Ireland's Information Society Commission***, published in December 1997, provided a summary account of initiatives already underway, and highlighted areas where urgent action was required. The second report entitled ***Second Report of Ireland's Information Society Commission***, published in April 1999, stated that many of the building blocks of the information society were now in place, but also stressed the need for Ireland to step up the pace of preparation, particularly in the areas of provision of low cost broadband, emerging skills shortages, intellectual property rights, and fostering e-commerce capabilities among Irish businesses.

[14] The Prime Minister of Ireland and leader of Government

In 1998 the Government established a public Interdepartmental Implementation Group on the Information Society, and a Development Team in charge of preparing a framework for action, to be followed by an action plan. The group comprised of 17 members from all ministries and the central statistics office, and was chaired by An Taoiseach.

In December 1998 the Implementation group published a proposal for an action plan entitled ***Implementing the Information Society: A Framework for Action*** (Department of An Taoiseach, 1998a). The report contained two parts: (1) a proposed action plan including tasks and timeframes, resource requirements, and allocation of responsibility; and (2) a commentary on the proposed action plan. The report stressed the need to begin delivering services electronically, in a three strand approach enabled by a Personal Public Service Number (PPSN), a unique personal reference number that would be used to access government services (Citizens Information Board, 2014). Government departments were encouraged to develop pilot flagship projects and there is a vague reference in strand 3 to *"the concept of seamless, client-centred electronic interaction with public administration"* (p. 29), taken to be a reference to tying all services together through a common interface. The report also highlighted the need for stringent monitoring and reporting whilst being flexible to take advantage of new developments in the information society environment. In July 1999, the Government approved the establishment of a special unit within the Department of Social and Family Affairs (DSFA), with a cross-departmental role, to develop an Integrated Social Services System (ISSS) for income support based on the PPSN. This unit was called Reach.

The *Framework for Action* plan was followed in January 1999 by the report ***Implementing the Information Society: An Action Plan*** (Department of An Taoiseach, 1999). The plan provided a comprehensive and co-ordinated approach in five key areas:

- telecommunications infrastructure;
- development of electronic commerce and business opportunities;
- opening up access to new technologies for the less privileged;
- legislative and regulatory measures;
- modernising the delivery of public services through new technologies;

The report indicated the responsible departments or bodies for each work area, and provided target dates for completion of action points. The plan would be funded by the

allocation of the Information Society Fund (ISF), a dedicated fund set up by the Government in July 1999 to be released in 2000 (The Information Society Policy Unit, 2002).

The Implementation Group produced a progress report in July 1999 which provided updates on the many initiatives already underway. The report noted that slippage had begun to occur and highlighted the need for substantial additional staff and funding to keep the action plan on schedule. It also stated that special measures were needed to attract and retain personnel with the necessary IT skills.

During 1999 the Implementation Group also published a report entitled *The e-Broker Model* which set out a rationale and guiding principles for the development of an electronic broker (the PSB) which would use state of the art technologies to provide secure access to Government services for citizen and business clients by integrating services at the delivery end, and presenting them in an integrated fashion to the client – referred to as *"integrate at the gate"* (R4). The PSB would deliver quality services on the basis of client needs, achieving overall efficiency gains across the Public Service. This model was approved by the Government in May 2000.

In its final report, dated December 2000, the ISC identified major challenges that still needed to be addressed (Information Society Commission, 2000). These included the slow move from awareness to adoption of new technology; the high cost of communications services in Ireland, the slow progress with deployment of broadband, and the differences among socio-economic groups in regard to access to, and use of, new technologies. To meet these challenges the ISC proposed a set of principles including partnerships between industry and community groups to facilitate increased involvement in the information society, encouraging Irish business to use e-business, making high-speed low cost networks available in every part of the country, and providing an appropriate legislative framework to facilitate the development of a progressive and inclusive information society.

A new Information Society Commission was appointed in November 2001, some 11 months after the previous one was disbanded, comprising 21 completely new members from business, the social partners, and the Government itself (The Information Society Policy Unit, 2002). The Commission reported directly to the Taoiseach. In March 2002 a second government action plan for implementing the information society, called ***New Connections***, was launched, covering the period 2002 to 2005 (The Information Society Policy Unit, 2002). The themes of the first plan were repeated, but the second

plan was more ambitious, and the scope of action was deeper. The Government committed itself to the objective of having all public services that are capable of electronic delivery available on-line, through a single point of contact, by 2005. The projects listed in the plan ranged in sophistication from those offering on-line information about services, to those allowing full on-line processing of transactions by individuals and businesses. Others were inter-agency projects designed to improve efficiency by transforming the way in which public service agencies interact. The expected benefits from implementation of the e-Government initiatives were:

- a reshaping of the delivery of government services around user needs, rather than on the basis of departmental/agency structures;
- international competitive advantage through reduced costs, higher efficiencies, better service, and opportunities to allow Irish industry to develop;
- accessing of e-Government activity serving as a stimulus to wider engagement with ICT, by the business community and the general public.

The report listed a total of 71 e-Government projects underway by departments and agencies. Among these were 'flagship' services to citizens e.g. on-line motor tax, court fines, driving licences, road haulage licences, passports, and registration on the electoral register; and to businesses e.g. on-line tax returns, payments to the Revenue Commissioners, vehicle ownership, returns to the Central Statistics Office, and annual returns to the Companies Registration Office;

New Connections also referred to the Public services Broker (PSB), which had been adapted in May 2000 as the framework for integrated service delivery through a single point for access to all on-line public services. By this time responsibility for development of the PSB had already been assigned to the Reach Agency.

During its tenure the new ISC published a range of reports on key technology policy areas such as e-Government, Ireland's digital divide, R&D at third level, and broadband. A damning report in November 2004 warned the Government that its plans to place Ireland in the top 10 of OECD countries in terms of broadband penetration would not be reached (Kennedy, 2004). A report on the New Connections strategy in 2003 highlighted the slow delivery of the PSB and stated that this was the biggest issue in the development of the e-Government programme, and that continued delay would adversely impact on the development of on-line service delivery in agencies awaiting the shared components that the PSB enabled.

The ISC was disbanded on 31st December 2004 (Kennedy, 2004) and was not replaced as it was considered it had served its purpose as an important vehicle for embedding an information society agenda into the DNA of the Irish Government.

6.3.3 Implementing the e-Government Agenda

The Department of An Taoiseach saw its role as that of providing a sense of direction and prioritisation for implementing e-Government. Departments and agencies were required by a Government decision of May 2000 to develop specific e-Government strategies in relation to their own areas of operation (C&AG, 2007). Each Individual government department and agency was responsible for implementing e-Government projects under the normal delegated sanction arrangements for ICT-related expenditure, as set out in Government Circular 16/97 (The Deptartment of Finance, 1997). These procedures provided for the delegation of financial authority to the maximum extent possible and required that appropriate controls be operated.

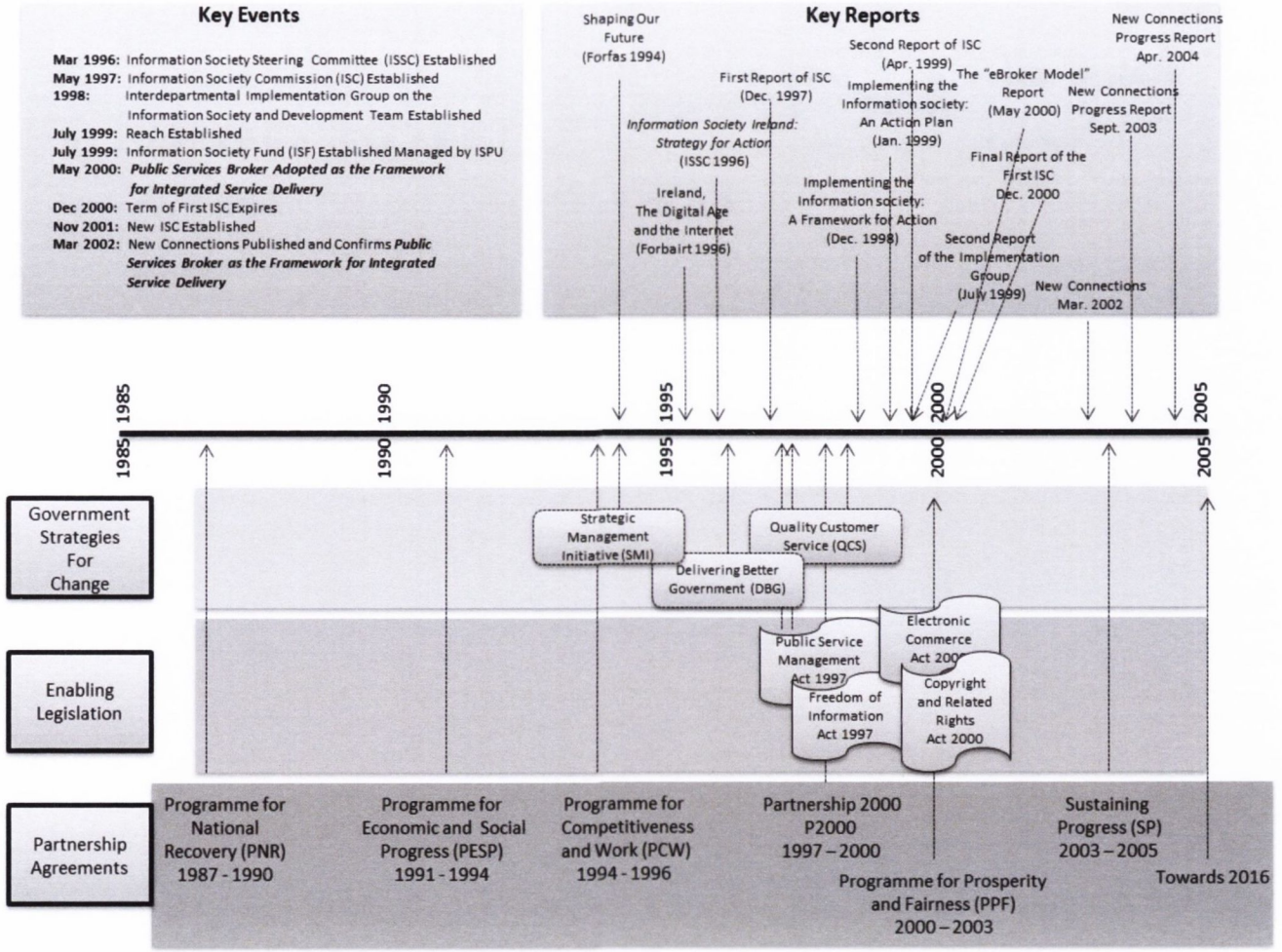
A number of cross-cutting structures were established to co-ordinate the implementation of e-Government plans. These included:

- a Cabinet Committee on the Information Society;
- an e-Strategy Group of Secretaries General;
- an e-Government Implementation Group of Assistant Secretaries, with a remit to co-ordinate activities relating to implementing the information society and to contribute to policy development in this area.

The Information Society Policy Unit (ISPU) was established to assist the Implementation Group of Assistant Secretaries in their work. The role of ISPU is discussed in section 6.4.3.1 below:

Section 6.3.4 below provides a diagrammatic timetable of public service modernisation. A summary diagrammatic timetable of the PSB initiative will be presented in 6.5.8.

6.3.4 Summary Timeline of Public Service Modernisation



6.4 The Public Services Broker (PSB)

6.4.1 Background to the PSB

Against the background of the Government's first action plan, CIOs at the Department of An Taoiseach and the Department of Finance developed the concept of a Public Services Broker (PSB) to deliver a range of e-Government services to both business and the public. The PSB was envisaged as a web-based system to integrate all services of central and local government, and make them accessible on a one-stop basis through a range of channels. It was envisaged that a single website (the PSB) would integrate public services, sharing data and establishing links between all the services associated with, or affected by, significant events, such as a change of address, the birth of a child, the loss of a job, the death of a relative, start-up of a business, etc. (The Reach Agency, 2002). It was envisaged that members of the public could choose from a range of access methods including on-line, by telephone, or by correspondence. It was also envisaged that access would be facilitated through a network of 'one-stop' drop-in offices for users who required mediated access (Fitzpatrick Associates, 2006).

For government departments and agencies, the PSB would provide a single 'front-end' to users, managing their interaction with government services. The PSB would authenticate the client's identity and all transactions would be secure. The PSB would also provide a secure facility to store personal or business information that was routinely needed to facilitate access to a range of public services. Figure 14 below shows a basic schematic of how the PSB would operate:

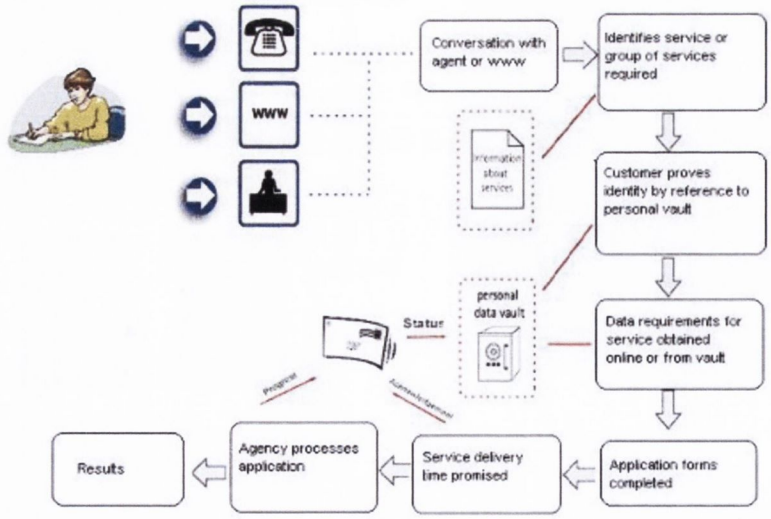


Figure 14 - The Public Services Broker (PSB) - Source: *(Dept. An Taoiseach, 2004).*

The initial proposals to establish the PSB as the framework within which integrated public services would be delivered through a single access point were approved by the Government in May 2000 (C&AG, 2007; R4). Because the PSB concept was considered to be compatible with the existing Integrated Social Security System (ISSS) project, responsibility for developing and implementing the PSB was assigned to Reach, an agency established under the Department of Social and Family Affairs (DSFA), as described in section 6.4.3.2 below. The Department of An Taoiseach has stated that, when presented to Government in May 2000, the PSB was an innovative concept that would clearly need a considerable degree of further analysis and planning before it could see the light of day (C&AG, 2007). While the basic idea was simple, the technical and business change requirements it involved were complex. The risks to security and confidentiality of data inherent in an internet-based service were also considerable.

6.4.2 The Role of Other Departments and Agencies in the PSB Initiative

It was envisaged that all departments and agencies, who were delivering components of life or business episodes, would be required to cooperate with the Reach Agency, and to make the necessary adjustments to their internal procedures, processes, and systems to facilitate the required level, and quality of interaction with the PSB, using a common, standards-based, interface to exchange data, with capacity for 24x7 availability, and ultimately a work-flow system to provide enhanced case tracking facilities. This represented a major undertaking in organisational change in addition to the development of what would be a complex technical architecture. Some particular departments and agencies were initially identified as critical to the success of the PSB concept. These were: (1) The Department of Enterprise, Trade and Employment; (2) The National Social Services Board (now Comhairle); and (3) The Information Society Commission (ISC)

6.4.3 The Main Actors in the PSB Initiative

6.4.3.1 Information Society Policy (ISPU)

The Information Society Policy Unit (ISPU) was established within the Department of An Taoiseach with the general responsibility of providing a leadership role for developing, co-ordinating, and driving implementation of the information society agenda (McCaffrey, 2007), and to contribute to policy development in this area (Department of An Taoiseach, 1998a). The ISPU was to act in a co-ordinating role for the Government action plan on the information society, which included co-ordinating

the work of the cross-cutting e-Government structures (the Cabinet Committee on the Information Society, the e-Strategy Group of Secretaries General, and the e-Government Implementation Group of Assistant Secretaries), and the Information Society Commission (The Information Society Policy Unit, 2002).

The ISPU had responsibility for administrating the Information Society Fund (ISF) that was established in 1999 with the purpose of providing seed funding to enable e-Government projects to be initiated. Evaluation, prioritisation and approval of projects applying for funding from the central IS Fund was carried out by ISPU and the Department of Finance (CMOD), described in 6.4.3.3 below. Over the six years, 2000 to 2005, in excess of €57 million was paid out of the Fund in support of 176 information society projects and initiatives. The ISPU also had responsibility for co-ordinating Ireland's participation in the EU benchmarking exercise in on-line public service delivery. It did so by serving as a liaison between the consultants who conduct the benchmarking on behalf of the Commission, Capgemini[15], and the departments and offices responsible for the relevant public services covered by benchmarking, ensuring that each department and office was aware of the methodology employed by the consultants.

The ISPU was headed by a director at Assistant Secretary level (CIO). The director played a key role in the development of the PSB from the outset, being a key visionary in its conceptualisation, and as an active member of both the first and second Reach Boards. As administrator of the ISF the director of ISPU also played a key role in the allocation of funding for Reach during its lifetime.

6.4.3.2 The Reach Agency

In July 1999, the Government approved the establishment of a special unit, called Reach, within the Department of Social and Family Affairs (DSFA), with a mandate to develop an Integrated Social Services System (ISSS) for income support. The basic objective of the ISSS was to bring greater coherence to the provision of social services, by making them more co-ordinated, simpler to understand, more efficient, easier to manage, and more accessible and user friendly.

The scope of work to be completed by Reach by 2002 was:

- establishment and use of Personal Public Service Numbers (PPSNs);
- development and submission of proposals for national public services cards and public e-commerce strategies;

[15] http://www.capgemini.com/

- development and acceptance of the public services card as the citizen's key to public services;
- the issuing of the public services cards;
- the establishment and implementation of a common database of citizens' income and means;
- the development and provision of customer identity validation services by the Department of Social and Family affairs;
- integration of the processes for registration of births, and issue of the new PPSNs.

Reach was allocated an initial budget of €14.3 million for the three-year period 2000-2002. Because the PSB concept was considered to be compatible with the ISSS project responsibility for developing the PSB was assigned to Reach. Reach's mandate was formally stated in *New Connections* as *"To radically improve the quality of service to personal and business customers of Government and to develop and deploy the Public Services Broker to help agencies achieve that improvement"* (p. 17). An initial staff complement of 13 was approved by the Department of Finance in 2000. In July 2000 Reach produced a Statement of Intent and in September 2000 launched a website.

The Reach Agency was managed by a Director at Assistant Secretary level, and by a Deputy Director at Principal Officer level. The Director reported directly to the Secretary General of DSFA and had overall management responsibility for the administration of Reach, the management of projects/programmes, and for the business development and financial aspects of management. The Director would assume CIO responsibility for the PSB initiative following its endorsement by the Government in May 2000. A Deputy Director assumed management responsibility for security, quality assurance, operations and ongoing service delivery of Reach. Much of the core staff in Reach were drawn from the ranks of DFSA. The Reach reporting structure is shown in Figure 15 below.

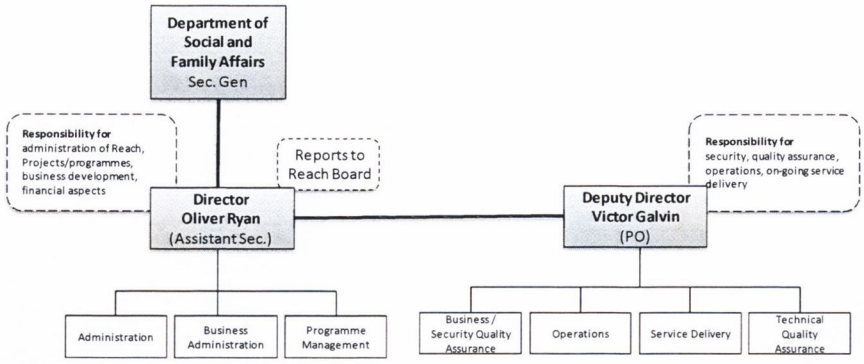


Figure 15 - Management and Reporting Structure of the Reach agency

At the time of its establishment the possibility of establishing Reach as a cross-departmental unit under Section 12 of the Public Services Management Act, 1997, reporting to the Minister for Social and Family Affairs was investigated, however it was determined that such a development would not be appropriate at the time (C&AG, 2007). This was a surprising decision given the level of cross-departmental collaboration required to build such a complex system as the PSB, and the associated integrated change programme it would entail.

The governance structure for Reach was a complex arrangement involving three government departments, with formal oversight and direction provided at three levels by the cross-cutting agencies at cabinet, secretaries general, and assistant secretary level. Funding was provided by ISPU at the Department of An Taoiseach, and approval for its work from CMOD at the Department of Finance. The Reach governance structure is illustrated in Figure 15 below. This complicated arrangement gave rise to multiple reporting channels. Furthermore not only were the governance arrangements complex but they changed a number of times over the course of the initiative. In 2002 an inter-departmental/local government consultative group, representing all relevant departments and agencies, was established to assist the e-Strategy group in co-ordinating actions across departments and agencies (C&AG, 2007). This consultative group however did not function in any systematic manner. Although a number of briefing sessions were held for departments and agencies at various points, there was no ongoing process of consultation (The 3rd Reach Board, 2008). The lack of a formal consultative process resulted in an uneven relationship between Reach and its client departments leading to dissatisfaction (C&AG, 2007). Consequently a formal Reach Board was established in May 2002 under an independent chairman, and with

representation from ten departments and agencies (see Appendix 16 for membership of Reach Boards). This board would be reconstituted a further two times over the lifetime of the PSB initiative.

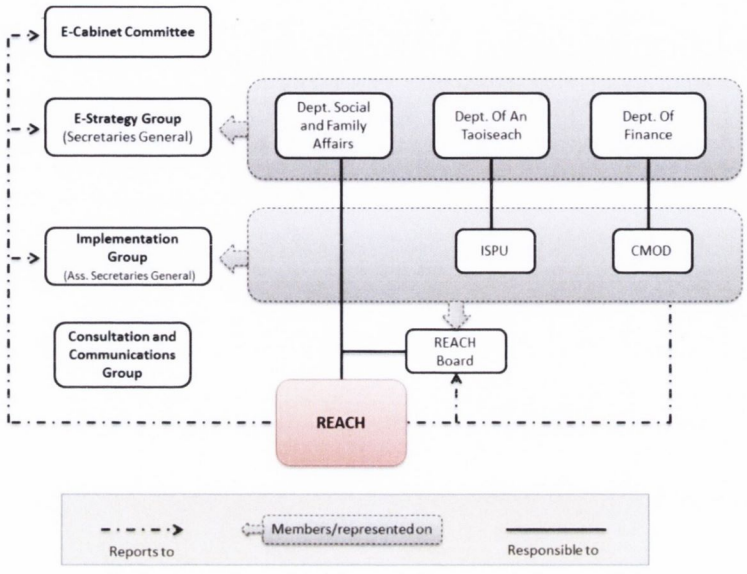


Figure 16 – The Reach Agency Governance Structure (Adapted from C&AG, 2008)

6.4.3.3 The Centre for Management and Organisation Development (CMOD)

CMOD is a division within the Department of Finance (now called the Department of Public Expenditure & Reform) with a general strategic role for ICT in the Public Service, including strategic direction, common services and common infrastructure (C&AG, 2007). CMOD has a central role in Government for the provision of advisory services and support, evaluation of projects, monitoring and approving ICT spend in civil and public service bodies, telecommunications policy and infrastructures, e-Government policy and infrastructures, technology research and policy, central ICT procurements and frameworks, and common IT systems including payroll and HR Management (Dept. Expenditure and Reform, 2011).

CMOD is headed by a director at Assistant Secretary level (CIO) who, alongside the ISPU CIO, was a partner visionary in the PSB conceptualisation, and also played a key role throughout its development. As has already been stated the evaluation, prioritisation and approval of projects applying for funding from the central Information Society Fund (ISF) was carried out by ISPU and CMOD. There was a significant amount of collaboration between CMOD and both the ISPU and Reach Agency over

the lifetime of the PSB, although the level of involvement in the actual development of the PSB was not consistent over the development period. CMOD was also involved in, and sat on the board of, the Donegal Integrated Service Delivery Project (DISDP), a related service integration programme initiated by Donegal County Council and described in section 6.4.3.4 below.

At the level of overall expenditure the Reach budget was technically subject to the standard budget review and appraisal process within the DSFA in which it resided. However in 2001, it was agreed between Reach and CMOD that Reach would submit delegation material to CMOD in respect of its own projects independently of DSFA (C&AG, 2007). Therefore, in practice, the proposed programme of work for the PSB, and related expenditure, largely arose from direct contacts between Reach and CMOD. For example Reach had to obtain the approval of CMOD before issuing the request for tenders for the PSB (C&AG, 2007).

In May 2003, it was agreed by the e-Cabinet Committee that corporate policy issues around the development of the PSB would be facilitated by a central group drawn from ISPU and CMOD which would consult with other departments and agencies, and initially focus on the manner in which they interoperate electronically (Nolan, 2010). This group was chaired by a representative from CMOD (C&AG, 2007). CMOD also had approval rights over developments at Reach (C&AG, 2007) and were heavily involved in the PSB procurement process in terms of design and evaluation.

CMOD continued to have representation on all three Reach boards (C&AG, 2007).

6.4.3.4 The Donegal Integrated Service Delivery Project (DISDP)

During the 1990s Donegal County Council had developed plans to decentralise services to customers by the provision of public service centres throughout the county whereby customers could avail of a range of public services and advice on a one-stop-shop, walk-in basis (Donnell et al., 2003; Kieran & Mcdonagh, 2006; Timonen et al., 2003). This initiative was driven by senior management in Donegal County Council, and was further incentivised by the ***Better Local Government*** initiative launched by the then Minister for the Environment Brendan Howlin in 1996. The proactive work of the Donegal County Council in creating a better customer experience presented an obvious opportunity for Reach to test some initial ideas about the delivery of integrated services, and in particular channels that did not require the customer to have access to the internet. Donegal was therefore identified by Reach as a suitable partner to evaluate how integrated services could be delivered, and as a pilot testing ground for how services might be delivered through the PSB (C&AG, 2007, R1; R6).

Consequently the Donegal Integrated Services Delivery Project (DISDP) was formally inaugurated in June 2001 by the establishment of a Project Board. It was envisaged that integrated services would be provided on a one-stop-shop walk-in basis through the co-location of different public services in the same building (Fitzpatrick Associates, 2006). Six agencies were involved in the pilot – Donegal County Council, Health Services Executive North West, Department of Social and Family Affairs, FÁS, Comhairle, and Donegal Citizens Information Service. The board consisted of representatives from each of the partner organisations (ISPU & CMOD) and the Reach Agency. A project manager was assigned to the project in 2001, funded by Reach. In addition to its work with Reach the DISDP worked closely with ERNACT[16] in developing business requirement specifications and design of integrated forms in support of integrating customer services (Ernact, 2014).

During the early part of the engagement there was close co-operation between Reach, CMOD, and DISDP. Weekly project meetings were held to discuss design issues, and regular workshops were facilitated in Donegal to test ideas about how concepts might be further developed (R1). The work began to surface some key challenges in implementing the PSB concept of providing integrated services and associated data vault facilities. For example it soon emerged that departments and agencies often attached different meaning to data (R1; R6). Similarly it was discovered that due to data protection issues it would not be possible to mass populate the data vault with social security data (R3; R4).

It was felt that Reach were never able to demonstrate how the ideas generated by the DISDP project could be implemented under the PSB model (R6). The low level of engagement from supporting departments was also noted (R1; R6). Frustration with Reach increased over the course of the engagement because of the perception on the part of DISDP that there was too much emphasis on developing the technology and not enough on what the actual business requirements were (R6). This may have been due to a change of focus by Reach, CMOD, and ISPU to the PSB procurement process that commenced during 2002 (C&AG, 2007).

Engagement between DISDP and the central agencies continued up to 2004 over which time relationships began to cool between all parties because of an apparent disconnect between the focus of each group (R2; R6). After about a year the weekly brainstorming meetings had *"slackened off to about once a month"* (R1). It was felt that Reach became more focused on on-line service delivery and therefore the Donegal

[16] www.ernact.eu

initiative, being more focused on physical delivery mechanisms, became less relevant to its agenda. CMOD also adopted a more passive role over time. No tangible product resulted from the engagement with Reach and CMOD. An evaluation report on the overall DISDP project by Fitzpatrick Associates in 2006 (Fitzpatrick Associates, 2006) stated that despite some progress in relation to improvement in customer service the project had not realised its full potential in relation to real integration of services and that the benefits realised thus far have mainly been a consequence of the physical co-location of services within the building.

Although the planned delivery of integrated services based on the PSB was not achieved, five walk-in centres remain in operation in County Donegal in Carndonagh, Donegal Town, Dungloe, Letterkenny and Milford (R1; R6). In terms of the PSB development the Donegal pilot confirmed the difficulties in integrating data systems in different organisations and reducing duplication in data collection.

6.4.3.5 The Local Government Computer Services Board (LGCSB)

Local Government in Ireland consists of 34 counties/cities with an overall total of 114 independent organisations, operating within a legal framework defined primarily by the Department of the Environment, Heritage & Local Government. Local Authorities provide a wide range of services, all of which are underpinned by ICT (LGCSB, 2007). The mission statement of the LGCSB articulated in the ***Strategic Plan 2003 - 2007*** is: *"... the LGCSB will be the partner of choice for Local Government initiatives in the delivery of quality services through the optimum application of information and communications technologies"* (p. 3).

The LGCSB provides a range of ICT services to Local Government and city councils as follows:

- hosting wide area network;
- software platforms;
- research and development;
- business systems for finance, housing, planning;
- customer service.

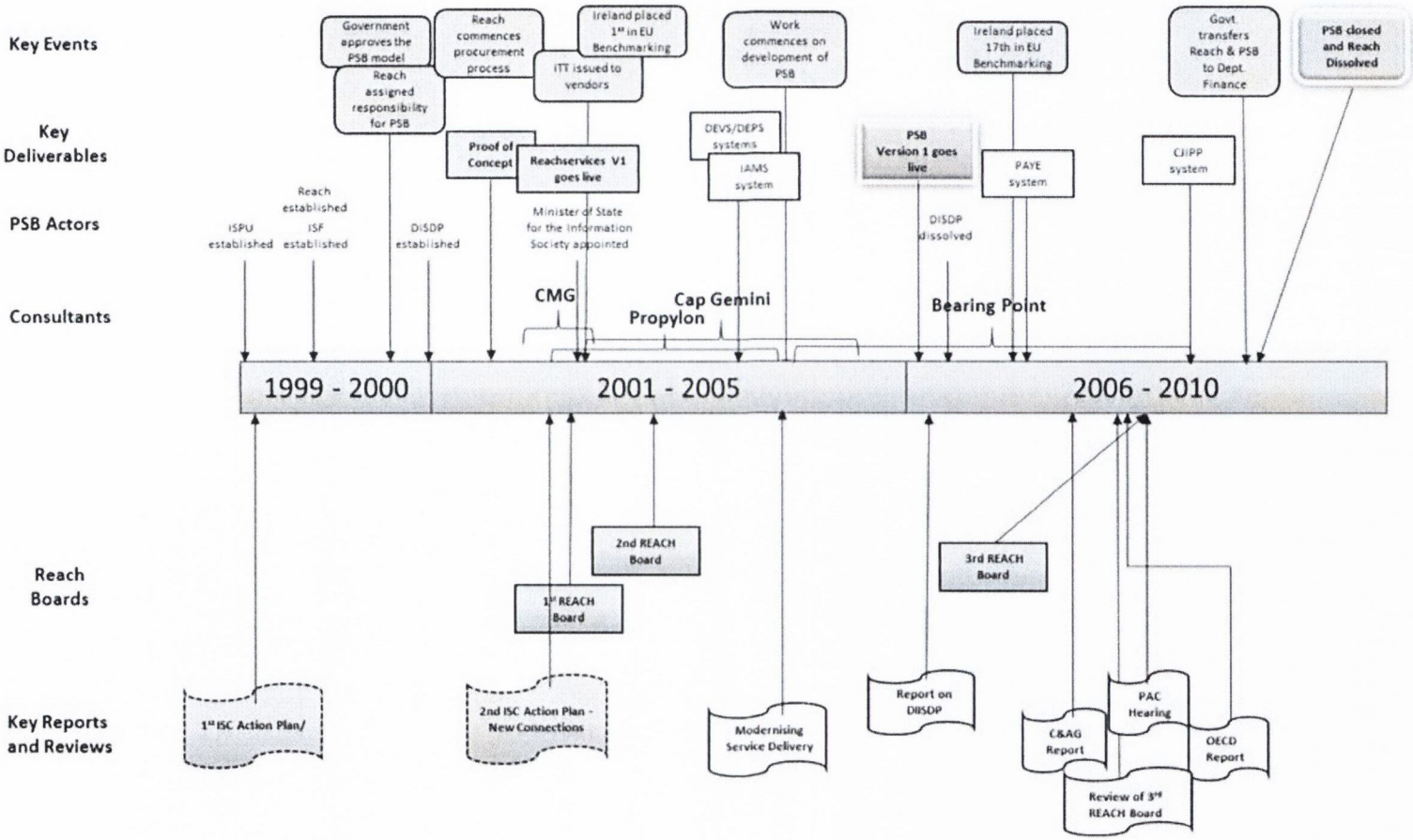
The LGCSB was a standalone entity during the life of the PSB project but has now been integrated with the Local Government Management Services Board and An Comhairle Leabharlanna to form the Local Government Management Agency (LGMA, 2014).

By early 2000 the LGCSB had developed an on-line application called 'e-forms' whereby applications for Local Government services could be made by completing the necessary documentation on-line. Forms could be built 'on the fly' from a database of common items of required information (e.g. Number of children) combining various fields, depending on the particular application, into the form appropriate to that application. Development of the system was championed by the Department of An Taoiseach and went live in 2001. The e-forms application would later become the first publicly available PSB service offering from Reach.

6.5 The PSB System Development Timeline

This section describes the development timeline of the PSB across six distinct phases, from the genesis of the initiative in 1999, through to its termination in 2008. The six phases were identified in chapter 5 as distinct phases in the development process, each with an outcome without which the next phase of the development would not have occurred. A summary diagrammatic timeline of the PSB initiative is provided in 6.5.1 below.

6.5.1 Summary Timeline of the PSB Initiative



6.5.2 The Genesis Phase

At the time of publication in 1998 of ***Implementing the Information Society: A Framework for Action*** the concept of delivering government services electronically was already being mooted, along with the notion of a system to deliver integrated public services through a single access point (Department of An Taoiseach, 1998a). The initial conceptualisation work on such a system was done through a collaboration between the head of the ISPU, and head of CMOD, with ISPU providing the basic ideas and conceptualisations, and CMOD investigating the technical feasibility of each idea (R4). Over time a conceptual model emerged, based on the notion of *"integrate at the gate"* (R4), which was to form the basis of the PSB as a *"service orientated architecture based around web services"* (Ryan, 2002).

The initial proposal to establish the PSB as the framework within which integrated public services would be delivered was presented in a memo to Government, and approved in May 2000. At this time however the proposal was conceptual in nature and no specific designs were in place (R4). No budget or timetable for the project was set, no business, financial, staffing, or risk management planning had been conducted, and no analysis had been carried out on the complex data, processes, technology and organisational issues that such a system might entail (C&AG, 2007; R4). This was contrary to the principles underlying the Department of Finance's guidelines for the appraisal and management of capital expenditure which states that, before capital expenditure projects were committed to, detailed appraisal should be undertaken in respect of all proposals (The Department of Finance, 1994). This loose governance, of what was to become a significant and strategic element of the whole government service modernisation and change agenda, was indicative of the general enthusiasm surrounding the information society and e-Government agenda at this time, and a desire to position Ireland as an 'e-leader' within the wider European context. When the PSB project commenced, no examples of similar infrastructure were then available to inform estimates of the likely effort or cost involved and, given the innovative nature of the project, significant research and development effort would be required (C&AG, 2007; R4; R13).

Following approval of the PSB framework in May 2000 responsibility for developing the PSB was assigned to the Reach Agency (R4). Thereafter CIO responsibility shifted from the two visionary CIOs in ISPU and CMOD to the Director of the Reach Agency. Both of the visionary CIOs would remain as supporting partners to the initiative, but

executive responsibility would henceforth reside within Reach for the remainder of the PSB lifetime.

6.5.3 The Initiation and Conceptualisation Phase

In July 2000 Reach produced a Statement of Intent and commenced an advocacy programme to create awareness and to elicit support (including requests for secondment of staff) from other departments. A website (www.reach.ie) was launched in September 2000.

The approval of the Department of Finance was received for the appointment of 13 staff to the Unit. By March 2001, seconded staff had been appointed and initial consultancy appointments made (C&AG, 2007). A number of consultancies (most notably Propylon[17] & CMG Admiral) were engaged to provide thought leadership around the PSB concept (R1). This is in line with stated government policy on outsourcing of IT initiatives (R9). The appointment of consultants at this point was necessary because of the lack of in house expertise in the technologies required to build elements of the PSB. The PSB programme thus became heavily reliant on external consultants and contractors from the outset (R3; R6).

LGCSB played a significant role in further developing the PSB concept at this stage, acting in a governance capacity, and providing the e-forms system to Reach, which was launched as Reachservices V 0.1 (R3; C&AG, 2007). The Donegal Integrated Services Project (DISDP) was also initiated during this period, and did a lot of work identifying technical and organisational complexity issues as they arose (R1; R6).

The advocacy programme undertaken by Reach received a mixed reaction with many departments and agencies feeling that the idea was too grand in scale and could never be delivered upon (R3). It was also felt that Reach's approach may have been somewhat heavy handed and directive rather than collaborative (R3; R4; R8). This contributed to a lack of buy-in from other departments and agencies from the start, and created an atmosphere where Reach was seen to be 'telling' how things would be done, without demonstrating any track record or capability in this regard – *"they were trying to take over things that they didn't understand... they've nothing developed yet they're telling us what we're doing wrong"* (R3).

In April 2001 Reach was given approval to commence a procurement process and Capgemini were engaged to provide additional advocacy support to Reach, technical capability in the areas of enterprise architecture, identity management and security,

[17] http://www.propylon.com/

and management of a procurement process (Capgemini and Reach, 2006; R5). The approval to commence a procurement process for the development of the PSB was given despite the fact that no system specification had yet been produced and the design was still at the conceptual stage. The DISDP project was also formally inaugurated in June 2001 (R1; R2).

A proof of concept exercise was also initiated to test the viability and overall design of the system. Following a competitive tendering exercise, the contract for development was awarded to Bearing Point (R5), and the proof of concept software was developed and delivered in August 2001 (C&AG, 2007).

6.5.4 The Design Phase

In 2000 Ireland scored poorly in international benchmarking in the provision of digital public services. This was an extremely disappointing outcome given the amount of work that had already gone into developing the Information Society strategy, and was seen within Government as damaging to Ireland's reputation in the area of on-line provision of public services. The poor performance created an urgency within government departments to reverse this situation, and a drive to get services on-line as quickly as possible.

In September 2001 a meeting was arranged with the LGCSB by Reach, CMOD, and ISPU, where it was agreed that the 'e-forms' system, developed by LGCSB, would become Reach's initial offering as a means of strengthening Ireland's position in the EU Benchmarking rankings (R3; R4), and would be branded as Reachservices. In December 2001, Reach commenced work with the LGCSB to integrate the proof of concept software with the LGCSB's e-forms repository to meet short-term goals associated with EU Spring 2002 Benchmarking. The resulting prototype system, referred to as Reachservices Version 0.1, went live in April 2002. This was hosted by the LGCSB and featured on-line forms and proof of identity by means of a linkage to the Department of Social and Family Affairs' (DSFA) systems. Appendix 14 provides sample screenshots of the Reachservices portal.

Thanks in the main to the Reachservices Portal Ireland came first in the EU 2002 benchmarking exercise (Oireachtas, 2002). This was indeed a positive outcome, however the focus on short term wins in EU benchmarking contributed to a loss of sight of the broader mandate of the Reach Agency of integrating public services through the PSB.

In parallel with the deployment of Reachservices V 0.1 work continued on the design and specification of the PSB. The design was done mainly by Reach and CMOD, supported by ISPU, LGCSB, Capgemini, and Propylon who are leaders in the field of XML enabling. However as there was no comparable system in existence the design was continuously evolving as new ideas were scoped and tested. Similarly the requirement to develop a standardised mechanism to integrate data, distributed across many government departments, created enormous challenges due to the range of processes and services that the data was required to support. For example *"there was somewhere over a hundred different services that were subject to a* ***means test*** *of some kind or other, all operated by different agencies, all applying different rules"* (R6). Consequently no tangible specifications emerged, and the scope and complexity of requirements began to grow (C&AG, 2007).

Capgemini provided thought leadership and other consultancy services for producing the Invitation to Tender (ITT), and the procurement and launch of the PSB. They also assisted with a series of cross-departmental workshops designed to garner the necessary support, buy-in, and understanding, across the Public Service. CMOD was also heavily involved in the specification at this point. This resulted in the development of a set of interoperability guidelines and a common set of standards to deliver services from a range of disparate departmental systems. Capgemini provided technical capability in the areas of enterprise architecture, identity management, and security which was to include assistance with up-skilling of Reach staff through the use of a 'buddy' system whereby knowledge and expertise would be transferred over time (Capgemini and Reach, 2006).

Reach established a Technical Authority Group (TAG) to ensure that the design and development of the PSB was aligned to the principles that the individual departments had agreed to (R7). The TAG was also tasked with continuing development of the necessary interoperability standards to ensure that when the PSB went operational departments and agencies (the service providers) could easily utilise the PSB to deliver their services.

In addition to the work on the PSB there was a great deal of IS development work going on across the Public Service, driven in the main by the e-Government agenda. Systems already operational in 2001 included BASIS and OASIS public service information portals, Revenue Online Service (ROS), Land Registry (www.landregistry.ie), and public service recruitment (www.publicjobs.ie). In addition there were a large number of systems in development by departments and agencies at

this time (please refer to appendix 15 for a list of IS development projects). The focus on development of department specific applications somewhat diverted attention away from the integrative concept of the PSB.

Expressions of interest in developing the PSB were invited in January 2002 (C&AG, 2007). The Invitation to Tender (ITT) for the PSB, which had been developed since April 2001 was signed off by DSFA in March 2002, and by CMOD in July 2002 (C&AG, 2007), and issued to vendors in July of 2002, as a set of high-level requirements, contained in 6 volumes, in the areas of operating principles, functionality, organisational model, architectural model, and security model (The Reach Agency, 2002). This was referred to as PSB Phase 1, indicating that further development would be required to deliver the full functionality of the PSB as originally conceived. The requirements detailed in the Phase 1 documents did not describe exactly what was required in terms of a *"concrete architectural view"* (R3), but rather a high level description of how the PSB would work. It was expected that the PSB as described would be delivered by June 2003. The timeline for the whole of the phase 1 project is given below:

Milestone	Approximate Date
Issue ITN	12/7/2002
Receive Tenders	23/08/02
Announce Shortlist	18/10/02
Suppliers commence TDS	21/10/02
Agree draft contracts	8/11/2002
Issue BAFO request	15/11/02
Receive BAFOs and TDS	6/12/2002
Announce Preferred Supplier	20/12/02
Initial PSB Services delivered	31/03/03
Core PSB functionality complete	30/06/03
Additional Customer Services delivered	On-going

Table 18 – PSB Project Timeline (adapted from PSB Phase 1 Invitation to Tender 11th July (2002)

In May 2002 an interdepartmental Board (the first Reach Board) representing ten departments and agencies, was appointed to oversee Reach's work. Membership of all Reach Boards is given in Appendix 16. The Board undertook a wide-ranging review of the PSB project during the latter months of 2002 on the basis of the responses received from the bidders and decided to recommend proceeding with a revised and less ambitious first phase of the PSB. Amid some disagreement in relation to direction

and the approach to procurement, the Board disbanded in January 2003. This group was later re-constituted as a consultative and communications vehicle for Reach and departments and agencies using its services, but did not meet formally (C&AG, 2007).

In May 2003, it was agreed by the e-Cabinet Committee that corporate policy issues around the development of e-Government would be facilitated by a central group drawn from ISPU and CMOD, which would consult with other departments and agencies, and initially focus on the manner in which they interoperate electronically. A new smaller Board (the 2nd Reach Board) was established, made up of a representative from DSFA, ISPU, and CMOD, with an external, independent non-executive Chairman (The 3rd Reach Board, 2008). Please refer to Appendix 16 for membership of the Board. The roles adopted by the new Board were:

- to act as co-ordinator, to ensure that the interests of stakeholders in the PSB were being looked after;
- to ensure that progress is on track and that issues are elevated to the appropriate authority;
- to resolve or escalate policy issues that might arise;
- to sign off on Reach deliverables.

Following reviews of the project in 2002 and early 2003 the scope of the initial phase was narrowed to elements that could be more readily specified. This version of the PSB was presented to the e-Cabinet Committee on the Information Society in May 2003, who agreed that a more limited scope, called PSB Version 1, be built, and that Reach should proceed with the procurement process. At that stage, the cost of development of the proposed PSB Version 1 was estimated at around €14 million (C&AG, 2007).

The PSB procurement process was conducted as a fixed price negotiated procedure, a highly unusual form of contract within the public service (R13; R15 PAC), whereby an agreement is reached that the vendor will deliver on a set of as yet unknown requirements for a fixed price (R9; R13) - *"a fixed deliverable for a fixed fee rather than a flexible partnering contract"* (C&AG, 2007, p. 55). By this time Reach's mandate was formally changed to focus solely on *"delivering a piece of strategic ICT infrastructure as its primary objective"* (C&AG, 2007, p. 45; R 11), the PSB vision had been *"whittled ...down to an ICT project"* (Mc Donagh, 2004, p. xiv), with an un-finalised design whereby - *"Reach could not specify the requirements for the Broker to a sufficient level of detail to be in a position to sign a firm contract ... for delivery"* (C&AG, 2007, p. 55).

In December 2003, Bearing Point was selected as the preferred contractor to build and service the PSB Version 1 (R3; R5; R11).

6.5.5 The Development Phase (PSB Version 1)

The contract to develop the PSB was signed in February 2004, but even at this point Reach could not specify the requirements for the system to a sufficient level of detail to be in a position to sign a firm contract with Bearing Point for delivery – *"there wasn't any hard and concrete architectural view produced ... I don't think Bearing Point won anything, they were just better at documenting what they thought the answer was"* (R3). The level of uncertainty around the requirements would require a great deal of flexibility on the part of the consultant during the development phase as requirements became clearer, however the actual contract was structured more along the traditional lines of a fixed deliverable for a fixed fee rather than a flexible partnering contract (R5). Because of the low number of permanent staff within Reach, Bearing Point became *"effectively the IS division of Reach"* (R9) - *"there were a few of us and quite a lot of them"* (R7). The revised plan was to have the PSB operational by August 2004.

Development of the PSB began in Feb 2004. The main parties involved were: The Reach Agency, Capgemini, and Bearing Point. Propylon were engaged to provide technical expertise in the area of XML (R5). The development was driven largely by Capgemini with little involvement from other government stakeholders at this time.

As soon as the development began issues surfaced among the parties involved. There was frequent argument concerning technical issues, including scope changes (R7). For example at one point Capgemini stated that the project could not be delivered as designed and proposed major changes which resulted in a long process of argument. Propylon proposed solutions based on XML which Bearing Point contended would not work, thereby creating further delays in the implementation (R5). A lot of focus went into small design details such as screen design and colour, whilst losing sight of the overall design and architecture (R2; R4; R7). The ever-changing design led to concern being raised by Bearing Point, who at one point threatened to close the contract, and necessitating a compromise to enable the project to proceed (R5; R11).

It became clear very soon that the vision of the PSB would be hard to translate into a working system. It was a totally innovative and complex design which had never been done before. Consequently nobody really had a definitive idea how the concept would be operationalised, which led to constant debate among the design parties, resulting in considerable changing of minds over the course of the development. It was felt that in hindsight it might have been better to either limit the scope of the original concept and

build expertise gradually, or modify an existing system (R5; R7; R13). The focus of the project team was almost entirely on IT with no thought of the organisational change aspect of the project (R4; R5). Furthermore there was very little input from Government in relation to how the PSB concept fit with the overall change and modernisation programme (McDonagh, 2004).

Many of the difficulties with the project were attributed to deficiencies within the Reach Agency. Reach was never properly set up to carry out the task of delivering on the PSB vision. It was not resourced properly and never had the authority to effect some of the organisational change that the PSB required. The working relationship between each consultancy group was often confrontational resulting in low morale, an absence of teamwork, and a sense of *"them and us"* (R5). Management of the consultants by Reach was considered weak (R2; R3). Leadership within Reach was also considered somewhat chaotic and decision making directive rather than collaborative (R3; R4; R5). It was also felt that Reach management were "*very careful about taking things up the line"* (R5), particularly in relation to problems with the development.

In March 2005, the Reach Board was presented with a revised date of July 2005 for completion of the PSB. A number of difficulties had arisen around the detailed design specification and quality assurance processes, requiring intervention of the Reach Board. These issues were resolved and the target completion date was reset to end of August 2005 (C&AG, 2007). Around this time Bearing Point won the contract to host the PSB. In August 2005 the contract with Capgemini was terminated (The 3rd Reach Board, 2008).

The completed system was finally delivered in December 2005, 16 months behind schedule.

6.5.6 The Operation Phase

Table 19 below shows what was actually delivered against the original specification of the PSB (Phase 1).

Broker Component	Not Delivered	Enabled	Partially Delivered	Deliverd as Expected
Client Authentication			X	
Identity Management		X		
Certificates		X		
Access Manager				X
Search Engine				X
Forms			X	
Agency Services Directory				X
Transaction Manager				X
Episode Knowledge Directory	X			
Data Vault	X			
Means Data		X		
Personal Data				X
Entitlements		X		
Relationships		X		
Secure email			X	

Table 19 – Functionality of the PSB on delivery (adapted from C&AG, 2008)

Two significant planned functions, the Data Vault and the Episode Knowledge Directory were not delivered (C&AG, 2007).

The Data Vault: One of the original ideas for the PSB was that it would support the ISSS (refer to section 6.4.3.2) by providing a data vault which would be a key component in integrating customer data. That idea proved to be too complex and costly to develop, and some departments had concerns at the centralisation of sensitive data. It was decided not to proceed with it at the time and other technology and design options emerged. **The Episode Knowledge Directory:** (more commonly known as the Life Event Directory) was to be a storage point for managing information about a client's life 'episodes', such as changes of address, change of name on marriage, death, etc. This was excluded from the scope of the Phase 1 project.

However significant capability, over and above that initially envisaged in the PSB Phase 1 specification, was enabled by the **Inter Agency Messaging Service (IAMS),** a system built by Reach in conjunction with the General Register Office and the DSFA to support the electronic exchange of customer data among public service agencies (Coughlan, 2003). A second deliverable was the facility to allow on-line payments to Government although this was not listed explicitly in the original framework.

According to the Report of the C&AG the PSB, as delivered, *was "a piece of enabling technology which handles message passing, identity authentication and security. It is a*

piece of infrastructure built to an industry leading design, which should prove to be sufficiently open and robust to allow future technologies to connect to it. The security arrangements are in line with good practice" (p. 44). However the same report goes on to state that the PSB does not *"host and integrate the range of front-end services required by citizens and business, or provide the linkages to the full range of back-end services provided by departments and agencies"* (p. 45), and that *"in terms of output, Reach has not delivered strategic change within Government or an integrated social services system, as was originally envisaged. It has delivered a complex ICT system in the form of the Broker, which has potential, if used"* (p. 57). This fell far short of the original vision for the PSB.

The total cost of developing the PSB was of the order of €37 million compared to an initial total estimate of €14m. Please refer to Appendix 17 for a full breakdown of these costs. Ongoing costs were expected to be in the region of €14-15 million per annum (The 3rd Reach Board, 2008).

After the initial go-live the PSB underwent a series of modifications and improvements carried out by Reach and Bearing Point (The 3rd Reach Board, 2008). In particular considerable development effort went in to enhancing the messaging fabric, and minimising the original complexity of the security system. By the end of 2007 the PSB provided the following functionality:

- identity management services to allow customers to be identified and authenticated online. These rely, in part, on public service identity data held in the Department of Social and Family Affairs;
- Inter-agency Messaging Services (IAMS) which allow for the exchange online of data and documents between agencies (Coughlan, 2003);
- Reach interoperability guidelines, a series of standards for message exchange by Government and private sector service providers;
- a customer account and secure inbox which customers can use to receive and send communications with public service agencies in a secure, recorded way;
- a central services index which offers basic information and signposts to some 1,300 services offered by public agencies;
- a front-end forms and manager service to handle online interactions with customers across the public service.

Source: (The 3rd Reach Board, 2008).

A number of departments and agencies were using the IAMS capability of the PSB to transfer information and messages between their computer systems. These included:

- the automatic provision by the General Register Office (GRO) of birth registration data to the Department of Social and Family Affairs (for child benefit payment purposes) and to the Central Statistics Office;
- the Death Event Validation Service (DEVS) and Death Event Publication Service (DEPS) linking the General Register Office with almost 40 other departments and agencies;
- the exchange of export refund information between the Revenue Commission and the Department of Agriculture and Food.

The C&AG report states that a total of ten government departments and agencies were users of the PSB. Many other departments did not take up the services on offer with the main reasons cited as: not appropriate for the needs of the department/agency; not available on time; system which would use the PSB not yet developed; service required could not be provided by Reach; lack of resources to evaluate the applicability of the PSB; and lack of awareness of PSB facilities (C&AG, 2007). The most frequently quoted issue was the lack of a higher level of identity authentication than was currently provided by the PSB. By the time of its release some departments had also already developed their own on-line service portals (C&AG, 2007).

By the time the PSB was launched it was already suffering from an identity issue across the public service and the reputation of the Reach Agency had suffered a number of blows (Nolan, 2010). In terms of identity the use of the PSB by the public through the www.Reachservices.ie portal was low, probably as a consequence of the lack of profile that Reach had achieved among the general public (R2). The profile of www.Reachservices.ie was further impacted because the service overlapped with another on-line information facility operated by the Citizens Information Board (www.citizensinformation.ie). In fact in the 2007 EU benchmarking survey it was the Citizens Information website rather than Reachservices that was assessed as the national portal (C&AG, 2007). The identity of the Reachservices portal was further compromised in 2007 with the launch by the Health and Safety Authority of the www.reachright.ie website which provides information on regulatory issues relating to the use of certain chemicals. The number of users of www.Reachservices.ie increased significantly in 2006 – 2007, as did the number of personal PSB accounts opened, but this was mainly because the PSB provided the identity authentication functionality for citizen access to the Revenue On-Line Service (ROS).

By the time the PSB was delivered interest in the project was waning. Delays during the design and implementation phases caused significant frustration within CMOD, as did the frequent changes in scope and specification (Nolan, 2010). Escalating costs and the heavy reliance on consultancy services led to a dilution of trust and confidence by CMOD, and others, in management at the Reach Agency (Nolan, 2010), a significant issue given the policy formulation and sanctioning role held by CMOD within the Public Service, and its oversight role in the development of the PSB.

The extended timeframe to deliver a working PSB architecture also meant that advances in search engine and other web based technologies were causing a shift in thinking away from the original architectural concept to more public domain access technologies. The delays in delivering the PSB functionality, compounded by interoperability issues surrounding the integration of disparate data sets, and difficulties in getting these problems resolved, also caused immense frustration within many departments and agencies (Nolan, 2010). Two such projects; the Revenue Commissioners PAYE authentication project, and the Department of Justice Criminal Justice Interoperability Pilot project (CJIPP) were frustrated by the apparent lack of planning and management capability within Reach, the level of business development acumen displayed, and the unwillingness of Reach to proactively engage with other departments, preferring to delegate such responsibility to contractors (Nolan, 2010). Both projects felt that problems which arose had to be solved by the department itself, with very little input from Reach. Many other departments were developing their own approach to service integration (e.g. the DISDP), and in fact many departments and agencies were already building their own on-line capability at this time.

By this stage political interest in the PSB initiative was also waning. The Information Society Commission had been wound down in 2004 and no formal e-Government strategy had been announced since the beginning of 2006 (The 3rd Reach Board, 2008). It was stated at the PAC Hearing that *"The focus and momentum which we seemed to have in 2000 and 2002 have been lost ... and [that] since 2005 we have had no strategy or nobody driving this causes concern with regard to the level of interest at Government level"* (R21 PAC). In the EU Commission's benchmarking exercise of 2007 Ireland's overall ranking regarding on-line sophistication of e-Government had fallen to 17th place from 1st place in 2002 (C&AG, 2007). Ireland's 2007 scores for overall sophistication and range of on-line services (78% and 50% respectively) also compared poorly with those of the top ranked countries (Capgemini, 2006). There is no evidence that any action was initiated within Government on foot of this poor performance.

6.5.7 The Termination Phase

Amid the growing concern about the future viability of the PSB a decision was taken at Government level to establish a reconstituted Reach Board (The 3rd Reach Board, 2008). The membership of this board is given in Appendix 16. The board was established in June 2007 and tasked with conducting a comprehensive review of the PSB to include its continued validity as an endeavour, the appropriateness of the current technology platform, the appropriate organisation and governance structure for Reach, the on-going operation of the PSB, the required management structure, staffing levels, and skillsets, appropriate consultation mechanisms for engagement with public bodies for future developments, appropriate charge-out mechanisms, and identification of potential candidates for delivery of integrated services (The 3rd Reach Board, 2008). The Board also took into consideration findings of the Special Report of the Controller and Auditor General which had been published in October 2007 (C&AG, 2007).

The report of the 3rd Reach Board, published in January 2008, recommended that with certain provisos the PSB should continue as an important provider of shared services to facilitate departments and agencies in providing on-line services to the public, and in collaborating with each other. However the board recommended that the original all-encompassing model, envisaged for the PSB, as a one-stop-shop for the delivery of all public services should not be pursued. The report also recommended that the www.reachservices.ie portal be closed down and that responsibility for providing front-end facilities should reside with individual departments and agencies, a significant change to the original concept of the PSB as the gateway to integrated service delivery. Subject to a new e-Government strategy, the Board recommended that Reach be given a new mandate and resources to identify opportunities for better collaboration between departments and agencies in the provision of services. Significantly the report also stressed that the future role, objectives, and priorities for the PSB and Reach must be set in the context of central government initiatives such as service modernisation and quality customer service.

A report by the OECD entitled **Ireland – Towards an Integrated Public Service**, published in 2008, stated that *"This visionary approach has experienced several setbacks, however, and for the moment, has fallen short of expectations. It is linked to too few online services, and its centrepiece – the Reach online authentication service – is generally not considered to be user friendly as its registration process involves both online and mail-in procedures, resulting in a lengthy and complicated process"* (OECD, 2008, p. 36), and that the PSB is *"primarily being used for information transfers within*

the Public Service and to confirm identity and provide PINs for the ROS" (OECD, 2008, p. 200). It also noted the lack of a pre-populated form filling service which it considered essential for most public bodies to provide service through the PSB.

The PSB was the subject of discussion at the Committee of Public Accounts debate into the Value for Money Report 56 of the Comptroller and Auditor General (Public Accounts Committee, 2007) on 6th March 2008. At the debate the PSB was variously described as a failure *"which has very much overrun its budget"* (R21 PAC), and which *"from the beginning it was in trouble"* (R20 PAC). Concern was expressed regarding the lack of planning and budget for the project (R18 PAC), the under-resourcing of the project (R20 PAC), and the difficulty in establishing where responsibility for the project actually lay (R21 PAC).

Following the presentation of the report of the 3rd Reach Board the Government decided that the functions in relation to the operation of the PSB should be transferred to the Department of Finance (CMOD) following a period of assessment. The transfer occurred on 31st March 2008 shortly after which the Reach Agency was dissolved and the PSB closed.

6.5.8 Summary Timeline of PSB Development

Date	Event	Main actors
Jan-99	First Information Society Action Plan	Dept. An Taoiseach, ISPU
Jan-99	ISPU Established	Dept. An Taoiseach, ISPU
Jul-99	Reach established	DSFA, Reach
Jul-99	Information society Fund Established	Department of an Taoiseach, ISPU
2000	Ireland scores badly in EU Benchmarking	EU, Capgemini
May-00	Government Approval for the e-Broker model (PSB)	Government, ISPU, CMOD
May-00	Reach Agency assigned responsibility to deliver the PSB	Government, DSFA, Reach
Jul-00	Reach produces statement of intent	Reach
Sep-00	Reach launches website www.Reach.ie	Reach
Mar-01	13 staff appointed to Reach and initial consultancy appointments made	Reach
Apr-01	Approval given to Reach to commence procurement process for PSB	Government, Reach

Jun-01	DISDP project formally launched	Donegal County Council, DISDP board, Reach, CMOD
Jun-01	Capgemini appointed as consultant to PSB initiative	Capgemini, Reach
Aug-01	Initial proof of concept delivered	Reach, Bearing Point
Sep-01	Reach begins collaboration with LGCSB on the 'e-forms' system	Reach, LGCSB, ISPU, CMOD
Jan-02	Expressions of interest to develop PSB sought	Reach
Mar-02	Invitation to Tender for PSB signed off by DSFA	DSFA, Reach
Mar-02	2nd Information Society Action Plan: *New Connections*	Dept. An Taoiseach
Apr-02	Reachservices.ie goes live	Reach, ISPU, CMOD, LGCSB
May-02	1st Reach Board established	Reach Board
Jul-02	Invitation to Tender for PSB signed off by CMOD	CMOD
Jul-02	Invitation to Tender issued to vendors	Reach
Jun-02	Government Minister of State with responsibility for the Information Society appointed	Dept. An Taoiseach
2002	Ireland comes 1st in EU Benchmarking	EU, Capgemini
2003	2nd Reach Board established	DSFA, ISPU, CMOD
May-03	Revised PSB presented to the e-Cabinet Committee (PSB Version 1)	Reach
2003	DEVS/DEPS projects	Reach, DSFA, General Registry Office
2003	Inter-agency Messaging System (IAMS)	Reach, Propylon
Dec-03	Bearing Point selected to build PSB Version 1	Reach, Bearing Point
Feb-04	Contract to develop the PSB signed and work begins	DSFA, Bearing Point, Capgemini, Propylon, CMOD
Nov-04	Report: Modernising service delivery - A Blueprint for Development and Change presented	Reach, Dr. Joe McDonagh
Jun-05	Project Management Office established in Reach	Reach
Mar-05	Go-live date for PSB revised to July 2005	Reach
Aug-05	Contract with Capgemini terminated	Reach, Capgemini
Dec-05	PSB Version 1 delivered (16 months behind schedule)	Reach, Bearing Point
2005 - 2008	Criminal Justice Integration Pilot Project (CJIPP)	Reach, Courts Service, An Garda Siochana
2006 -	PSB Version 1 live and used by 10 government	Reach

2007	departments and agencies	
Jan-06	Evaluation of Donegal Integrated Service Delivery Project:	Fitzpatrick associates, DISDP
2006	PAYE Project goes live	Reach, Dept. Finance
2007	Ireland ranked in 17th place in EU Benchmarking	EU, Capgemini
Jun-07	3rd Reach Board established	3rd Reach Board
Oct-07	Report of the Comptroller and Auditor General on e-Government	C&AG
Jan-08	Report of 3rd Reach Board	3rd Reach Board
2008	OECD Report	OECD
Mar-08	Public Accounts Committee (PAC) debate includes PSB	Public Accounts Committee, Dept. of an Taoiseach, DSFA, CMOD
Mar-08	Government decision to transfer PSB to dept. Finance (CMOD)`	Reach, CMOD
Apr-08	PSB closed and Reach dissolved	CMOD

Table 20 – PSB Timeline

6.6 Conclusion

The PSB was a ground-breaking, inventive, and expansive concept, which, if implemented as originally conceived, would have become a visionary vehicle for the delivery of integrated services in line with the service modernisation vision as articulated in the Strategic Management initiative (SMI), Doing Better Government (DBG), and Quality Customer Service (QCS) programmes. Although a number of positive outcomes emerged from the endeavour the trajectory of its life from initial concept to closure shaped a number of conditions, some from the outset that resulted in its failure to deliver on its primary objective to supply integrated government services, and associated organisational change, and ultimately its closure.

This chapter has presented a detailed narrative of the PSB initiative beginning with an analysis of the political and technology environments of the 1990s and early 2000s which created a huge swell of interest in the potential of ICT to deliver e-Government services, which ultimately led to the conceptualisation of an enabling architecture called the Public Service Broker (PSB). The story of the design and development of the PSB

through the years 1999 up to its eventual closure in 2008 is then presented as six distinct phases.

As stated in Chapter 3 failure is a social construct (Bovens & Hart, 1996 in Goldfinch, 2007), the assessment of which is dependent on the values of the person or group making the assessment, what standards are applied to the assessment, and what qualities are regarded as significant (Bignell & Fortune, 1984). The fact that the PSB initiative was closed satisfies Sauer's assertion that failure occurs when the level of dissatisfaction with a system is such that there is no longer enough support to sustain it (Sauer,1993b), however it should be acknowledged that the PSB initiative was central to the development of identity management services, interoperability guidelines, and the Inter-agency Messaging Service (IAMS), all of which were transferrable to other government systems after its closure. The PSB project was also central to the development of a number of systems such as birth registration, death event services, and export refund services.

Regardless of the assessment it should also be acknowledged that the concept of the PSB was both visionary and brave and that if it had worked to plan would have represented a unique achievement in the provision of integrated government services. It is a testament to the tenacity of the many Government departments who were involved in its conceptualisation, and ultimate delivery. It is also interesting to note that even if the PSB had delivered on its original concept some of the architectural design, which contributed enormously to the complexity of the project, was being superseded by rapid advances in the areas of web based technologies even as the development of the PSB was taking place. This may ultimately have made much of the complex architecture of the PSB redundant. Of course the advances in technology would not have addressed the failure to support the PSB concept with an accompanying service delivery and organisational change framework, both of which were also essential to the delivery of integrated public services.

Chapter 7

Towards a Theory of how the Role of the CIO Influences IS Failure Outcomes

Chapter 7 - Towards a Theory of how the Role of the CIO Influences IS Failure Outcomes.

Nothing is so practical as a good theory (Lewin, 1951 p. 169)

7.1 Introduction

Gregor (2006) describes theories as *"abstract entities that aim to describe, explain, and enhance understanding of the world, and in some cases, to provide predictions of what will happen in the future"* (p. 616). Sutton & Staw (1995) state that "*theory is about the connections among phenomena, a story about why acts, events, structure, and thoughts occur....the nature of causal relationships... as well as the timing of ... events*" (p. 378). Theory, based on the interpretivist tradition, is idiographic in nature (Lee & Baskerville, 2003) and includes antecedents, consequences and context (Sutton & Staw, 1995) which *"plays a crucial role in interpretive research and clearly distinguishes it from just anecdotes"* (Klein & Myers 1999, p. 75)

The purpose of this chapter is to offer a theory relating to the role of the CIO during the course of IS failure and how the role influences IS failure outcomes. The concept of role emerged in the social sciences (Biddle, 2014), and is based on a metaphor borrowed from the theatre which describes a part played by an actor in a drama (e.g. she played the role of the wife) (Solomon et al., 2014; Thies, 2009). Although the concept of role remains plagued by conceptual and definitional confusions (Biddle, 2014) it is a term that is used every day in an organisational context to mean a position within the organisation (e.g. functional manager) with an associated set of objectives and accountabilities to guide the performance of the role. For example Mintzberg's seminal work on the role of the manager defines role in terms of 10 functions (or attributes), which include both formal and informal duties (Mintzberg, 1980). Extant literature on the CIO role does not precisely define the term role but instead speaks of it in terms of (1) the position of the CIO function within the organisation (Chun & Mooney, 2009; Kearns & Sabherwal, 2007; Smaltz et al., 2006; Tagliavini & Moro, 2003), and (2) the performance of a set of functions carried out by the CIO such as leader, spokesperson, monitor, liaison, entrepreneur, and resource allocator (Chen et al., 2010; Grover et al., 1993; Lundberg, 2008; Preston & Karahanna, 2005).

Based on this the use of the term role in the research question is taken to mean the gamut of plans, actions, decisions, etc. performed by the person(s) occupying the position of CIO, which influence, and are influenced by, the trajectory of events over time (Chun & Mooney, 2009; McCall & Sergist, 1980; Mintzberg, 1990). Taking this position will help focus on answering the research question in the context of the engagement of the CIO throughout the process of failure.

When developing theory Lee & Baskerville (2003) suggest a two phase process. Phase one involves the development of first-level constructs based on understandings held by the observed people themselves, followed by a movement from raw data to description. The execution of phase one was described in Chapter 5 (data analysis) and Chapter 6 (the case narrative). Phase two involves the development of second level constructs by moving from description to theory. This process conforms to Weick's (1995) notion of theory development as a process which *"starts with guesses and speculations and ends with explanations and models"* (p. 386). It should also be acknowledged that, in addition to the inductive-deductive process of theory building in qualitative research, a third element exists which is that of inspiration, driven by creativity and insight on the part of the researcher (Langley, 1999).

Section 7.2 describes the framework that emerged from a detailed analysis of the data collected from the case of the Public Services Broker (PSB) as described in Chapters 5 and 6. Section 7.3 presents the theory of how the role of the CIO influences IS failure outcomes. Section 7.4 then uses the framework to assess the key CIO roles that resulted in the failure. Section 7.5 compares the emergent theory with extant literature. And Section 7.6 describes the contribution of the emergent theory from an academic and practitioner context. Section 7.7 then concludes the chapter.

7.2 A Description of the Theoretical Framework.

Chapter 5 described in detail the research process which led to the emergence of a theoretical framework to describe the role of the CIO during IS failure. The typology speaks to a series of phases/stages with each phase/stage delineated with a set of defining characteristics. The phases/stages are defined as *genesis, initiation and conceptualisation, design, development, operation,* and *termination*, and each phase is delineated by four dimensions of failure: *vision, support, governance, and execution capability* which are also described in detail in Chapter 5, Section 5.6. The typology forms the backdrop to the performance of the role of CIO, which is central to the emergent theory. The theoretical framework is presented below.

Phase / Failure Dimension	Genesis	Initiation / Conceptualisation	Design	Development	Operation	Termination
Vision	Technology-led Visionery	Technology-led Director	Downgraded Developer	Overseer of a Shrinking Vision	System Administrator	Executioner
Support	Solo Evangelist	Conditionally Supported Advocate	Unsuccessful Relationship Manager	Passive Relationship Manager	Unresponsive Relationship Manager	Defender
Governance	Informal Watchdog	Marginalised Observer	Moderator of Diverse and Vested Interests	Information Gatekeeper	Passive Escalation Facilitator	Non-participative
Execution Capability	Advisor	Under-resourcer	Under-resourced Facilitator	Under-resourced Abdicator	Overrun Leader of a Rudderless Entity	Terminator

Figure 17 - Theory of how the Role of the CIO Influences IS Failure Outcomes.

Section 7.3 will describe the emergent theory of how the role of the CIO influences IS failure outcomes based on the theoretical framework described above. The theory will describe the role played by the CIO in the context of the four dimensions of failure extending over six phases representing the entire initiative, during which time the process of failure emerged. It will describe the interaction between the performance of the CIO role and the dimensions of failure as they both influence, and are influenced by, each other, thereby creating outcomes which may impact during later phases of the initiative, and forming additional jeopardies, or compounding existing ones over time. This is consistent with a processual ontology (events, activities and actions, which unfold over time and in context (Hinings, 1997; Langley & Tsoukas, 2010; Pettigrew, 1997)) whereby theories provide explanations in terms of patterns in events and choices over time (Mohr, 1982), emphasising necessary causality rather than necessary and sufficient causality (Langley & Tsoukas, 2010).

7.3 The Theory of how the Role of the CIO Influences IS Failure Outcomes.

7.3.1 Genesis

7.3.1.1 Vision

CIOs at the Department of An Taoiseach and Department of finance played key visionary roles in executing their mandate to investigate how integrated services could be delivered (R16 PAC) as "*a single 'front-end' to users, managing their interaction with government services*" (C&AG, 2007). Both CIOs were senior career civil servants with significant IT and business experience, and impeccable service records. The partnership was synergistic as one CIO, the head of CMOD, had over 30 years' experience in IT, and the other, the head of ISPU, had a long career in both IT and innovation with technology (R4).

However the primary focus of the vision was on technical feasibility (R4; OECD, 2008) – *"it was starting, as was many IT projects ... we now have the technology ... let's figure out what use we might make of it"* (R6). The *"very considerable investment"* and *"re-engineering of substantial elements of the public service"* and "*the risk of resistance to change which can arise in any large organisation*" (Department of An Taoiseach, 1998, p. 29,31) were known but not fully investigated by either the CIOs or the government - *"we knew it [organisational aspects] would but we kept kicking it down the road"* - *"we saw e-government as an IT problem, not as an organisational change"*

(R4). The result of this was a mis-alignment, from the outset, between the **technology-led** PSB vision and the organisational change aspect of the wider government modernisation strategy (R19 PAC; R11).

Similarly, the level of cross departmental co-operation that would be required had never been attempted before, and was not given any serious consideration. This would manifest later in the project in the form of lack of buy-in from some departments and agencies, and the inability of the CIO to compel departments and agencies to co-operate.

Compounding this was a decision by government not to subject the PSB proposal to the usual formal government consultation process (R18 PAC, R4). Instead the decision to proceed was based on a limited knowledge of the technical and organisational complexity involved (R4) which stifled a more thorough examination of what was being proposed. The CIOs had *"got a decision that we shouldn't have got and we were delighted to get a decision, but the evidence wasn't substantial"* (R4).

7.3.1.2 Support

Support for the PSB at the Genesis phase was very strong both, implicitly and explicitly, influenced largely by the prevailing perception within government that *"we need to do 'e'"* (R5), stated objectives in government strategic plans (Mc Donagh, 2004; Timonen et al., 2003), and the desire to demonstrate leadership in e-Government in Europe (R4; R5).

Both CIOs played an evangelising role at this point which was received with enthusiasm across government. In particular one CIO had a long standing reputation for innovation using IT, and played a key role in garnering support for the concept of the PSB, which was compounded by the broad wave of enthusiasm towards the initiative – *"it sounded great, it was great … it started to turn on lights everywhere…. everybody who looked at it was convinced it would work"* (R4). However one of the CIOs also acknowledged a tendency to engage in self-appointed conceptual projects – *"I tended to do solo flights …. I'd sit down … I'd come up with a concept … I'd come into a meeting and they'd all say, 'Jeez, what's this guy talking about? … that's the way I am"* (R4), which was a contributory factor in the early pursuit of a solution - *I actually did a* ***solo flight*** *on that [PSB] and on other things like that … which was wrong* (R4).

The manifest support across government and others would transpire to be largely initial enthusiasm rather than commitment that would endure over the lifetime of the PSB initiative. The level of IT knowledge at government level was low resulting in a lack of

full understanding of the scale and scope of what was being proposed (R3; R4; R8), and failed to capture the *"sketchy"* (R4), *"single sheet of paper"* (R9) nature, and the technology focus, of the proposed solution; a point overlooked by the CIOs at the time. Furthermore, support in the form of formal structures was not established. For example no project sponsor was assigned and no owner of the project was identified at government level. Furthermore it was not until 2002 that a government Minister of State with responsibility for the Information Society was appointed to oversee development in this area (R2). The failure to establish proper support structures would later surface significant barriers to the successful completion of the project in terms of both the level of authority and the resources given to the Reach Agency to execute the task, and would manifest as waning support within government as the initiative progressed.

7.3.1.3 Governance

Both CIOs, as heads of CMOD and the ISPU respectively held key positions in the central government departments of Finance and An Taoiseach respectively. As such they had significant powers of governance in relation to IS initiatives through funding (in the case of CMOD), or the central e-Government programme (in the case of ISPU). However, although responsible for creating the vision for the PSB, both CIOs assumed only an **informal watchdog** role rather than an active role in formal governance structures. Instead it was decided by government that the Co-ordinating and Implementation Groups, set up to drive forward the change programmes envisaged by the SMI (Boyle & Humphries, 2000), would provide central governance for the PSB initiative (Department of An Taoiseach, 1998a; McCaffrey, 2007). No governance structure was set up explicitly to manage the PSB initiative, and no formal sponsorship or ownership was established for a project incorporating *"complex technical issues and complex business change and required central governance – which was not recognised and addressed from the outset"* (R11).

Furthermore, at the time of its inception, the vision for the PSB was only notionally aligned with the service modernisation strategy and the alignment between the business objectives and the PSB initiative was not given sufficient attention by government or the CIOs, as evidenced by the lack of a formal approach to the organisational change aspects of the PSB. Formal oversight for such a ground-breaking vision was inadequate – *"it really isn't enough to build a technical solution without looking at the governance, the business functions ... I think, we didn't address [these] properly"* (R9) - which resulted in the absence of *"measurable targets"* for the PSB from the outset (C&AG, 2007, p. 11). Governance of the PSB project would prove to be extremely complex throughout the lifetime of the project, and chaotic at some

stages - *"the governance structures were inadequate, and expectations were unrealistic in the absence of feasibility assessment and proper planning"* (C&AG, 2007, p. 11).

7.3.1.4 Execution Capability

At this stage execution capability was unknown as "*the Broker was an innovative concept that would clearly need a considerable degree of further analysis and planning before it could see the light of day"* (R13), and there was limited understanding of how the concept could be operationalised. Executing the PSB vision would entail significant organisational change due to the cross-departmental nature of the vision (Department of An Taoiseach, 1998). Similarly developing the PSB would require significant IT resources, the availability of which had already been cautioned in the *Framework for Action* document (Department of An Taoiseach, 1998a).

The CIOs played an **advisory** role in relation to execution capability, advising that *"the initial implementation should be built to be simple, with limited functionality"* (R13). However due to a government intervention the visionary CIOs would not play a key role in implementing the vision for the PSB. Following cross-departmental discussion, it was decided by government to assign responsibility for the further development of the PSB to the Reach Agency (C&AG, 2007). The agency had a *strong IT capacity"* (R14 PAC), and *"a very good reputation for delivering on IT services, and the nature of [its] work ... appeared to support the broker* (R19 PAC). However like most other IT units within the Public Service, its experience of this type of ground breaking, cross-departmental initiative was untested (R3; R4; R8). CIO responsibility for the PSB initiative formally transferred to the Director of the Reach Agency, a senior IS manager at Assistant Secretary General level with an excellent track record in the management of IT departments (R3; R4). Both of the visionary CIOs remained closely involved, but with advisory and oversight responsibility only (R3; R4; R13).

The transfer of responsibility to Reach removed the two CIO visionaries from direct control of the future direction of the PSB, thereby leaving the new CIO in a vulnerable position by creating a disconnect from two of the most powerful government departments (R6). Furthermore the position of the Reach Agency within DSFA would marginalise it, leading to significant difficulty in securing support for the initiative going forward.

7.3.2 Initiation and Conceptualisation

7.3.2.1 Vision

When the Reach Agency was assigned responsibility for the further development of the PSB (R4; R6), its mission was to translate the vision into a workable system design that could then be built to specification. The expansive but sketchy nature of the vision would have to undergo a significant body of further conceptualisation and design before the vision could be implemented. The new CIO assumed a **directorial role** and set about organising and resourcing the Reach Agency for the task ahead – *"he [CIO] took over the boardroom and did planning sessions how this would be done and even how Reach would need to be organised to do it"* (R1).

The CIOs vision for the PSB remained ambitious and expansive – *"they wanted to run the world"* (R3), however further developing the vision continued to focus largely on the technical aspects of the PSB architecture - *"it was driven almost exclusively as an IT project"* (R6), at the expense of a wider set of organisational factors. This is evidenced by the fact that all external expert opinion engaged by the CIO during the conceptualisation period related to technical aspects of the PSB. For example CMG Admiral were tasked to scope a proof of concept (R3; R7), Propylon were engaged to design a messaging solution based on XML (R3; R5), and Capgemini were engaged to assist Reach with advocacy, managing a procurement process, and to provide technical expertise (Cap Gemini and Reach, 2006; R5).

As conceptualisation progressed the complexity of the originally proposed vision began to crystallise, and associated technical difficulties would begin to emerge.

7.3.2.2 Support

Implicit and explicit support for the PSB remained high at this point and was reinforced by the support and enthusiasm of the secretary general of DSFA, the parent department of Reach (R6; R9; R10). The first signs of difficulties relating to support emerged as the CIO began an advocacy programme for the PSB (R11). The advocacy programme failed to garner the expected support and commitment from other departments and agencies, the intended targets of the PSB. A number of reasons have been sighted for this including a failure on the part of Reach and the CIO to market the PSB concept in a convincing way (R3; R5), a perception of a dictatorial stance being taken by Reach management including the CIO, a sense among users of *"just being told do it!"* (R3), a low perception of credibility and capability of the Reach Agency (R3), and that *"Reach has not created a value proposition to demonstrate the worth, to public services providers"* (R7; C&AG, 2007, p. 49). The emerging signs of a lack of perceived

value of the PSB among stakeholders would be further aggravated when complexity issues began to arise during the design phase.

Compounding the difficulties in garnering support for the PSB initiative was the fact that when established, Reach was not given a cross-departmental mandate and therefore had no powers to compel other departments to engage (R6, R11). Support for the PSB was therefore **conditional** on its perceived utility to the potential user community, as there was no financial penalty for not engaging with the PSB initiative. This position was further exacerbated by the location of the Reach Agency within the DSFA as will be explained in section 7.3.2.3 below. This left the CIO in a very vulnerable position, effectively without a clear mandate or authority, which was something that had not been considered during the initial wave of enthusiasm surrounding the genesis of the PSB initiative.

Support from ISPU and CMOD also started to waver as it became apparent that the project was not progressing as smoothly as first envisaged, and negative opinion about the capability of the CIO began to surface – *"Nobody could decide to do anything to do with a project, plan, or an architecture, or a proof of concept project. It was just wandering all the time."* (R4).

7.3.2.3 Governance

Governance arrangements for the project remained similar throughout this period with regular contact and input from ISPU, CMOD, and LGCSB. More formal monitoring and governance continued to be done through the Implementation Group of Assistant Secretaries, but on a limited basis (C&AG, 2007; R19 PAC).

The decision by government to assign the PSB to an agency within a department (DSFA) with no central role in e-Government isolated Reach from central authority and therefore the unitary management and accountability required for cross-departmental initiatives (C&AG, 2007). This greatly **marginalised** the position of Reach and the CIO leaving them to play an observer role in the governance of the PSB. If, for example, Reach had been established under CMOD or ISPU then it would have had a far stronger cross-departmental mandate through funding (in the case of CMOD), or the central e-Government programme (in the case of ISPU), (R5) - *"the organisational status of Reach seems to have been too far from the Centre, where visions and guidelines are decided ... This has diminished Reach's credibility"* (OECD, 2008).

Project controls were also very loose. The project was developmental at this point (R14 PAC) and Reach was still in the process of deciding how the vision might be delivered,

therefore much of the work was trial and error. It is of note however that this phase was allowed to continue for 15 months with no specific timelines or defined budget (R14; R18 PAC), and no *"business, financial, staffing, or risk management plan in place"* (C&AG, 2007). Allowing the project to proceed in this fashion was a clear breach of government capital appraisal policy (Government Circular 16/97, 1997; The Department of Finance, 1994), and project management standards (C&AG, 2007), the blame for which must be borne by the Principal of the Reach Agency (CIO). Furthermore although nothing tangible was emerging, and the project appeared to be drifting (R9), the CIO secured government approval in April 2001 to commence a procurement process for the PSB (C&AG, 2007).

7.3.2.4 Execution Capability

On transfer of responsibility for the PSB to the Reach Agency the main role of the CIO was a resource allocator to position the Reach organisation for the task in hand. A number of interviewees expressed opinion about the suitability of the appointment of the Reach CIO which was both negative and positive. On the negative side, opinion was expressed that the CIO's experience was of legacy IT systems and not sophisticated enough to manage a more complex undertaking like the PSB (R3; R4), that the individual in question lacked decisiveness, was prone to procrastination (R3; R4), and did not have the personal charisma to create a vision that would bring people on board (R4; R8) – *"you needed a different kind of person to manage this"* (R3). This was articulated by the OECD who questioned - *"the capacity of the Reach Agency ... to formulate and communicate the functionality of a system in an environment characterised by fast-paced technological change, uncertainty about the level of buy-in from other departments and agencies"* (OECD, 2008). On the other hand other interviewees expressed positive opinion - *"I think part of it was managed well"* (R8) – *"a strong CTO [Chief Technical Officer] behind him it would be fine"* (R3).

Up until the appointment of 13 staff in March 2001 the Reach Agency consisted only of the Director and Deputy Director, who worked in close co-operation with CMOD and ISPU at this time. A role scoping exercise conducted by the CIO showed a need for a number of senior appointments, however no further appointments were ever made (R1). A significant omission was the absence of a senior IT architect with the knowledge and capability to engage with subject matter experts in relation to the emerging complexities of the PSB vision (R3; R9). In fact all 13 staff appointed to Reach did not have the expertise in the areas that the concept was directing them to, such as XML. In the words of one external observer *"Reach was never set up properly"* (R5). Failure on the part of the CIO to **adequately resource** the appropriate technical

skill-set in-house created a serious imbalance between in-house expertise and outsourced expertise leading to an inability to *"keep control of the design of what you are doing"* (R9), and started a dependency on external consultants, who often appeared as the face of Reach during engagement with other stakeholders - *"[Reach was] very taken in by the Propylon guy"* (R5) – *"it was never Propylon working for Reach, it was always Reach working with Propylon"* (R7). The lack of in-house expertise also hampered progress in developing the vision as Reach appeared to get bogged down in minute detail – *"they seemed to be tying themselves up in knots"* (R4; R13) - *"the feedback we got from consultants ... that there was no decision making"* (R3; R4).

This situation would endure and grow for the remainder of the initiative, resulting in reputational damage to Reach and negative opinion about the leadership capabilities of its CIO.

7.3.3 Design

7.3.3.1 Vision

The broad visionary role of the CIO was changed, during this phase, by the government decision to remove responsibility for developing other elements of the ISSS[18]. This effectively **downgraded** the remit of Reach, and consequently the role of the CIO as its director, to that of delivering a piece of *"strategic ICT infrastructure ... rather than delivering the strategic social services integration project that was originally envisaged"* (C&AG, 2007, p. 45). The main role of the CIO at this point was to finalise a working model for the PSB, source a partner to complete the development, and deliver a functioning PSB system (R3; R13).

The Downgrading of the CIO role was further evidenced by the rushed launch of Reachservices V 0.1, to fulfil a need perceived by government to be of the utmost importance in terms of EU benchmark ranking, but which was not congruent with the original vision for the PSB – *"So, Reach were there trying to set up a central standard for the broker and at the same time Taoiseach's were just trying to get websites up and trying to get Ireland looking good"* (R3). This diversion (amounting to political interference – *"the Taoiseach ... wanted to tick a box"* (R4)), at a critical point in the PSB design caused further delay in progressing the PSB design and greatly compromised Reach's position, and by default the role of the CIO, in relation to its original mandate (R7). The delivery of Reachservices V 0.1 and subsequent elevation of Ireland to 1st place in Benchmarking ranking in 2002 only served to fuel the notion

[18] See chapter 6 section 6.3.2.3

that the original vision for service modernisation in Ireland was well on course, whilst the emerging seeds of failure around the trajectory of the PSB project were largely being ignored.

Despite the fact that the PSB design had not been finalised at this stage the 'negotiated procedure' contract entered into with Bearing Point copper-fastened a contractual arrangement which created a serious risk exposure for the PSB, as it consisted of two incompatible components: (1) an acknowledgement that the system design would need further refinement; however (2) the fixed price structure of the contract would leave little room for the flexibility that such an arrangement would necessitate. This situation was summed up by one interviewee as - *"Picking a partner to help you deliver nothing was a useless exercise"* (R3). Failure to envisage the obvious difficulties that would ensue was a significant oversight on the part of both the CIO and his advisors, which would surface significant issues during the development stage in the form of arguments, and even a threat to close the project by the developers (R5), and would eventually lead to escalating costs due to the frequent scope changes. However one must also consider that the decision to award the contract on the basis of a negotiated procedure was not taken unilaterally by the CIO as CMOD were instrumental in approving the work done by Reach at this time.

7.3.3.2 Support

Although support for the PSB was reinforced with the publication of *New Connections* the reality on the ground was that government support had now become more focused on quick stop-gap efforts to position Ireland at the forefront of EU benchmarking, driven by *"pressure from Europe to produce on-line services"* (R4). To maintain support for the PSB initiative the CIO had begun to collaborate with a number of user departments and agencies, including Revenue, Agriculture, Donegal County Council (DISDP), DSFA, and Land Registry. In many cases however engagement by other agencies was predicated on the need to utilise the citizen personal identification system that was owned by DSFA (R7).

Beyond this requirement it remained difficult for Reach to present any benefit for other agencies to engage (R9; R7). The difficulties with support which had surfaced at the initiation phase of the initiative became manifest as many departments wished to provide services on their own branded website (R1; R7). Furthermore the traditional silo IT project culture (C&AG, 2007; R21 PAC) that existed across the public service remained difficult to break down - *"getting a huge amount of 'not invented here syndrome'"* (R9), which was articulated by one senior attendee at a presentation on the

PSB - *"if I had responsibility for services it would give me great comfort to know they were delivered by my own people"* (R1). There were also concerns about the centralisation of sensitive data (R7), and many departments did not wish to contribute (unless mandated) to an initiative that could diminish their status (R5; R8).

Better collaborative and **relationship management skills** on the part of the CIO, and a more agile and incremental approach to the development might have achieved steady incremental progress at a fraction of the cost, as early failures could have been used to increase organisational learning, build capability and expertise, and lock down a fully worked out design (R8). However the *"start small - build trust, establish credibility"* (R5) advice was rejected by the CIO's insistence on an ambitious 'big-bang' approach to the development, which greatly increased complexity and length of time to deliver, and had a detrimental effect on the relationship between Reach and its proposed partners.

The CIO also failed to maintain strong relationships with the partner agencies. Support from ISPU and CMOD began to diminish during this phase as the credibility of Reach and the CIO continued to be questioned. CMOD had expressed serious concerns about the 'big bang' approach being pursued by Reach (Nolan, 2010). LGCSB were also heavily involved in the ITT evaluation process and in the development of Reachservices V 0.1 (R3; R4), but the relationship between LGCSB and Reach were often strained (R3). Support in the form of collaboration between Reach and the DISDP project also continued but began to show signs of strain as the project progressed without any tangible output (R1).

The ISPU at this stage had largely disengaged from direct involvement with the initiative which caused consternation from some sources who felt that given its central role in driving the e-Government agenda, should have remained more proactively involved (R1; R6) – *"you're [ISPU] responsible for driving IT policy ... what are you doing about it?"* (R6). However ISPU kept a watchful eye on the project (R6) because of the stories emanating of *"an awful lot of messing ... going on at the Reach Board and ... way too many interests being represented ... and not an awful lot happening"* (R9). At one point during this period the director of ISPU, supported by a number of secretary generals, made a presentation to the secretary general of DSFA (Reach's parent department) outlining *"what it [Reach/PSB] was costing and how it was achieving nothing and suggesting that it be stopped"* (R4). This was met by a stern rebuke to all from the secretary general of DSFA, and a vow to continue with the project (R4). Reasons suggested for this position were that DSFA was being put under pressure at government level to deliver the PSB - *"they told us it would work ... we*

don't want this to fail, it has to happen, it has to work ... it was highly emotional for a lot of people" (R8), and that DSFA would not wish to cede control of the running of the identity management system to another department (R4). This ominous escalation of support, which would continue right up until the PSB was terminated at an eventual cost in excess on of €41 million, put significant pressure on the CIO who had ultimate responsibility for delivering on the PSB vision.

7.3.3.3 Governance

During this period governance of the Reach initiative changed significantly in the form of two Reach Boards. The first Reach Board was established by government in May 2002 (two years after the government's endorsement of the PSB concept) to address the by now obvious drift and lack of progress in developing the PSB design (R4; R9). The Board was very disorganised (R8) and served to highlight many of the serious difficulties with the project that had been allowed to develop over the previous two years. The CIO played the role of **moderator**, however, the Board "*consisted of too many **diverse, and vested interests**"* (R11) and was therefore *"unwieldy and dysfunctional in some respects* (R8). Most of the board members were potential customers of Reach and therefore all had their own agenda and *"saw themselves as representing their own agencies interests more than being a board to Reach"* (R9). Arguments led to a number of scope changes, which introduced further delay in getting anything agreed (R7; R8; R11). The CIO continued to focus on a 'big bang' approach to development despite a number of dissenters (R4; R8; R13), who expressed opinion that the project simply was unworkable from a technical and operational perspective (R8) - *"the problem was there was much stronger IT people outside of them ... they [Reach] were being second-guessed and I suppose ... if everybody was second-guessing them they probably just put up their barriers"* (R3).

The Second Reach Board, established in early 2003, consisted of representation from three departments: Finance (CMOD); An Taoiseach (ISPU); and DSFA, with the main purpose of *"refocus[ing] it [Reach] on what it was doing ... to look at the adequacy of what was being developed ... to drive it [PSB] to completion"* (R9). The board introduced direct control over what was happening within Reach, including some risk and financial reporting, but was predominantly *"a commentary on progress to date and issues outstanding"* (C&AG, 2007, p. 54). Although the second Reach board introduced a sharper, more structured focus on the project (arguably the role of the CIO from the start) the transition from the first to the second board frustrated progress as it held up decision making, and hence progress, during the transition period (R11). One of the consequences of reducing the board to a solution focused subgroup was the dispersal

of a number of potentially key stakeholders – *"taking the smaller board just to deliver the project might have got over the initial [problem] ... [we] let the wider community dissipate"* (R9).

7.3.3.4 Execution Capability

The number of full time internal staff at Reach remained at thirteen, a request by the CIO for an additional staff of 29 in 2002 having being declined (C&AG, 2007), thereby leaving Reach wholly under-resourced. The failure of the CIO to acquire additional staff, and in particular the failure to acquire appropriate subject matter and technical expertise from within was considered *"a serious risk in a technology-intensive organisation such as Reach"* (C&AG, 2007, p. 55). There is further evidence of a lack of technical and business leadership on the part of the CIO which manifested in a lack of ability to control the design (R5; R11), to take action about the poor overall governance surrounding the project (C&AG, 2007), and to be more persuasive about bringing these issues up the line (R5). This combination of a passive management style and a lack of authority and mandate placed Reach at the mercy of advisors who, in some cases, were thought to *"create division among decision makers so that they could influence"* (R8). This positioned the CIO as a mere **facilitator** rather than a driver in the design process, an inevitable outcome of the under-resourcing of the Agency of which he was Principal.

The failure of the CIO to implement standard project controls also represented a serious failing at this crucial stage of the project when there was so much change and uncertainty. Reach still *"did not operate formal change control* (C&AG, 2007, p. 43), thereby losing track of the changes in design that were taking place over time (C&AG, 2007). Furthermore the absence of best in class project management practices surrounding the project such as *"consistent, regular, clear and measurable reporting on progress against plans ... risk management ... was not in line with leading practice, and processes for quality management, knowledge management and benefits management were not evidenced"* (C&AG, 2007, p. 55).

The failure of the proof of concept, delivered during the initiation and conceptualisation phase, to surface many of the technical difficulties that were emerging during this phase served to highlight the inadequacy of this exercise and the lack of proper governance over the outcome. The decision on the part of the CIO to seek to proceed to a procurement process compounded an already serious error of judgement and would continuously dog the progress of the technical development of the PSB solution. For example it transpired that the data vault, a key feature of the original concept of the

PSB, could not be mass populated as originally envisaged (R1), and difficulties relating to means testing indicated that delivering the PSB would be *"far greater and more complex than had been anticipated"* (R19 PAC). Collaboration between Reach and other agencies highlighted similar issues – *"there were always edge conditions ... it was like the last 5%" ... I remember the land registry were actually quite engaged at the time ... but then it got too complex"* (R7).

7.3.4 Development

7.3.4.1 Vision

The vision for the PSB, although **greatly reduced from the original vision** was still quite an ambitious technical solution, a situation facilitated by the length of the agency's gestation period, the still high expectations of the PSB and Reach at government level, and the approach to systems development that prevails within the public service which places a high emphasis on completeness and accuracy of systems (R8). The essential role of the CIO during this phase was to manage the process of development of the PSB, utilising the services of three major external consulting groups, with a small in-house organisation, with limited experience in project management, and no experience with the technologies required to deliver the system. A key issue at this stage remained that the complete architectural structure of the PSB had still not been fully specified (R3; R4), and the design therefore was not frozen prior to the award of the contract to Bearing Point, even though the contract was structured as a fixed price deliverable. As the development progressed complexity issues, as already described, continued to dog the development phase, greatly curtailing the ability to deliver on the design, and resulting in a continuous scaling back of the original concept for the PSB, which fell far short of the original vision.

In 2004 the CIO commissioned a report on progress with implementing the original vision of the PSB as an integrated service delivery platform *"integrated into a wider programme of change focused on improved service delivery."* (Mc Donagh, 2004, p. i). This was a clear testimonial that after 4 years, and a total expenditure of €37 million (by the time a considerably scaled back version of the PSB went live in Dec 2005), the PSB initiative was still unclear about the vision of how it aligned with the broader change and service modernisation strategy as articulated in the SMI, DGB, and New Connections strategies. The resulting report perceptively highlighted the on-going difficulties in translating the vision for integrated public services into purposeful action, and the dangers of treating service modernisation and ICT as synonymous, leading to

an environment where *"technical change dominates at the expense of associated organisational change"* (Mc Donagh, 2004, p. xiii).

7.3.4.2 Support

At government level expectations remained high, however one of the consequences of the change of focus of the PSB to that of a technical deliverable was a reduction in direct government interest in the initiative – *"I felt that if we lost the interest of the senior civil servants and politicians by keeping it in the IT domain it would go nowhere and I think we did actually lose it eventually, they just hadn't a clue what we talking about"* (R4). Although a government Minister of State with responsibility for the Information Society was appointed in 2002 (R2) their involvement in this area was to a large extent an adjunct to other more pressing responsibilities, and therefore received little attention (R14).

Failure to get engagement from other departments and agencies remained the norm due to the prevailing absence of a commanding mandate for the Reach Agency, the failure of the advocacy programme to solicit sufficient engagement or demonstrate sufficient value-add, the emerging complexity issues for those who did seek to engage, and the **passive** leadership of the CIO.

Reach management were not considered to be good collaborators (R5) and failed to adequately manage relationships among all parties (Nolan, 2010), resulting in the absence of a partnership approach during the development process, and frequent conflict (R5; R7) which was compounded by the absence of a coherent project management structure (R5). Relationships tended to be *"confrontational with no team work* (R5) - *"an us versus them feeling to a degree"* (R7). There were disagreements among the consulting groups regarding technical issues (R5; R7; R11). Lack of a strong leadership style meant that *"all voices were considered legitimate"* (R11), which meant that *"we were putting a lot of expensive consultants in a room and they were shouting at each other for a day and we were spending a fortune"* (R7). The continuous evolution of requirements, a direct result of the failure to lock down a complete design before moving to development, led to friction between the developers (Bearing Point) and Reach (R4), which left Bearing Point in a very difficult position because of the fixed price contract (R5; R11; R15 PAC) and led to a more rigid approach being taken in relation to additional changes which further exacerbated rising costs (R3) – *"so everything became structured, formal and expensive to do"* (R7).

The CIO was also unable to maintain strong relationships with the partnership agencies which resulted in a further decline of support. ISPU, although a full member of the

second Reach Board had largely disengaged from the initiative (R4), LGCSB had not secured a position on the 2nd Reach Board (R8; R3), and were only intermittently involved from this point onwards, and the relationship between DISDP and Reach had largely deteriorated (Nolan, 2010). CMOD, who had serious concerns about *"governance and about how competent are the people that are in there to do this highly new ground breaking [thing]"* (R8), was also starting to disengage having largely executed its role in the procurement process. Although *"never short of putting the story as they saw it forcibly"* (R8), CMOD were becoming increasingly frustrated by the lack of progress (R2; R5) and the continued focus on the 'big bang' approach to development, which was at odds with CMOD's preferred approach (R13).

7.3.4.3 Governance

Governance of the PSB initiative was largely confined to the oversight of the 2nd Reach Board which improved matters somewhat by focusing more control over the development process (R9). However governance was at project, not organisational level in order *"to produce some value for money"* rather than *"delivering a solution"* (R9). The CIO reported formally to the Reach Board, which met at least quarterly and often monthly (R9). Reports covered risk and financial reporting, but predominantly were a commentary on progress to date and issues outstanding. Although proceedings of the Board were conducted formally (R9), one board member commented that much of the reporting by Reach management was focused on presenting a picture that was more positive than reality on the ground (R4). Another interviewee stated that the CIO *"was very careful about taking things up the line"* (R5) – essentially performing the role of a **gatekeeper**. It was also stated that that there were different interpretations among the board of what Reach's mandate actually was, which created confusion and further held up decision making or reaching compromise solutions to emerging difficulties (R11).

The technical and project focus of governance diverted attention away from costs, which started to rise sharply as a result of the appointment of additional consultants to complete the development (see below), a direct result of the under resourcing of Reach, and the structure of the 'fixed price' contract. One interviewee stated that everything became a change request (R7), which resulted in escalating costs.

7.2.4.4 Execution Capability

Reach management, including the CIO, were considered to be well intentioned (R6), with a large amount of emotional investment in, and commitment to, the PSB project (C&AG, 2007; R9). However it was stated that management capability in Reach was

weak (R3; R4; R8), did not display the necessary *"vision, leadership, direction or expertise"* (Nolan, 2010, p. 213) required to manage such a complex initiative, nor the drive to inspire (R8). Responsibility for the delivery of the PSB rested with the three main consulting groups (R5; R7; R11). One interviewee painted a somewhat sarcastic picture of the scene - *"we were left with Bearing Point to implement the vision as originally articulated by Propylon, developed to some degree by Capgemini, muddied by all of them*" (R7). Interestingly the interviewee did not include the involvement of Reach in any stage of this process. Effectively the development of the PSB was **abdicated** almost entirely to external consultants – *"Bearing Point were the IS division of Reach"* (R9) - *"there were a few of us and quite a lot of them"* (R7), with Reach providing input in such areas as analysis, research, and communications (R7; R9). This abdication of responsibility (R6; R8; R9), however was the inevitable result of lack of in-house resources, a government decision.

Project planning and control remained weak (R4). Project management processes and controls were still not rigidly enforced therefore *"consistent, regular, clear and measurable reporting on progress against plans was not available"* (C&AG, 2007, p. 55). One interviewee stated that they could remember the project manager in each of the consulting partners but could not recall a project manager in Reach (R5).

7.3.5 Operation

7.3.5.1 Vision

The PSB system as delivered was described in the Report of the Comptroller and Auditor General (C&AG, 2007) as *"a piece of enabling technology ... built to an industry leading design, which should prove to be sufficiently open and robust to allow future technologies to connect to it."* (p. 44). However the same report states that the PSB does not *"host and integrate the range of front-end services required by citizens and business, or provide the linkages to the full range of back-end services provided by departments and agencies"* (p. 45), and that *"in terms of output, Reach has not delivered strategic change within Government or an integrated social services system, as was originally envisaged."* (p. 57). Similarly the OECD report *Ireland: Towards and Integrated Public Service* stated that *"This visionary approach has experienced several setbacks, however, and for the moment, has fallen short of expectations. It is linked to too few online services, and its centrepiece – the Reach online authentication service – is generally not considered to be user friendly"* (OECD, 2008, p. 36). Clearly the vision for the PSB as the framework for the integrated delivery of public services as endorsed by the Irish Government in 2000, and reiterated in *New Connections* (The Information

Society Policy Unit, 2002) had not been achieved. In the absence of any significant change in direction relating to the PSB prior to the publication of the C&AG report the CIO remained as Director of Reach, playing an **administrative role** in the ongoing maintenance and development of the PSB.

7.3.5.2 Support

By the time the PSB was formally released political interest in the PSB initiative had waned – *"the politicians responsible have lost interest"* (R22 PAC) – *"The focus and momentum which we seemed to have in 2000 and 2002 have been lost ... and since 2005 we have had no strategy or nobody driving this ... at Government level"* (R21 PAC). The ISC had been wound down in 2004, and no formal e-Government strategy had been announced since the beginning of 2006 (The 3rd Reach Board, 2008). By the time of publication of the report of the C&AG in 2007 a total of 10 government departments and agencies were using the PSB, a small uptake given the original whole of government vision.

There was continued frustration among departments and agencies with Reach. The failure to as yet find a workable solution to identity authentication and data protection made the utility of many systems unworkable for applications requiring a high level of identity management (C&AG, 2007; R14 PAC; R15 PAC) fuelling the negative perception of Reach's ability to solve problems (Nolan, 2010). Many observers commented on the submissive nature of the CIO manifesting as a lack of effort to encourage more engagement from potential partners (Nolan, 2010), described as an attitude of *"if you build it they will come ... but they didn't"* (R7). Reach were also seen as **unresponsive** partners during many engagements and appeared unwilling or unable to solve issues as they arose *"Reach wait for people to come and lobby them ... the layer of business development people were not doing any work* (Nolan, 2010), leading to frustration at the lack of progress (Nolan, 2010). Many departments moved ahead building their own systems without partnering with Reach (C&AG, 2007; R7). Yet again the absence of strong leadership on the part of the CIO, an issue that had surfaced during the early phases of the PSB (R3; R4; R8), is further evidenced by the failure to engage with the wider government community *"Reach Management left issues between agencies to sort out themselves. There was no point in sending issues up the line for resolution"* (Nolan, 2010, p. 213). The experience of both the ROS and the CJIP projects (see Chapter 6) was by now a common theme which centred on two recurring issues: (1) the inherent complexity of the PSB system; and (2) the failure by Reach to resolve issues as they arose.

The low uptake of PSB services by the public also indicated a failure on the part of the CIO to establish a profile for the PSB and Reachservices.ie. In the first 5 months of operation there were less than a total of 10,000 visits to www.reachservices.ie (C&AG, 2007) compared with the 2.5 million visitors in 2005 to the Citizens' Information website www.oasis.ie, a clear indication of the lack of marketing effort that had gone into branding and marketing the PSB service to the general public (a total of €230,000 of a total spend of €37 million in 2000 – 2005, i.e. 0.6%). This is another manifestation of a focus on the IT side of the project rather than the broader organisational and customer related issues.

As a final straw, support of the partner agencies had all but disappeared. The last remaining supporting agency CMOD, who considered the PSB a failure a long time before dissolution (Nolan, 2010), had lost confidence in Reach's capability to deliver, was frustrated by the increasing use of contractors, and concerned with the resulting escalation in cost (Nolan, 2010). The disengagement of the partner agencies *took away another bit of the rug from underneath Reach"* (R9) effectively sealing its fate.

7.3.5.3 Governance

Governance of the PSB continued as had been during the development stage. The 2nd Reach Board remained in situ and was largely concerned with delivering PSB functionality as planned (R9).

One of the main consequences of poor governance was **escalating** costs, which were driven largely by the number of external consultants and contractors engaged in delivering the system - *"the consultancy bill just kept going up and up"* (R4). The total spend on the PSB up to the end of 2006 was over €41.5 million. Many respondents were shocked at the continued waste of money on an initiative that had clearly not delivered - *"The thing that struck me was that how they could continue to let so much money be wasted"* (R9) - *"the waste of money was outrageous ... that's the only time I've seen that much money wasted"* (R4). Contractors and consultants met with senior management on a weekly basis at this point but there was no formal accountability about costs (Nolan, 2010). Some respondents have suggested that this situation was facilitated by the CIO because of pressure at senior management and government level (R4) not to let the PSB initiative fail - *"we don't want this to fail, it has to happen, it has to work"* (R9). During the time of the investigation by the C&AG a series of inter-departmental consultations took place which led to a Memorandum submitted to Government on 2 March 2007 which formed the basis for the Government Decision S 180/20/10/0466 on 6th March 2007 to initiate a review of the PSB project (The 3rd

Reach Board, 2008) and the establishment of a new Reach Board (the 3rd Reach Board) to undertake this review.

7.3.5.4 Execution Capability

The failure to acquire additional in-house resources and expertise meant that responsibility for the further enhancement and hosting of the PSB was largely abdicated to Bearing Point, who had responsibility for the on-going development and hosting of the system, and a varying number of external contractors who filled a range of roles from coding to management of specific engagements with departments and agencies (Nolan, 2010). This arrangement effectively preserved the dysfunctional imbalance in power which continued to impact on Reach's ability to maintain proper managerial control of the project, and proactively engage with the wider government community, as evidenced by the failure to overcome both technical and operational challenges of the CJIPP and ROS projects (Nolan, 2010) described in Chapter 6. It of course was also the primary cause of escalating costs as described above.

By this stage the Reach Agency was effectively *"**rudderless**"* (R18 PAC) and the CIO essentially **overrun** - *"taken in"* by consultants (Nolan, 2010; R5), compounding the increasing perception of the CIO as ineffectual, and lacking in leadership (R9). In the words of one interviewee *"By the time the 3rd Reach Board was established [June 2007] the Reach agency was essentially worn down"* (R11). The CIO was therefore left in the unenviable position of maintaining a system that had no significant support as Reach's profile by this stage was one of a failing entity (R11) and *"due to delays in the delivery of the Broker, departments and agencies went their own way and developed independent on-line services"* (C&AG, 2007, p. 49).

7.3.6 Termination

7.3.6.1 Vision

Seven years after it was originally endorsed by the government the *Report of the Comptroller and Auditor General (C&AG)* stated that *"The feasibility of the originally proposed role of the Broker as a front office integrating all public services for business and personal customers' needs to be reconsidered"* (C&AG, 2007, p. 57).

When the 3rd Reach Board presented its review of the PSB Project in January 2008 it confirmed the original vision for the PSB as *"a 'one-stop-shop' for public services [implying] major structural changes in the way that the public sector delivers its services- not just the provision of enabling technology"* (The 3rd Reach Board, 2008, p. 10). In line with previous assessments (C&AG, 2007; McDonagh, 2004), and those yet

to be presented (OECD, 2008), the report also confirmed that this vision had been dramatically altered over the course of the initiative and was now less about full integration of public services and more about making available a set of shared services through the PSB infrastructure, which can be used by departments and agencies in providing their own services online to the public.

Reach became a defender of the system stating..... *"The PSB infrastructure as now deployed, while modified as the project evolved, delivers substantially on the original vision and concept. However, in the light of developments since 2000 – particularly the lack of a demand for a centralised services portal and the slow pace of delivery generally (both of the Broker and new models of services by departments and agencies) – Reach management see the most logical future role for Reach and the PSB as a provider of a restricted range of shared services"* (The 3rd Reach Board, 2008, p. 12)

Although the report recommended that *"the PSB should continue as an important provider of shared services"* (The 3rd Reach Board, 2008) it recommended that Reach should become part of the central departmental structures responsible for e-government, and that it should be adequately resourced from internal personnel to carry out whatever tasks are allocated to it under the, soon to be published, new e-government strategy (The 3rd Reach Board, 2008). This again positioned Reach (and the CIO) as passive actors in e-Government strategy making, and the role of IS therein, however this point was made moot by the decision to transfer the Reach Agency from DSFA into a central position in the Dept. Finance, effectively transferring CIO responsibility to a new CIO. Shortly after this transfer of responsibility a decision was made to terminate the PSB as an active project and disband the Reach Agency. The new CIO effectively became the **executioner** of the vision for integrated delivery of public services through multiple channels, and Reach as the agent of this vision. It is of note that 8 years after its initial endorsement by the government the report noted that it had found *"very few examples of Broker- type models deployed and working to deliver integrated services via a one-stop-shop"* (The 3rd Reach Board, 2008, p. 14), which questions the viability of the initial vision.

Upon termination the role of CIO and Principal of the Reach Agency was axed and the CIO returned to an IS role within DSFA.

7.3.6.2 Support

Notwithstanding the decrease in support for the PSB over the lifetime of the initiative, and the low level of usage of the system by the public, the review noted a generally

supportive attitude towards the PSB and Reach. The Department of Finance and Department of An Taoiseach were conditionally supportive of its continuance albeit with a changed focus of providing 'behind-the scenes' functionality with individual service providers responsible for the front-end provision. The Reach Agency along with the CIO **defended** the PSB track record to date and were supportive of the continuance of the PSB initiative, along the lines recommended by The Department of Finance and Department of An Taoiseach (The 3rd Reach Board, 2008). In the wider consultation, departments and agencies generally agreed with retaining a third party agency to facilitate delivery of services across the public service, and having service-wide standards and guidelines for inter-operating with other departments and agencies. However, in general, and certainly in the case of the larger departments, they did not see a role for such an agency in integrating the front-end delivery of services, or acting as a central access point to services. This was in line with CMODs current position (R13).

Unofficially however support for the PSB and Reach from all previous supporters (government, partner agencies, user departments, consultants/contractors) had all but vanished (Nolan, 2010). Interest by the government in the area of service modernisation had diminished, and in any case the growing signs of an economic crisis had become a far more pressing issue (R7). The partner agencies (CMOD, ISPU, LGCSB) had already largely disengaged due to frustration with the perceived direction of the PSB, the management of the Reach Agency, and the escalating cost of maintaining and enhancing the system (R3; R4; R15). Even the consultants were by this stage completely disillusioned with the *"messy"* project (R11), and some felt that they should have just *"bowed out"* (R5). The PSB project and the Reach Agency had effectively become toxic. Although there was a residual enthusiasm amongst Reach staff the true level of support for the PSB was demonstrated on 1st April 2008 with the decision by CMOD to terminate the project.

7.3.6.3 Governance

Governance of the PSB initiative had now transferred by the establishment of the 3rd Reach Board who would be responsible for directing its future. The CIO would **play no further official role** in the governance of the PSB as he was not a member of the third Reach Board. The report of the 3rd Reach Board identified many of the key governance issues already described (The 3rd Reach Board, 2008) and was corroborated by the report of the Comptroller and Auditor General, who had also criticised the governance arrangements as complex, volatile, with incongruence between the formal and actual lines of authority, and inconsistent financial management and decision-making

structures and lines of accountability (C&AG, 2007). There was also much criticism of the governance of the PSB at the public accounts (PAC) hearing where it was stated that – *"The governance was complex"* (R19 PAC), *"there was no planning ... the entire project is currently rudderless"* (R18 PAC), and *"it is very difficult to establish where responsibility for this project lies"* (R21 PAC). Other respondents remarked that *"There was no structure of governance"* (R5) - *"no governance at the centre to drive the initiative forward – so nothing happened"* (R11).

Acknowledging these deficiencies, and the urgency to establish a robust governance structure for the PSB going forward the report directed that Reach/PSB should become part of the central department structures responsible for e-Government and that the governance structures for the PSB should include specific arrangements to ensure that there would be a true partnership approach giving all of the stakeholders a say in running the service. These recommendations had come eight years after the decision by government to endorse the PSB, and were of course far too late to save a project in its death throes.

7.3.6.4 Execution Capability

Execution capability did not change during this phase except that since the PSB had been delivered as per the contractual agreement Bearing Point was now engaged on a time and materials basis. There were 11 full time internal Reach personnel and 21 independent contractors (The 3rd Reach Board, 2008).

The report of the 3rd Reach Board also highlighted the on-going difficulties in execution capability that had dogged the PSB initiative since inception. In particular, it recommended that in the future Reach should be adequately resourced primarily with permanent staff, with the necessary skills, and an agile approach to systems development, with minimisation of reliance on external consultants. However the decision by the new CIO at the Dept. of Finance to terminate the PSB as an active project and disband the Reach Agency **terminated** all further development activity on the PSB.

7.4 Employing the Framework to Evaluate how the Role of the CIO Influences IS Failure Outcomes.

This section, which follows the theory of how the role of the CIO influences IS failure outcomes, utilises the framework presented to examine the key roles played by the CIO in the context of the totality of the failure process, and attempts to determine the defining failure points and how the role was played out in terms of when the CIO took

actions, or failed to take actions, which initially helped sow the seeds of the system's ultimate demise; when things started to go wrong; failed to take actions that might have helped to avert failure; and took sensible actions that were a natural consequence of the unfolding failure. In doing it provides a succinct evaluation of what CIO roles are critical at each phase of an IS initiative in order to avoid failure, thereby making a further contribution to our knowledge of IS failure and the related role of the CIO.

The first seed of failure of the PSB system can be clearly traced to the Genesis phase of the project as the 'vision' was developed by the two visionary CIOs, and subsequently presented to, and approved by, government. One of the key roles of the CIO is to act as a visionary and entrepreneur to the business. Such work cannot be done without blue sky thinking and pushing the envelope of IS opportunity, and the CIOs are to be commended for their endeavours in this regard. However in the rush of enthusiasm to propose an IS solution, that was considered compatible with the rest of the Government's service modernisation programme, the CIOs made a number of errors. Firstly the vision for the PSB as presented to government by the CIOs was far too basic a foundation upon which to build a strategic development decision as it was flawed in many respects due to the sketchy nature of the concept, its focus on a technical solution based on emerging and untested technologies, and failure to consider the enormous organisational implications of what was being proposed and which had never been attempted before within the predominantly bureaucratic and hierarchical Irish public service. Secondly they allowed the government to side-line the official consultation process for large scale project proposals which would have demanded an appropriate evaluation of the feasibility of what was being proposed, including risks and costs, and may have halted the project, or at a minimum called for further evaluation of its feasibility, before the decision was made to proceed. This lax attitude to organisational governance would continue throughout the project, resulting in a prolonged phase of commitment to a failing entity, and escalating costs.

The decision by government to assign responsibility for developing the PSB to Reach was clearly an appointment of convenience based on (1) the track record of DSFA in delivering systems and (2) the perceived synergy between the PSB and the ISSS system, which was Reach's other main project. This decision was a defining moment in the trajectory of the PSB and greatly impacted upon the ability of the CIO to perform the role. In order to fully understand the effects of this decision a number of contextual and organisational factors need to be borne in mind. From a contextual viewpoint the enthusiasm within government for all things 'e' was very strong at this point and was reinforced by the EU benchmarking programme, with its emphasis on the electronic

delivery of government services. This created pressure within government to be viewed as leaders in electronic service delivery. From an organisational viewpoint the appointment of Reach to deliver the PSB was based solely on the reputation of DSFA for delivering legacy systems. No consideration was given to its capability to deliver such a ground-breaking initiative along with the organisational change it would necessitate. Furthermore Reach was not given a cross departmental mandate to implement its mission and therefore had no executive authority outside of its parent department (DSFA), and could not compel other departments to engage. Lastly locating a cross departmental initiative within a single department outside of the central e-government programme, with a very limited governance structure, isolated the Reach Agency from the central powers and further diminished its executive authority.

In addition to the contextual and organisational contexts described above a number of key errors were made by the director of reach (the newly appointed CIO) during the project initiation and conceptualisation phase which would compound the mistake made during the Genesis phase of pursuing an untested vision. These mistakes would create a series of conditions that had significant implications for the rest of the project. Firstly the capability of the CIO was questionable. His distinguished track record in the delivery of IT systems did not in any way provide him with the skill set necessary to deliver a complex and ground-breaking cross departmental initiative. Furthermore he had a tendency to procrastinate and focus on small technical issues rather than managing the bigger picture. Secondly his leadership and relationship management skills were not very well honed which caused him to come across as directive rather than in a partnership mode. This turned off a number of potential partners and created an initial credibility issue with Reach across much of the government, and partner agencies, which would worsen as time went on. Thirdly the CIO focused exclusively on the technical aspects of the PSB which further removed the initiative from the organisational change aspects of what needed to be done. Fourthly the CIO failed to adequately resource the Reach Agency which left it bereft of the necessary in-house technical capability to both manage and deliver the system, a situation that would persist throughout the entire project. Fifthly the CIO failed to establish standard project controls within the Reach organisation. This was a basic and fundamental error which resulted in the project drifting, from the start, with no clear management authority coming from within Reach, inability to properly manage external partners, and no formal documented records of how the initiative was progressing. Compounding all of these mistakes the CIO went ahead and got approval from government to commence a procurement process to develop the PSB whilst having achieved very little after 15

months work other than a very flimsy proof of concept that was little more than a display of screen formats of how things might look that failed to even scratch the surface of the technical complexities that would emerge as the project moved into design and development phases.

The mistakes made during the initiation and conceptualisation phase were further compounded by additional mistakes made by the CIO during the design phase. Firstly the decision by the CIO to insist on a big-bang approach to the development of the PSB had a large effect on the ability to lock down a design for the PSB thereby exacerbating the absence of proper project control systems. The complexities that began to emerge were the direct result of the sketchy nature of the vision as originally articulated. Much of this complexity should have been surfaced by the earlier proof of concept however, as already stated, this was not the case. Had the CIO heeded the advice of many of the partner agencies to adopt an agile approach to developing the PSB this may have obviated some of the technical complexities involved in adapting a big bang approach however two further mistakes at the design phase compounded the big bang approach and would eventually scupper the project. Firstly, even though the design of the PSB had not been finalised, the CIO proceeded with a procurement process resulting in the selection of Bearing Point to develop a system that was as yet undefined. Secondly, the contractual arrangement with Bearing Point was that of a fixed price negotiated procedure whereby the vendor agrees to deliver on a set of as yet unknown requirements for a fixed price. This would result in much argument during the development phase as the requirements continuously changed, and resulted in escalating costs as changes became a chargeable item.

Although there were many contextual and organisational factors, that by themselves may have scuppered the PSB initiative, these were compounded by a series of mistakes made by the CIO in the first three phases of the initiative. By the start of the development phase the CIO had created a situation whereby a dysfunctional contractual relationship had been entered into with an external partner to develop an extremely complex system that had not yet been fully designed, which was to be managed by a wholly under resourced project organisation, headed by the very person whose ability to deliver such a ground-breaking initiative was questionable, and who had failed to establish appropriate organisational or project governance structures and controls for the initiative. Consequently by the start of the development phase the PSB initiative was in such a perilous state that it is difficult so say with any certainty whether it could have been rescued. Any rescue attempt would have to have addressed the organisational issues such as project governance and the mandate and possible

position of the Reach Agency. However bringing the project to a successful conclusion would also require strong leadership to build an appropriately resourced project organisation, establish proper project controls, manage external partners, and manage the engagement with potential partner departments and agencies. Clearly the present CIO had failed in all of these respects during the first three phases of the PSB, and by this stage had developed a reputation for procrastination and a passive attitude to engagement with potential collaborators which further alienated the Reach organisation.

Although the PSB initiative progressed through a development and operational phase before termination the system delivered fell far short of the original vision for the PSB of providing an integrated service delivery system in support of the government service modernisation agenda. The failings that the CIO manifested during the first three phases of the project continued to manifest during the later phases in the form of weak leadership of the Reach Agency and its consulting partners, a passive approach to engagement with potential partner departments and agencies which eventually lost the support of all concerned, and which was compounded by unwitting collusion in the on-going commitment to a project that had been abandoned to technologists by the government, and was clearly, by this stage, rudderless.

As already stated IS developments are complex, protean, social phenomena (Wastell & Newman, 1993), the failure of which are typically complex processes that unfold over time. The framework has proven to be a useful tool with which to critique a case of IS failure, and in particular the enactment of a role over the course of the failure. Using the lens helps in the analysis of the process of failure by facilitating the detection of patterns in its trajectory through a series of phases (genesis, initiation and conceptualisation, design, development, operation, and termination) with each phase/stage delineated with a set of defining failure characteristics (vision, support, governance, and execution capability) to form the backdrop to the study of the performance of a role (in this case the CIO). It is important to note that the pattern of performance found during each case of failure may be somewhat unique due to the systemic nature of the process of failure, and the role performed during each case. Use of the framework is therefore extremely valuable in offering the basis with which to structure the study of such a compex phenomena and roles played therein.

7.5 Comparing the Framework against Extant Literature

7.5.1 Introduction

The four dimensions of failure *vision, support, governance,* and *execution capability,* described in the theoretical framework are consistent with the symptoms of failure (spheres of influence) as variously identified by Kappelman et al. (2006), Wallace et al. (2004), and (Yeo, 2002), and described in Chapter 3. The case of the PSB also supports the contention of both Wallace et al. (2004) and Sauer (1993b) of the systematic interconnectedness of determinants of project outcomes. The emergent theory demonstrates that systematic connectedness among dimensions of failure may extend across phases/stages of an initiative in the sense that a seed of failure sown in one phase may not surface until subsequent phases of the initiative. For example a failure to articulate a comprehensive *vision* may result in the surfacing of unexpected complexity at a later stage of the initiative, which may impact on the *execution capability* of the IS function, resulting in a loss of *support* which is not properly addressed because of an inappropriate *governance* structure. This will be evident from the proceeding descriptions in this section where it will be shown that many significant seeds of failure were sown during the first three phases of the project, which would have a significant impact on the eventual outcome of the PSB initiative, and on the performance of the CIO role throughout the initiative.

7.5.2 Vision

A key demand side responsibility of the CIO is to operate at a strategic level within the organisation (Applegate & Elam, 1992; Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Rockart, 1982; Smaltz et al., 2006; Tagliavini & Moro, 2003; Weiss & Anderson Jr, 2003), to solve business problems through the use of IS (Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Smaltz et al., 2006; Tagliavini & Moro, 2003; Weiss & Anderson Jr, 2003), and to actively contribute to business strategy formation based on an understanding of organisational information flows (Peppard, 2010; Tagliavini & Moro, 2003). The CIO therefore has a high responsibility in bringing forward visions for the innovative uses of technology that add value to the business, and in maintaining support for initiatives throughout their life.

This is supported in the case of the PSB as the two visionary CIOs played a key role in developing the vision for the PSB, in so far as the vision was consistent with the strand three objective of *Implementing the Information Society: A Framework for Action* (Department of An Taoiseach, 1998a). However the case of the PSB also supports the contention that failed IS projects, almost always have planning failures (Jones, 2004)

and that mistakes made at this point may develop into larger problems later in the project (Sutterfield et al., 2006). The vision for the PSB, as conceived, had two major flaws which are acknowledged in extant literature as major causes of IS failure. These are: (1) the failure to articulate a well thought out vision; and (2) failure to align the vision with the overall strategy of the organisation.

7.5.2.1 Failure to Articulate a Well Thought out Vision

Failure to articulate a well thought out vision can result in the surfacing of unexpected technical and organisational complexities at a later stage of a project (Aloini et al., 2007; Goldfinch, 2007; McAfee, 2002; Nandhakumar, 1996; Southon et al., 1997). The sketchy nature of the vision presented by the CIO (R13) of how the "*broker might work" (R4)* meant that the PSB end product was not clearly articulated to a sufficient level of detail. The vision *"had never been done before" (R11) - "using in some cases technologies that were very new, with unknown scaling* characteristics" (R13) thereby making it impossible to conduct an appropriate risk and dependency analysis, which is a key element of the project planning phase (Bloch et al., 2012; Schmidt et al., 2001), or to construct a project charter to serve as a reference of authority for the duration of the project (Glaser, 2004). A proper risk assessment carried out at the genesis phase of the initiative may have highlighted the significant risks involved in undertaking such a ground-breaking, ambitious, and complex initiative. Confirming the findings of Clegg et al. (1997), and Doherty & King (2005) technical (authentication, data incompatibilities, complexity of systems integration), and organisational (lack of buy-in, unclear mandate, waning of government support) issues began to surface, but only after a long gestation period, by which time the project had built up a self-propelled momentum based a somewhat emotional and dysfunctional attitude amongst some important stakeholders of *"we don't want this to fail, it has to happen, it has to work"* (R8). This ultimately impacted upon the execution capability of Reach, and created a cycle of reducing support from the wider stakeholder base for the PSB initiative, which would ultimately contribute to its abandonment (Sauer, 1993a, 1993b).

Another consequence of a poorly defined vision is changing requirements over the lifetime of the project, which is also described as a major risk to an IS initiative (Keil et al., 1998; Scott, 1999), and a major cause of project failure (Arnuphaptrairong, 2011; Daniel, 2006; Kappelman et al., 2006). Projects that experience scope changes are particularly difficult to manage (Montealegre & Keil, 2011). The case of the PSB enhances our understanding in this area by highlighting the compounding effect of a dysfunctional contractual arrangement with consulting partners (R9; R13), which resulted in escalating costs (R4; R7) as the scope continued to evolve over time.

Lack of clarity of vision may also lead to ambiguity surrounding the resources required to complete the project (Schmidt et al., 2001; Wallace et al., 2004). Reach was wholly under-resourced to execute the project - *"Reach was never set up properly"* (R5), which resulted in the proliferation of external consultants and contractors - *"there were a few of us and quite a lot of them"* (R7). This resulted in a power asymmetry between Reach and its advisors - *"an us versus them feeling to a degree"* (R7), which greatly impacted on the ability of the CIO to maintain a leadership role (R6; R8; R9). This contributed further to reputational damage and the isolation of Reach (R3; R6), and blame for the failure of the PSB being disproportionately attributed to the CIO (R3; R6) – thereby supporting Peppard's (2010) concept of a *"vicious circle"* of dissatisfaction and disengagement on the part of the organisation when presented with recurring failure conditions (p. 87).

The process of introducing modern IT systems into large complex organisations is fraught with difficulty (Loonam et al., 2014; McDonagh & Coghlan, 2006, 2010) which is further evidenced by the case of the PSB. McDonagh (2014) states that support for an IS initiative can be heavily influenced by organisational pathologies which are caused by IT driven organisation change. In the case of the PSB the nature of the magnitude of the agenda for change were ill defined in the vision, and poorly understood (McDonagh, 2004, p. xiv). Little consideration was given to the potential organisational effects of the PSB - *"we kept kicking it down the road"* (R4) – supporting the findings of Boos et al. (2013), and Doherty & King (2005), that organisational issues tend to be addressed only as they emerge. Furthermore despite the warnings that *"service modernisation and ICT are not synonymous"* (McDonagh, 2004, p. xiii) - the original vision for the PSB as a service modernisation strategy became *"whittled ...down to an ICT project"* (Mc Donagh, 2004, p. xiv) over time, supporting the 'magic bullet' fallacy (Markus & Benjamin, 1997) that many organisations believe that technology alone will affect the necessary organisational change. Schein (1996) states that deployment of IS can surface dysfunctional aspects of organisation culture. In the case of the PSB *"traditional departmental 'silos' [and] existing budgetary arrangements may have militated against effective cross-cutting e-Government developments"* (C&AG, 2007, p. 12). Furthermore there is evidence supporting the findings of Beynon-Davies (1999) and Doolin (2004) that political manoeuvring on the part of individuals or groups can cause a project to fail - *"if you see swathes of jobs disappearing you wouldn't exactly be the most popular person"* (R8).

7.5.2.2 Failure to Align the IS Vision with Organisation Strategy

Creating a vision for an IS initiative also entails ensuring that the system concept is aligned with the overall strategy of the organisation in the achievement of its goals (Chan et al., Sabherwal, & Thatcher, 2006; Piccoli & Ives, 2005; Sambamurthy et al., 2003; Weill, Subramani, & Broadbent, 2002). Failure to align IS strategy and organisation strategy (the vision) can significantly increase the risk of IS failure due to: (1) under resourcing of the IS function (Kaarst-Brown, 2005; Willcocks & Sykes, 2000) - *Reach was never set up properly" (R5)* – which manifested in diminished execution capability due to the appointment of a CIO with no experience in cross cutting change initiatives, and an under-resourced in-house team with inadequate specialist skills to meet the requirements of the project (R5; R9); (2) an over reliance on external consultants (McAteer & Elton, 2000; Willcocks & Sykes, 2000) - *"Bearing Point [consultants] were the IS division of Reach"* (R9); (3) a demand by the business for rapid deployment of applications to support business growth (Johnson, 2002) - *"Reach were there trying to set up a central standard for the broker and ... Taoiseach's were just trying to get websites up"* (R3); (4) a difficulty in assessing and prioritising IS investments (Karahanna & Watson, 2006) - *"but the Taoiseach at the time wanted to tick a box"* (R4); and (5) the creation of silo projects which are not integrated into an overall plan (Kaarst-Brown, 2005) - *"cross-cutting projects should have unitary management" (C&AG, 2007).*

Failure to align IS and organisational strategy may also create a situation where the technical aspect of an IS initiative becomes separated from the social, behavioural, and political context in which it is deployed (Boddy et al., 2009; Fortune & Peters, 2005; McDonagh, 2001; Sauer, 1993b). In the case of the PSB - *"the complex data, process, technology or organisational issues were not analysed ... or addressed for a number of years after commencement"* (C&AG, 2007, p. 45 & 56). Given this strategic disconnect it is little wonder that the government failed to gain an understanding that *"service modernisation and ICT are not synonymous"* (p. xiii), resulting in an environment in which the PSB development dominated at the expense of associated organisational change, which eventually led to the original expansive vision for change been *"whittled ...down to an ICT project"* (Mc Donagh, 2004, p. xiv). In parallel with this it became increasingly difficult for the CIO to sustain a common vision among senior management, which is acknowledged as a key precursor to successful IS strategy (Chan, 2002; Doll, 1985; Preston & Karahanna, 2005; Raymond et al., 2008), which culminated in the eventual waning of enthusiasm for the entire project over time - *"the politicians responsible have lost interest"* (R22 PAC).

7.5.3 Support

Sauer (1993b) describes an IS failure in terms of when the level of dissatisfaction with a system is such that there is no longer enough support to sustain it. Support in the context of extant IS failure literature includes senior management support (Doll, 1985; Ginzberg, 1981; Glennon, 1978; Kappelman et al., 2006; Kearns, 2007), stakeholder groups (Achterkamp & Vos, 2008; Assudani & Kloppenborg, 2010; Yuttapongsontorn et al., 2008), and formal organisational support structures in the form of sponsorship of the Initiative (Doll, 1985a; Gupta & Raghunathan, 1989; The Standish Group, 2012).

Senior management commitment to an IS initiative is described as a risk factor that overshadows all others (Schmidt et al., 2001) and is a key precursor of IS success (Doll, 1985; Ginzberg, 1981; Glennon, 1978; Kappelman et al., 2006; Kearns, 2007). Dysfunctional senior management support was a key factor in the failure of the PSB in two ways. Firstly senior management support appeared to be very strong at the initial stages of the PSB (The Information Society Policy Unit, 2002; R4), however much of this support was actually enthusiasm, caused by a lack of technical savvy on the part of senior management, and the general hype at that time about the potential of e-Government, and the perceived *"need to do 'e'"* (R5). This supports the concept of the knowledge gap as described by Fiegener & Coakley (1995). Secondly commitment must also be maintained over the lifetime of the initiative (Schmidt et al., 2001), however as the PSB initiative became more technically oriented (Mc Donagh, 2004) the knowledge gap widened (R4; R22 PAC), resulting in an almost total abandonment by senior management, supporting Clegg et al. (1997)'s view of leaving *"technology to the technologists"* (p. 281). This further weakened the authority profile of the Reach agency and consequently the CIO as predicted by Preston & Karahanna (2005), and had a negative effect on the overall innovative IT climate surrounding the PSB initiative as identified by Watts & Henderson (2006). The case also confirms the findings of Enns (2001) that the CIO requires not only support from senior management, but also assistance in the implementation process by ensuring support for the initiative at functional levels in the organisation. In the case of the PSB there was no imperative for partner departments or agencies to engage with Reach, and no penalty for not engaging.

Support for an IS initiative must be maintained across all stakeholder groups (Sauer, 1993a, 1993b; Yuttapongsontorn et al., 2008), not just key sponsors, and communication has been identified as a key ingredient in maintaining support (Sauer, 1993a, 1993b), highlighting the need for good communication skills within the IS

function, and in particular the CIO (Hyvari, 2006; Sutterfield et al., 2006). Successful IS initiatives are highly dependent on a good working relationship between IS and the organisation (Senn, 1978), and in maintaining support during the lifespan of the project (Enns & McDonagh, 2012). The role of relationship manager is described as a key accountability of the CIO (Earl & Feeny, 1994; Peppard et al., 2011; Peppard, 2010; Rockart, 1982; Smaltz et al., 2006; Tagliavini & Moro, 2003; Weiss & Anderson, 2003). The number and diversity of stakeholders involved in the PSB initiative, and the cross-departmental impact of its development suggests a requirement for a significant relationship management capability. Notwithstanding the dysfunctional organisational position of the Reach Agency, its lack of a commanding mandate, under resourcing, and the complexity and apparent lack of a 'killer application', it was considered that Reach management, and in particular the CIO, were not good collaborators (R5; R8), and failed to maintain good relations among all parties to the PSB (Nolan, 2010). The Report of the C&AG states that *"Relationships between Reach and its (potential) client departments and agencies have been uneven, and there is some dissatisfaction"* (C&AG, 2007, p. 11), which supports the assertion by Chan (2002), Preston & Karahanna (2009), and Tai & Phelps (2000) of the importance of the CIO in creating a shared vision as a precursor to successful IS and business alignment. The failure of the CIO to create a vision that would bring people on board (R4; R8), and the lack of effort by Reach to encourage more engagement from potential partners (Nolan, 2010), would further alienate an already sceptical user community leading to a continuous waning of support for the initiative as the development process unfolded. The relationship between the CIO, Reach, and external agencies was also poor as inappropriate contractual conditions and continuously changing scope gave rise to frequent argument. Many interviewees spoke of the absence of a good working relationship among the developing parties - *"confrontational with no team work* (R5) - *"an us versus them feeling"* (R7), although this was also the result of Reach's inability to control the project as it progressed.

Formal Support for an IS initiative should also be demonstrated by the appointment of an executive sponsor (The Standish Group, 2012) with overall accountability for the success or failure of a project (Glaser, 2004; PMI, 2013; Turner, 2009). Formal sponsorship for the PSB initiative was a grey area from the start in so far as CMOD had ultimate budgetary responsibility for the PSB and were therefore the de facto sponsors, but a formal sponsor role was not formally invested in them. Neither was it invested in the ISPU, which meant that the CIO relied on informal support structures for the duration of the initiative. The absence of formal sponsorship resulted in a lack of

clarity among key stakeholder groups regarding accountability, and facilitated disengagement by key sponsors and user departments over the lifetime of the PSB. Most informal supporters were merely project champions to start with, which facilitated culpability free disengagement from the initiative as the process of failure progressed. Furthermore the case of the PSB confirms the danger of unchecked champions who may create an unsupportable level of hype and false optimism, particularly at the early stages of a project (Turner, 2009). The dysfunctional effects of informal championing of IS initiatives and informal executive sponsorship was also demonstrated in the form of the secretary general of DSFA who sustained commitment to the project even when obvious signs of difficulty (e.g. escalation of costs) began to emerge. This also demonstrates the relationship between organisational power and sustained commitment to a failing initiative in the absence of a proper governance structure.

The case of the PSB presents an interesting dichotomy in relation to user support for IS initiatives. On the one hand it confirms lack of user support as a risk/failure factor (Aloini et al., 2007; Barki et al., 1993; Kappelman et al., 2006; Schmidt et al., 2001). Many potential partner agencies were sceptical about the PSB proposition and thus were reluctant to engage with Reach - *"If I had responsibility for services it would give me great comfort to know they were delivered by my own people"* (R1). This resulted in a failure to gain momentum at the start of the initiative which would be exacerbated over time as complexity, and capability issues began to emerge. On the other hand there was strong commitment from some departments initially (Dept. Finance and Dept. An Taoiseach) thereby confirming the contention of Gallivan & Keil (2003), and He & King (2008) that user involvement is necessary but not sufficient to achieve IS success.

7.5.4 Governance

Effective governance facilitates a holistic, long range perspective of key performance indicators relating to IS initiatives, and has been shown to be effective in the success of IS projects if accompanied by proactive strategic guidance, and top management commitment (Bernroider, 2008). Avison et al. (2006) states that governance is the responsibility of all stakeholder management, including senior management. Inadequate governance is cited regularly as an IS risk factor (Avison et al., 2006; Keil & Mähring, 2010) and features regularly in practitioner surveys as a key management priority (DeHaes & Van Grembergen, 2005). It is also a topic in the project management literature (Abednego & Ogunlana, 2006; Turner, 2006), however, although alluded to, it is largely ignored in the IS failure literature (Avison & Wilson, 2002) as a research topic, and in particular in relation to the role of senior management

during the lifetime of an IS initiative, and the role of the CIO as both a senior executive and leader of the IS function.

The case of the PSB highlights many of the negative outcomes that may result from a failure to establish a robust governance structure at the commencement of an initiative supporting the findings of Avison et al. (2006) of the need for an effective Governance system to mitigate risk of failure.

Firstly the governance structure for the PSB was extremely complex involving three government departments, with formal oversight and direction provided at three levels by agencies at cabinet, secretaries general, and assistant secretary level. Funding was provided by ISPU at the Department of An Taoiseach, and approval for its work from CMOD at the Department of Finance. This complicated arrangement gave rise to multiple reporting channels without a defined centre of responsibility for the initiative. Not only were the governance arrangements complex but they changed a number of times over the course of the initiative which effectively meant that *"nobody is in charge of these projects nor are controls in place"* (R18 PAC). Other than reporting to the various governance structures the CIO played no significant part in overall governance of the initiative.

Secondly IT enabled change initiatives should be a shared responsibility between the organisation and the IS function (McDonagh, 2014). On the surface the PSB was considered to be part of the wider e-Government agenda, and notionally had a governance relationship with the central e-strategy and e-implementation groups (C&AG, 2007). However the decision at the Genesis phase of the initiative to assign responsibility for the PSB to the Reach Agency created a strategic disconnect between the PSB initiative and the overall e-Government strategy because of Reach's position as an agency within a department (DSFA) that was not central to the e-Government agenda. Furthermore as Reach did not have a cross-departmental mandate to implement such a ground breaking, collaborative initiative there was in effect only a very superficial alignment between e-Government strategy and the PSB initiative. Positioning Reach in this fashion further complicated an already complex governance structure with - *"no governance at the centre to drive the initiative forward"* (R11), making it *"very difficult to establish where responsibility for this project lies"* (R21 PAC). The position of the Reach agency, and hence the CIO, outside of the central e-Government authority also effectively isolated the CIO from direct access to the executive team (the cabinet), other than through a dysfunctional governance structure, thereby removing the opportunity for the CIO to participate in overall strategic planning,

which is described as the defining responsibility of the CIO (Stephens & Mitra, 1995). This made it impossible for the CIO to directly nurture a shared understanding amongst senior management of the role of the PSB in the overall e-Government strategy - *they [government] just hadn't a clue what we talking about"* (R4), which is described as a key precursor to successful alignment (Preston, Karahanna, & Rowe, 2006; Reich & Benbasat, 2000). This, combined with the under resourcing of the Reach Agency, eroded the authority profile of the CIO and the Reach Agency over time, and decreased both the scope and effectiveness of the CIO role from that of a directorial role to that of an administrator as the Reach Agency became mired in the dysfunctional development and implementation process.

Thirdly, supporting the findings of Keil & Mähring (2010) that uncertainty and ambiguity surrounding the progress of an IS initiative may result in escalation of commitment to a failing course of action the PSB initiative displayed escalation of commitment which was evidenced by the escalation of costs during the latter half of the project. The case of the PSB also supports all four contributory escalation factors as identified by Staw & Ross (1987) in Keil et al. (1994) as follows: *project factors* – the PSB was seen as a flagship project presenting huge potential benefits to the profile of Ireland within Europe as evidenced by the assertion that *"we need to do 'e'"* (R5); *psychological factors* – there was much personal commitment to the PSB on the part of Reach and the CIO *"it was highly emotional for a lot of people…. it has to work"* (R8)"; *social factors* - DSFA would not wish to cede control of the running of the identity management system to another department (R4); and *organisation factors* – the dysfunctional governance structure meant that there was no formal structure (until the 3rd Reach Board) that could take action regarding the obviously *"rudderless"* project (R18 PAC), with the consequent escalation of costs in excess of €40 million by the time the project was terminated.

Lastly, the failure of the CIO to establish standard project controls in the form of *"business, financial, staffing, or risk management"* (C&AG, 2007), or a project management methodology, were key contributors to project drift - *It was just wandering all the time"* (R4). This facilitated scope creep as identified by Kreps & Richardson (2007) McAfee (2002), and Umble (2003), which is described as a major risk to an IS initiative (Keil et al., 1998; Scott, 1999), and a major cause of project failure (Arnuphaptrairong, 2011; Daniel, 2006; Kappelman et al., 2006). The establishment of the 2nd Reach Board in 2003, and the project management office in 2005 (C&AG, 2007) offered some structure to project governance. It is of note that the makeup of the 2nd Reach Board confirms the assertion by Drury (1984) that steering committees are

often dominated by IS personnel, and further supports the notion of them being forced to deal with operational rather than control or strategic issues, as the 2nd Reach Board was focused entirely on driving the PSB project to completion (R9) - *"to produce some value for money"* rather than *"delivering a solution"* (R9). This was not however the case of the 3rd Reach board which had a much broader strategic remit which ultimately resulted in the closure of the PSB initiative.

7.5.5 Execution Capability

Setting IS policy for the organisation is identified as a key role of the CIO (Applegate & Elam, 1992; Peppard et al., 2011; Smaltz et al., 2006). As a visionary initiative (R11; R13), the IT architectural requirements for the PSB could not be defined from the outset, and would require significant development over time. To obviate the risks of ground-breaking and complex initiatives Earl & Feeny (1994) propose a cautionary approach to implementation. The fact that there was no *"risk management plan in place for the delivery of the Broker and the complex data, process, technology or organisational issues were not analysed."* (C&AG, 2007) was a key contributor to its eventual failure the blame for which must rest with the CIO. Failure to undertake a proper risk assessment before the project commenced was compounded by the failure to complete an adequate proof of concept for the PSB during the conceptualisation phase which resulted in a contract for development being signed before the system design had been adequately tested. Emergent technical and organisational complexity, combined with the decision by the CIO to proceed with a full blown system development (R4; R13), would have serious consequences for the capability to complete the PSB as designed (C&AG, 2007; R14 PAC), and would ultimately lead to significant cost escalation (R4; R6; R9), and eventual closure of the PSB.

The Inspiring IT Manager represents the *supply side* of the CIO role which involves managing the IS function, including sourcing and development to meet known business needs. A key aspect of this role is ensuring adequate staffing to meet operational performance needs (Applegate & Elam, 1992; Peppard, 2010; Rockart, 1982; Smaltz et al., 2006; Tagliavini & Moro, 2003; Weiss & Anderson, 2003). The CIO secured only a total of 13 staff for the Reach Agency over the course of the PSB initiative (C&AG, 2007) which created a significant imbalance between in-house and external expertise which would ultimately lead to a situation whereby the Reach Agency, and by default the CIO, were unable to adequately manage the project. This resulted in frequent argument among all parties (R7), reputational damage to Reach (the IS function) and the CIO, and escalating costs as described below.

Managing the IT budget is also identified as a key accountability of the Inspiring IT Manager Role (Applegate & Elam, 1992; Peppard et al., 2011; Smaltz et al., 2006; Weiss & Anderson, 2003). In addition to the absence of risk management as described above *"No budget or timetable for the project was set"* (C&AG, 2007, p. 10) when the PSB project was initiated. Failure to establish an appropriate budgetary framework and project schedule must also be laid at the feet of the CIO as head of the Reach Agency. The absence of *"measurable targets"* (C&AG, 2007) for the PSB from the outset meant that the normal departmental budgetary review and appraisal process was not *"strictly implemented"* (C&AG, 2007, p. 66), which ultimately resulted in a cost escalation to over €41.5 million (The 3rd Reach Board, 2008) by the end of 2006, a situation described as *"outrageous"* (R4). The CIO also succumbed to pressure at both government and departmental secretary level in the form of an *"it has to work"* (R8) attitude, which was facilitated by the absence of an effective governance structure.

Managing the project life cycle is another role of the inspiring IT manager (Peppard et al., 2011; Peppard, 2010; Weiss & Anderson, 2003) however it is clear there were many deficiencies in this area (R4; R5; R14; R18 PAC). From the start *"There was no business, financial, staffing, or risk management plan in place for the delivery of the Broker"* (C&AG, 2007, p. 45). Failure on the part of the CIO to enforce standard project management processes and controls in the form of *"consistent, regular, clear and measurable reporting on progress against plans* (C&AG, 2007, p. 55) facilitated project drift (Kreps & Richardson, 2007; McAfee, 2002; Umble, 2003) – *"It was just wandering all the time."* (R4). This was further exacerbated by the fact that Reach *"did not operate formal change control* (C&AG, 2007, p. 43), therefore no record was kept of the frequent changes in design that were taking place over time.

7.6 Research Contribution

7.6.1 Theoretical Contribution

7.6.1.1 Contribution of the Theoretical Framework

The emergent theoretical framework is a process based typology which deepens our understanding of IS failure by presenting a novel explanation of IS failure in terms of 4 dimensions of failure *(vision; support; governance; and execution capability)*, that have all individually been shown in extant literature to be significant contributors to failure, but have not been presented previously in the context of a holistic processual framework that examines the relationship between each dimension, and uses each dimension to delineate a series of phases/stages: *(genesis; initiation and*

conceptualisation; design; development operation and termination), each described by a set of defining characteristics and encompassing the entire duration of a failing IS initiative.

The framework makes a further contribution to theoretical development by presenting an instrument that facilitates explication of how both IS failure and the role of CIO are systematically intertwined in a complex contextual web of cause and effect. To date there is a dearth of theoretical development which addresses this phenomenon therefore the framework presented offers an opportunity to open a new programme of role based research relating to IS failure (and possibly other IS related) phenomena.

7.6.1.2 Theoretical Contribution

The emergent theory deepens our understanding of the role of the CIO by placing the CIO role at the centre of a failing IS initiative, thus situating the performance of the role in a somewhat unique context (Siggelkow, 2007), thereby offering a novel, dynamic, and revelatory view of the performance of the role (Darke et al., 1998) that is not present in extant literature. The theory demonstrates that all six CIO roles identified from extant literature, and described in Chapter 2 (*strategist, business innovator, enterprise IS architect, inspiring IT manager, relationship manager, and environmental scanner),* are each relevant to the performance of the role of the CIO during the course of a failing IS initiative, and finds that the importance of each role changes at different times, and in response to emergent and contextual situations.

Comparing the CIO role during IS failure to the archetypal role profile identified in extant CIO literature presented some interesting findings in so far as it was found that there were many deviations from the accepted CIO role profile as described in extant literature, which both contributed to, and was impacted by, the emergent failure conditions during the course of the initiative. For example the CIO failed to effectively perform the role of *strategist* and *business innovator* by not adequately articulating a well thought out vision, failing to ensure that the vision was aligned with organisational strategy, and failing to ensure that the organisational change aspect of the vision was adequately addressed from the start. The CIO also failed to undertake a proper risk assessment of the proposed initiative, failed to ensure an adequate governance structure for the initiative, and failed to ensure adequate organisational sponsorship and support for the project which is not consistent with the archetypal role of *enterprise IS architect* as described in the literature. The performance of the *relationship manager* role was also not consistent with the archetypal role in terms of failing to engender a common vision amongst all stakeholder groups and in failing to adequately address

dwindling support from the wider government community and partner agencies as the project progressed. The role of *inspiring IT manager* was also not adequately performed as evidenced by the failure to ensure proper project management and control measures, failure to adequately resource the PSB project, and failure to adequately manage the budget.

Failure to effectively perform these roles as expected can result in negative outcomes, the effect of which may not be immediately apparent, but that may subsequently lead to IS failure. For example performance of the *strategist*, *business innovator,* and *environmental scanner roles* during the early gestation stages of a new IS initiative are critical to the outcome. Failure to develop a robust vision for IS deployment *(strategist and business planner)* that is based on a sound understanding of the external technology and business environment *(environmental scanner & information broker),* and is strictly aligned with overall business strategy, may sow seeds of failure at the start of an IS initiative which can subsequently result in costly and often catastrophic consequences during later stages (Ginzberg, 1981; Sutterfield et al., 2006), and which may also impact on the performance of other CIO roles (*enterprise IS architect, inspiring IT manager, and relationship manager).*

The findings also highlight the important impact of contextual factors on the performance of the CIO role. For example, from the start, the cross departmental mandate that was assumed by government for the Reach Agency (and hence the CIO), without the concomitant authority profile to implement the mandate as envisioned, created a strategic disconnect between the vision and the execution capability of Reach, and isolated the CIO from the central authority required to complete such a ground breaking initiative. The lack of IT savvy (Peppard, 2010; Weill & Ross, 2009) within government at the time contributed to a lack of understanding of the enormity of the PSB vision resulting in an organisational failure to ensure that proper structures were in place to address governance, organisational change, cross departmental cooperation, and resourcing that were key contributors to the failure of the PSB.

The emergent theory highlights the importance of ensuring that the mandate for the CIO is aligned with that of the organisation and the consequences of not doing so. Peppard et al. (2011) found that the appropriate role for a CIO is determined by: (1) the chosen strategy of the organisation and (2) the level of information capability within the organisation. Acquiring or assuming a 'notional' mandate to undertake a strategic IS initiative is not a sufficient authority profile to complete the task. The CIO must ensure that his/her mandate meets all of the requirements to carry out the initiative (e.g. cross

departmental authority, rules of engagement etc.), and is supported by an appropriate organisational seniority/authority profile for the IS function, and appropriate central organisational structures that lend authority to the mandate given. In the case of the PSB the CIO, and the Reach Agency (the IS function), was never given the appropriate mandate or the necessary authority profile to implement the cross-departmental change necessitated by the initiative thereby highlighting the consequences of mis-alignment of the mandate of the IS function and the strategy of the organisation. Although there may be additional factors, both organisational and personal, the absence of a proper mandate for the CIO makes cross-cutting initiatives practically impossible to execute. Setting an inappropriate mandate for the CIO role can be the result of a lack of IT savvy at organisational level thereby highlighting the criticality of the necessary leadership capability, particularly in the areas of strategic alignment and the creation of a shared understanding and vision amongst the senior executive team. In the case of the PSB the selection of Reach and the CIO as the executors of the vision for the PSB was made solely on the basis of a perceived fit between the work of Reach on the Integrated Social Services System (ISSS), and that required to execute the PSB vision. Assigning a pioneering mandate to a CIO with no experience in delivering ground-breaking initiatives can have disastrous consequences due to the gap between actual and perceived capability. It also gives further weight to evidence that CIOs with exemplary careers can underperform when placed in a different set of circumstances as the Director of Reach (CIO) was a senior civil servant with an excellent service record in senior IT management positions, but wholly unsuited to the task at hand.

The theory also highlights that reputational damage to the IS function and the CIO may come from all levels of the organisation when failure conditions begin to emerge. The effect of such criticism (in conjunction with other failure and contextual conditions) may gradually erode the status of the CIO. For example the visionary CIO role at the initial stage of the initiative was gradually downgraded to that of an administrator as ability to control the trajectory of the vision diminished, the role of evangelist was reduced to that of a defender as stakeholders began to withdraw support due to the inability to support their needs, the role of governance watchdog was reduced to a non-participative role as more and more responsibility for the PSB was taken out of the hands of the CIO, and the role of advisor/resource allocator was eventually whittled down to that of an overrun abdicator as the CIOs grip on execution of the vision slipped over time due to under-resourcing of the IS function.

In the case of the PSB it is of note that the majority of internal criticism for the failure of the PSB was levelled at the IS function, and the CIO in particular. This opinion however was not expressed as strongly amongst partners external to the organisation who recognised the strong impact of organisational factors in the failure of the initiative.

The theory highlights a very interesting aspect regarding senior management commitment to IS initiatives, a condition that is described as a 'meta-factor' that encompasses other IS success/failure factors (Schmidt et al., 2001), and a risk factor that overshadows all others. The case of the PSB highlights the phenomenon which I term *'enthusiasm masquerading as commitment'* and its effect on the outcome of an IS initiative. Enthusiasm (as distinct from commitment) may be the result of a lack of detailed understanding on the part of senior management of the consequences of many proposed visionary IS initiatives in terms of the organisational change that may be required, the level of resource commitment over the life of the initiative, and the need to deal with unanticipated issues that are the nature of IS initiatives. The consequence of this can be a huge initial rush of enthusiasm for an initiative that quickly dissipates because of the emergence of unexpected issues, escalation in costs, or a refocus on other strategic issues thereby 'leaving the technology to the technologists'. Enthusiasm masquerading as commitment highlights the need for the CIO, as the senior IS official, to act as watchdog for this phenomenon to ensure that all initiatives are backed up by the appropriate organisational commitment structures and that these are maintained throughout its life. This role may become increasingly important as IS becomes increasingly embedded into the fabric of the organisation and onto the critical path of strategic initiatives.

Finally the research has demonstrated that the absence of a proper governance structure is a key reason why failing entities are allowed to continue. In this case the absence of proper IS governance facilitated escalation of commitment to a failing entity, and allowed an obviously dysfunctional project to limp along for eight years at a cost in excess of €41 million. IS governance is an organisational issue as it is designed to ensure that IS is meeting the strategic goals of the organisation. A key element of the CIO role as enterprise IS architect is the setting of IS policy, and maintenance of enterprise-wide IS standards for the organisation. Such a role must also ensure that proper governance structures are in place. No senior management team would argue with the necessity of having a proper financial or legal governance system applied throughout the organisation and therefore a key challenge for the CIO is to imbed a similarly rigorous governance process for IS across the organisation. Making IS governance an organisational, not just a project orientated, standard will help distribute

responsibility and risk (which is inherent in IS initiatives) and ensure that there is timely organisational response to jeopardy situations should they arise. It can also help place the IS function more centre stage within the organisation and nurture a sense of ownership that over time will reduce or eliminate the knowledge and credibility gaps that continue to persist.

7.6.2 Empirical Contribution

Chapter 2 highlighted an underlying theme in the CIO literature suggesting that the high rate of failure of IS initiatives is in some way attributable to a failing in the performance of the role of the CIO (Jones et al., 1995; Kaarst-Brown, 2005; Karahanna & Watson, 2006; Willcocks & Sykes, 2000). Chapter 3 highlighted the dearth of research into the role of CIO and IS failure, despite the fact that the literature suggests the need for a senior organisational oversight role, with the necessary business and technical expertise to identify and address IS failure conditions. Furthermore it was found that there is a paucity of empirical research in both the CIO literature and IS failure literature that explains the relationship between the role of the CIO and IS failure.

The research makes a contribution to the body of CIO literature, advancing the current focus of CIO role studies on the construction of generic role and competency profiles, by presenting a dynamic, process view of the performance of the CIO role. This offers a broader explanation of the CIO role, and how its performance both shapes, and is shaped by, the context in which it is performed (in this case IS failure), and how the role performance may change over time in response to emerging circumstances.

This research also adds to the body of extant IS failure literature, and in particular process based IS failure studies (where the focus to date has been on the themes of critical event analysis, resistance to change or technology, escalation and de-escalation of commitment, and sense-making or attribution - see Appendix 2), by presenting a role based process study of IS failure, focusing on the role of the CIO over the course of a failing IS initiative.

Furthermore this research addresses an additional gap in extant literature by presenting a holistic view of both the process of failing, and the role of the CIO therein, and explaining the connection between the two. In doing so it transcends the boundary of two essentially discrete, yet inherently connected, academic silos (IS failure and the CIO), adding to the body of knowledge in both domains. This approach is consistent with the principles of the professoriate, which emphasises both the scholarship of

discovery and the scholarship of integration (Boyer, 1990), and offers a basis of a new research agenda that connects both domains.

7.6.3 Methodological Contribution

From a methodological perspective the research adds to the growing body of interpretive, longitudinal, process studies in the domain of IS failure. Using a case study as an overarching methodology for the conduct of the inquiry combines two research approaches (process inquiry and the case method) which facilitates a deeper explication of the dynamics of the performance of a role (in this case the CIO) over time, and how the performance of the role both affects, and is affected by, the context in which it is performed.

The research also presents a practical guideline for the use of case study as an overarching methodology for the conduct of a process inquiry thereby offering a systematic methodology, along with the necessary tools and frameworks to guide the conduct of the inquiry, which strengthens the rigor and accuracy of the research process.

7.6.4 Contribution to Practice

Process knowledge is also highly relevant to practice (Hinings, 1997; Langley & Tsoukas, 2010), is often motivated by a desire for a better understanding of events leading to a positive or negative outcome (Langley & Tsoukas, 2010), and is therefore seen as problem solving (Hinings, 1997). This research presents a unique real life case of IS failure and the role of the CIO therein. Case study facilitates opening the 'black box' of IT in order to better understand how it affects and is affected by the people who use it (Benbasat et al., 1987; Leavy, 1994). Case study is therefore not only a research method but is also a powerful learning instrument (the case method) used in many of the world's leading business schools as a way to explore high risk phenomena in a safe, risk free, environment. This is particularly relevant today for certain sectors of the economy, such as government, where IS underperformance continues to be a regular and costly phenomenon (House of Commons, 2011; McDonagh, 2014) and the role of CIO is less mature than the private sector (Lawry & Waddell, 2008).

The research findings are also practically significant as the role of CIO becomes increasingly embedded within both private and public sector organisations (Lawry & Waddell, 2008). Whilst not a talking pig (Siggelkow, 2007) the case of the PSB presents an interesting and novel account of the role of the CIO during a somewhat

extreme case of IS failure. Presenting such a case can nurture new ways of thinking by presenting a holistic account of IS failure that encapsulates the entire course of the failure along with the role of the CIO, thereby explaining the multiplicity of failure conditions that may arise, and how these are impacted by the performance of the role of CIO in a 'real life' setting. The findings discussed below are therefore of practical value to the CIO in carrying out the role responsibilities of the most senior IS position.

Perhaps the most important implication of this research for the CIO is that not only is IS failure a persistent and costly phenomenon (McDonagh, 2014; McDonagh & Coghlan, 2006; Sauer, 1999; The Standish Group, 2013), which can have significant reputational implications for the CIO and the IS function, but so too are the reasons for failure when viewed at a macro level. For example consider the similarity of the case of the PSB with the case of the Taurus Project, a system to facilitate securities transfer at the London Stock exchange, which was cancelled after 6 years development work and a cost in excess of $600 million (Lyytinen & Robey, 1999). The project involved novel technologies, massive scale, and ineffective project controls which allowed requirements to change continuously. This was exacerbated by the failure of management to heed clear warnings about technical risks, and the presence of powerful interests who pushed for continued development despite confusion about the systems purpose and design, and the influence of advocates who held an almost superstitious belief in the project, dismissing objections and proposals for modification (Drummond, 1996; Keil & Robey, 2001; Pan, 2005). The similarity of this case and other more recent cases within the public service (e.g. House of Commons (2011, 2013) and The Comptroller and Auditor General (2009, 2012)) confirms that the challenges of implementing major IS initiatives are as enduring as ever, despite over fifty years research into this phenomenon, and that the CIO, as the most senior IS official, must be aware of these challenges in the execution of the role and be proactive in their mitigation.

Another practical implication of this research is the need to integrate IS into the fabric of business strategy implementation. Specifically the organisation needs to recognise that although IS may be a major part of a strategic change initiative it is only a part and therefore responsibility lies at organisational level to ensure that all parts of the strategy are implemented. Failure to do this can result in a high percentage of the risk being borne by the IS function (because of the key part IS plays in the outcome) and may lead to abdication of ownership and responsibility as the project progresses. IS policy is an organisational issue and it is therefore incumbent upon the CIO to nurture a shared understanding between the business and IS of the need to align both strategies, and

the consequences of not doing so. It also highlights the need for an inclusive, interdependent relationship between senior organisation executives and the CIO, including joint ownership of a shared strategy, risk sharing and proper accountability structures for all stakeholder groups.

The research also highlights the challenges for governments implementing major IS initiatives. The level of scrutiny of public sector IS systems has led to a high value being placed on completeness and accuracy, and the ability of systems to cater for all known circumstances regardless of frequency or importance. The result of this is that projects are typically large and complex, and are developed using the waterfall or SDLC type methodologies (as was the PSB). This tends to result in a long gestation period and a tendency to define all requirements during the initial specification stage. The result of this is that systems may be delivered years after they are first conceived and specified thereby creating a number of inherent and significant risk factors including the threat of rapidly changing technology, scope creep as new requirements emerge during the development phase, changing personnel, substantial sunk costs before any benefits are realised, and shifting strategic priorities or competitive circumstances over time. A key challenge for the CIO is therefore to nurture a change in mind-set that supports a more agile approach to systems development whereby major strategic initiatives can be implemented in an incremental fashion facilitating a quicker time to market with substantially reduced risk, whilst still meeting the exacting requirements of government IS development policy on IS outcomes.

Finally the research highlights some practical pitfalls in resourcing IS initiatives. An organisational policy to limit the number of in-house staff assigned to projects usually results in the engagement of external advisory services in the form of consultants and contractors. There are many advantages of using external advisory services such as the rapid acquisition of required expertise, and to fill a temporary gap in resources. However it is incumbent upon the CIO to ensure that a proper framework exists for engaging external services and assessing their performance. The CIO must maintain sufficient in-house expertise to enable the organisation to retain ownership and control of the project. In addition to certifying the capability of all externally sourced resources the CIO must ensure that contractual arrangements cover accountability and risk balancing, and that penalty structures are in place for noncompliance. When engaging external expertise for long duration projects the CIO must ensure that there is a workable system in place to enable the transfer of skills in-house to ensure that knowledge and skills built over the course of an innovative endeavour are not the sole property of the external advisors on completion of the project.

7.7 Conclusion

This chapter presents an emergent theory of how the role of the CIO influences IS failure outcomes. Following an introduction to the chapter Section 7.2 presents a theoretical framework consisting of a series of phases/stages with each phase/stage delineated with a set of defining characteristics. The phases/stages are defined as *genesis, initiation and conceptualisation, design, development, operation,* and *termination*, and each phase is delineated by four dimensions of failure: *vision, support, governance, and execution capability*. The typology forms the backdrop to the performance of the role of CIO, which is central to the emergent theory which is described in detail in Section 7.3. Having presented the theory in detail Section 7.4 then then uses the framework to assess the key CIO roles that resulted in the failure. Section 7.5 compares the findings of the research against extant literature on both IS failure and the role of the CIO using the four dimensions of failure *vision, support, governance,* and *execution capability,* described in the theoretical framework. This comparison serves to highlight how the performance of the CIO role may result in the emergence of failure conditions and how the performance of the role is influenced by the context in which it is performed. Section 7.6 presents the research contribution in terms of theoretical contribution, empirical contribution, methodological contribution, and contribution. Section 7.7 concludes the chapter.

Chapter 8

Conclusion

Chapter 8 – Conclusions

You'd be amazed how much research you can get done when you have no life whatsoever."

Ernest Cline, Ready Player One (p. 64)

8.1 Introduction

The previous chapter presented in detail an emergent theory of how the role of the CIO influences IS failure outcomes. It discussed the emergence of four dimensions of failure and described the relationship between the role of the CIO and these failure dimensions during six distinct phases/stages representing the entire course of a failing IS initiative. It also drew comparison between aspects of the emergent theory and extant literature in the areas of IS failure and the role of CIO, and discussed the implications of the emergent theory for both theory and practice.

This final chapter will now act as the conclusion for this thesis. Section 8.2 presents a brief review of the research study. Section 8.3 describes how the aims of the study have been achieved from a theoretical, empirical, methodological, and practitioner perspective. Section 8.4 presents some observations on the use of process studies highlighting both its applicability and limitations. Section 8.5 explores the limitations of this body of research in terms of the type of case study chosen, the research setting, and the use of qualitative/interpretive methods. Section 8.6 presents an agenda for further study based on the emergent theoretical framework, and section 8.7 highlights additional themes that emerged during the research. Section 8.8 offers a personal reflection on the four years spent on this research and Section 8.9 presents a brief final conclusion for this work.

8.2 A Brief Review of the Research Study

This research is situated in the field of information systems (IS)[19] (Bacon & Fitzgerald, 2001), in the research area of IS development, as described by Sidorova et al. (2008), and in the area of development, implementation, and use of systems as described by Taylor et al. (2010). The purpose of this research was to explore and develop novel theory on the role of the Chief Information Officer (CIO) during IS failure. The emergent

[19] The field of Information Systems (IS) is concerned with the management and use of Information Technology (IT) for managerial and organisational purposes (Lee, 2001)

theory from this research resulted from the conduct of a longitudinal process inquiry of the case of the Public Services Broker (PSB), a failed IT enabled public service modernisation initiative, which commenced in 1999, and was terminated in 2008 having failed to significantly deliver on its intended purpose.

Interest in undertaking this research arose because of a 30 year involvement as a practitioner in the Information and Communications Technology (ICT) industry, and in particular an interest in the factors affecting the performance of senior roles in this dynamic area.

The genesis of this research began with a search for a deeper understanding of the role of CIO, commencing with a trawl of academic material relating to the role, which found that the role of CIO has evolved significantly since first coined by Synnott & Gruber (1981), to become the most senior IS official in may organisations, reflecting the growing importance of IS during the last 30 years. The role has been described as one that requires a thorough knowledge of the interconnection of the information flows of the business (Benjamin, et al., 1985), along with an enterprise-spanning viewpoint to rival that of the Chief Executive Officer (CEO) (Lepore, 2000; Thomas, 1990).

As the highest ranking IS executive the CIO has ultimate responsibility for the successful deployment of IS to meet the strategic objectives of the organisation. The importance of the CIO, as a senior organisation executive, in creating a shared vision amongst the rest of the senior management team (TMT) is also acknowledged (Chan, 2002; Doll, 1985; Preston & Karahanna, 2005; Raymond Young & Jordan, 2008). The literature however suggests that there may be a range of issues specific to the CIO role which continue to impact negatively on the success of the role, and which may also contribute to the enduring problem of IS underperformance and failure.

Evidence persists that there are a number of issues (called 'gaps') that continue to impact on the ability of the modern CIO to elevate the IS function as an equal partner to the business (Preston & Karahanna, 2005; Watts & Henderson, 2006). Specifically a *knowledge gap* (Fiegener & Coakley, 1995), the lack of understanding among executive management of the nature and role of IS within an organisation, and *credibility gap* (Fiegener & Coakley, 1995), whereby many CIOs experience difficulty in making the transition from functional manager to executive team member, continue to present difficulties for the CIO in engaging at a strategic level with senior executives. For many CIOs making the transition to business strategist remains a challenge (Karahanna & Watson, 2006) and there continues to be a lack of IS literacy among senior executives (Peppard et al., 2011; Peppard, 2010). Many senior executives still

regard IS as a hygiene factor (Peppard, 2010; Willcocks & Sykes, 2000), and consequently view the CIO as being primarily concerned with technology and operational processes (Peppard et al., 2011; Peppard, 2010), all of which can result in a failure on the part of the CIO to create a shared vision of IS across the organisation, which in turn can lead to a failure on the part of senior management to engage with IS during strategy formation (Jones et al., 1995), thereby resulting in a vicious cycle of dissatisfaction and disengagement on both sides (Peppard, 2010), leading to sub optimal investment in IS, and sometimes outright failure (Kaarst-Brown, 2005; Willcocks & Sykes, 2000).

Seeking further explanation of this matter prompted a review of literature in the IS failure domain. Although there is no widely accepted explanatory model of IS failure (Sauer, 1993b), or indeed even an agreed definition of the concept (Lyytinen & Herschein, 1987; Nakamura & Kijima, 2011), studies indicate that it is widespread and is costing industry in the tens of billions of US$ per annum. Studies of IS failure indicate an outright failure rate of IS projects of between 18% (Eveleens & Verhoef, 2010) and 50% (McDonagh, 2001). In addition many projects not considered to be outright failures fall far below expectations (Bloch et al., 2012). Mahaney & Lederer (1999) propose that failure has become an accepted aspect of IS implementations, an ominous proposition given the ever increasing complexity of IS (Koh et al., 2011) and its growing importance in maintaining competitive superiority (Piccoli & Ives, 2005). Gartner estimate that total global spend on IS for 2014 will be $3.8 trillion. Even a conservative estimate of the percentage of this amount that is spent on underperforming IS represents a significant figure, which is a motivation and justification for continued inquiry in this area (Drevin, 2008).

It was found that despite the underlying theme in the CIO literature suggesting that the high rate of failure of IS initiatives is in some way attributable to a failing in the performance of the role of the CIO (Jones et al., 1995; Kaarst-Brown, 2005; Karahanna & Watson, 2006; Willcocks & Sykes, 2000) this theme is not explored in any level of depth in extant IS failure literature. In fact there is a paucity of empirical research in both the CIO literature and the IS failure literature which provides any explanation about the relationship between IS failure and the role of CIO. This represents a significant gap in research given that the CIO is the most senior IS officer in the organisation, and is ultimately responsible for the successful deployment of IS. Consideration of how this gap might be addressed resulted in the formulation of the research question *'How does the role of the CIO influence IS failure outcomes?'* The conduct of a research programme to answer this question presented an opportunity to

address this gap, and in the process transcend the boundary of two essentially discrete, yet inherently connected, academic silos (IS failure and the CIO) by undertaking a novel study that connects the two, thereby presenting a holistic view of both the process of failing, and the role of the CIO therein. The effective execution of such a study makes a significant contribution to academia and offers a basis for both informing and transforming professional management practice (Dempsey & McDonagh, 2014a).

Having analysed the range of philosophical positions, along with associated data gathering and analysis methods, it was decided to adopt a qualitative/interpretivist approach as the most suitable strategy to undertake this research. The interpretive approach is well suited to research that is exploratory in nature (Walsham, 1995b), and is unique in its ability to address issues of description, interpretation and explanation (Bluhm et al., 2011), in the context of socially constructed organisational settings. In particular, because IS developments are complex, protean, social phenomena (Wastell & Newman, 1993) narratives of IS failure tend to be multi-stranded stories of experiences and reactions that lack collective consensus (Dalcher & Drevin, 2003). They can therefore be best understood by focusing on the complexity of human sense making and decision making (Cunliffe, 2010) through the interpretation of social constructions such as language, shared meanings, documents, tools and other artefacts. The adoption of an interpretivist approach in turn indicates that a qualitative approach to data gathering and analysis is appropriate.

Having reviewed a range of research methodologies a process inquiry was selected as the most appropriate for the conduct of the research. This is because IS development is a temporally evolving process (Sauer, 1993b; Sauer & Davis, 2009; Wilson & Howcroft, 2002), and IS failure is also a process (Wilson & Howcroft, 2002). A process inquiry enabled a focus on behaviour in organisations, and sequences of events, activities and actions, which unfold over time and in context (Hinings, 1997; Langley & Tsoukas, 2010; Pettigrew, 1997). As contextual understandings are best achieved by direct, first-hand knowledge of a research setting it was also decided to undertake the process inquiry in a real life case setting.

On the basis that every IS failure is unique in some fashion, and can therefore provide a novel setting for a study of the role of the CIO, a decision was made to undertake a single-case design for the purpose of the research. Following this a set of selection criteria was drawn up evaluate suitable candidates. A number of potential candidates were identified and a decision, based on discussions with a number of CIOs in the

private sector, was made to focus on the public sector as there tends to be more publicly available data on IS failure available due to stringent public management accountability regulations, strict regulations in relation to governance, the existence of audit functions such as the Comptroller and Auditor General, and the publication of Value for Money and other such reports. Finally, on the basis of fit with the selection criteria, and availability of research data and access, a decision was made to select the case of the Public Services Broker (PSB), a failed IT enabled public service modernisation initiative, as an appropriate case for the conduct of the research.

The outcome of the process inquiry is a theoretical framework (described in Chapter 7) to describe the role which explains how the role of the CIO influences IS failure outcomes. The typology presented speaks to a series of phases/stages with each phase/stage delineated with a set of defining characteristics. The phases/stages are defined as *genesis, initiation and conceptualisation, design, development, operation,* and *termination*, and each phase is delineated by four dimensions of failure: *vision, support, governance, and execution capability*.

The typology forms the backdrop to the performance of the role of CIO during IS failure, which is central to the emergent theory. The framework also offers an opportunity to open up a new programme of role based research relating to IS failure (and possibly other IS related) phenomena. Further contributions are discussed in section 8.3 below.

8.3 Achievement of the Aims of the Research

From a *theoretical perspective* the research presents a novel process based theoretical framework on the role of the CIO during the course of a failing IS initiative. The framework deepens and extends our understanding of the role of CIO by placing the study in the context of a unique setting of a failing IS initiative. To date little theoretical development has been undertaken in this area, despite calls in the literature.

From an *empirical perspective* the research addresses a gap in current academic literature by transcending the boundary of two essentially discrete, yet inherently connected, academic silos (IS failure and the CIO), thereby adding to the body of knowledge in both domains, by presenting a novel study that connects, and explains the relationship between, the two. This approach is consistent with the principles of the professoriate which emphasises both the scholarship of discovery and the scholarship of integration (Boyer, 1990), by presenting a holistic view of both the process of failing, and the role of the CIO therein.

From a *methodological perspective* the research adds to the growing body of interpretive, longitudinal, process studies in the domain of IS failure. Using a case study as an overarching methodology for the conduct of the inquiry combines two research approaches (process inquiry and the case method). The research also presents a practical guideline for the use of case study as an overarching methodology for the conduct of a process inquiry thereby offering a systematic methodology, along with the necessary tools and frameworks to guide the conduct of the inquiry, which strengthens the rigor and accuracy of the research process.

From a *practitioner perspective* the research presents a unique real life case of IS failure and the role of the CIO therein. Case study is not only a research method but is also a powerful learning instrument (the case method) used in many of the world's leading business schools as a way to explore high risk phenomena in a safe, risk free, environment. This is particularly relevant today for certain sectors of the economy, such as government, where IS underperformance continues to be a regular and costly phenomenon (House of Commons, 2011; McDonagh, 2014) and the role of CIO is less mature than the private sector (Lawry & Waddell, 2008).

8.4 Observations on the Use of Process Inquiry

The selection of a process inquiry in a case based setting as a research methodology proved to be an excellent fit with the purpose of the research as it facilitated a focus on the temporally evolving, longitudinal and creative nature of the IS development (and failure) process, which encompasses a broad range of complex activities and events that are subject to a range of contextual factors that contribute to the outcome. It therefore provided a focal point for the study of the role of CIO during the process of failure.

Process research however is a 'messy' endeavour as it involves inquiry across a number of different levels of analysis, past present and future, for holistic rather than linear explanations of process, involving actions in context that result in outcomes (Pettigrew, 1992). This involves devoting a considerable amount of time to the collection of data from a myriad of sources, the time for which should not be underestimated by the researcher. The end result of this is a dataset that is large, complex, typically unstructured and therefore difficult to unravel. The researcher must be aware of the danger of 'death by data asphyxiation' as cautioned by Pettigrew (1990), and undertake a rigorous process of disconfirmation and verification of data throughout the research process. Doing so helps the researcher conceptualise

emergent themes over time, described by (Berg, 2001) as 'sorting the noodles from the soup'.

The researcher found narrative extremely useful for the development of process theory as it facilitated the weaving of disparate accounts and perspectives from various voices and data sources into a narrative that could be related back to the research question (Langley, 1999). This was extremely helpful in interpreting the multitude of sometimes conflicting 'stories' that embody IS innovations (Hirschheim & Newman (1987). The researcher also found the use of temporal bracketing (Langley, 1999) extremely useful as it facilitated the construction of a series of phases/stages with defining characteristics that form part of the theoretical framework, which is central to the emergent theory.

Dalcher & Drevin (2003) caution that evidence collected during failure investigations often appears to be ambiguous, incoherent and confused. It may also be messy, contradictory, subjective, and bias laden, therefore the researcher must take every precaution to guard against this. This is where the use of the case method proved invaluable as it presented a range of guidelines for the conduct of a process inquiry including the use of triangulation as a means of exploring different interpretations and validating data. The works of Guba & Lincoln (1994, 2005) were also invaluable in focusing the researcher on internal validity, external validity, and transferability by providing practical guidelines such as the construction of alternative explanations to test plausibility of findings and regular reviews during the writing phase from a range of appropriate people, including informants (Darke et al., 1998; Yin, 2009). The professional experience of the researcher and knowledge of the research subject was also invaluable in understanding the orientation and potential bias of people at different levels within an organisation, the 'us and them' attitude that may prevail between IS and non IS people, and the tendency towards emotional sentiment about failed initiatives which may be subliminal to the research subjects.

Finally the messy, complex, and contextual nature of process data and the need to cater for time as integral to the inquiry can make codification of processual data difficult and time consuming. Unfortunately no simple solution to this enduring problem was discovered. The use of nVIVO was extremely helpful as a single repository for the qualitative data collected from multiple sources, however, the researcher found it difficult to 'animate' the data with an emphasis on action and events over time which is so essential to a processual view. An alternative approach to codification using Excel and described in Chapter 5 resulted in a two stage process of data categorisation

which clarified (1) the process of failure; and (2) the dimensions of the process of failure. This approach facilitated a cyclical process of data reduction and codification which eventually resulted in the emergence of the theoretical framework on how the role of the CIO influences IS failure outcomes described in Chapter 7.

8.5 Limitations of the Study

As with all empirical studies this study has limitations. Limitations that apply to this research include the type of case study chosen, the research setting, and the nature of qualitative research. These are discussed below.

8.5.1 The Type of Case Study Chosen

The methodology used to conduct this research is a process inquiry in a single case setting. The case study has been shown to be eminently suitable for inquiry into IS phenomena (Benbasat et al., 1987; Darke et al., 1998; Leavy, 1994; Markus & Robey, 1988), as has the use of process inquiry (Van de Ven & Poole, 1995; Wilson & Howcroft, 2000, 2002), however there are concerns within the academic community about the generalisability of single case studies. Section 8.7 presents some appropriate suggestions for further study in order to test the generalisability of the emergent theoretical framework. It must also be emphasised that the nomothetic nature of experimental science (i.e. positivism) cannot be directly correlated with the interpretivist approach to research. Generalisability simply refers to theory that has been tested and confirmed in a variety of situations regardless of the methodology used (Lee, 1989). Single case studies are capable of developing and refining generalisable concepts and frames of reference (Pettigrew, 1985), therefore a single setting is also a legitimate area of inquiry. Interpretivism does not emphasise generalisability (Maxwell, 2002), or the striving for universal laws as knowledge is more than statistical significance and the force of example must also be considered legitimate (Flyvbjerg, 2006).

This research also satisfies a number of accepted practical criteria for justifying the use of a single case design including: single-case design is appropriate at the outset of theory generation (Benbasat et al., 1987); it represents a rare or unique circumstance (Siggelkow, 2007); it is revelatory in some way (Darke et al., 1998); and is longitudinal (Yin, 2009). It is also of note that an analysis of 185 case studies by Dube & Pare (2003) found that 60% were of the single-case design. Furthermore my review of the literature on IS failure found that out of a total of 59 case studies 45 (76%) used a single-case design.

8.5.2 Research Setting

This research is situated in the public sector which comprises the central government sector plus all public corporations, including the central bank (OECD, 1997). Public sector organisations have a number of features that make them somewhat different from private sector organisations and which may impact upon the management of technology and the role of IS officials, including the CIO.

Public sector organisations are frequently judged on their political efficiency and achieving their policy mission, whereas, the overarching objectives of private sector organisations are often expressed in terms of financial profitability and efficiency (Kraemer & Dedrick, 1996; Sethibe et al., 2007). In comparison to the private sector the public sector has a higher proportion of multiple, mostly intangible or conflicting goals, with programs that have numerous stakeholders with competing interests (Campbell et al., 2009; Sethibe et al., 2007), and a complex set of accountability relationships.

Various internal structures and processes may also contribute to differences between the public and private sector (Sethibe et al., 2007). Public sector organisations tend to be bureaucratic in nature (Bannister, 2001; Boyne, 2002) and are therefore characterised by a hierarchical structure and authority profile, functional specialisation, limited discretion (Weber, 1919), and red tape (Bretschneider, 1990). This has given rise to the proliferation of a large number of different unintegrated IT systems that mirrors the bureaucratic structure, and which are resistant to change (Boyne, 2002).

Private sector organizations can more readily justify risky investments in innovation for competitive advantage (Rocheleau & Wu, 2002). Purchasing in the public sector is subjected to many bureaucratic constraints and the process of acquiring new hardware/software is lengthy (Kraemer & Dedrick, 1996), which can make investments and decision-making difficult for IT managers (Dawes et al., 2004). Public sector organizations generally have less scope for explicit incentives (Campbell et al., 2009) and unfavourable salary differentials between the public and private sector contribute to high staff turnover in some skill areas (Dawes et al., 2004), resulting in a tendency to outsource IT skills (Gershon, 2008).

Whilst the CIO has been in existence for about 30 years in the private sector the public sector has lagged behind in identifying the need for such a role and the requisite competencies (Hooper & Bunker, 2013), therefore the role has evolved differently (Lawry et al., 2007; Lawry & Waddell, 2008). Furthermore the IS function tends to be placed lower in the hierarchy than in the private sector (Bretschneider, 1990). Therefore the challenges faced by public sector CIOs are often very different to those

in the private sector, and this might place different requirements on them in terms of knowledge and competence, as well as the roles they fulfil. Furthermore the government environment often places more onerous constraints on CIOs than in the private sector, especially so in terms of reporting level, the ability to influence strategy, decision making flexibility, and resourcing (Hooper & Bunker, 2013).

A further limitation of the research setting is that CIO personnel changed at a critical point in time during the initiative. The replacement of the two visionary CIOs with the director of the Reach Agency was based on a perceived fit between the work of Reach and the vision for the PSB. This had a number of effects. Firstly, it created a disconnect between the creators of the vision and its execution. Secondly it moved the PSB project out of the central eGovernment structure, effectively isolating Reach from central authority and therefore the unitary management and accountability required for cross-departmental initiatives. This greatly marginalised the position of the CIO whose scope of work was broad, but did not have some of the strategic corporate functions (e.g. direct access to the top management team, cross-function mandate etc.) that a typical corporate CIO would have. Thirdly in selecting the Reach CIO to implement the PSB vision no thought was given to the type of person that would be required to formulate and communicate the functionality of a system in an environment characterised by fast-paced technological change and uncertainty about the level of buy-in from other departments and agencies. Therefore the CIO appointed to execute the PSB vision, although a very successful senior IT executive, may not have had the competencies and attributes to carry out such a task, and did not have the level of seniority (an issue for many public service IS functions) that one would expect from a corporate CIO.

8.5.3 The Nature of Qualitative Research

This research takes a qualitative/interpretive approach and therefore is ideographic rather than nomothetic in nature. The issue of generalisability in relation to ideographic studies is addressed in 8.5.1 above. Other issues relating to this type of research are how validity and reliability criteria are established and the possible effects of bias during the research process.

Validity and reliability are equally important in qualitative studies (Runeson & Höst, 2009), however it is argued that criteria applicable to the scientific method are inappropriate for qualitative research because of the different epistemological and ontological assumptions (Hammersley, 1992) in (Whittemore et al., 2001), the contextual and subjective nature (Kahn, 1993), and the level of subjectivity and

creativity (Whittemore et al., 2001). Lincoln & Guba (1985) in Whittemore et al. (2001) developed four validity criteria for qualitative research that parallel the quantitative criteria, and which remain as the standard for assessing the quality of qualitative research. *Internal validity* is paralleled by *credibility*, e*xternal validity* is paralleled by *transferability, reliability* is paralleled to *dependability,* and *objectivity* is paralleled by *conformability.* Chapter 4 describes in detail how these issues and the issues of *trustworthiness* and *reflexivity* were addressed at the planning stage of the research, and Chapter 5 describes how they were actioned during the research process.

The issues of *subject bias* and *observer bias* were also addressed at the planning stage and actioned during the research process thereby shifting the focus from truth to understanding which is central to the ideographic nature of the research (Merrick, 1998).

8.6 Agenda for Further Inquiry

The outcome of this research is a theoretical framework on how the role of the CIO influences IS failure outcomes. As such it is limited in its focus to the current research setting. However there are a number of areas where further inquiry will help to extend the current theory.

Firstly, the framework requires further testing to validate its applicability in both the academic and practitioner space. Additional studies on the role of the CIO during IS failure based on this framework are required to refine it, to test its empirical validity, and the extent of its generalisability. Further studies are therefore recommended in other public sector settings both within Ireland, where the research was conducted, and other jurisdictions with similar public service structures, in order to extent the potential value of the theory presented.

Secondly, further studies on how the role of the CIO influences IS failure outcomes should also be conducted using the framework to strengthen the reliability of the role profiles identified in this study for each failure dimension and phase. Doing so will increase the overall veracity of the framework by identifying emerging dominant patterns, which will in turn increase its power as an analytical tool.

Thirdly, the framework may also be used as a basis for inquiry into the role of other stakeholders during IS failure. For example the framework may support inquiry into the role of the project sponsor, the role of the project manager, the role of external partners, the role of the CEO, and others during IS failure. Doing so would deepen our understanding of the role played by a range of stakeholders in IS failure, and would

further develop the framework based on this expanded demographic, thereby making further contribution to empirical knowledge in the domain of IS failure.

Fourthly, the framework may also be used as a basis for inquiry into the role of the CIO during IS failure in the private sector, and to test its generalisability in this expanded domain. Doing so will facilitate a deeper understanding of the similarities and differences in the performance of the CIO role in two distinct sectors of the economy. It may also lead to the development of a more formal theory on the role of CIO during IS failure.

Finally consideration should be given to the use of the framework, or some derivative of the framework, as the basis for inquiry into the role of key stakeholders in other innovative endeavours such as new product development and market penetration strategies.

8.7 Other Emerging Themes

As this research is a novel inquiry on how the role of the CIO influences IS failure outcomes a number of additional themes emerged during the course of the research. The following are significant themes considered to be worth further enquiry.

Firstly is the nature of the relationship management role of the CIO. There are many studies on the relationship between the CIO and the senior management team (TMT) and the importance of the CIO in creating a shared vision as a precursor to successful IS and business strategy alignment (Chan, 2002; Preston & Karahanna, 2009; Tai & Phelps, 2000). However the case of the PSB highlights the requirement for a relationship management role for the CIO at all levels of the organisation and throughout the lifetime of an IS initiative which is not explored in any detail in extant literature. Research in this area would provide further insight into the performance of the CIO role in general, and provide valuable insight into the parameters that are relevant to the role of relationship manager.

Secondly Enns (2001) states that literature has not explored the role of the CIO in the IS implementation process, and Woolridge et al. (2007) acknowledges gaps in existing research on the role of the CIO in projects. This represents a significant gap in our understanding of the CIO role. This research attempts to address the paucity of empirical findings in this area but is narrowly focused on the phenomenon of IS failure. As the most senior IS official no one would expect the CIO to devote a significant portion of time to the hands-on management of projects, however it is incumbent upon the CIO to ensure that projects are fully supported by the organisation in terms of

standards, risk management and, accountability. Further inquiry is therefore recommended in this area.

Thirdly it has been shown that IS initiatives are risky endeavours that are prone to failure (Brooks, 1987; Nelson, 2007). Escalation of commitment has been shown to be a prevalent factor in the continuance of failing IS initiatives (Keil & Mann, 2000), and was also shown to be a factor in the escalating cost of the PSB initiative. Yet again there is a paucity of empirical finding on what role the CIO plays in escalation situations. A key function of the CIO is to add value to the organisation through the deployment of IS which surely suggests a role in protecting the organisation against a phenomenon that is both prevalent, and has the potential to waste significant organisational resources.

Fourthly the case of the PSB highlighted the dysfunctional effects of IS governance on the outcome of an IS initiative. As the most senior IS official one would expect the CIO to have a key role in the setting of IS governance policy for the organisation (in a similar fashion to the CFO role in financial governance and the CLO role in legal governance), and an oversight governance role in relation to IS projects. However there is a paucity of studies on what role the CIO plays in relation to IS governance at both an organisational and a project level. Failure to fully understand this key role for the CIO represents a significant gap in or understanding of the CIO role.

Fifthly the case of the PSB has highlighted the significant role of external partners in some IS initiatives. Other studies have highlighted the reliance of public sector organisations on external contractors and consultants (Campbell et al., 2009; Gershon, 2008; House of Commons, 2011). In the case of the PSB the consultants played both a stabilising and destabilising role during the initiative. They played a stabilising role in terms of providing technical expertise, project management capability and managing the procurement process. They also played a destabilising role in terms of committing to an unworkable contract, contributing to conflict amongst the developing partners and in failing to pull out of an obviously failing venture. More study is therefore required into the role of external partners during a failing IS initiative.

Finally the case of the PSB highlighted the dysfunctional effects of the mismatch between the mandate assumed for the CIO and the authority profile to implement the mandate as envisioned. Research has shown that the public sector has lagged behind the private sector in identifying the need for the role of CIO (Hooper & Bunker, 2013), however the CIO has now started to become more prevalent within this sector (Lawry et al., 2007; Lawry & Waddell, 2008). The emergence of the CIO role within public

sector organisations therefore requires a concomitant focus on inquiry on CIO mandates within public sector organisations. The case of the PSB suggests that failure to further our understanding in this area is a recipe for future IS failure.

8.8 Some Personal Reflections

When one devotes a substantial portion of time and energy in the pursuit of a goal two key questions should always be addressed: (1) was the goal accomplished, and just as importantly (2) was the attainment of the goal worth the effort. The answer to the first question is at the mercy of those who utilise this work. The answer to the second question requires a personal reflection which brings a number of thoughts to the fore.

Firstly is the extent to which the transition from thirty years as a practitioner to academic was a major 'culture shock'. Having being used to digesting relatively short and concise business reports replete with fancy pictures, charts, and diagrams it took quite an amount of time to re-orientate to a more disparate body of academic literature that is by its nature diverse and somewhat fragmented and unstructured. It took time to develop the necessary skills to unravel the seemingly endless amount of important (and not so important) empirical evidence 'out there' in order to build a full picture of what is known in the domain of inquiry. Once I understood that the diversity of research in the IS domain is what makes the field so intriguing it became more and more difficult to pull back on further research, as the joy of discovery took hold, but which sometimes resulted in pursuit of a seemingly important concept down a blind alley.

Secondly ontology and epistemology are not words or concepts that receive much attention in the practitioner world, which is more concerned with decision making based on experience, gut instinct, and ability to digest limited information. My lack of experience with, and understanding of, ontological and epistemological concepts required a basic study of the fundamentals of philosophy of being and knowing, which then led to inquiry into research philosophies, which in turn opened up a whole new vista of understanding for the researcher who had little prior knowledge of this area.

Having mastered the fundamentals of the research domain and the philosophical aspects of conducting academic inquiry the researcher found the immersion in case study research more natural as being situated in an organisational environment took the researcher back to his comfort zone. However it would be remiss of me not to point out that undertaking case studies of failure in organisations is a difficult endeavour for a number of reasons, not least of which are reluctance on the part of many organisations to discuss failure, and the tendency to attribute blame for failure at a superficial level.

Experience in dealing with organisational professionals, the conduct of business meetings, and understanding how organisations conduct business with external people was invaluable in preparing for, and during, the conduct of interviews and following up with people. It also prepared one to watch out for various human tendencies such as bias, attribution of blame, etc. Experience in business writing was also invaluable in preparing written correspondence and in writing up material throughout the research process.

Finally after a four year endeavour that was both daunting and enriching in equal measure there is one further nagging question – will the research make a difference? Will IS failure ever be conquered or should we defer to the ominous proposition of Mahaney & Lederer (1999) that failure is now an accepted aspect of IS implementations. Will the emergent theory of the role of the CIO during IS failure make a contribution to an improvement in the performance of the role in reducing IS failure. To further this goal it is the intention of the researcher that the research should make a contribution in both the practitioner and academic arenas. Therefore on the basis that IS is an applied discipline (Baskerville & Myers, 2002; Darke et al., 1998) I intend to present this research to the practitioner community as a practical learning instrument on the role of the CIO during IS failure, and to develop a number of future articles on this theme for academic publication which will communicate the research to a wider audience, with the possibility of sparking further research from other interested parties in this fascinating research subject.

8.9 Conclusion

This is the final chapter of the thesis and acts as a conclusion for the body of work presented. Following a brief introduction in section 8.1 Section 8.2 presents a brief review of the research study. Section 8.3 explores to what extent the aims of the study have been achieved from a theoretical, empirical, methodological, and practitioner perspective. Section 8.4 presents some observations on the use of process inquiry, highlighting both its applicability and limitations, and sounds a note of caution to those embarking on the study of IS failure. Section 8.5 explores the limitations of this body of research in terms of the type of case study chosen, the research setting, and the use of qualitative/interpretive methods but also acknowledges that all empirical inquiry is subject to limitations. Section 8.6 presents an agenda for further study based on the emergent theoretical framework, and section 8.7 highlights additional themes that emerged during the research that require further enquiry. Section 8.8 offers a personal

reflection on the four years spent on this research and this section presents a brief final conclusion for this chapter.

Appendices

Appendix 1

Studies on the Role of the CIO

	Empirical Studies									Conceptual Papers				
Role	Applegate & Elam (1992)	Rockart (1982)	Benjamin et al. (1988)	Earl & Feeny (1994)	Weiss & Anderson (2003)	Tagliani et al (2003)	Smaltz (2006)	Peppard (2010)	Peppard et al (2011)	Gupta 1991	Willcocks & Sykes (2000)	Earl & Feeny (2000)	Remenyi et al. (2006)	Karahanna & Watson (2006)
actively contribute to business strategy formation	x	x		x	x	x	x	x	x	x	x	x	x	x
understand organisational information flows						x		x						x
Solve business problems through the use of IS				x	x	x	x	x	x	x	x			x
enable an agile and flexible organisation									x					
promote and support the creation of business value through IS innovation across the organisation value chain		x		x		x	x	x	x	x	x	x	x	x
leverage technology for business advantage	x			x	x	x		x	x	x	x			
manage risk sharing between the business and IS					x				x					
enable an agile and flexible organisation through business process innovation					x	x	x		x	x	x	x		
Set IS policy for the organisation	x						x		x		x	x		
maintain an agile IS infrastructure for competitive positioning	x				x				x	x	x			
Use of IS to increase organisational efficiency		x			x		x	x	x	x	x			
maintain enterprise-wide IS standards	x	x		x	x		x		x			x	x	
build and maintain IS resilience in support of business continuity	x						x		x		x		x	
certify enterprise IS security	x			x			x	x	x			x		
recruit and develop a professional IT organisation	x	x				x	x	x		x			x	
ensure adequate staffing to meet operational performance targets	x	x			x					x				
support staff training and development (IT and business skills)	x	x				x	x			x				
set and manage IT budget	x				x		x		x				x	
manage project lifecycle for large scale implementations					x			x	x				x	
manage IS contracts	x										x			
educate and create a shared understanding and vision with the TMT		x		x		x	x	x	x	x	x	x		x
manage relationship with functional managers		x		x		x	x	x	x	x	x			
manage relationship with internal and external customers				x		x	x	x	x	x	x		x	
manage relationship with external vendors					x		x				x			
manage external relationship in the wider business and IS community (including consultants)					x			x						
Scan the external technology environment to identify possible technology revolutions		x		x				x	x			x	x	
Scan the business environment for possible innovation opportunities				x				x	x					

Appendix 2

Process Studies in IS

Author	Year	Title	Theme	Type of Study	Sites	Processual Theory
Abdel-Hamid & Madnick	1989	Lessons Learned From Modelling the Dynamics of Software development	IS development / implementation	Field study	5 organisations	Constructs a comprehensive model of the dynamics of software development
Barley	1986	Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments	IS development / implementation	Case Study	Multiple (2 cases)	A study of the introduction of CT scanners in two radiology units and the effect on traditional role relations among radiologists and radiological technologists. Technology is treated as a social rather than a physical object, and structure is conceptualized as a process rather than an entity.
Bartis & Mitev	2008	A Multiple Narrative Approach to IS Systems Failure: A Successful System That Failed	IS development / implementation (failure)	Case Study	single	A narrative methodology used to analyse how different stakeholders attribute different meanings to the deployment of a system over time
Beynon-Davies	1999	Human Error and IS Failure: The case of the London Ambulance Services Computer-aided Despatch System Project	IS development / implementation (failure)	Case Study	Single	Using web description to explain failure in terms of complex intertwining relationships and environmental conditions
Brown	1998	Narrative, Politics, and Legitimacy in an IT Implementation	IS development / implementation	Case Study	Single	A ethnographic study of 2.5 year duration providing a narrative of the complexity of the generative forces that condition IT implementations

Bussen & Myers	1997	Executive information system failure: a New Zealand	IS development / implementation (failure)	Case Study	single	A case study of a failed EIS in a large New Zealand organization and comparing this case with the success factors found in the research literature.
De Sanctis et al	1991	Using Computing in Quality Team Meetings: Initial Observations From the IRS-Minnesota Project	Group Decision Support System	Experiment	5 teams over 7 months	Uses an input-process-output model to show the unpredictable relationship within teams due to emergent social interaction which is subject to random influence
Eitel	2004	The Dynamics of Chronic Failure: a Longitudinal study	Organisational Change (failure)	Case Study	Single	A Longitudinal study (25) years of changes in an organisation leading eventually to failure of the organisation culminating in merger
Galegher & Kraut	1994	Computer-mediated Communication for Intellectual Teamwork: An Experiment in Team Writing	Group writing projects	Experiment	117 participants	Construction of a temporal model to explain the levels of activity in a group in relation to allocated tasks over a two week period
Gallivan & Keil	2003	The User–Developer Communication process: A Critical Case Study	IS development / implementation	Case Study	Single	Proposes a process model that delineates four stages of communication between users and software developers, and argues that these stages must occur for user participation to lead to effective outcomes.
Gauld	2006	Public Sector Information System Failures: Lessons From a New Zealand Hospital Organisation	IS development / implementation (failure)	Case Study	single	Narrative of failure process and comparison with extant literature on IS failure in the private sector
Gupta & Gupta	1990	A Process Model to Study the Impact of Role Variables on Turnover Intentions of Information Systems Personnel	HR Policy, role perception and employee turnover within an IS department	interviews	not stated	Use of System Dynamics to analyse the dynamic behaviour of complex feedback systems and explain the relationship of variables sequentially and predictably
Joshi	1991	A Model of Users' Perspective on Change: The Case of Information Systems Technology Implementation	IS development / implementation (resistance)	Case Study	Multiple (using previously reported cases)	Based upon equity theory this article develops a theory-based understanding of IS users' resistance to change. It describes a three-level process employed by users to evaluate a change in terms of its impact on their equity status.
Keil	1995	Pulling the Plug: Software Project management and the Problem of Project escalation	IS development / implementation (failure)	Case Study	Single	A longitudinal study (14 years) of an IS failure utilising a project escalation model based on project, psychological, social, and organisational factors.

Kim & Pan	2006	Towards a Process Model of Information systems Implementation: the Case of CRM	IS Development / implementation (failure / success)	Case Study	3 cases	Develops a process model of IS implementation to explain the dynamics of IS success
Langley & Traux	1994	A Process Study of New technology Adaption in Smaller Firms	technology adaption	Case Study	Multiple (5 cases)	Longitudinal case studies of new technology adoption in five smaller Canadian firms. The paper develops an inductive process model that views the technology adoption process as a partially nested set of three parallel and interacting sub-processes: the strategic commitment process, the technology choice process and the financial justification process.
LaPointe & Rivard	2007	A Triple Take on Information System Implementation	IS development / implementation	Case Study	Single (embedded units of analysis)	Study of IS implementation in hospitals using an alternate template analysis at the individual, the group, and the organization levels
Larsen & Myers	1999	When Success Turns to Failure: A Package Driven PBR Project in the Financial Services Industry	IS development / implementation (failure)	Case Study	Single	A processual interpretive study over the course of a PBR implementation life cycle focusing on sense making over the course of the project
MacKay & Elam	1992	A Comparative Study of How Experts and Novices Use a Decision Aid to Solve Problems in Complex Knowledge Domains	problem solving with decision aids	Experiment	21 participants (4 groups)	A study (based on four models of problem solving based on precursor conditions) of the way that professionals used spreadsheet software to address a business oriented task. The physical interactions as well as the thought processes underlying these interactions were captured.
Mahring et al	2004	Trojan actor-networks and swift translation: Bringing actor-network-theory to IT project escalation studies	IS development / implementation (escalation)	Case Study	single	Investigates the appropriateness of the use of Actor Network Theory (ANT) for the study of IS project escalation
Markus	1983	Power Politics and MIS Implementation	IS development / implementation (resistance)	Case Study	Single	A study of resistance to IS implementation due to personal factors, factors relating to the technology itself, and a combination of both.

Markus	1994	Electronic Mail as the Medium of Managerial Choice	technology adaption (electronic mail)	Mixed method (Case & survey)	Single	This paper examines how and why managers use electronic mail including top management sponsorship and socialisation as precursor conditions to the outcome
Meyer & Goes	1988	Organizational Assimilation of Innovations: A Multilevel Contextual Analysis	Technology assimilation	Field Study (6 years)	Multiple	Examines the assimilation of innovations into organizations, a process unfolding in a series of decisions to evaluate, adopt, and implement new technologies.
Montelealegre & Keil	2000	De-escalating IT Projects:	IS development / implementation (failure/success)	Case Study	Single	A longitudinal case study that develops a 4 phase model of the de-escalation process of an IS project
Nandhakumar	1996	Design for success?: critical success factors in executive information systems development	IS Development / implementation (success)	Case Study	Single	Drawing on an in-depth study of EIS development in a large manufacturing company, this paper seeks to provide a theoretically-based explanation of the process by which the relationship between key success factors and the EIS development operated.
Newman & Noble	1990	User Involvement as an Interaction Process: A Case Study.	IS development / implementation	Case Study	Single	Four process models used to study the effect of interaction between users and analysts on positive or negatives outcomes
Newman & Robey	1992	A Social Process Model of User-Analyst Relationships	IS development / implementation	Case Study	Single	Examines the social dynamics of IS development. ISD is punctuated by encounters between IS and users resulting in acceptance, equivocation, or rejection of the initial leadership condition
Newman & Sabherwal	1989	A Process Model for the Control of IS Development Projects	IS development / implementation	Case Study	Multiple (2 cases)	Examines the relationship between users and IS during four defined implementation stages based on perceived threat and balance of power
Newman & Sabherwal	1996	Determinants of Commitment to Information System Development Projects: A Longitudinal Investigation	IS development (commitment)	Case Study	single	The changing nature of commitment over the lifetime of an IS development based on four intervening factors (project, psychological, social, and structural). Project determinants play a central role during initial commitment but other determinants assume greater importance in later stages
Orlikowski	1993	CASE Tools as Organisational Change: Investigating Incremental and Radical Change in Systems Development	IS adaption	Case Study	Single	Examines the adaption of CASE tools over time

Orlikowski	1996	Improvising Organizational Transformation Over Time: A Situated Change Perspective	IS adaption	Case Study	Single	The effect of new technology on structure and practice among IS support staff
Orlikowski & Yates	1994	Genre Repertoire: The Structuring of Communicative Practices in Organizations	technical standards definition	Case Study	Single	Explains how communication patterns and conventions changed over the course of a project to define technical standards
Orlikowski et al	1995	Shaping Electronic Communications: The Metastructuring of Technology in the Context of Use	technology adoption (use)	Case Study	Single	Explains how the relationship between users and technology is influenced by organisational actors and a series of reinforcement and adjustment events
Pan et al.	2008	Information systems Implementation Failure: Insights From Prism	IS development / implementation (failure)	Case Study	single	PRISM model used to study antecedent conditions, critical events, and outcomes over the course of an IS implementation life cycle. Analysis of critical incidents and the relationship between preceding events and consequences
Pare et al.	1997	Implementation of a Patient Charting System: Challenges Encountered and Tactics Adopted in a Burn centre	IS development / implementation	Case Study	single	Study of the implementation of a patient charting system in a large, teaching hospital.
Poole & Holmes	1995	Decision Development in Computer-Assisted Group Decision Making	model building of decision development process	Case Study	Single	A flexible phase mapping method employed to map group decision paths during phases in the decision making processes
Robey & Farrow	1989	Group Process and Conflict in System Development.	IS Development / implementation	Case Study	Single	Assesses group process during the development of an information system It describes the relationships among four variables in a model of conflict-participation, influence, conflict, and conflict resolution-at five different periods over a 22-month period.
Robey & Newman	1996	Sequential Patterns in IS Development: An Application of a Social Process Model	IS development / implementation	Case Study	Single	Traces the process of developing and implementing a materials management system in one company over a 15-year period. The study examines the dynamics of encounters leading to acceptance, rejection, or equivocation
Sabherwal	2000	Cutting Your Losses: Extricating Your Organisation When a Big Project Goes Awry	IS development / implementation (failure)	Case Study	Multiple (2 cases)	Presents a narrative of the case of Denver International Airport (DIA) and the failure of the Taurus system based on 4 phases of de-escalation and identifies seven ways to implement a de-escalation process

Sabherwal & Robey	1995	Reconciling Variance and Process Strategies for Studying IS Development	IS development / implementation	Analysis of IS projects	50 IS projects	Used variance strategy to indicate levels of participation of key actors and process strategy to study sequences of actions thereby indicating that variance and process strategies can be reconciled.
Sabherwal & Robey	1993	An Empirical Taxonomy of Implementation Processes based on Sequences of Events in IS Development	IS development / implementation	Case Study	Multiple (53 cases)	Develops a taxonomy of IS implementation processes by examining the dynamics of implementation in 53 case studies using a process optimal matching procedure
Sambamurthy & Poole	1994	The Effects of Variations in Capabilities of GDSS Designs on Management of Cognitive Conflict in Groups.	group conflict management	Field study	39 groups	Examines the process (events) from conflict to consensus
Sarkis & Sundarraj	2003	Managing large-scale Global ERP Systems: A Case Study at Texas Instruments	IS development / implementation (success)	Case Study	Single	A process-oriented study over the life cycle of a major ERP initiative at Texas Instruments examining the factors that contributed to success of the project
Sauer	1993	Why Information Systems Fail: A Case Study Approach	IS Development / implementation	Case Study	Single	A detailed study of the Mandata IS failure over an 11 year period. The process of failure is explained in terms of 5 phases
Shroeder et al.	1986	Managing Innovation and Change Processes: Findings from the Minnesota Innovation Research Program	Innovation	Case Study	Multiple (7 innovations)	Develops a model of the innovation process based on longitudinal research studies of seven innovations included in the Minnesota Innovation Research Program
Southon et al	1997	Information Technology in Complex Health Services: Organisational Impediments to Successful technology Transfer and Diffusion	IS development / implementation (failure)	Case Study	Single	Examines the process of the transfer and diffusion of IT systems in healthcare using the configurational theory of IT fit
Tyre & Orlikowski	1994	Windows of Opportunity: Temporal Patterns of Technological Adaptation in Organizations	technology adaption	Case Study	Multiple (5 cases)	Examines the levels (cycles) of adaption over the lifetime of technology implementation. The process of technological adaptation is not gradual and continuous, as often argued in the innovation literature, but is instead highly discontinuous.

VanAkkeran	2012	United we stand, divided we fall: the failure of an Accounting IS in a Major Radiology Provider	IS development / implementation (failure)	Case Study	single	A study over the course of a major IS implementation that examines the issues (mostly circumvention of use) that led to the ultimate failure of an accounting IS
Wilson & Howcroft	2000	The politics of IS evaluation: a social shaping perspective	IS development / implementation	Case Study	Single	A study of the process of evaluation of an IS implementation based on social and political processes through which terms such as failure, disaster, benefits, or success are ascribed to technological systems
Wilson & Howcroft	2002	Re-conceptualising failure: social shaping meets IS research	IS development / implementation (success/failure)	Case Study	Single	A study of the process of evaluation of an IS implementation describing how interpretations of a series of events are described as success or failure depending on legitimacy ascribed to different voices.
Yuttapongsontorn et al.	2008	Complexities of Large-scale Technology Project Failure: A Forensic Analysis of the Seattle Popular Monorail Authority	Technology adaption (failure)	Case Study	single	Using stakeholder theory to present a narrative of an engineering project which ultimately ended in failure

Appendix 3

Case Study Protocol for the PSB

1. Background:

1.1 Research Question

The research question is:

How does the role of the CIO influence IS failure outcomes?

1.2 Background to the Research

This research is undertaken as part of a PhD programme by Brian Dempsey at The University of Dublin, Trinity College

1.3 Purpose of the Research

The Purpose of the research is to answer the research question by conducting a detailed qualitative inquiry utilising both primary and secondary data.

1.4 Description of the Type of Study Being undertaken

The case study is a single, longitudinal, process based, inquiry into the role of senior IS management over the course of failure of the Public Service Broker initiative described below. The inquiry will be qualitative / interpretive.

1.5 Short Description of the Case of the PSB

The Public Sector Broker (PSB) was part of an Irish government strategy to modernise and improve the quality of service delivered to customers of the Irish Public Service. The PSB was intended deliver to an ICT services platform, crossing traditional departmental boundaries and consolidating all the necessary data to progress public sector transactions for the individual and business community. The PSB initiative was conceived and initiated by the Dept. of An Taoiseach however the planning and delivery of the initiative involved many stakeholder organisations within the Public Sector, some with dedicated IS departments headed by CIO equivalents. The PSB was delivered four years late in a significantly scaled-back form and was eventually closed in 2008.

2. Type of Evidence to be Collected

2.1 Primary Data

The primary source of data in a qualitative interpretive case study is the interview (Pan & Tan, 2011; Yin, 2009). The use of interviews is also well established in the field of IS research (Schultze, 2011). Yin (2009:106) describes interviews as *"guided conversations rather than structured queries"* where the stream of questions is fluid rather than rigid. This makes interviews very suitable for qualitative, interpretive studies as (if skilfully executed) they bring us closer than any other method to an intimate knowledge of people and their social world (Hermanowicz, 2002) and facilitate the search for meaning, intentionality, and context; all of which are major objectives of qualitative research (Hermanowicz, 2002; Schultze, 2011).

2.2 Secondary Data

The set of secondary data relating to the case of the PSB is provided. This material may be augmented as new material becomes available during the course of the research.

2.3 Maintaining Chain(s) of Evidence

Throughout the research process it is vital to maintain chains of evidence to support the research findings. Each chain of evidence must be designed in such a way that it will allow an external observer trace the steps taken from the initial research question to the research conclusions. The chain of evidence will include sufficient cross-referencing to methodological procedures carried out, and the resulting evidence leading to the research findings.

2.4 Data Triangulation

A major strength of case study inquiry is the use of multiple primary and secondary data sources. This provides a rich pool of data which can be combined to corroborate findings rather than relying on a single source (Mathison, 1998; Yin, 2009). Such triangulation of data facilitates the development of "converging lines of enquiry" (Yin, 2009:115) and mediation of conflicting accounts (Pan & Tan, 2011), which in turn supports a more convincing narrative, and ultimately increases the reliability and validity of research findings (Dube & Pare, 2003; Kaplan & Maxwell, 2005; Yin, 2009).

3. Guidelines for Interviewing

There are many prescriptive texts about how to conduct good interviews (Pan & Tan, 2011; Saunders et al., 2009; Yin, 2009; Kvale, 1996) however Hermanowicz (2002) cautions against rigidly following an interview methodology as this can make the experience overly procedural at one end or totally unstructured at the other, and

proposes that the art and science of the interview process should be carefully balanced.

Yin (2009) identifies two types of interview: an *in-depth interview* where, in addition to the facts of the matter the researcher can ask questions so as to elicit opinion and insight relating to the topic at hand, and a *focussed interview* which, as the name suggests, is designed to focus on specific facts using a specific set of questions, usually to corroborate previous information. Interviewing is a skill that must be learned over time.

Based on the above recommendations the following approach should be adapted to the interview process, bearing in mind that each interview is both a data gathering exercise and an opportunity to hone one's personal interview techniques. The overall approach involves three main areas: (1) personal awareness and conduct, (2) ethics of interviewing, (3) recording and transcription.

3.1 Personal Awareness and Conduct

The following guidelines for personal awareness and conduct should be followed at all times:

- Continuously assess one's own personal biases and prejudices.
- Prepare well for each interview (e.g. get background information on the organisation including culture, topic, and the interviewee).
- Prepare an interview plan (guide) with suggested questions and have a rough expectation of what is required from each interview.
- Endeavour to establish a good rapport with each subject by projecting a warm and open persona while at the same time assessing their preferred style, openness, etc.
- Be a good listener throughout the interview, probe for further detail and insight, and use silence as a method of furthering the conversation.
- Maintain control of the interview whilst letting conversation flow.
- Be professional at all times in terms of manner, dress, and level of candour.

In addition to the personal conduct as described above one should also be cognisant of the following issues as they relate to the interview process:

- Interviewing is both an art and a science, it is deceptively difficult, and takes time to develop the necessary skill-set that facilitates open and honest dialogue (Hermanowicz, 2002).
- There is a limit to respondents' tolerance for the amount of data that can be collected on one occasion (Ruspini, 2000).
- The double edged nature of language during an interview (Schultze, 2011).
- All material sourced from interviews is subject to bias, poor recall, inaccurate articulation and steps should be taken by the researcher to corroborate information from interviews with data from other sources (Yin, 2009).
- The only way to uncover meaning is through detail, however one should be aware of the potential for data overload, particularly in a longitudinal study, described by Pettigrew (1990) as data asphyxiation.

- Beware of becoming over-reliant on a small set of willing participants because of the potential for interpersonal influence on the research process.

3.2 Ethical Issues Particular to Interviewing

Kvale (1996) identifies three ethical considerations which are particularly relevant when conducting interviews: informed consent; confidentiality; and consequences.

Informed consent: Permission must be obtained from anybody who provides data for the research project. Every interviewee should be made clear about the purpose and procedure of the interview so that they have a clear idea of what they are agreeing to, including potential risks and benefits. They should be made fully aware of possible future use(s) of the interview, including access and publication. This may form part of a written agreement.

Confidentiality: any issues regarding confidentiality of the interview, including transcription and reporting should be addressed and agreement sought in advance.

Consequences: the interviewee should be asked to consider any possible negative consequences regarding their partaking in the interview, including their reservations about discussing a particular topic or question.

3.3 Recording and Transcription

Saunders et al. (2009) state a number of advantages of recording interviews as follows:

1. An accurate and unbiased record of the interview is created.
2. The interviewer can concentrate on questioning and listening.
3. The researcher can re-listen to the interview.
4. A recording facilitates direct quotations.
5. Questions formulated at an interview are accurately recorded for use in later interviews.

Walsham (2006) however cautions that recording may make the interviewee less open or less truthful, and that recording does not capture the tacit, non-verbal elements of an interview, which are crucial aspects of the experience for the researcher.
Permission is to be sought from each interviewee prior to commencement of the interview.

3.4 The Interview Plan.

For most research designs based on case studies the researcher needs to be able to interview a wide cross-section of personnel, down and across the organization, (Leavy, 1994). Yin (2009) highlights the potential rich insights which can be obtained from key informants, including direction towards other sources of information or evidence.

The following government entities were associated with the PSB over the lifetime of the initiative: which are summarised in the table below.

Acronym	Name	Role in PSB
ISPU	Information Society Policy Unit at the Dept. of an Taoiseach	Setting the vision for the use of IT to modernise service delivery across the public service
CMOD	Centre for Management and Organisational Development	a general strategic role for ICT in the public sector including strategic direction, common services and common infrastructure
REACH	REACH Agency	Given primary responsibility by the government to deliver the PSB
Dept. Finance	Department of Finance	The parent Department of CMOD
DSFA	Department of Social and Family Affairs	The parent Department to the REACH agency
LCGCSB	Local Government Computer Services Board	Provides computer facilities for local authorities. Hosted the first version of the PSB
Donegal County Council	Donegal County Council	Initiated the Donegal Integrated Services Delivery Project in partnership with REACH to develop and deliver public services. Chosen as the pilot for the PSB

Government Entities Involved in PSB.

The interview plan is to identify and conduct a series of semi-structured interviews with key IS personnel in each of the entities identified. Pan & Tan (2011) recommend that the first interview should take place with an informant who can provide an overview of the phenomenon under study, and who can identify other key people involved. Informants in other related entities should be identified during the course of the inquiry.

3.5 Practical Methodology for Conducting Each Interview

Having described the overall considerations for the conduct of interviews including access, personal skill-set, ethics, and the use of recording, the following procedure should be enacted for each interview:

3.5.1 Preparation for the interview

- Initial contact to be made outlining the nature and purpose of the proposed interview.
- Follow up the initial contact via telephone seeking, agreement to proceed.
- Prior to each interview publicly available background data about the individual to be gathered.
- Personal items such as recording device, appropriate dress, and writing material to be reviewed.

3.5.2 Conducting the interview

The interview should be divided into four phases:

1. *The warm-up* phase involves basic introductions, a repeat of the purpose of the interview, and general discussion to put both parties at ease.
2. *The background information* phase is where the interviewee is asked a number of background questions relating to the topic (e.g. level and period of involvement).
3. *The interview detail* is the conduct of the semi-structured interview using a set of predetermined questions to guide the enquiry. This phase forms the main part of each interview and is by far the longest part of the interview process.
4. *The conclusion* phase is where the interview is wrapped up. At this point the interviewee will be asked if anything they think may be relevant, has been left out and if there is anybody else they think should be contacted in relation to the enquiry

3.5.3 Post Interview

1. A soon as possible after the interviewer must reflect on the interview and capture personal observations.
2. The interview is to be transcribed from the recording.
3. The transcription will be presented to the interviewee in order to agree its accuracy and leave way for a follow up.

4. Additional Protocols

4.1 Sample letter of Introduction

A sample letter / e-mail of introduction is shown in Addendum 1 of this appendix.

4.2 Code of Research Conduct

Code of conduct for the research is based on the code of conduct of the Association for Information Systems (www.ais.org).

4.3 Confidentiality Agreement

A confidentiality agreement may be found as Addendum 3 of this Appendix

4.4 Use of Case Study Database

A case study database has been constructed for storing material relating to this inquiry. The database currently has the following format but this may change over time. All data related to the case must be retained in the case study database.

- **The Case of the PSB**
  - **Case Protocol**
  - **Secondary Documentation**
  - **Fieldwork**
    - Interview Protocols
    - Interview Recordings
    - Interview Transcripts
    - Case Notes
    - Respondent Communication
  - **Data Analysis**
    - nVIVO Database
    - Tabular data
    - Process Diagrams

Addendum 1

Letter of Introduction

TRINITY COLLEGE DUBLIN
COLLAISTE NA TRINOIDE, BAILE ATHA CLIATH

THE UNIVERSITY OF DUBLIN

Brian Dempsey
School of Business
Trinity College Dublin
Aras An Phiarsaigh 3.05
dempseb@tcd.ie

Dear X,

My name is Brian Dempsey, a mature PhD student in the TCD Business School. I am researching in the area of information systems with a specific interest in IS initiatives and the role of senior IS managers. My particular area of interest is the role of senior IS management over the course of an under-performing IS initiative.

I recently met with Mr Y on this subject and he has kindly passed your email to me to make contact with you.

I would be very grateful if you would agree to be a contributor to my research by providing time for an interview of approximately 60-90 minutes duration - time and location at your discretion. I would also be interested if you have any material relating to the Reach initiative in general, and the PSB in particular.

Kind regards,

Brian Dempsey.

PhD Researcher
Trinity College Dublin
Ph. 087-2398967.

Addendum 2

TRINITY COLLEGE DUBLIN
COLLAISTE NA TRINOIDE, BAILE ATHA CLIATH

THE UNIVERSITY OF DUBLIN

Brian Dempsey
School of Business
Trinity College Dublin
Aras An Phiarsaigh 3.05
dempseb@tcd.ie

This form is intended to ensure the confidentiality of data obtained during the course of the study entitled: An Investigation into the Role of Senior IS Management during the Course of a Major IS Initiative.

We ask that all participants read the following and sign the statement indicating they agree to comply.

I _____ hereby affirm that I will not reveal or in any manner disclose information obtained during the course of this study. I agree to discuss material directly relating to this research only with members of the research term. In any reports, papers or publications I write I agree to remove obvious identifiers.

Participant:

_____

Researcher:

_____

Date:

Appendix 4

Primary Data Reports Research Methodologies

Modernising Service Delivery: A Blueprint for Development and Change: (Mc Donagh, 2004).

This report is the result of a year-long engagement with the Reach agency which involved on-going dialogue with a wide range of individuals throughout the Irish public service and beyond.

Evaluation of Donegal Integrated Service Delivery Project: (Fitzpatrick Associates, 2006).

The Terms of Reference for this evaluation specified a series of requirements for the evaluation to fulfil. These included an assessment of progress to date on the strategic objectives of the project, the identification of elements of the project that proved most effective (or otherwise), and the drawing up of recommendations for the further development of the public service centres, including the future role of the Information service. In response to this, a methodology was adopted involving an extensive research process, including the following tasks:

- An extensive desk-based research phase of appropriate material, including relevant national policy documentation, strategic, corporate, annual reports or other key reports from partner organisations, specific project material and other relevant research undertaken.
- A review of existing data relating to levels of usage of the services within the centres, a previous survey of public service users, and the funding provided to support project operations.
- A comprehensive consultation process in all five centres involving bilateral meetings with management and employees of each of the services and a cross-service workshop exercise involving frontline staff.
- A survey of users of the public service centres, conducted for two full working days in each location.
- A series of consultation with key national stakeholders, including senior management of partner organisations and other departments and agencies with an interest in integrated service delivery.

Comptroller and Auditor General Special Report 58 – e-Government: (C&AG, 2007).

- A joint consultancy team from Ernst & Young and Talbot Associates was appointed. They worked in consultation with officials of the Office of the Comptroller and Auditor General, who provided some additional material for inclusion in the examination report.
- The consultancy team carried out a programme of structured interviews with relevant personnel in the Departments of the Taoiseach, Finance and Social and Family Affairs (including Reach). The interview structure was based on a model designed to assess key risks that may arise in ICT-related business transformation. Relevant documents and files held in each of the organisations were also reviewed.
- A total of 36 departments and agencies were asked to complete questionnaires about the e-Government projects they planned or carried out in the period 2000 to 2005. Where considered appropriate, there were follow-up interviews with

officials of the departments and agencies and written enquiries to clarify issues arising from the responses to the questionnaire.

- The consultancy team also undertook a survey of published international benchmarks of e-Government performance to assess the progress of e-Government in Ireland in comparison with other countries.

Reach Board (3rd Reach Board) Review of the Reach Project: (The 3rd Reach Board, 2008).

- As well as papers submitted by individual members of the Board and the discussions at the Board meetings, the Board organised a workshop on the most critical issue - the continued validity of the PSB model - to which representatives of all Government departments and offices as well as agencies under their auspices were invited. A total of 46 representatives attended.
- In addition, departments and other bodies were asked to complete a questionnaire to assist the Board in assessing their attitude to the services currently offered by the PSB and their likely future demand for these or other services from the Broker. There was an excellent response and 21 completed copies of the questionnaire were returned.
- The Board also held a workshop on the technology aspects with participation from the Centre for Management and Organisation Development (CMOD) in the Department of *Finance, BearingPoint (who won the contract to build the PSB), Reach experts and Board members.
- All of these inputs were taken into account by the Board in the review. Regard was had also to the VFM report on e-Government undertaken by the Comptroller & Auditor General, which was published on 7 January 2008, as well as to available information and views on relevant international developments.
- A draft of the report was discussed with representatives of the Departments of Taoiseach and Finance. Their views have been taken into account in finalising the report.

Ireland: Towards an Integrated Public Service: (OECD, 2008)

- In the first stage of the review, the OECD Secretariat developed a "methodology paper" in agreement with the Irish High-level Steering Group concerning the objectives, analytical framework, issues to be covered, approach and timeline of the study.
- The terms of reference for the review instructed the OECD to focus on two key tasks:
- to benchmark the Public Service in Ireland against other comparable countries, including identification of appropriate measures to compare the productivity and effectiveness of the Irish system, or discrete elements of it, against comparable international best practice, and
- to make recommendations as to future directions for Public Service reform which will support the Irish Government's drive for delivery of world class services to the citizen within existing resources commitment, and contribute to sustainable national competitive advantage.

Inputs

The report is primarily qualitative in nature, presenting a combination of description, analysis and judgements gleaned from reports and official documents, and field interviews, on the one hand, and comparative data from OECD research and

databases, on the other. OECD research In order to place Irish public service reforms in a broader international context, the OECD drew on a number of its on-going data collection activities to "benchmark" Ireland as agreed in the Terms of Reference. These sources include the "Management in Government:

The study drew upon a wide range of government documents across sectors and functions. Information was also drawn from recent relevant reports and reviews of Ireland from the OECD, other international organisations, academia, the private sector and other sources. The review team conducted a series of over 100 interviews with Irish government officials, Social Partners, Ministers and members of Parliament, and other stakeholders from relevant interest bodies, the private sector, and academia. All interviews, which were strictly confidential, followed a structured set of questions, covering each of the main themes of the report. The interviews focused on the more informal issues that would less likely be covered in formal analyses and studies. OECD interviews: Political level

Taoiseach, Mr. Bertie Ahern T.D.*

Tánaiste and Minister for Finance, Mr. Brian Cowen T.D.

Minister for Health and Children, Ms. Mary Harney T.D.

Peer review

In the assessment phase of an OECD Peer Review, the main findings of the review are typically discussed in a plenary meeting of the body responsible for the review. The examiners lead the discussion, but the whole body is encouraged to participate extensively. Following discussions, and in some case negotiations, among the members of the body, including the reviewed country, the final report is adopted, or just noted by the whole body. Generally, approval of the final report is by consensus, unless the procedures of the particular peer review specify otherwise.

For the Ireland review, it was decided to have a "closed" peer review process, with the participation of 5 countries: Denmark, Finland, Netherlands, New Zealand, and Sweden. This meeting took place in Dublin on 7 December 2007, with the participation of the peer reviewers, the OECD Secretariat and consultants and the members of the Irish Liaison Group for the review.

Independence, neutrality and verification of inputs

Within a framework agreed with the High-level Steering Group of the Irish Government, the study was conducted with guidance from the Department of the Taoiseach which did not bias the study or influence the final conclusions in any way. The report was drafted by the OECD Secretariat with input and comments from the five peer reviewers: Denmark, Finland, Netherlands, New Zealand, and Sweden. The OECD regularly briefed both the High-level Steering Group and the OECD Liaison Group on the progress of the review. The text also benefited from fact-checking, consideration and feedback by these two groups. Economic and sector analysis, in particular for the case studies, benefited from an internal OECD review of sector data and analysis by colleagues in the Economics; Education; Employment, Labour and Social Affairs; and Environment Directorates.

High Level Steering Group: members

Dermot McCarthy (Chair), Secretary-General, Department of the Taoiseach

Ciaran Connolly, Secretary-General (PSMD), Department of Finance

Sean Aylward, Secretary-General, Department of Justice, Equality and Law Reform

Professor Tom Collins, Education Department, NUI Maynooth

VFM Report 65 of the Comptroller and Auditor General – Public Service Case Studies:(Public Accounts Committee, 2007).

Attendees: Mr. Ciarán Connolly: Chairman:

Mr. D. McCarthy (Secretary General, Department of the Taoiseach) Mr. Ciarán Connolly: I am Chairman:

Mr. Ciaran Connolly (Secretary General, Public Service Management and Development, Department of Finance) accompanied by Mr. Jim Duffy from the organisation, management and training division of the Department (CMOD).

Ms B. Lacey (Secretary General, Department of Social and Family Affairs) accompanied by Mr. Niall Barry, head of our IS division, and Mr. Victor Galvin, principal officer in the Reach agency.

The Dynamics of Collaboration in IT-enabled Change: (Nolan, 2010).

Doctoral thesis using qualitative data from 26 interviewees across a range of government departments.

Appendix 5
Interview with Respondent X
(04/01/2013)

Objectives for this meeting:

Obtain Mr. X's narrative of the PSB including key activities / events / actions including contextual factors.

Establish what his role (title) was over the course of the PSB initiative

Discuss the Reach Board and other governance structures

Perception of the Senior IS personnel

Discuss difficulties with access to key personnel

Opening question:

I would like you to tell me the story of the PSB from the beginning of your involvement through to the end of involvement with an emphasis on particular phases of the project, who the key players/stakeholders were, and the role of your department at each stage if relevant.

Prompter questions:

Describe any role you had in the development of the wider PSB project

Were you involved through to the end of the project?

What could you say about the working relationships between CMOD / DSFA /Taoiseach / LGCSB / DISDP over the course of the PSB initiative?

Who was in charge?

Were there any problems during the initiative?

To what extent was the PSB system delivered according to requirements.

General questions

How was the broker project managed in terms of?

- Leadership
- Governance
- Management
- Decision making

How did senior IS management perform in relation to the above

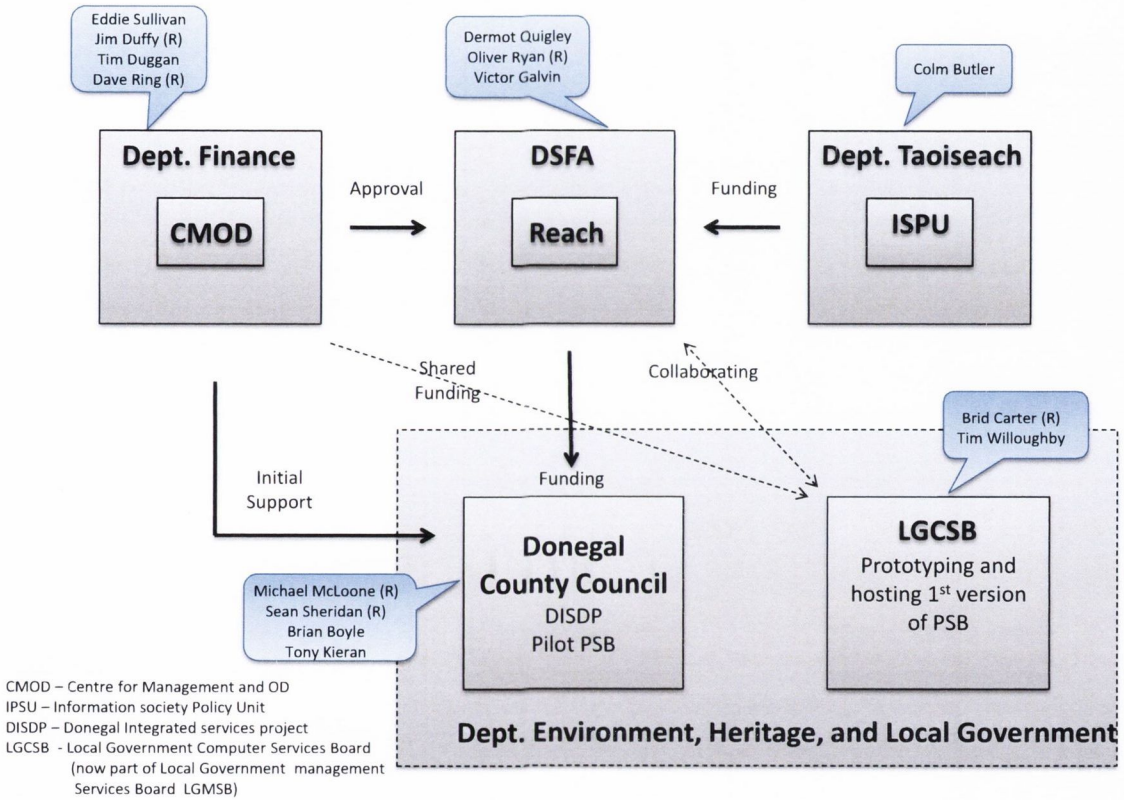
What are your views on the use of consultants on the project (control / expertise /...)

If you were asked to begin again what would you do differently?

Request for further access

Can you assist in arranging meetings with other people? (see attached sheet for possible candidates)?
Do you have any documentation that may be useful?
Is it possible to get access to documentation through FOI etc.?

Appendix 6
PSB Stakeholders



CMOD – Centre for Management and OD
IPSU – Information society Policy Unit
DISDP – Donegal Integrated services project
LGCSB - Local Government Computer Services Board
(now part of Local Government management Services Board LGMSB)

Appendix 7

Redacted List of Respondents

RI	[redacted]	Senior Project Manager
R2		Project Manager
R3		Chief Technical Officer
R4		Chief Information Officer
R5		External Consultant
R6		Senior Manager County Council
R7		Project Manager / Developer
R8		Head of Department
R9		Head of Department
R10		External Consultant
R11		External Consultant
R12		Project Manager / Developer
R13		Chief Information Officer
R14		Government Official
R14 (PAC)		Secretary General
R15 (PAC)		Head of Department
R16 (PAC)		Secretary
R18 (PAC)		PAC Chairman
R19 (PAC)		Secretary General
R20 (PAC)		Dail Deputy
R21 (PAC)		Dail Deputy
R22 (PAC)		Dail Deputy

Appendix 8

Mental notes following Interview with R4

This was an extremely informative interview as this interviewee was a senior official and one of the original CIOs and hence actively involved during most of the initiative and with oversight during the terminal phases. He was therefore able to provide a complete narrative of the PSB from the early stages right up to closure and beyond

The interviewee provided some significant insight into the behaviour of stakeholder groups and individuals over the course of the PSB initiative. Of particular note was his narrative about how support for the PSB waned overtime and explained how this occurred for many of the stakeholder groups, including the government.

He was very candid in relating the story and personal experiences. In particular he was forthright enough to discuss his failings in relation to the project and how he could have acted differently at times (e.g. he mentions his initial enthusiasm and losing interest in the project due to frustration with some of the personnel involved). Of note is his assertion that the CIOs went to the government too early, and got a decision they should not have got – but were also swept up in the overall hype surrounding the information Society and the role the PSB might play, and how favourably this would make Ireland look as a leader in e-Government.

He appeared to be quite disparaging about the Reach agency and made several comments about the competency of the CIO and others to carry out such a ground breaking initiative. I need to check going forward if this is shared by other people or whether it is the result of turf wars and settling of early scores as alluded to by one of my initial informants. I need to do some follow up in relation to governance as I'm not sure I fully understood the complexities and how active the initial governance structures were.

Appendix 9

Secondary Data

	Year	Title	Aurhor
Key Project Review Reprts	2007	Special Report 58 - eGovernment	Comptroller and Auditor General
	2004	Modernising Service Delivery: A Blueprint for Change	Joseph Mc Donagh
	2007	Review of the Reach Project	3rd Reach Board
	2006	Evaluation of Donegal integrated Service Delivery Project - Final Report	Fitzpatrick Associates
	2008	Ireland Towards an Integrated Public service	OECD
	2010	The Dynamics of Collaboration in IT Enabled Change	J. Nolan
	2008	VFM Report 56 of the Comptroller and Auditor General: Improving Performance — Public Service Case Studies — Chapter 19.	Public Accounts Committee
Social Partnership Agreements	1987 - 1990	Programme for National Recovery (PNR)	Social Partners
	1991 - 1994	Programme for economic and Social Progress (PESP)	Social Partners
	1994 - 1996	Programme for Competitiveness and Work (PCW)	Social Partners
	1997 - 2000	Partnership 2000 for Inclusion, Employment, and Competitiveness (P2000)	Social Partners
	2000 - 2003	Programme for Prosperity and Fairness (PPF)	Social Partners
	2003 - 2005	Sustaining Progress	Social Partners
	2005 - 2016	Towards 2016	Social Partners
Information Society Publications	1998	Implementing the Information society: A Framework for Action	First Report of the Interdepartmental Implementation Group on the Information Society
	1999	Implementing the Information Society in Ireland: An action plan	The Information Society Commission
	1999	Progress Implementing the Information Society	Second Report of the Interdepartmental Implementation Group on the Information Society
	2000	New Connections: A Strategy to realise the potential of the Information Society	The Information Society Commission
	2003	New Connections: First progress Report	The Information Society Commission
	2004	New Connections: Second Progress Report	The Information Society Commission
	2004	Survey Assessments of the Information Society in Ireland	ESRI
	2000	Statement on Telecommunications, eBusiness, and the Information society	Forfas

Information Age Town	1996	Letter to Information Society Chairperson	Information Society Committee
	1996	Report on Meeting of Information Society Steering Committee 3 December 1996	Information Society Committee
	1996	The Superhighway and Multimedia	Information Society Committee
	1996	The Information Age - An Overview	Telecom Eireann
	1996	Ireland and The Information Society	Telecom Eireann
Information Society Commission	2002	Building the Knowledge Society	The Information Society Commission
	2003	eGovernment 2003	The Information Society Commission
	2003	eInclusion 2003	The Information Society Commission
	2005	Learning to Innovate	The Information Society Commission
Local Government Documents	1996	Better local Government: A Programme for Change	Department of the Environment, Heritage, and Local Government
	2012	Proper Local Government for Ireland	Catherine Murphy, TD
	2013	Local Government Reform: real or Imaginary	Dr Aodh Quinlivan, UCD
	2003	Strategic Plan 2003-2007 - A Partnership for the Future	LGCSB
	2003	Changing Local Government	Boyle
eEurope	2000	eEurope Action Plan	Commission of the European Communities
	2002	eEurope 2005: An Information Society for All	Commission of the European Communities
	2006	Benchmarking eGovernment: tools, theory, and practice	European Journal of ePractice · www.epracticejournal.eu
	2002	eGovernment Benchmark Study 2001 / 2002	Capgemini
	2012	Assessing User Centric eGovernment performance in Europe – eGovernment Benchmark 2012	Capgemini
	2013	eGovernment Benchmarking in Europe Past to Present to Future	Capgemini
	2006	i2010 eGovernment Action Plan: Accelerating eGovernment in Europe for the Benefit of All	Commission of the European Communities
	2003	Key Principles of an Interoperability Architecture	European Public Administration Network eGovernment Working Group
	1994	The Bangemann Report	European Commission

General and Consultants Reports	2006	On-line Availability of Public Services: How is Europe Progressing	Cap Gemini
	2007	The User Challenge Benchmarking The Supply Of Online Public Services	Cap Gemini
	2006	Delivering Electronic Government to Citizens and Business Users in Ireland	Cap Gemini
	2010	Digitizing Public Services in Europe: Putting ambition into action	Cap Gemini
	Unknown	e-Cabinet Project Final Report	PricewaterhouseCoopers
	2007	Irish Information Society Policy	Mc Caffrey
	2011	Leadership in the Irish Civil Service	NUI Galway
	2003	Transformational aspects of e-Government in Ireland: Issues to be addressed	O'Donnell et al
	Unknown	The Information Age - An Overview	Unknown
	2007	Leadership in Customer Service: Leadership in Government service - Delivering on the Promise	Accenture
	2006	Understanding and Measuring e-Government Benchmarking	Heeks
	2002	Identifying factors of success and failure In European IST-related National/Regional developments	The Circa Group
	2000	Public Strategies for the Information Society in the Member states of the EU	ESIS
	1997	Beyond the "Information Society": Selected Atoms and Bits of a National Strategy in Ireland	Preston
	2000	An Analysis of Irelands Growth Performance	Robert Schuman Centre for Advances Studies
	2008	Charting the Development of the Central Bureaucracy in Ireland	Connaughton (University of Limerick)
	2010	Institutional Evolution of the Irish State Administration	UCD/IPA
	1997	Politics and Administrative Practice in the Irish Information Society	file:///C:/Users/Brian%20Dempsey/Google%20Drive/Ph.D%20Master/Thesis%202014/Chapter%207/PSB/Document%20Folder/Political%20History/Politics%20and%20Admi
	2008	Transforming Public Services	Government of Ireland
	2012	Government of Ireland	Wikipedia
	2012	Politics of the Republic of Ireland	Wikipedia
	2012	Progress and pitfalls in public service reform and performance management in Ireland	Rhodes & Boyle

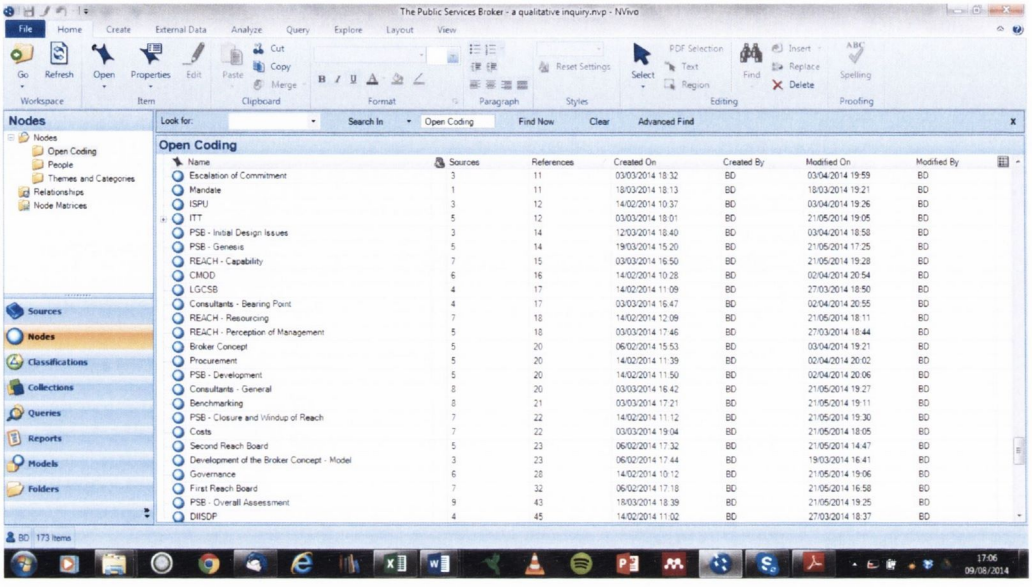
Reach Documents	2008	Case Study 14 Reach / Public Services Broker	www.iccs-isac.org
	2001	Where is e Government headed?: A Briefing for Top Management in the Public Service	Multiple government speakers
	2006	Delivering Electronic Government to Citizens and Business Users in Ireland	Cap Gemini and Reach Agency
	2002	Draft Contract	Reach
	2002	PSB Phase 1 - Invitation to Negotiate	Reachservices
	2002	PSB Phase 1 - Requirements Statement	Reachservices
	2002	Technical Overview of the Public Services Broker	Reachservices
	2002	Reach - Phase 1 Functionality	Reachservices
	2002	Reach - Broker Organisation Model	Reachservices
	2002	Reach - Broker V1	Reachservices
	2002	Reach - Broker Architectural Model	Reachservices
	2002	Reach - Broker Operational Model	Reachservices
	2002	Reach Broker Security Model	Reachservices
	2002	Reach - Principles of Interoperability	Reachservices
	2003	IAMS - Messaging Infrastructure for Intra-governmental Cooperation	Ger Coughlan (Reach)
	2000	Reach - Integrating Services to Citizens	O. Ryan (Reach)
	2002	Reach Brochure	Reachservices
	2004	Reach - Industry Briefing	Reachservices
	2003	Request for Tender for Hosting	Reachservices
The SMI DBG Initiatives	1996	Delivering better Government	Co-ordinating Group of Secretaries
		Strategic Management Initiative	
	2002	Civil service Conference on SMI	PA Consulting
	2001	SMI Impact	LINK
	2001	SMI Conference Feedback	LINK
	1998	History of SMI and DGP	LINK
	2002	Progress of the Strategic Management Initiative	PA Consulting
Irish Government	2005	Guidelines for the Appraisal and Management of Capital Expenditure in the Public Service	Department of Finance
	2006	Capital Appraisal Guidelines	Department of Education and Science
	2007	Knowledge Society and eGovernment Policy	Department of An Taoiseach
	1997	Circular 16/97: New Delegation Arrangements for IT-related Expenditure (including Office Machinery)	Department of Finance
	2012	Bunreacht Na hEireann	Government Publications Office
	2008	Civil Service Induction Manual	Government of Ireland
	2000	Modernisation of the Public Sector – eGovernment	Brief for Oireachtas
	1997	Public Service Management Act	Government of Ireland

OECD Reports	1999	Irish Service Delivery Modernisation	OECD
	2001	Understanding The Digital Divide	OECD
	2004	Measuring The Information Society	OECD
UK National Audit Office	2002	Better Public services Through eGovernment	UK NAO
	2009	Nomis - House of Commons PAC Report	House of Commons
	2009	National Offender Management System (NOMIS)	C&AG
	2009	National Offender Management System (NOMIS) - Summary	C&AG
	2011	National Programme for IT in the NHS	C&AG
	2012	Assurance for Major Projects	C&AG
	2011	Government and IT - a Recipe for Rip-offs	House of Commons
	2013	House of Commons PAC Report on NHS	House of Commons
	2010	Assurance for High Risk Projects	UK NAO
	2011	The Failure of the FireControl Project	UK NAO
	2011	UK NHS Patient Care Record System	C&AG
		Managing IT Scotland	
	2011	The delivery of ICT services and ICT projects under the Merlin contract	NAO Wales
	2006	Managing IT to deliver information in the NHS in Scotland	Audit Scotland

General	2000	CPMR Discussion Paper 17 - A New Change Agenda for the Irish Public Service	Committee for Public Management Research
	2003	CPMR Discussion Paper 25 - e-Gov and the Decentralisation of Service Delivery (2003	Committee for Public Management Research
	2003	QUALITY, SATISFACTION AND TRUST IN GOVERNMENT: REASSESSING TRUST IN A REINVENTED GOVERNMENT	EGPA STUDY GROUP ON PRODUCTIVITY & QUALITY IN THE PUBLIC SECTOR
	2013	Why do we need a digital strategy for Government?	McCluggage
	2013	Driving change: my first 100 days as Government CIO	McCluggage
	2013	New government Chief Information Officer	Government Press Release
	2013	Supporting Government Reform eGovernment 2012 - 2015	Dept. Public Expenditure and Reform
	1998	Budget 1999 speech	Minister for Finance
	2011	Public Service Reform	Dept. Public Expenditure & Reform
	2013	2012 Register of Public Sector Bodies	Central statistics Office (CSO)
	2006	Public Sector Employment and Earnings	Central statistics Office (CSO)
	2006	Electronic Government and Public Service Modernisation: Experience from the frontline	Kieran & McDonagh
	2005	Guidelines for the Appraisal and Management of Capital Expenditure Proposals in the Public Sector	Department of Finance
	2006	Capital Appraisal Guidelines	Department of Education and Science
	2000	eBusiness: Where Are We and Where Do We Go From Here?	Forfas
	2004	Broadband Telecommunications Benchmarking Study	Forfas
	2004	Launch of Broadband Benchmarking Study	Forfas
	2010	Shaping our Future: Ireland 2025	Forfas
	2010	Telecommunications for eBusiness	Mason
	1996	SHAPING OUR FUTURE: A Strategy for Enterprise in Ireland in the 21st Century	Forfas
	2008	PAC Report Summary Recommendations	C&AG
	2008	PAC Report Press Release	C&AG
	2011	Challenges for Irish Public Administration and Priorities for Public Service Reform	IPA
	2008	Government 2020 - an Irish perspective	IBM Institute for Business Value
	2001	GOVERNMENT, MARKET AND THE CIVIC SECTOR: THE SEARCH FOR A PRODUCTIVE PARTNERSHIP	THE 9TH. NISPAcee ANNUAL CONFERENCE:
	1998	Governance and Accountability in the Irish Civil Service	Richard Boyle (IPA)
	2005	VFM Report 51- Development of Human Resource Management System for the Health Service (PPARS)	Comptroller and Auditor General
	2006	Online Availability of Public Services: How Is Europe Progressing ?	Capgemini
	2008	United Nations e-Government Survey 2008 - From e-Government to Connected Governance	United Nations

Appendix 10

Sample Coding Using Nvivo



Aggregate	Classification	Coverage	Number Of Coding References	Reference Number	Coded By Initials	Modified On

Nodes\\Open Coding\\eForms

Document

Internals\\Participant Categories\\Internal actors\\Transcript of Interview with TW and CB

No		0.0298	6			
				1	BD	03/03/2014 17:28

So, Reach were there trying to, I suppose, set up a central standard and a central stall for all of - the broker and at the same time Taoiseachs were just trying to get websites up and trying to get Ireland looking good. So, they may have been slightly across purposes that if all of the focus had been on the broker, you know, in two or three years they might have had their e-government success without having to have individual success, but the Taoiseach at the time Bertie, wanted to take a box.

2	BD	03/03/2014 17:30

So, during 2001 we developed a product which we initially called e-forms, which was we looked across local authorities, we found there was about 34 different authorities that provided at least 100 different services and if you multiplied the numbers out you got an awful lot of forms that had to be made electronic. So, we developed a product that literally initially was a very simplistic product developed on the whiteboard beside us here, which was the idea that you could - a form was made up just of simple questions and by making the user select the form they wanted from which authority, we could actually build a form on the fly and it would re-order the questions and re-use questions, so that the 'How many children?' question was probably asked about 100 times across all the different forms and we say well, we just re-use that and that platform, that question became part of all the different forms. So it was a big XML exercise in designing forms, but what happened was that Taoiseachs got wind of it and worked with us to work with the local authorities and we literally spent two months re-designing all of the local authority forms as electronic forms and we went from having no electronic forms to having all of them, and one of the outputs was that even if you didn't want to fill it in electronically, you could create a PDF on the fly. So, it became something we could put up online.

3	BD	03/03/2014 17:30

Reach weren't involved, but the Taoiseachs - what was it? The Information Society?

The Taoiseachs were. Information - sorry, the Information Society Fund.

4	BD	03/03/2014 17:31

So, that got us to probably mid-2001 and we basically got to the stage where we could do whatever we wanted with forms.

5	BD	03/03/2014 17:31

We showed it a number of times to Jim Duffy and Tim Duggan and they kind of were - well, they were at crossed purposes, because one, they wanted to win benchmarking and two, they were trying to support Reach. So eventually, to cut a long story short, on September 11th, which is - I'll never forget the day because of all the things that were happening on September 11th, but Brid Carter and myself were summoned from a conference that we were at with local authorities to meet Jim and Tim and Victor and Colin in a secret meeting in Meath County Council, which again is only remembered because of the actual date of all the other things that were happening on September 11th. And we met and they decided at that stage that our e-forms product should become the Reach Services' initial offering.

6	BD	10/03/2014 16:33

Yeah, I was saying our September 11th meeting in 2001 was Jim and Tim deciding that Victor and Oliver would take over our forms engine, because the forms engine was one of the catalysts for us doing well in the benchmarking

Appendix 11

List of Actions, Events and Outcomes Grouped into 6 Phases

Genesis	The Public Services Broker w as originally described in the report of the Implementation Group for the Information Society Action Plan (upon w hich the Government decision of 2000 w as based). This envisaged that the Broker w ould bring together the government services associated w ith, or affected by, significant events for the user - an individual or a business - such as a change of address, the birth of a child, the loss of a job, the death of a relative, start up of a business, etc.
Genesis	The e-government agenda dates back to 1999. The policy objective of the first action plan w as to create a new vision of service delivery including facilitating self-service and making many services available on-line on a 24-hour basis. There w ere also efficiency and modernisation benefits to be pursued. (Mr. Dermot McCarthy)
Genesis	So w e slow ly then built this conceptual model on the back of a piece of paper, really, on how the public services broker might w ork w here it had multiple people coming in through a filtering process that w ould do some w ork.
Genesis	the broker project w as first approved by government in 2000
Genesis	Because the Broker concept w as considered to be compatible w ith the ISSS project, responsibility for developing the Broker w as assigned to Reach
Genesis	So, the government noted the memo w hich they usually do w ith them, but they also said, 'Go ahead and do it and get Reach to do it.'
additional genesis text blocks	
Initiation & Conceptualisation	and then it w as handed to Reach
Initiation & Conceptualisation	Reach produced a Statement of Intent in July 2000 and launched a w ebsite in September 2000. The approval of the Department of Finance w as received for the appointment of 13 staff to the Unit. By March 2001, seconded staff had been appointed and initial consultancy appointments w ere made.
Initiation & Conceptualisation	One of the things that Oliver did do and I attended a couple of one day sessions out in CMOD w here he took over the boardroom and did planning sessions how this w ould be done and even how Reach w ould need to be organised to do it.
Initiation & Conceptualisation	They decided they'd get a new Director of Reach at assistant secretary level
Initiation & Conceptualisation	They brought in a principal consultant as a vision man
Initiation & Conceptualisation	But I also think that from that time on it started to become a major IT project w hereas in actual fact it w as an organisational change project.
Initiation & Conceptualisation	In April 2001, Reach proposed testing of elements of the Broker system in the form of a 'proof of concept' - a partial system designed to test the viability and overall direction of the Broker system and to identify technical issues. A proof of concept w as delivered in August 2001 but it w as nothing except a few screen shots of how things might w orksystem also potentially provides feedback for budgeting, business planning and project control. Follow ing a competitive tendering exercise, the proof of concept softw are w as developed and delivered in August 2001.

Design	The resulting 'prototype' system, referred to as Reachservices Version 0.1, w ent live in April 2002. This w as hosted by the Local Government Computer Services Board and featured on-line forms and proof of identity by means of a linkage to the Department of Social and Family Affairs' systems.
Design	3.27 An interdepartmental Board, representing ten departments and agencies, w as appointed in May 2002 to oversee Reach's w ork. The Board undertook a w ide-ranging review of the Broker project in the latter months of 2002 on the basis of the responses received from the bidders.
Design	The process (ITT) ended w ith a 1000 page detailed document being submitted by Bearing Point. The feeling w ithin Bearing Point w as that the detail required w as overly complex and potentially costly. The process w as very prescriptive on the part of Reach (courtesy of Cap Gemini).
Design	w hen w e w ent to the market the figures that came back from the consultants w ere much higher than anticipated
Design	This group (1st Reach Board) w as later re-constituted as a consultative and communications vehicle for Reach and departments and agencies using its services, but did not meet formally
Design	In early 2003, a new , smaller Board for Reach w as established. This w as made up of a representative from each of the Department of Social and Family Affairs, the Department of the Taoiseach (ISPU), and the Department of Finance (CMOD) w ith an external, independent non-executive Chairman.
Design	So Bearing Point w on the contract to build the PSB
additional design text blocks	
Development	the changing requirements w ere affecting costs
Development	the costs became skew ed in the direction of people costs
Development	the consultancy bill just kept going up and up
Development	They'd been trying to get ES in a more polite w ay to close it dow n
Development	ES just w ouldn't Budge
Development	In July 2005, the target date w as moved to end August 2005. The completed system w as finally delivered in December 2005 - 16 months behind schedule.
Development	Delays in completing the project occurred for a variety of reasons, and the project w as finally completed in December 2005. The final expenditure w as of the order of €37 million, w hen all the costs associated w ith development of the system are included. Ongoing costs are expected to be in the region of €14-15 million a year.
additional development text blocks	
Operation	Since January 2006, additional project control structures have been put in place.
Operation	the project w ent on so long that technology that w as out there changed so rapidly over the course that maybe the initial design could have been fulfilled by something far more simple
Operation	The momentum tow ards developing eGovernment that w as evident in the early years of the decade appears to have faded somew hat. This is evident in the absence of a formal eGovernment strategy since the beginning of 2006.
Operation	the entire project is currently rudderless
Operation	By the time of the 3rd Reach Board w as established the Reach agency w as essentially w orn dow n (see below).
additional operation text blocks	
Termination	The Reach agency is now being brought into the centre
Termination	Yeah, I suppose from 2008 onw ards I mean, w e w ere into the contraction of public services, w e w ere in the business of contracting services and letting staff go all of that so from our point of view you know w e certainly didn't have any available resources to invest in all of this
Termination	the day after he retired Finance closed it (REACH) dow n
Termination	it w as w ound up really abruptly
Termination	w e w ere fecked out basically
Termination	Reach transferred to Department of Finance
additional termination text blocks	

Appendix 12

Mapping the Emerging Dimensions of Failure to Spheres of Influence over the Outcome of IS Initiatives

Subsystems of IS Project Risk	Risk Categories	Symptoms of Failure Associated with the Risk	Dimension of Failure
Technical Subsystem Risk (Wallace et al, 2004) / Content Driven Sphere of Interest (Yeo, 2002) / Project Risks (Kappleman et al., 2006)	**Project Complexity (Wallace et al., 2004)** *the project is large or comparatively complex*	technical complexity of the system (scale, scope, number of interfaces)	Vision
		organisational complexity of the system (number of system interfaces, number of internal and external stakeholders, geographical span)	Vision
		new or immature technology	Execution Capability
		lack of experience with the technology	Execution Capability
	Requirements Risk (Wallace et al., 2004) *requirements of the system not clearly defined or understood*	requirements unclear or defined incorrectly	Vision
		changing requirements	Vision
		poor technical / BPR design integration	Vision
Project Management Risk (Wallace et al, 2004) / Process Driven Spheres of Interest (Yeo, 2002) / Process Risk (Kappleman et al., 2006)	**Project Planning (Wallace et al., 2004; Yeo, 2002)** *Inadequate planning and support of the project at strategic and/or tactical level*	misalignment of business and IS planning	Vision
		inadequate planning of the project (business case, financial and other resource requirements), milestone planning, estimating, technical planning	Execution Capability
		Project support (top management, steering committee, champion)	Support
	Project Management (Yeo, 2002) *management of the project is not appropriate*	lack of project management methodology	Execution Capability
		Project Manager is ineffective	Execution Capability
		Ineffective communication	Support
	Project Control (Wallace et al., 2004; Yeo, 2002) *inadequate organisational oversight of the project*	Poor project governance	Governance
		escalation of commitment to a failing project	Governance
	Project Team Risk (Wallace et al., 2004) *Ineffectiveness of the project team*	lack of experience within the project team	Execution Capability
		inadequate specialist skills to meet requirements	Execution Capability
		Inadequate training	Execution Capability
		Poor relationship between the IS department and the rest of the organisation	Support
Social Subsystem (Wallace et al., 2004) Context Driven Sphere of Interest (Yeo, 2002) People Risks (Kappelman et al., 2006)	**Organisational Environment (Wallace et al., 2004)** . *the impact organisational factors on an IS initiative*	organisational culture	Support
		organisational politics	Support
		resistance to change	Support
		failure to learn from failure	Vision
	Users (Wallace et al., 2004; Yeo, 2002) *the impact of people on IS initiatives*	user resistance	Support

Appendix 13

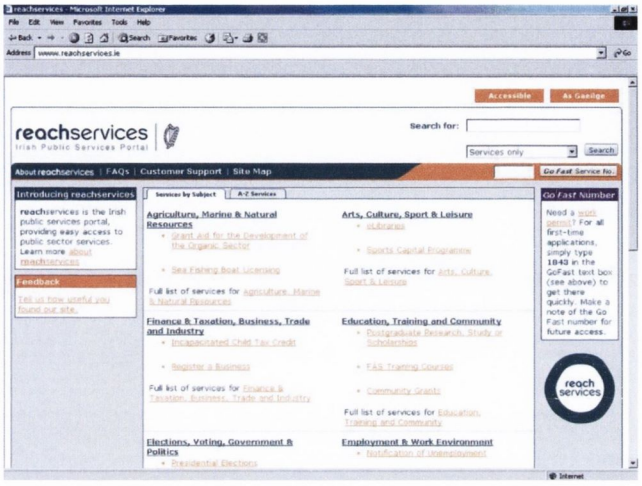
Higher Order Themes

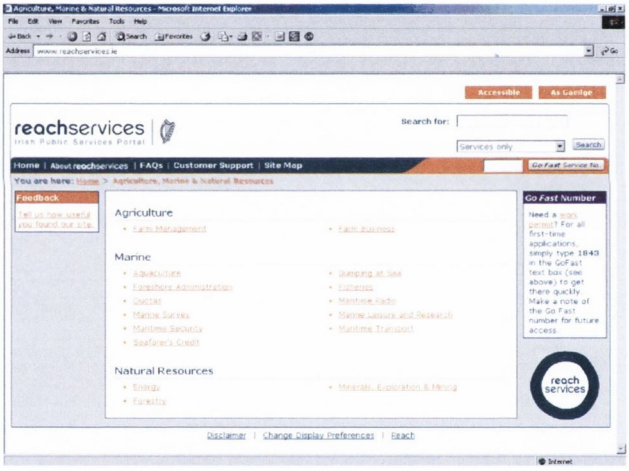
1st Order	2nd Order	3rd order
Vision	Service modernisation vision	SMI
		DBG
	PSB vision	Technical focus
		Complexity
		Scope changes
		Architecture
		Alignment with Service modernisation vision
	Organisational change	
	e-Europe	
	Reachservices V1.0	
	Proof of concept	
	Invitation to tender	
	Contract for development	
	Delivered PSB system	
	Termination of vision	
	System design process	
Support	Partner Agency Support	ISPU support
		CMOD support
		LGCSB support
		DISDP support
	Advocacy programme	
	PSB value proposition	Departmental buy-in
		Partnerships
		Buy-in
	Collaborative projects	Project Issues
		Frustration
		Disengagement
	Relationships	
	Reach Reputational damage	RM capability
		Reach credibility
	Government Support	Service modernisation agenda
		New Connections
		EU Benchmarking
		Government mind-set
	Public service silo culture	
	Enthusiasm Vs Support	Solo-run
		Waning support
	Escalation of commitment	
	Public uptake	

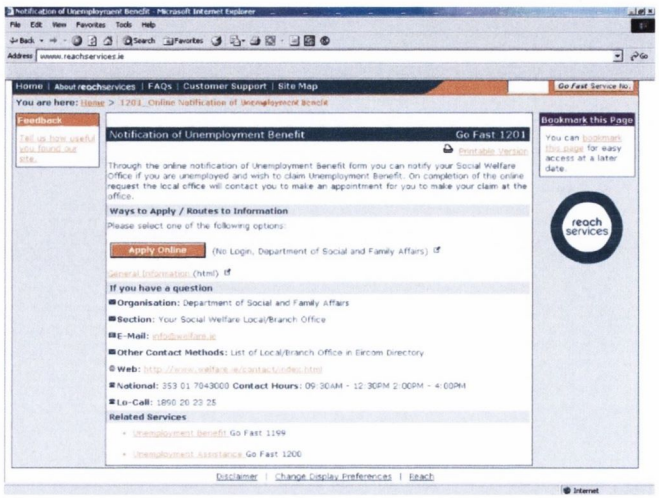
1st Order	2nd Order	3rd order
Governance	Partner Agency Governance	ISPU support
		CMOD support
		LGCSB support
		DISDP support
	Co-ordinating groups	Implementation group
		Information Society Commission
	Reach	Mandate
		Organisational position
	Reach Boards	First reach Board
		Second Reach Board
		Third Reach Board
	Escalation	Commitment
		Costs
	Government capital appraisal guidelines	
	Project reviews	Reach Report (2004)
		3rd Reach Board
		Evaluation of DISDP
		C&AG
		OECD
		Public Accounts Committee
	Programme controls	Risk analysis
		Business planning
		Project management
Execution Capability	The Reach Agency	Resourcing
		Skill sets
		Mandate
		Organisational Position
	Project management and Control	
	Abdication of Responsibility	
	Contract Design	
	System complexity	Organisational Change issues
		PSB integration issues
		PSB design complexity
	Contractors and Consultants	Cap gemini
		Propylon
		Bearing Point
		Contractors
	CIO Capability	CIO personal style
		CIO leadership
		CIO experience
	Partner Agencies	ISPU capability
		CMOD capability
		LGCSB Capability
		DISDP Capability

Appendix 14

Sample Screen-shots of Reachservices V 0.1 Portal







Appendix 15

Public Sector Systems in Development in 2001

Motor Tax: The facility to pay motor tax online

Driving Licences: The facility to apply and pay for a driving licence online

Road Haulage Licences: The facility to make online applications for road haulage licences

Passports: The facility to make complete passport applications online

Birth, Death and Marriage certificates: The facility to make online applications for birth, death and marriage certificates

Local Authority Housing: A facility enabling online applications for local authority housing, including provision for online self-assessment of eligibility

Planning Applications: An online facility providing access to the Planning Application and Development Control process, including citizen interaction with the draft development plan and the online registering of unauthorised development, commencement notices, and objections

Court Fines: A facility for online payment of Court fines

Electoral Register: The facility to apply online for registration on the electoral register

Child Benefit: A re-design of the Child Benefit system to support online applications, involving improved integration with the birth registration process and the updating of child dependant payments on social welfare schemes

Adult Education Guidance Project: An online national database of adult learning opportunities, complemented by a national telephone help-line service. An online management information system will also provide further education centres throughout the country with valuable information on participation patterns and outcomes of further education programmes.

Agriculture: A new system to allow online access to area aid applications; and a new system to support disease eradication schemes incorporating online access for veterinary practitioners and subsequently catering for farmer access.

eCabinet Project: a flagship project initiated by the Department of the Taoiseach will involve replacing existing manual systems of managing and disseminating Cabinet papers with electronic ones. It will also provide enhanced supports for different users of the system from initial drafting of Government memoranda right through to the Cabinet meeting itself. The project is a collaboration between the Department of the Taoiseach, which has responsibility for the Cabinet process, and CMOD, (Department of Finance). The private sector partner in the project is In.vision, who are involved in designing the system and who have developed the software on which eCabinet will run

E-Legislation: The Oireachtas and the Office of the Attorney General jointly progressing proposals to support the e-enablement of the process governing the preparation of legislation

Department of Finance: Progress is underway towards e-enabling the processes through which Departments and Agencies interact with the Department of Finance, in relation to the administration of public finances, including the estimates process and the ongoing monitoring of public expenditure.

Creation of Knowledge-Based Public Service: a natural extension of e-Government to allow greater collaboration between agencies: sharing of knowledge, sharing of services and processes. The ISPU is working with CMOD (Dept. Finance) to shape developments in this area in the context of the unfolding modernisation processes.

Appendix 16

Reach Board Membership

Reach Board 1

Name	Department
Dermot Quigley	Chairman of The Reach Agency
Matt Benville	Dept. Transport
Colm Butler	Dept. An Taoiseach
Brid Carter	Local Government Computer Services Board (LGCSB)
Sean Connolly	Revenue
Gerry Daly	Dept. Social & Family Affairs
Tim Duggan	Dept. Finance (CMOD)
Sean Hurley	Health Boards Executive
Eamonn Laird	Dept. Enterprise Trade & Employment
Donal Connolly	Waterford County Council
Oliver Ryan	Dept. Social & Family Affairs
Victor Galvin	Dept. Social & Family Affairs

Reach Board 2

Name	Department
Dermot Quigley	Chairman
Colm Butler	Dept. An Taoiseach
Gerry Daly	Dept. Social & Family Affairs
Tim Duggan	Dept. Finance (CMOD)
Oliver Ryan	Dept. Social & Family Affairs (Reach)
Victor Galvin	Dept. Social & Family Affairs (Reach)

Reach Board 3

Name	Department
Dermot Quigley	Chairman
Niall Barry	Dept. Social & Family Affairs
Alec Dolan	Dept. Justice Equity & Law Reform
John Kelleher	department of Environment, Heritage & Local Government
Damien McCallian	HSE
Philip O'Reilly	Dept. Agriculture fisheries & Food
Liam Ryan	Revenue commissioners
Tony Crean	Secretary to the Board, Dept. Social & Family Affairs
Representatives	Dept. Finance (CMOD)

Appendix 17

Total Expenditure by Reach 2000 - 2005

Direct project costs	
Broker Version 1 design/build	20,908
Procurement costs	3,287
Broker 'proof of concept'	285
Reachservices.ie website	490
Donegal Integration Project	484
Branding of the Broker	230
Advertising, communications for the Broker	67
Total direct project costs	**25,742**
Project overheads	
Salaries	3,344
IT maintenance	2,432
Office machinery	1,444
Telecommunications	663
Other (accommodation, premises expenses, etc.)	3,370
Total project overheads	**11,253**
Total expenditure	**36,995**

Source: (C&AG)

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