The Appropriation of Technology in the Process of an Imposed Organisational Transformation: a Relational Approach

By

Abdulhafeez Abdullah Alharbi

A Thesis Submitted in Fulfilment of the Requirements for the Degree of Doctor of Philosophy of Cardiff University

Management, Employment and Organisation Section of Cardiff Business School, Cardiff University

September 2015

DECLARATION

This work has not previously been accepted in substance for any degree and
is not concurrently submitted in candidature for any degree.

Signed ……………*Abdulhafeez Alharbi*………… (candidate)

Date ……30-09-2015………

STATEMENT 1

This thesis is being submitted in partial fulfillment of the requirements for the degree of
………PhD………… (insert MCh, Md, MPhil, PhD etc, as appropriate)

Signed ……………*Abdulhafeez Alharbi*………… (candidate)

Date ……30-09-2015………

STATEMENT 2

This thesis is the result of my own independent work/investigation, except where otherwise
stated.
Other sources are acknowledged by footnotes giving explicit references.

Signed ……………*Abdulhafeez Alharbi*………… (candidate)

Date ……30-09-2015………

STATEMENT 3

I hereby give consent for my thesis, if accepted, to be available for photocopying and for inter-
library loan, and for the title and summary to be made available to outside organisations.

Signed ……………*Abdulhafeez Alharbi*………… (candidate)

Date ……30-09-2015………

ABSTRACT

The purpose of this thesis is to contribute to existing explanations of the organisational outcomes of Information Technology (IT). In studying this phenomenon, prior research and theory have taken different approaches. At the one end, technology is seen as a major agent of change determining the structure and behaviour of organisations and their members. In stark opposition to this perspective, the tradition of social construction of technology represents IT outcomes as the product of human interpretations, intentions, and voluntary practices. Recent debates in the field have attempted to go beyond these two extreme positions in order to admit both the role of technology, and the social context into which it is introduced. In line with this emerging literature, this research devises an original conceptual framework to allow for the incorporation of multiple entities and the consideration of the dynamic interaction amongst them. This relational approach is employed to examine IT appropriations and the ensuing organisational change in a case of implementing an IT system in three organisational units of a large airline firm. The evidence from this research reaffirms the significance of human agency in mediating IT outcomes. It also demonstrates how the exercise of agency is informed by both the internal and the external environment of the organisation, as well as by the technology's characteristics. The thesis's main contribution is that it provides a sociological account of an instance of IT-associated change that avoids both technological determinism and extreme social constructivism.

DEDICATION

This work is dedicated to my dearest family who have been with me in this journey through its sweet and bitter times.

*To my wife, **Kathrin**, with utmost love. You have been loving, caring, understanding, and supportive for all the countless hours of reading, researching, and writing, and this is as much your doing as it is mine.*

*To **Nawaf**, **Lina**, **Tala**, and the little **Nayef** who joined us in the middle of this journey. The joy and bliss you bring into my life are my fuel and inspiration.*

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

CHAPTER 4

CHAPTER 5

CHAPTER 11

CHAPTER 1

INTRODUCTION

1.1   Research Rationale

The role of Information Technology (IT) in organisations and society has been a question of interest to academics in various different disciplines, as well as to practitioners in the field (Robey and Boudreau, 1999). In studies of IT implementation and its organisational consequences, research has for long been dominated by deterministic approaches to the impact of IT on organisations. From these imperative lenses, technology and situational contingencies are viewed as autonomous forces that pattern organisations. Research postulations are grounded either in "hard-line" determinism: the belief that certain outcomes inevitably follow from the introduction of technology; or in less deterministic, contingent views: the incorporation of situational parameters into the equation of technology impact (DeSanctis and Poole, 1994). These forms of structuralist approach – which relate only to technical or situational elements orchestrated by managerial decision, can be seen as denying or at least underestimating the crucial role of human agents in processes of organisational change (Markus and Robey, 1988; Orlikowski and Baroudi, 1991).

Another dominant perspective evident in the research on Information Systems (IS) builds on a conceptualisation of technology as "socially constructed", and can be interpreted and appropriated in various ways (e.g. Grint and Woolgar, 1997). This stream of research represents a shift away from the deterministic accounts of technology's role in organisations towards a view of technologies as fundamentally social objects, whereby human agents can exercise their discretion to shape the effects of technologies on work (Walsham, 1993). Criticism of the constructivist approach focuses more or less on the flip side of the deterministic argument; organisational

members clearly do not develop ideas and make choices in a social vacuum (Lamb and Kling, 2003). Their thinking and doing are shaped by the situational factors and by the profound influences of the wider context (Kling, 1992; Mutch, 2002).

Due to the limitations of both social constructivist and structuralist approaches in providing explanations that attend to the complex and unpredictable interactions between technological features, actors' intentions, and the wider organisational context, scholars have called for processual theories and multi-levelled perspectives able to account for the interaction that exists amongst these dimensions (e.g., Markus and Robey, 1988; Boudreau and Robey, 1999; Barrett, 2006; Pare et al., 2008). Such processual approaches are assumed to be more valuable in research designed to explain the dynamics of IT implementation projects and the changes associated with the introduction of information technologies.

Accordingly, there has been a burgeoning scholarly work responding to this suggested line of inquiry. In particular, researchers from the IS field have turned to social theories such as Structuration Theory (Giddens, 1984) and Actor-Network Theory (ANT) (Latour, 1987, 1996) as organising themes for their studies. These endeavours have offered valuable insights and fresh understandings of the relationship between IT and organisation. However, they are repeatedly criticised on ontological bases (e.g. Mutch, 2002; Mingers et al., 2013), that is, in terms of how these perspectives conceptualise the relationship between the social and the material, or human action and the structural contexts. Through explanations confined within the level of the process, these conceptualisations inevitably underestimate one or more of the interacting dimensions involved in IT in organisations. For example, structurational treatments tend to focus the interaction analysis at the realm of action, and thus underplay the enduring structural contexts that characterise organisations (Jones et al., 2004; Jones and Karsten, 2008). As a consequence of this process-centric focus, there doesn't appear to be an explicit place for the distinctive capabilities of technology (Jones et al., 2004; Faulkner and Runde, 2012). In terms of ANT analyses of the IS-related phenomena, the borders between action, technology, and structural conditions are dissolved for the sake of maintaining symmetry amongst the actors (Mutch, 2002). Also, the contention that nonhuman entities can act in the absence of human

intervention renders ANT explanations problematic, because it assigns agency (e.g., will and intention) to technical objects (Rose et al., 2005).

Therefore, the present research sets out to respond to the call for multi-levelled, processual approaches in examining the IT-organisation relationship. In pursuing this objective, it attempts to overcome the perceived conceptual deficiencies of other processual perspectives. To this end, the research utilises a relational sociology perspective (Emirbayer, 1997). This relational approach highlights issues of process and context, with a focus on the dynamic, unfolding relations among their entities. As such there is a concern to emphasise the interpretations and actions of individuals and groups, but there is also recognition that actors are never fully voluntary, and the effects of structures are never wholly deterministic. In the domain of organisations, a relational analysis engages with connections both within organisations and with their broader contexts, with an aim to understood and situate organisational action (Mutch et al., 2006). Accordingly, the interaction of organisational members with new IT conditions is understood within the constraining and enabling characters of changing contextual conditions.

Building on these concepts, the research starts with a stratified account of reality in which human action is understood to be emerging within contextual preconditions, but is not reducible to them (Mutch, 2002; Mutch et al., 2006). Central to this form of analysis is the position of "analytical dualism", whereby structural and agential components are analysed separately, with a focus on their logical relations and the conditions and possibilities that these allow (Archer, 1995; Reed, 1997).

This ontological position and this theoretical approach provide a firm foundation for examining the interplay of structure, human agency, and technology, without blurring the differences between them, thus obtaining a better purchase on how IT is appropriated in organisations, and the processes of change and continuity associated with its adoption.

1.2   Definition of Key Concepts

The present research uses a number of core concepts such as technology, appropriation structure, agency, and organisational change. These constructs will feature throughout the thesis and thus require some elucidation at this juncture in order to clarify the thesis's theoretical position and its main arguments.

The definition of technology has been the centre of some important debates in the organisational literature (Mutch, 2008). These debates will be reviewed in the theoretical background of the thesis presented in the subsequent chapters. At a basic level, the term may refer to a tool of a practical utility. However, this definition does not include aspects of the social context, including the people involved in the use of the tool. A more comprehensive definition would have to regard technology in a broader sense that not only includes the physical side but also users' interpretations and experiences. Therefore, the present research concurs with Sahal (1981) views technology as a "configuration", observing that the technology relies on a subjectively determined but specifiable set of processes and products. This stance is helpful because it offers a view of technology that stresses the interrelationship between technology and organisation, but also preserves a space for the material properties of technology. Building on such a view, this research focuses on Information Technology (IT). And for this purpose, IT is defined as *"Technologies for the processing, storage, and transmission of digital material, consisting of ensembles of hardware and software with distinctive feature sets allowing for the physical storage and logical representation of different forms of data" (*Mutch, 2010, p.507). Such a definition means that the material properties of technology are deemed important. The concept suggests, according to Mutch (2010), that these properties emerge from particular combinations of hardware, software, and data. This doesn't, however, make technology a structure in its own right; rather technology mediates the impact of structures (such as hierarchy). Such mediations are still subject to users' interpretations and engagements with these particular constellations of technology.

The notion of appropriation is focused on uses of the IT. As explained by Baillette and Kimble (2008), it implies the active and reflective role of the person in the way in

which a technology is being used. Also, the appropriation concept is understood to be a process that evolves over time.

Organisational change is defined and used by many authors in different contexts. These multifaceted understandings will be explored in the following chapters. For the purpose of introducing the term, it is described as new ways of organising and working (Dawson, 2003, p.11). This study observes IT-associated change which looks primarily into the critical elements associated with the adoption and use of technology (Orlikowski, 1996).

The concept of human agency will also be expounded thoroughly in the body of the thesis, In essence, it can be described as the capacity of individuals to act independently and to make their own free choices (Barker, 2003). Importantly, human agency is considered a dialogic process by which actors engage with others in collectively organised action contexts (Emirbayer, 1997). This conceptualisation foregrounds the relational nature of agency, and thus sees agency as inseparable from the unfolding context and the challenges posed by changing situations (Emirbayer and Mische, 1998).

For the purposes of this research, structure is defined as the recurrent patterned arrangements which seem to influence the choices and opportunities available to individuals or groups of people (Barker, 2003). Empirically, it refers to the contextual arrangements surrounding actors at different levels of inquiry. This includes the macro level of society (e.g. cultural norms), as well as other meso-levels (middle-levels) of the organisation or work group.

1.3   Research Objective

The purpose of this thesis is to contribute to existing explanations of change associated with the implementation of IT in organisations. To this end, it seeks to study how IT is received, interpreted, and used in real organisational settings. The main research question, thus:

How organisational members appropriate a technology that is authoritatively imposed by top management?

In addressing this pivotal question, the research aims to observe a number issues of profound theoretical and practical importance. These issues include the following:

- *The role of technology's properties in the process of IT appropriation.*
- *The nature of the context and its implications in shaping the process of IT appropriation.*
- *The position of human agency in the processes of IT appropriation and organisational change.*

Examining these issues will highlight further the significance, and constraints, of agency in the process of an authoritatively imposed organisational transformation.

1.4   Outline of the Thesis

This thesis is organised in eleven chapters. The following paragraphs briefly summarise the contents of each chapter.

*Chapter 1 – Introduction***:**

This chapter provides the rationale for the study, defines the central concepts, presents the research objectives, and outlines the structure and contents of the thesis.

*Chapter 2 – Theoretical Background***:**

This chapter provides a review of the relevant literature surrounding IT and organisational change, highlighting contributions, and discussing limitations of the major research streams on the subject, as a means to identify the theoretical position of the current research within the academic debate. The first section traces the different meanings attributed to change, concluding by highlighting the importance of viewing change as an emergent, unfolding process. The second explores the agency-structure debate, with an emphasis on the field of IT. It ends by positioning the current research within a relational perspective.

Chapter 3 – Studies on IT implementation and Use:

This chapter reviews and discusses the major research perspectives on IT implementation and use in organisations, providing illustrative examples that point to the value of each theoretical strand, and by offering critical commentary on their limitations.

Chapter 4 – Conceptual Framework:

This chapter outlines the theoretical approach of the study. The relational sociology approach is defined and then further explained with respect to its stance within the agency-structure debate. The position of technology in this approach is then outlined accordingly. Finally, the adopted temporal-relational view of agency is thoroughly explained.

Chapter 5 – Methodology:

This chapter presents the methodology of the study. It provides a discussion of the research assumptions, and then explains the research design. This is followed by an outline of the process of data collection and data analysis.

Chapter 6 – The Context of Technological Change:

This chapter offers a broad overview of the contextual background of the case. It first offers a historical background of the case organisation and the strategic change programme. It then provides an introduction to the implementation project, the implemented system, and the business units being studied.

Chapter 7 – The Process of IT Implementation:

This chapter provides a detailed narrative of the IT system implementation process in the three organisational units under study.

Chapter 8 – Contextual Conditions:

This chapter concerns the macro, and meso levels of analysis. It provides a detailed analysis of the contextual arrangements surrounding the process of IT implementation. The analysis covers elements related to the technology, the organisation, and the external environment.

Chapter 9 – Micro-Level Processes:

This chapter focuses the analysis on the micro-level processes of IT appropriation. It provides an in-depth analysis of the agentic processes that underlie actors' engagement with the requirements of configuration and utilisation of the implemented IT system.

Chapter 10 – Technology Appropriation and Organisational Change:

This chapter presents an overall discussion of the key themes that emerged from the analysis of the empirical evidence. It first attends to the role of technology in the process of change. It then outlines the interacting mechanisms in the appropriation process. This is followed by explanations of the change processes in the three settings of the case organisation.

Chapter 11 – Conclusion:

This chapter concludes the thesis by linking the research inferences with the research inquiries. It then highlights key contributions and implications of this research. Lastly, the research limitations are indicated.

CHAPTER 2

THEORETICAL BACKGROUND

2.1 Introduction

Within the disciplines of Organisation Studies and Information Systems (IS), there has been a continued interest in understanding the organisational change enabled by the introduction of advanced information technologies (Huber, 1990; Robey and Boudreau, 1999; Markus, 2004; Barrett et al., 2006). Research on IT-enabled change has taken different approaches in studying this phenomenon, depending mainly on two kinds of assumption. The first assumption relates to how change has been understood and conceptualised, while the second kind of assumption concerns the relative significance attributed to agency against structure (and technology) in explaining change. In other terms, the assumed weight to human agents, or structural and technological contexts in shaping the outcome of IT in organisations.

The following sections provide an overview of the different perspectives and theories in relation to these critical issues - as a means of positioning the current research within the academic debate around IT and organisational change.

2.2 Competing Perspectives on Organisational Change

Studies about organisational change have typically conceived of change as either an observed difference over time in an organisational entity - on selected dimensions - or as an account of how change has developed over time (Van de Ven and Poole, 2005). The implications of these two conceptualisations are explored in the following subsections.

2.2.1 Change as a planned intervention

When change is viewed as a structured approach, change studies focus on the outcome or "destination" of a planned change intervention (Barrett, et al., 2006). Such studies typically employ a variance approach (Mohr, 1982), where change is represented as a dependent variable explained with a set of independent variables statistically explaining variations in the dependent variable of change. The second meaning of change takes an event-driven approach that is often associated with process-based explanations of the order and sequence in which change events occur (Markus and Robey, 1988; Poole et al., 2000; Tsoukas, 2005). In this usage, the issue of "how change happens" is addressed by presenting a sequence of events that explains the change process (Van de Ven and Poole, 2005).

In the information systems field, researchers have manifested more interest in variance models of inquiry (Boudreau and Robey, 1999; Gregor, 2006). The underlying assumption is that an outcome will constantly come about when the sufficient and required conditions are present (Poole et al., 2000). The variance approach is beneficial for studies focusing on the causes and outcomes of organisational change. An example of such an approach is factors-based research which - by sampling across a range of projects - identifies those 'factors' that are most strongly associated with the successful or unsuccessful outcomes of IS projects (see, for example, Nah et al., 2001; Hong and Kim, 2002; Al-Mashari et. al., 2003). These studies have been criticised, however, for being static (Walsham, 1993) and for failing to explain how outcomes develop over time (Markus and Robey, 1988), and also for ignoring the vested interests of the stakeholders involved (Azad and Faraj, 2011). In addition, these kinds of study have normally found inconsistent and at times contradictory results (Davidson and Chismar, 2007). One key explanation of these limitations is the tendency amongst theorists to examine the variance between independent and dependent variables, it approaches the organisations as a black box, whereby social and political impacts and human perceptions are absent and ignored (Robey and Boudreau, 1999).In response, scholars have contended that process research models may be more valuable in understanding issues pertaining to the designing and implementation of information systems, assessing their impacts, and

uncovering the processes of change associated with them (i.e. Kaplan, 1991; Boudreau and Robey, 1999).

2.2.2   Change as a phased process

Early research works that utilised process-based explanations have been dominated by what Weick and Quinn (1999) call "episodic" change. This form of change is labelled episodic because it tends to occur in distinct periods during which shifts are triggered by external events such as technology change or internal events such as changes in key personnel. Studies that embraced this type of conceptualisation offered "staged" models of IT-enabled organisational change. Examples of these kind of study are found in organisational change models that draw on the typical sequential model of unfreeze, change, and refreeze (Lewin, 1951), as well as Rogers' (1962) diffusion of innovation theory (see, for examples Kwon and Zmud, 1987; Cooper and Zmud, 1990). Other examples and variations include the use of the model of punctuated equilibrium (Tushman and Romanelli, 1985; Romanelli and Tushman, 1994) - (e.g. Lyytinen et al, 2009).

By comparison with factor-based approaches, the staged process approach has a more lively sense of change, encompassing a series of generic, linear stages that are sequentially accomplished to achieve a pre-determined change vision. This approach offers a greater theoretical leverage by highlighting some key processes that should be attended to when managing IT adoption. For example, Aladwani (2001) provided a conceptual framework consisting of three phases (knowledge formulation, strategy implementation, and status evaluation) to help managers avoid the difficulties of the organisational change associated with the implementation of enterprise systems.

However, this approach has been criticised for portraying only one possible sequence of events, through which all organisations are expected to progress (Boudreau and Robey, 1999), and for characterising the process in an excessively sequential (non-iterative) manner (Orlikowski and Hofman, 1997). Also, Mohr (1982) describes stage models as incomplete process models, because they generally lack specification of the mechanisms by which subsequent stages come about.

Furthermore, because this conceptualisation views change as a sequence of events that exhibit different states along a linear trajectory, it merely describes what happens at these different states overlooking what happens between the states. In this way, it does not offer insight into the "open-ended micro-processes that underlie the trajectories" of change (Tsoukas and Chia, 2002, p.570). In this sense, it provides limited considerations of the background assumptions, situated practices, and unintended consequences of organisational action; or in the words of Tsoukas and Chia (2002, p.572), "the actual emergence and accomplishment of change".

2.2.3   Change as an emergent process

The criticisms levelled at the stage-model process approach have suggested that organisational change processes are best conceptualised as being more dynamic and iterative in nature, and that a more flexible process approach is warranted. To this end, there has been a call for the use of more 'emergent' (Markus and Robey, 1988), 'enactive' (Orlikowski and Iacono, 2001) or 'interactive process' (Slappendel, 1996) perspectives on the role of IT in social and organisational change processes, thus emphasising their inherent complexity and indeterminacy. In all of these conceptualisations, change is viewed as more dynamic and emergent, concerned with the different activities of "changing" as part of organising, rather than change as a static event (Weick and Quinn, 1999). Studies taking this approach ascribe non-linear, embedded, temporal, contextual, and asymmetrical properties to change (Pettigrew, 1997), in order to explain how outcomes develop over time. Studies that adopt an emergent processual approach are scarce, and change scholars have repeatedly made calls for further research to employ such a methodological approach (i.e. Weick and Quinn, 1999; Pettigrew et al., 2001; Tsoukas and Chia, 2002; Van de Ven and Poole, 2005).

In the case of IT-prompted change, this emergent approach is meant to accommodate the complex and unpredictable interactions between technological features, actors' intentions, and the wider organisational context (Markus and Robey, 1988; Pare et al., 2008). Markus and Robey (1988) argue that such an emergent perspective is better able to account for conflicting findings about IT impacts - by demonstrating the

different meanings that the same IT system acquires in different social settings (p.595). However, understanding the interaction between technology, human action and social structure presents an important theoretical challenge in the conceptualisation of the relationship between organisation and technology.

Commonly, researchers have tended to ascribe change to the "deterministic" impact of technological and other external forces independent of human behaviour. Or, on the other hand, they have contended that the interpretations and actions of the people involved determine the outcome of technology in organisations. These tendencies are typically rooted in philosophical presuppositions about agency (and structure). It is the position of this research, in line with others in the Information Systems field (e.g., Rose et al., 2005), that an adequate theoretical treatment of agency is an essential step in characterising the relationship between technology and organisation.

Agency in its widest meaning relates to actions which have outcomes or consequences. In Giddens' terms 'the capability to make a difference' or the ability to 'act otherwise' (Giddens, 1984, p.14). The characterisation of agency in this research is based on that of Emirbayer and Miche (1998). Ahead of elucidating this characterisation, the next section will review different theoretical positions of agency in IT-associated organisational change.

2.3   Agency in IT-associated Organisational Change

The previous section outlined different approaches to the study of change in organisations, distilling key features of relevance to this study. The section concluded by signalling the benefits of employing a processual approach - which can account for the dynamics of change associated with the use of IT. It has been also indicated that a better understating of the change process can be reached if a proper conceptualisation of agency is proposed. In what follows, a number of dominant representations of agency in the study of IT in organisations are reviewed.

The study of IT in organisations has traditionally alternated between the two extremes of determinism and voluntarism (Orlikowski, 2005; Leonardi and Barley, 2008). These two positions differ primarily with respect to 'the direction of causality'

(Doherty et al., 2006). Deterministic perspectives are those that tend to study the organisational outcomes of IT projects by ascribing causal agency either to the technology itself or to the organisational and social context within which it is deployed. Voluntarist perspectives take the opposite stance, arguing that agency lies in humans, and maintaining that the practices, beliefs, and interpretations of actors (e.g. designers, managers, and users) significantly shape how IT affect organising. Both perspectives have made lasting impressions on IS research, and can be epitomised in two intellectual traditions that form the basis of much of the literature concerning IT in organisations: "Technological Determinism" and "Social Constructivism".

2.3.1 Technological Determinism

Early studies explaining the outcomes of ITin organisations have been characterised by a deterministic stance maintaining that certain effects inevitably follow from the introduction of technology (Markus and Robey, 1988; Orlikowski and Baroudi, 1991). Scholarly work within the technological determinism paradigm considered technology as a major agent of change where technology is seen to determine the structure and behaviour of organisations and their members. This broad stream of management research has its basis in technology literature developed since the dawn of the industrial revolution, with a number of studies examining the relationship between technology and social systems (Trist and Bamforth, 1951), forms of organising (Woodward, 1958), organisational processes (Likert, 1961), and later on, strategic choices (Child, 1972).

By way of illustration, Fulk and DeSanctis (1995) suggest that advances in information and communication technologies have five features that can exert significant consequences on organisational forms. These features are the increased speed of communication, the dramatic reduction in the costs of communication, the rise in communication bandwidth, the vastly expanded connectivity, and the integration with other computing technologies (e.g., Fulk and DeSanctis 1995, p.338). Barrett (2006) identifies a number of dimensions of the linkage between the advances in the information and communication technologies and changes on both intra- and

inter-organisational forms. One dimension of change on intra-organisational forms is a shift from vertical control to flatter organisations and a thinner middle management layer. This change is enabled by more reliance on technology-based control at the expense of human-based coordination (Zuboff, 1988). Another dimension of intra-organisational form change is the facilitation of horizontal coordination by means of electronic workflow and virtual organising. A third dimension refers to the reduction of organisational size that is enabled by lean-dispersed forms of organising, coordinated by the expanded connectivity and integration of IT systems. Also, the Internet has furnished the trend towards the outsourcing of value activities, meaning that the size of the core organisation has increasingly been reduced. In terms of change in the inter-organisational form enabled by IT advancements, Barrett (2006) refers to a rise in outsourcing and collaborative planning. Also, technologies such as the Internet facilitate a tight coupling between buyers and suppliers. Manifestations of this coupling include electronic trading in financial services and the airline industry.

According to this approach, technology causes changes in organisations, and people and organisations are powerless to resist these changes.

In another "less" deterministic view, researchers studied technology in organisations as it interacts with situational factors to cause outcomes. This research tradition still subscribes to the notion that technology has powerful impact on people and organisations, whilst mediated by a range of organisational and contextual contingencies (Orlikowski, 2010). The aim of this stream of research has been to devise a set of principles about technology and organisation which would hold across all organisations and technologies. An example of such an approach is the study by Tallon et al. (2000) on the alignment between IT and organisational business foci. The study differentiated between operation-focused, market-focused, dual-focused (market and operation), and unfocused firms. Their results suggest that executives in dual-focussed firms perceived the highest level of IT business value. In such cases, the adoption of IT is used to enhance strategic positioning by creating or improving value propositions for customers.

The tradition of technological determinism has been accused of ignoring the role of people in shaping technology's consequences through their involvement in the development, implementation, and appropriation of those technologies. This perspective also has difficulty in accounting for situations where the same technology produces different outcomes in similar organisational contexts (Barley, 1986; MacKenzie and Wajcman, 1999). Critics of this technical/rational emphasis have also pointed to IT projects' failure to deliver the expected outcomes, and to resistance to change - as demonstrations of the incapability it has developed to explain and determine IT consequences (Avgerou and McGrath, 2007). The literature concerning IT implementations repeatedly refers to the significance of the social context (Avgerou and Walsham, 2001) and the political behaviours of actors involved in the processes of IT implementation (e.g. Walsham and Sahay, 1999; Ciborra, 2002).

2.3.2 Social Constructivism

Since the 1980s, Information Systems research has seen a shift from regarding technology as a material cause to focusing on the role of agency and the social shaping of technology (Williams and Edge, 1996; Leonardi and Barley, 2010). This stream of research, sometimes labelled the 'social construction of technology' (SCOT) (Pinch and Bijker, 1987), stands in opposition to the technological determinism perspective. It holds that technology does not directly "impact" upon the social system in which it is developed and used. Rather, technologies are subject to social interpretation by the actors designing, implementing, and using them. At its extreme, the social constructivist position holds that technologies themselves hardly matter at all in discussions of social change; what actually matters are the ways in which those technologies are used in the context of work or other social settings (Grint and Woolgar, 1997). Grint and Woolgar (1997) suggest the "technology as a text" metaphor. Therefore, the capabilities of technology are never obviously transparent, nor do they lend themselves to predefined interpretations. Rather, technology is "interpretively flexible"; the focus is on the process of design (writing) and use (reading) of the technology. Within this line of theory, the material world exists insofar as it becomes an object of interpretation. For example, Orlikowski in her early work (Orlikowski and Gash, 1994) introduced the term "technological

frames" to describe the interpretive schemes (assumptions, expectations, and knowledge) used to understand technology in organisations. In this sense, material objects exist only as "objects of knowledge" or "carriers of meaning" rather than as independent material entities exuding explanatory force. Overall, this tradition represents technology outcomes as the product of human intentions and actions in design and use.

Although this stream of research offers a complementary understanding of technology in organisation (Orlikowski and Barley, 2001), scholars like Kling (1992) warn that this theoretical position appears to render technology irrelevant. It also prevents, according to Kling (1992), a practical debate that takes into account powerful institutions such as government agencies. In this way, Kling (1992, p.359) writes:

> *"...narratives can rarely feature some unique cause ... usually technologies and related social arrangements enable, facilitate, inhibit, or catalyze other social changes. But the converse of these claims would be harder to argue".*

In response to the increasing dissatisfaction with the extreme poles of technological determinism and social constructivism - and recognising that technology is both shaping, and shaped by, its working environment (Doherty et al., 2006) - there has been a growing consensus surrounding the necessity of forging a middle ground regarding the direction of causality, to bridge the divide between determinism and voluntarism.

2.3.3 Intermediate Approaches: Structuration and ANT

Accounts of IT and organisational change that treat structure or technology as the cause of change or consider change as the product of social construction have been continually questioned in the IS literature. Twenty years ago, Sahay and Walsham (1995) stressed the need for multilevel analysis of IT in organisations. Foregrounding the context of developing countries in particular, but also directing attention towards the value of exploring the interaction between levels, Sahay and Walsham (1995, p. 118) maintained that *The process of IT use in developing countries is a complex phenomenon and it typically involves actors at various levels. It is important to study*

the interaction of these different actors on the process of IT implementation and use". Recent debates in the field have attempted to go beyond the two extreme positions of technological and social determinism to develop an intermediate position that could admit both the role of technology, and the social context into which it is introduced (Rose and Jones, 2004; Doherty et al., 2006).

In this effort, IS scholars turned to social theories to explore new issues and develop original arguments that could explain how individuals interact with IT in organisations. The wide scope of sociology provides the potential for new ways of thinking about IT and organisation (Walsham and Sahay, 2006). Galliers and Whitley (2007) found that among the most popular social theory sources are 'structuration' (Giddens, 1984) and Actor-Network Theory (ANT) (Latour, 1987, 1996). Both theories reject the classical dichotomy of agency and structure, viewing them instead in a dynamic interconnected perspective. They thus offer a conceptual framing that could attend to issues of determinism and voluntarism. These two theories, however, vary in their conceptualisation of the structure-agency relationship.

2.3.3.1 Structuration Theory

In Structuration theory, Giddens rejects the concept of structure as an external, pre-existing, determinant of action, and also denies the random or entirely self-propelled nature of actors' behaviour (Bauman, 1997, p.219). Instead, Giddens seeks to transcend the limitations of the structure-agency dualism by proposing that structure and human agency are seen as a mutually constitutive duality. Structure is a continuous ongoing process rather than a static property of social systems. It is thus a "virtual order" of transformative relations (Jones et al., 2004, p.301). Along with his virtual view of structure, Giddens adopts a strongly voluntarist view of human agency, maintaining that change can be found in every act that contributes towards the reproduction of social life (Jones et al., 2004). Giddens argues, however, that agency does not determine the production of structure due to the "unacknowledged conditions" and "unintended consequences" of intentional action; this emphasis on "mutual shaping" can be seen as offering an alternative to technological or social determinism (Pozzebon and Pinsonneault, 2001; Rose et al., 2005).

Structuration theory has attracted much attention in the IS literature (Jones and Karsten, 2008). Early structurational approaches to studying technological change have shifted the focus from technologies causing organisational change and new structural forms towards treating technology as an "occasion" for structuring (Barrett et al., 2006). For example, Barley's (1986) study of the introduction of identical CT scanners into the radiology departments of two different hospitals showed very different social processes and organisational outcomes. Barley found that, based on different initial cultures and structures, the introduction of the scanners had divergent impacts on the interactions between the individual members of two occupations: radiologists and technologists. In one department, the relationship changed to become more collegial and cooperative; in the other, it changed to become more centralised and hierarchical. Barley's work advanced our understanding of the complex technology-organisation relationship by tracing the relationship between action and structure over time, and how technology was related to new ways of working at the action level - which was related to changes in structure.

In the field of Information Systems, there have been two notable attempts to develop IS-specific versions of structuration (Jones and Karsten, 2008). These are Orlikowski's (1992) duality of technology and DeSanctis and Poole's (1994) adaptive structuration theory (AST).

Orlikowski (1992) proposes a 'structurational' model of technology that emphasises the "interpretive flexibility" of technology in organisations. Technology is inherently social, in the sense that it is physically and socially constructed by human action. This interaction between people and technology is ongoing and dynamic, and thus, technology is both shaped by and shapes human action (the duality of technology). In this formulation, the focus is placed upon technology's use, which becomes a constitutive feature of organisational structure (Leonardi, 2013a, p.64).

DeSanctis and Poole (1994) introduced Adaptive Structuration Theory (AST) to support the study of IT effects on organisations. In assessing which aspects of technology may be consequential, AST considers the mutual influence of technology and social processes. AST's authors considered the interplay between the social

structures embedded in technology and the social structures in action. The social structures embedded in technology were characterised in terms of the two concepts of structural features and spirit. Structural features are "specific types of rules and resources, or capabilities, offered by the system", while spirit is "the general intent with regard to values and goals underlying a given set of structural features" (DeSanctis and Poole, 1994, p. 126). The authors argue that the embedded structures and human agency interact in practice, leading to a variety of appropriations of the tchnology.

The use of Giddens's ideas continued to take a considerable space in the IS literature either by citing Giddens directly or by applying the IS-specific developed versions - AST and the duality of technology. More recently, Orlikowski (2007, 2010; Orlikowski and Scott, 2008) introduced the notion of 'sociomateriality' which has also gained popularity amongst IS scholars (e.g. Cecez-Kecmanovic et al., 2014). By this concept, it is argued that the social and the technical do not exist as separate and self-contained entities, but are inherently inseparable. As Orlikowski (2007, p.1437) put it: "*the social and the material are considered to be inextricably related — there is no social that is not also material, and no material that is not also social*". In this concept, materiality might be a property of a technology, and practice becomes the space in which the social and the material are constitutively entangled (Orlikowski, 2010).

For the purpose of this research, all these variants subscribe to some sort of ontological inseparability, and thus are treated as structuration-based foundations for the study of IT-organisation.

2.3.3.2 Actor-Network Theory

Another relatively popular theory in the IS literature has been Actor-Network Theory (ANT) (Walsham, 1997; Hanseth et al., 2004). ANT is concerned with conceptualising and investigating the social phenomenon as networks of entities. These entities may include humans, technologies, organisations, institutions, but are all treated in an equal stance. In this way, ANT's proponents affirm that the question of agency and structure is insignificant. Rather, the task for social analysts is simply

to explore networks, providing rich descriptions of their development and operation (Law, 1999 cited in Mutch, 2002, p.484). In this sense, the theory dissolves altogether the borders between action and structural conditions. In terms of technology, ANT calls upon a symmetrical approach to humans and things. In this way, ANT contends that people and artefacts should be analysed with the same conceptual apparatus. Here, the concept of agency is not limited to human actors, but is extended to non-human "actant"s. ANT theory examines the motivations and actions of actors/actants that form elements, linked by associations, of heterogeneous networks of aligned interests.

The value of ANT in studying technology in organisations lies in its direct treatment of technology (Hanseth et al., 2004). In studying technological change in organisations, ANT reveals different aspects of change. For instance, Hanseth and Braa's (1998) study of the implementation of an ERP system in a company, speak of the system as an independent actor. ERP is introduced and controlled by managers and IT personnel, but is also an actor shaping its environment as well as its own future. In the authors' view, ERP, like any actor, is building alliances with others. However, the alliances might change over time. In their study, ERP was first allied with top management, playing the role as a powerful change agent. Later on, ERP was allied with local managers and users, helping them in bringing the process and pace of change under their influence. Towards the end of their study, having become installed and integrated into the company's technical systems and networks, ERP was allied with the corporate's infrastructure. As such, it had become everybody's enemy by constraining further organisational changes. Other notable researchers that have utilised ANT theory in their empirical work include Walsham and Sahay (1999), Braa et al. (2004), and Mathiassen and Nilsson (2008).

2.3.4 Structuration and ANT: Limitations

Both Structuration Theory and ANT have offered fresh understandings of technology in organisations that are grounded in processual analyses. Structurational concepts have highlighted the nature and influence of human agency in technological development and use, and have emphasised the critical role of humans in shaping the

consequences of technology's use in organisational life. Likewise, ANT has offered an explicit way of conceptualising technology as one of the "actors" in the actor-networks. In this way, ANT theory contributed by offering insight into how technology can be an autonomous and political actor in the process of organisational change. Despite these contributions, Structuration theory and ANT have been criticised for their problematic handling of agency in the IT-organisation relationship (Mutch, 2002; Rose et al. 2005).

In structuration theory, agency relates exclusively to human actors. Structure denotes the set of rules/resources which normatively govern social action, but which, for Giddens, has no existence or causal powers apart from processes of structuration. As such, structure only exists in the moment of instantiation, as traces in the human mind. Archer (1995) points to this view of the structure-agency relationship as a major defect that severely limits their utility in practical research. If structures cannot be separated from actions and their agential properties, Archer says, then there is no possible autonomous reflexivity (and agency), because actors can conceive of structure, and try to change it, only if it is external to them.

In structuration-based IS studies, the analysis is mostly confined within specific institutional settings, focusing on the micro-level interactions of actors. This is seen to be problematic due to the overemphasis on actors' 'agential knowledgeability' (Mutch, 2010), and the neglect of the influence of the broader institutional influences (Jones et al., 2004; Jones and Karsten, 2008).

With regard to the treatment of technology, structuration theory's conception of technological artefacts as 'allocative resources' - which influence social systems only when incorporated in practice - is seen to be problematic. This conceptualisation, according to Mutch (2010), leads to underestimation of the material properties of different forms of technology and the degree to which aspects of structure are inscribed into such properties.

According to the terms of ANT, technological artefacts are treated symmetrically to those of humans, and as equivalent participants in a network of human and non-

human actors. As such, ANT downplays the distinction between structure and agency, putting technology on the same footing as individual actors. This view is seen to be problematic, because humans and machines have different agential characteristics (Rose et al., 2005). For example, qualities such as "purpose" and "will" cannot be attributed to the nonhuman (Rose and Jones, 2004).

Therefore, while ANT acknowledges the material aspects of the technology much more readily than does structuration theory, its conflation of agents and structures reduces its capacity to examine how technology mediates change in organisations (Mutch, 2002). Other scholars have pointed to the primarily descriptive, rather than explanatory, nature of the theory (Kaplan, 1991, Walsham, 1997). For Mutch (2002), this is an inherent feature of ANT, primarily because *"it fails to escape (and indeed, does not wish to escape) from the level of process"* (Mutch, 2002, p.483). In this regard, the process of change is divorced from the historical dimension and broader social context of action (Whitley, 1984 cited in Mutch, 2002, p.484). Moreover, an approach that examines action at only the micro-level fails to attend to the relatively enduring institutionalised relationships that constitute structure and constrain agency (Reed, 1997).

2.4   Summary and Conclusion

This chapter has tackled two main issues of prime importance to the study of IT and its associated organisational consequences. In the first part, the different perspectives on organisational change have been discussed, explaining their philosophical stances, highlighting their contributions, and indicating their limitations. This first part was concluded by demonstrating the utility of an emergent, processual view of how IT is appropriated and thus implicated in organisational change. The second part delved into the characterisation of agency as advocated in a number of the major streams in IT research. It then alluded to the challenge in the conceptualisation of the relationship between different entities (Agency, Structure, Technology) in two of the major processual theories that are being utilised in studies of IT in organisations.

The following chapter will discuss how the existing literature on the implementation and use of IT in work organisations have dealt with the issues depicted in this chapter.

CHAPTER 3

STUDIES ON IT IMPLEMENTATION AND USE

3.1   Introduction

The literature on IT implementation in organisations is widely dispersed and complex. This chapter will attempt to provide a useful review of the major perspectives in this literature. A large number of IT implementation studies have tried to identify factors that are related to implementation success and failure (e.g. Nah et al., 2001; Hong and Kim, 2002; Al-Mashari et. al., 2003). Despite the prevalence and relevance of such studies, factor models have little to offer in terms of deep understandings of the implementation processes. Introducing advanced information systems in organisations is different from the introduction of a neutral material artefact. Some of the differentiating characteristics include the necessity to continually upgrade hardware and software. Also, embedded within information systems, working practices that are based on assumptions of, for instance, minimising employment, maximising automation, or modifications on roles and relationships (Westrup, 2000). Understanding of these features, and other characteristics which might be only discovered in the process of implementation, represents a primary concern to the current study. Therefore, in order to concentrate on those issues most beneficial to the theoretical approach of this research, this review will concentrate only on process-oriented accounts of IT implementation in organisations. These accounts are presented in three broad categories based on the main focus of the processual analysis. The first part of the review concerns those studies that adopt a focus on the role of human agency in processes of IT adoption and use. The second part will highlight other studies that tend to contextualise local organisational processes by attending to

inter-organisational, cultural, and institutional backdrops. Finally, the third part of the review will highlight those studies that have devoted special attention to the materiality of the technology in IT studies. It is noteworthy that, in some instances, one view may well acknowledge the others, but essentially subsumes this into the main assumed perspective. These categories are discussed in the following sections, offering illustrative examples of each line of research.

3.2 Agency-centred Perspectives

Agency-centred scholarly work have sought to offer understandings of issues of IT implementation and appropriation by focusing on the local interpretations and actions at users' level and within an organisational setting. The focus of this line of research has been on how individuals' attitudes about and interpretations of technology can shape patterns of appropriation. In this way, users of the technology are viewed as active agents, who can exercise their discretion to enact IT systems in a multiplicity of ways that do not necessarily matches the prescriptions of their managers or the technology's designers. This stream of research tends to adopt an interpretive stance to analysis actors' practices in relation to IT implementations in specific organisational settings.

In a well-cited paper, Orlikowski (2000) has developed a practice lens that uses "enactments" as a means to examine the emergent adaptations to IT use. The practice lens emphasises human agency and social interpretation as users enact technologies in light of their local experiences and needs. These emergent enactments (or technology-in-practice) offer explanations for the variety of observed outcomes from the use of information technologies in organisations. Orlikowski uses her technology-in-practice model to examine users' engagement with groupware technology in three organisations; the original IT company that designed and developed the technology (Iris), a large consulting firm (Alpha), and another large software company (Zeta). The analyses of how the technology was used identifies a series of different types of technology-in-practice across the three sites—one in Iris (a 'collaboration technology-in-use'), three in Alpha (a 'collective problem-solving' form among technologists, a 'limited-use' form among most consultants, and an 'individual productivity' form

among a minority of consultants) and two in Zeta (a 'process support' form and subsequently an 'improvisation' form among support specialists). The case study analyses demonstrate that the same technological artefact can be enacted differently across and within organisations.

Further published work that built on Orlikowski's (2000) manifesto have extended the framework by exploring the various forces that shape enactments and by refining the perspective's initial claims in light of further empirical evidence. For instance, Vaast and Walsham (2005) have shown how to treat schemas and frames and the intentions of designers and mangers as elements of the situation out of which patterns of practice emerge in the course of a technology's use. Also, Dery et al. (2006) have illustrated the significance of organisational factors in shaping how users enact technologies. In their case study, the researchers examined the ways in which branch managers in a large bank chose to enact an enterprise system after it had been implemented. Their findings suggest that users enacted the same technology in different ways due to differential impact of organisational factors, such as the character of the managerial function at the branch and organisational strategy in relation to the adopted system.

Other published work drew attention to how users' practices may shape the consequences of IT adoption. For example, Bondarouk (2006) analysis of three cases of IT implementation underscores the role of users' interactions in speeding up, slowing down or even terminating an IT implementation project. Through these interactive processes, which are named "group learning", the users of the system develop their understanding of an IT system, communicate their interpretations, and then reach, either explicitly or implicitly, a mutual decision on the use of the IT system. Similarly, Constantinides and Barrett (2006) highlight the role of actors in terms of legitimising and building commitment in IT projects. However, their study points out to the presence of conflict and negotiation amongst actors when opinions and preferences differ on how technology should be used. Their findings suggest that pre-existing power relationships affect how technology is put into practice.

Furthermore, some studies show that even in the face of the most apparently constraining technologies, human agents can exercise their discretion to shape the

effects those technologies have on their work. For instance, Boudreau and Robey (2005) report an interpretive case study of an ERP system after its implementation in a large government agency to replace a legacy financial information system. Drawing on Emirbayer and Mitch's (1998) temporal concepts of human agency, the study reveals that agentic discretion is reflected in two distinct enactments identified over a period of time. The first form of enactment is inertia, where technology is used to retain existing work patterns. The other form of enactment is reinvention, where the actors came up with work practices that allow them to accomplish their tasks using the new system. The transition from one enactment to the other is explained by the concept of improvised learning. Despite their focus on human agency, the authors also see a role for influences from project leaders and peers on individual enactments. The revealance of some situational issues in agency-centred explanations might have been served by the authors' use of Emirbayer and Mische's (1998) human agency theory, which whilst focusing on agency, preserves spaces for the context of action. This tendency is also echoed in another study of the usage of an online learning system by the employees of a Taiwanese hospital (Chu and Robey, 2008). This study attributes a decline of usage of the system to the agentic choices of the hospital's nurses and druggists. However, the choice to minimise their use of online training was traced to professional norms that valued traditional learning practices of sharing experiences among peers over online learning.

Despite their value in serving the purpose of defining the role and effects of agency, such perspectives are accused of being contextually underdeveloped, leaving nearly all contextual actors and factors off the analysis (Lamb and Kling, 2003). This approach potentially marginalises the role of both broader contextual aspects and technological features as enablers and constraints on human action (Leonardi, 2013b).

3.3   Contextualised Approaches

This broad stream of the literature on IT implementation shares a common feature that it pushes past an individual level of analysis. Such studies probe contextual circumstances that might shape the implementation and use of IT systems. This type of research, however, varies in terms of the boundaries of the context they consider.

One category is organisation-oriented research, focusing on the implementation of new IT systems in established organisational contexts. Another category is that which employs a wider scope, extending beyond the single organisation and includes aspects of the organisation's external environment.

IT implementation studies that concerned mainly with the organisational level have employed varied theoretical apparatuses, and have considered a wide range of issues. An illustrative example of this category is structurational analyses of IT by authors such as Orlikowski, (1992) and Walsham (1993). These types of research explored and offered insights on the processes through which IT systems are shaped under the influence of internal social relations, and also how they contributed to the shaping of these relations.

Other illustrations include research that explore issues of organisational culture, power, and managerial role in the study of IT implementations. A noteworthy study in this direction is that of Markus (1983), who explored how organisational politics drove the dynamics of implementations. He has also argued that the new introduced technologies are likely to produce changes in the power balance within the workplace setting.

Another study by Bingi et al. (1999) suggested a number of organisational issues as influencing IT integrated systems' implementation. These issues include commitment from top management, reengineering of the existing processes, integration with other information systems, selection and management of consultants and employees, and training of employees on the new system. In a similar organisational-focused study, Cabrera et al. (2001) concluded that successful implementation projects require the alignment between organisational culture and the behavioural requirements of the system.

Although such studies mark an increasing recognition of the context in IT studies, the value of a wider scope of analysis has been repeatedly stressed upon. Scholars like Walsham and Sahay (1999); Avgerou (2001); Orlikowski and Barley (2001); Lamb and Kling (2003), and Currie (2009) have all called upon researchers to attend to

inter-organisational, cultural, and institutional contexts. Thus the attention is directed to the importance of embedding agency in the broader institutional and organisational settings (Mutch, 2010).

Studies that attempted to contextualise the IT phenomenon in organisations made use of a number of theoretical approaches to highlight the role of broad contextual influences on IT adoption and use. The role of history and culture in informing IT adoption practices is illustrated in Pozzebon and van Heck's (2006) study of the local adaptations on a global IT-application. Using concepts drawn from studies on cross-cultural implementations, and IT-based organisational change literature, the authors scrutinised the nature and extent of local adaptations on a Dutch auction system that was implemented in a Brazilian organisation. Their findings revealed mutual adaptations between local contexts and global principles. IT-driven modifications on local business processes were paralleled with changes on the features crafted into the system. Their analyses suggest that the influence of the Dutch immigrants and their descendants was critical for taking local, contextual requirements into account without neglecting the imported knowledge. This mutual influence was further enabled by the Brazilian culture of recurrent improvisation. Another illustration of the role of history and culture is found in the study by Xue et al. (2005) who examined ERP systems implementation problems in five Chinese companies. Their analyses of the five cases revealed several socio-cultural features that hindered the implementation and use of the systems. ERP implementation failures were found to be also related to the differing evolution paths of ERP systems amongst the vendor Western companies and the adopting Chinese organisations.

The role of contextual influences is also found in Bada's (2000) study of IT use within Nigerian banking system. The study revealed that the researched banks were involved in non-local and vertically structured relationships, with consequences on their IT-related projects. In one instance, the implementation of IT systems was hindered because the technology development plans of one of the studied banks were tied to the dictates of a foreign partner. Only after these ties had been severed, computerising of the bank's services saw notable improvements.

The foregoing examples illustrated how research on IT implementation adopt a broad contextualist analysis that focuses on the situated practices, and consider the history of emergent changes, as they are shaped by the organisation's wider context. Other researchers, however, opted for particular theoretical lenses to contextualise IT studies. One of the influential theoretical approaches in this stream of research is the institutional theory (Meyer and Rowan 1977; DiMaggio and Powell, 1983; Scott, 2001). In general terms, the (neo)institutional theory conceptualises how structures become established as norms and guidelines for social behaviour. The call by Orlikowski and Barley (2001) was significant in encouraging institutional approaches as a means to develop a more structural and systemic understanding of how technologies are embedded in complex interdependent social, economic, and political networks (Currie, 2009; Mignerat and Rivard, 2009).

Studies on IT implementation focused on different aspects of institutional theory. A large number of studies (Mignerat and Rivard, 2009) examine how institutions affect organisational decisions in relation to IT implementation (e.g., Thatcher et al., 2006; Son and Benbasat 2007; Noir and Walsham, 2007). These studies are inspired by the conceptualisation of DiMaggio and Powell (1983) who identified three distinct institutional pressures (coercive, normative, and cognitive) stemming from the broader environment of an organisation, and leading to structural similarity. Liang et al. (2007) argue that these institutional pressures impact the implementation and assimilation of IT systems by providing institutional norms that guide organisational action.

For example, the study by Thatcher et al. (2006) has shown how IT implementation projects are prompted by coercive and normative pressures. Their study suggests that organisations influenced by institutional pressures may find poor fit between the implemented IT systems and their particular needs. In such a case, IT systems are not perceived as useful, leading to less use, and therefore resulting in wasted effort and resources for the organisation. Similarly, Noir and Walsham (2007) have examined the use of information systems in a healthcare setting, and have exposed the "ceremonial" use of IT in contrast to the traditional technical role that most see IT fulfilling. Their observations include users submitting faulty or inaccurate data in

reporting procedures if more accurate data are feared to give bad impression on their work.

Another common use of institutional ideas is to examine the interaction between IT and institutions (e.g., Gosain, 2004; Soh and Sia 2004; Sia and Soh 2007). The main lesson from these studies is that IT strategies and use of technology are facilitated when aligned with institutional dynamics, but face difficulties when in conflict with them (Christiaanse and Huigen, 1997). In a study of ERP implementation, Gosain (2004) argues that mismatch between "institutional logics" in the system and the incumbent institutional logics in the organisation can lead to resistance against the new enterprise system. Other researchers discuss misalignment between enterprise systems and the organisation. Soh and Sia (2004) identify the industry as a source of misalignment between an organisation and its packaged enterprise systems. Sia and Soh (2007) further suggest that these misalignments can arise from incompatibility in the structures embedded in the organisation and package, as well as from differences in the way the meaning of organisational reality is ontologically represented in the structure of the packages.

The contextual view on IT implementation and use spans a wide analytical space, and presents a variety of sources of contextual influences, from both within and beyond the organisational boundaries. Nevertheless, in such approaches, organisational actors are sometimes depicted as passive recipients using readily available scripts provided by institutional carriers (Fligstein, 2001). These approaches are encouraged to consider the capacity of humans to intervene in the flow of events, and to include a role for active agency (Greenwood and Hinings, 1996).

3.4 Technology-sensitive Perspectives

In response to concerns that the specific instrumental identity of information technology is grossly under-theorised (e.g., Orlikowski and Iacono, 2001; Kallinikos 2002; Zamutto et al., 2007), IS and organisational scholars have shown a renewed interest for studying the material properties of technologies as a means to identify the distinctive contribution they make in shaping organisations. This renewed attention to

the materiality of technology does not necessarily imply technological determinism (Leonardi and Barley, 2008). Whilst determinism holds that actions are caused by technology and other external forces. Materialism aspires to pay analytic attention to a technology's material constraints and affordances. The issue of materiality and its consequences on IT use have been approached in varied ways using different conceptual tools .

For example, some scholars have used the idea of *material agency* (Pickering, 1995; Jones, 1999). Material agency is defined as "*the capacity for nonhuman entities to act on their own, apart from human intervention*" (Leonardi, 2011, p.148). This view is common in actor-network analyses, which consider people together with their technologies as comprising social networks. In this sense, technology itself is deemed to exercise a form of agency. For instance, Askenas and Westelius (2003), based on a case study of ERP use in an ABB company over a decade, five different roles played by the ERP systems were identified. The ERP systems acted as Bureaucrat, Manipulator, Administrative assistant, Consultant or were dismissed (Dismissed) in the sense that intended users chose to avoid using them.

Another attempt in this direction is presented by Kallinikos (2004b), who describes technology as a system that has "*essential characteristics which remain beyond the reach of the negotiating and reshaping capacity of local contexts and situated agents*" Kallinikos (2004b, p.266). In his view, the role of technology is reflected in the dual strategies of *functional simplification* and *closure* by which technology admits but also controls and regulates human participation. Failure in technology implementations suggest these strategies are incomplete, and that technological systems differ in terms of how well these strategies are organised and implemented.

Another fairly new approach takes a different route by conceptualising the role of technology through the lens of "affordance" (e.g., Markus and Silver, 2008; Faraj and Azad, 2012; Robey et al. 2013). The affordance concept has recently gained popularity amongst IT scholars, and thus deserves an extended explanation.

The concept of affordance has its roots in the work of Gibson (1986) in ecological psychology to refer to what is offered, provided, or furnished to someone or something by an object. Hutchby (2001) has first imported this concept for studying the complex relationship between technologies and the actors. Affordances are described as emerging from the relation between IT systems and organisation systems (Zammuto et al., 2007). The utilisation of the concept in IS research is inconsistent. Primarily, the variation in the use of the concept is relates to its ontological position; whether affordances are properties of an object, or perceptions of the user, or alternatively are properties of the relationship between an object and an actor. Volkoff and Strong (2013) note that most affordance-based IS research has focused on how different visual prompts support perception of affordances. Markus and Silver (2008, p.622) chose the term "functional affordances" and define them as *the possibilities for goal-oriented action afforded to specified user groups by technical objects*. In this understanding, an analytical distinction is made between affordances and material properties. The later represents the particular arrangement of physical substances, which persists across contexts (Leonardi, 2012). Material properties do not constitute affordances themselves; affordances represent the relationship between the technical object and the user (Markus and Silver, 2008).

This concept, however, is distinct from the term "technology-in-use", coined by Orlikowski (2000) to refer to the situated and patterned interactions of a technological artifact and human action, because technology here is assumed to be inseparable from (i.e. has no ontological existence apart from) the ways in which people and organisations use it. In affordances, it is the actors, influenced by the specific circumstances they face, who grants meaning to the physical environment. Thus, an ERP system implemented in a resourceful organisation may develop into different practices and organising than would the same system implemented in a resource-poor organisation possessing little experience with IT.

The notion of affordance has been utilised in a number of IT implementation studies (e.g., Leonardi, 2011; Majchrzak et al., 2013, Volkoff and Strong, 2013). For example, Majchrzak et al. (2013), using this theoretical device, identified four affordances whereby social media support intellectual capital creation. One of the

affordances mentioned is "metavoicing", described as the potential for individuals in an online social collective to provide feedback on online content.

Technology-sensitive perspectives are characterised by their zooming on the properties of technology, which lead to the development of specialised knowledge useful to the IS profession (Avgerou, 2001). However, technology-focused studies are still lacking in addressing non-technology mechanisms (e.g, Volkoff and Strong, 2013), and thus provide incomplete explanations of organisational phenomena associated with IT implementation.

Another challenge facing researchers adopting these theoretical devices is the ambiguity and controversy related to their ontological status (Markus and Silver, 2008; Volkoff and Strong, 2013), or what is sometimes called the "problem of agency" (Rose et al., 2005). This last issue is of prime importance to the current research, as has been explained in the previous chapter. To address the shortcomings identified above in treatments with technology, there have been calls to apply the philosophy of Critical Realism to study technology in organisations (Dobson 2001; Mutch, 2002, 2010, 2013; Mingers, 2004; Volkoff et al., 2007). Critical realism is a philosophical project that is most associated with Roy Bhaskar (1978), whose point of entry into philosophy was a critique of both determinism and constructivism. (For a detailed exposition of the basic tenets of this philosophy, see Mingers et al, 2013, p.795-797).

An illustration of how this philosophy might be put to work is found in Volkoff et al.'s (2007) study of IT-associated organisational change. Volkoff et al. (2007) have introduced the concept of *technological embeddedness* to explain the relation between IT implementation and organisational change. For the authors, this concept describes "*the way in which technology introduces a material aspect to organisational elements*" (Volkoff et al., 2007, pp.843). Their study further suggests these material aspects can enable and constrain human action, without determining how humans would react. The material aspect of the technology could be tightly integrated, thus limiting users' choices, or it could be flexible and optional in use, resulting in fewer constraints on users.

3.5 Alternative Approaches

It can be concluded from the review of existing literature that there is a dearth of research that equally attend to issues of agency, technology, and the wider context in studying IT adoption in organisations. Studies that focus on local organisational processes are criticised of paying little attention to institutional forces emanating from the societal and inter-organisational levels. By the same token, other studies that attend to the macro level as a unit of analysis seem to underplay the role of individuals in shaping their organisational environment.

Orlikowski and Barley (2001, p.158) contend that IT research would benefit from embracing *"the importance of simultaneously understanding the role of human agency as embedded in institutional contexts as well as the constraints and affordances of technologies as material systems"*. In a similar account, Currie (2009, p.76) maintains that *"information systems research will be more influential across the management disciplines and in the practitioner community if it contextualises the IT artefact within a framework of powerful environmental, intra-organisational and agency influences"*. These quotations reflect an increasing recognition of the need to investigate the interconnection of levels of analysis in IT studies. A multi-level framework is assumed to be facilitating a better understanding of information systems in organisations (Svejvig, 2009).

The theoretical options for such a quest revolve around general sociological theories which can be thought of as connecting multiple levels from society down to the individual. These include Giddens' structuration theory and actor-network theory. The utility and limitations of these two theoretical approaches have been discussed in the previous chapter. Theories which derive directly from the IS field itself are less common (Walsham and Sahay, 2006). An alternative approach, therefore, would be to adopt a multi-theory conceptual framework. This methodological approach is found to be scant in the literature surveyed. One of the studies that sought to follow this approach is Jensen et al. (2009). Jensen et al. (2009) juxtaposed institutional theory with the theory of organisational sensemaking to add focus to the details of local

practices and the human agency that inform and respond to institutions in IS implementation.

For the purpose of this research, the study of IT appropriation and its associated organisational consequences demands a theoretical framework that avoids ascribing agentic characteristics (or causal powers) to social structures or technology, while still facilitating the study of IT role and institutional effects. At the same time, conceptualisation of human agency needs to allow for assessment of micro level agentic processes and for how these are informed and shaped by technological and contextual conditions. This way of approaching the phenomenon of IT in organisation is assumed to be best served by the theoretical ideas of Emirbayer in his relational sociology perspective (Emirbayer, 1997), and in the temporal-relational view of agency (Emirbayer and Mische, 1998). In order to attend to the specific role of technology in the appropriation processes, this relational approach is combined with critical realist conceptualisation of technology.

3.6   Towards a Relational Approach

The foregoing discussions and observations mean that our understanding of the processes of IT appropriation could be advanced by advocating a multi-level, processual approach. In order to address the problematic handling of agency in such an endeavour, some scholars (Mutch et al. 2006; Delbridge and Edwards, 2007; Delbridge and Edwards, 2013) have called upon a relational sociology approach (i.e. Emirbayer, 1997, Emirbayer and Mische 1998). The argument put forward in this call is to conceive of organisation as situated processes, rather than as entities. As situated processes, the attention -during the action analysis stage- is placed upon the context, recognising that actors and structures are in continuous processes of negotiation and accomplishment. This view is useful for studying users' engagement with technology in multifaceted organisational settings.

This approach is advocated in this research, and seen as useful due two main reasons (Mutch et al., 2006; Delbridge and Edwards, 2007):

- It presents a clearer appreciation of the connections between agency and structure, where agency and structure are held apart to explore the natures of both and the relationship between their unfolding development over time.
- It offers new insight into a variety of agentic orientations (to the past, present and future) that can provide a clearer purchase on the role of agency in processes of continuity and change.

Table 3.1 - **Relational analytical framework***

Structure	Contextual structures vary in their depth and power; they are multi-dimensional. Structure reproduction is not fixed
Agency	Agency can be understood in terms of orientation to the past, present, and future. How agents connect with their environment is informed by perceptions of the historical and local realties at a given moment. Agency has both intentional and unintentional outcomes.
Technology	Technology is understood to be part of the structural conditions of agency. Technology is not a structure in its own right, but is one of the ways in which structures are mediated. It operates through the inscribed features into technology at a number of levels.
Level of Analysis	Social structures are inter-relational and multi-layered. They both mediate and are the outcome of action. The transformational influence of agents is related to their actions, the embeddedness of the social structure and historical setting.

*Compiled from Delbridge and Edwards, 2007; Volkoff et al, 2007; and Mutch, 2010

The position of technology in this conceptualisation is inspired by the philosophy of Critical Realism in the field of Information Systems (i.e., Mutch, 2002, 2010, 2013; Volkoff et al., 2007; Mingers et al, 2013). Critical Realism (CR) conceptualisation of technology is seen as ontologically compatible with the advocated relational perspective (see Chapter 4.3 for further discussion). In CR, technology is relatively independent, and the role of technology in organisational change is conceptualised as part of the structural conditions that agents encounter. Using this perspective allows the conceptual space required to study the interplay between technology and human agents, and to examine the mechanisms through which agents affect technology, and

technology conditions actors' options (Volkoff et al, 2007, p.835). For Mutch (2010), technology operates by virtue of inscribed features at a number of levels. This disaggregating of technology into levels and features enables analysis to be specific about the materiality actors are engaged with, and also to explore the specific impacts of particular technical combinations (Mutch, 2010, p. 508). This brief introduction to the proposed relational analytical framework is summarised in Table 3.1.

3.7   Summary and Conclusion

This chapter has briefly presented major streams of the existing research on IT implementation and use. The agency-centred perspective tend to focus on local actors' interpretations and practices, and their role in the shaping of the process of IT implementation and outcomes. The review then turned to those studies which attempted to contextualise local practices in the wider context within which organisations operate. This review, then, highlighted the emerging concern with the properties of technology as a viable influence on IT appropriation patterns. The review then looked at theoretical options available to mitigate the limitations of different approaches. The relational approach was then proposed and briefly outlined. The next chapter will explain in detail the theoretical lens of the current research.

CHAPTER 4

CONCEPTUAL FRAMEWORK

The previous two chapters have reviewed some of the critical issues and main streams of research on IT in organisations. This review was concluded by illustrating the value of a relational approach in studying the process of IT implementation. In order to set the stage for the analysis and assessment of the case, the proposed conceptual framework is thoroughly presented and developed in this chapter.

4.1   Introduction to the Relational Sociological Approach

Relational thinking has proliferated in a wide range of intellectual fields (Mische 2011). The relational approach employed in this research is primarily based on the work of Mustafa Emirbayer (1997) in the "Manifesto for a Relational Sociology", and the relational theory of human agency (Emirbayer and Mische, 1998). The relational sociology perspective detailed in these two widely cited articles is an expression of the relational turn in American sociology in the 1990s. Termed by Mische (2011) as "The New York School" of relational sociology, amongst its prominent theorists are Andrew Abbott (1988; 1995), Charles Tilly (2004; 2006), and Harrison White (1992; Mische and White, 1998). (Please refer to Mische (2011) for a detailed analysis of the emergence and development of this school of thought).

At its broadest sense, relational sociology investigates social life by studying social relations. The particular strand of The New York School of relational analysis proposes a theoretical agenda where the performance of social relations come to the fore of analysis as a means "*to overcome stale antinomies between structure and agency through a focus on the dynamics of social interactions in different kinds of social* settings" (Mische, 2011, p.1).

Drawing on a range of philosophies as well as historical and network analyses, Emirbayer (1997) develops a critique of "substantialist" approaches to social analysis which focus on actors or structures of certain social phenomenon. He calls instead for a "transactional" approach focusing on the dynamics of relations that transcend individual actors (humans, groups, societies, etc.).

Citing Dewey and Bentley (1949), Emirbayer (1997) further explains the transactional approach in comparison to two key categories of substantialist worldviews. Those are "self-actional" and "inter-actional" views of social behaviour. The notion of self-action lives on in various forms. In one form (individualism), it posits that the elementary unit of social life is the individual human action (be it rational-choice or norm-following action). In another different form (structuralism), the idea of self-action posits that not individuals but self-subsistent societies, structures, or social systems are the exclusive sources of action. The second category of substantialist approaches is that of inter-action. This particular approach, which is sometimes mistakenly confused with the transactional approach, takes various entities into analysis, and pursue to examine their interaction. Each entity is independent of the existence of the others, and remains fixed and unchanging throughout such interaction. According to Abbott (1988), interactional approaches still cannot take all the dynamics related to how entities interact, precisely due their variable-centred method, which separates entities from their contexts and relations. When imported to organisational studies, these theoretical positions have led large parts of IT implementation research to be inclined to either a micro or macro perspective without depicting the dynamic relationships between technology and other actors within and beyond the organisation.

In a fundamental opposition to these varieties of substantialism, the relational approach sees the "transaction" as the unit of analysis, not entities isolated from their inter-relations. Entities gain their being while interacting in the relations and not because of their independent original existence. The units involved in a transaction derive their meaning, significance, and identity from the "changing" functional roles they play within that transaction (Emirbayer, 1997). Similarly, Tilly (2004) uses the concept of "transaction" and argues that transactions, interactions, social ties and

conversations constitute the basic stuff of social life. As a consequence, the relational approach to social action calls for the shift of analytical focus from the subjects and their interactions to the dynamic, unfolding process of the interaction itself, which necessarily involves entities at multiple levels.

The present research focuses on how organisational members engage with an authoritatively imposed technological change in an organisational setting that is characterised by numerous and sometimes conflicting stakeholders' expectations. In this sense, the relational approach provides a novel way to explore how organisational contexts and organisational members influence each other and are influenced in turn. Consequently, a relational approach could address effectively the complexities of the relationships between the units at different levels of analysis and offer a compelling understanding of the implications of technology in organisation.

4.2   Relational View of the Structure-Agency Relationship

A relational sociology approach, as outlined by Emirbayer (1997), seeks to focus sociological analyses on issues of context and process, with an aim to develop explanations without resorting to structural determinism or voluntarism. As such, there is a concern to emphasise agency within explanations, but also to place agential action within their structural contexts (Mutch et al., 2006). Accordingly, the relational approach provides a situated and contextualised account of organisational action, and examines the relations between structures and agency on agential capacity (Mutch et al., 2006). This comes in contrast to Giddens' conceptualisation of agency, which is grounded in notions of knowledgeability, and confined to micro-level interactions.

This view is important because organisational consequences of IT ultimately rely on the engagement of organisational actors with the introduced technologies. In this way, the relational approach is sensitive to the interaction of structural conditioning and individual agency in terms of how technology is appropriated. Moreover, a relational approach is suited to studies of technological change introduced in complex environmental and organisational contexts, particularly due to the situated account of

the organisation it offers, acknowledging the role of contextual factors in shaping organisational action.

In a relational perspective, action is understood to be contextually embedded, where actors and structures are in a dynamic, unfolding process. Emirbayer (1997, p. 295) explains relational analysis as "*a sociology of occasions….that takes as its unit of analysis game-like, unfolding, dynamic processes*" like those seen in organisations undergoing change. A relational approach fosters a systematic and multi-layered analysis while accounting for temporal considerations. Emirbayer and Mische (1998) suggest defining agency as:

> "*the temporally constructed engagement by actors of different structural environments – the temporal-relational contexts of action – which, through the interplay of habit, imagination, and judgement, both reproduces and transforms those structures in interactive response to the problems posed by changing historical situations*" (p. 970).

This way of approaching the structure-action relationship offers an opportunity to better understand the process of IT appropriation. This improvement is due to two main features: firstly, it is sensitive to the interaction of IT implementation activities and employees' agency in terms of how technology is implemented and used, including an assessment of power relations; secondly, this approach acknowledges the importance of the wider external context in explanations of why actors pursue change.

Relational perspectives have been used in organisational studies to inform analysis of a wide range of organisational phenomena. For instance, Delbridge and Edwards (2008) offer an account of institutional change in the superyacht industry, explaining this change as ensuing from a variety of actions of multiple actors engaging with different institutional arrangements. Also, Edwards and Jones (2008) have utilised a relational approach to agency in examining the interplay between agentic orientation, social skill, and the wider context in understanding a failed attempt at institution building.

In the field of Information Systems, there are a few researchers who have picked up on Emirbayer and Mische's (1998) conceptualisation of agency. In particular, the ideas of agentic orientations have been utilised for the purpose of studying changes in work practices following IT systems' implementation (Boudreau and Robey, 2005); to explain the variations in patterns of technology use enacted by mobile technology users (Cousine and Robey, 2005); and to explain the change in work and learning practices that followed the implementation of an online learning system (Chu and Robey, 2008). These studies have highlighted the emergent nature of technology's implementation and use, by disaggregating agency into elements reflecting actors' multiple orientations, and by specifying a range of influences on action.

4.3   Relational View of Technology

Relational analysis involves closely observing agency whilst at the same time searching for explanation by examining the connected contexts which inform agency. In the case of studying organisational behaviour in relation to technology, it becomes warranted to attend to the specific role that technology plays in informing IT uses. A growing body of IS literature has begun to acknowledge materiality in organisational analysis (Volkoff et al., 2007; Zammuto et al., 2007; Leonardi and Barley, 2008; Mutch, 2010; Leonardi et al., 2012). Understanding IT implications requires explicitly recognising the material properties (Orlikowski and Iacono, 2001) that may prompt different interpretations and uses (Markus and Silver, 2008).

In order to understand how the material properties of technologies are interpreted and further shape different appropriations, the relational approach arguably offers an important way forward. To understand the implication of a relational approach in terms of the theoretical status of technology, the focus is placed upon Emirbayer and Mische's (1998) relational agentic orientation. This agentic orientation takes into account material conditions, because agency is "always agency *toward* something by means of which actors enter into a relationship with surrounding persons, places, meanings, and events" (Emirbayer and Mische, 1998, p.973, emphasis in original). It is exactly in this relational view of agency that technology can fit in most appropriately. Technology is considered another element of the conditioning scene

surrounding agency. It has neither a deterministic effect in and of itself, nor is it infinitely malleable to agentic interpretations.

As indicated in the previous chapter (3.6), this overall approach, preserving an ontological space between material artifacts and their social context of use, is consistent with a critical realist conceptualisation of technology, which maintains that the social and the material are interacting but ontologically independent structures (Mutch, 2013).

In this sense, it comes in contrast to Structuration-based approaches, in the argument that the social and the material are so deeply interconnected that it is not, even analytically, possible to separate them (Orlikowski, 2007). It also avoids ascribing agentic characteristics to the material in the way ANT does. From a relational perspective, technology has an autonomous presence, but the role of technology is formed by actors' engagement (or disengagement) with its conditions in different contextual environments.

The analytical framework based on this relational approach has the potential to advance our understanding of IT appropriation processes by simultaneously attending to the role of technology and broader structures in informing agency, while also maintaining the analytical distinction between these concepts (Delbridge and Edwards, 2013; Mutch, 2013).

4.4   Temporal-Relational View of Agency

Emirbayer and Mische (1998) argue that change or stability relies on an agentic orientation towards past, present and future. Given the temporal aspect of agency, it is possible to identify different ways with which actors engage with technology and structures. The adopted relational framework allows us to see actions and decisions in relation to the temporal and structural contexts within which IT is introduced and embedded, and therefore offers a formulation of agency that involves the capacity both to sustain structures and to transform them. Emirbayer and Mische (1998) state:

The key to grasping the dynamic possibilities of human agency is to view it as composed of variable and changing orientations within the flow of time. Only then will it be clear how the structural environments of action are both dynamically sustained by and also altered through human agency—by actors capable of formulating projects for the future and realizing them, even if only in small part, and with unforeseen outcomes, in the present (p. 964).

This view is useful in the context of studying IT appropriations because it allows to see how and why actors' appropriations of technology emerge, and shift from one state to another. Emirbayer and Mische conceptualised human agency as constituted of three elements or dimensions that enable actors to shape their responses to situations:

(1) The "iterational" element is linked to past practice, and refers to "*the selective reactivation by actors of past patterns of thought and action, routinely incorporated in practical activity, thereby giving stability and order to social universes and helping to sustain identities, interactions, and institutions over time*" (ibid., p.971).

(2) The "projective" element is oriented towards the future, and encompasses "*the imaginative generation by actors of possible future trajectories of action, in which received structures of thought and action may be creatively reconfigured in relation to actors' hopes, fears, and desires for the future*" (ibid.).

(3) The "practical-evaluative" responds to the demands and contingencies of the present, and entails "*the capacity of actors to make practical and normative judgments among alternative possible trajectories of action, in response to the emerging demands, dilemmas, and ambiguities of presently evolving situations*" (ibid.).

Emirbayer and Mische (1998) maintain that the classification of agentic orientations is based on analytical distinction, because all three of these constitutive dimensions of human agency are to be found, to varying degrees, within any empirical instance of action. This is why they speak of a "*chordal triad of agency within which all three dimensions resonate as separate but not always harmonious tones*" (p.972). This is

not to suggest that all three dimensions are always present in equal strength. In any given case, one or another of these three temporal orientations is displayed as the "dominant tone" as actors respond to the diverse and shifting environment around them. Therefore, in the context of this research, where the focus is upon practices related to IT implementation and use, it is possible to speak of use practices that are more (or less) engaged with the past, more (or less) directed toward the future, or more (or less) responsive to the present. Moreover, Emirbayer and Mische argue that each of these dimensions of agency has itself a simultaneous internal orientation towards past, future, and present. But they add that, for each analytical aspect of agency, one temporal orientation features as "the dominant tone", shaping the way in which actors relate to the other dimensions of time.

Another critical feature of the proposed human agency concept – one which is worth emphasising prior to putting this analytical device to work - is that the proposed conception of agency is fundamentally social and relational (Emirbayer, 1997). Here, agency is situated within different contextual environments, whereby actors' practices are moulded by surrounding structures and unfolding events. Similarly, agency entails actual interactions with its immediate context, highlighting the importance of inter-subjectivity, social interaction, and communication. Emirbayer and Mische (1998) state:

> *Agency is always a dialogical process by and through which actors immersed in temporal passage engage with others within collectively organised contexts of action* (p. 974).

This last aspect of agency - that agential experience takes form within inter-subjective systems - is particularly relevant in the analysis of IT implementation and use in organisations such as the present case. Scholars of technology and organisation have begun to call for interpretive studies to shift from social constructivism to social constructionism (Leonardi and Barley, 2008). Building on the research of Papert (1991), Leonardi and Barley (2008) use constructivism to refer to *"the cognitive processes by which people construct unique understandings and interpretations of the world"*. Constructionism, on the other hand, is treated as *"communicative acts in*

which multiple people, through their interaction with one another, make the world in common".

When applied to the analysis of the present study, the insight from Leonardi and Barley (2008) implies that the constructed meanings and orientations of a set of people or organisations are likely to converge to a common understanding of an experience, and hence they eventually come to share similar realities that they take as natural and necessary. This view of agency becomes particularly relevant when the focus of investigation is on the dominating practices within an organisational group or a category of employees (rather than perceptions of individual users) toward the use of technology. These features of the theoretical lenses, which offer an understanding of agency in an "inter-subjective mode", are reflected in the data assessment and evaluation process presented in the next chapters.

In order to examine how organisational members shift in their appropriation of the implemented IT system, it is important to establish an understanding of the agentic processes involved in the way actors respond to the evolving situations. For this reason, the following subsections will analyse the internal structure of the three elements of human agency according to the criteria set by Emirbayer and Mische (1998). This will entail outlining the analytical components of each element and defining the processes involved in the reproduction of the past, the projection of the future, and the practical evaluation of the present situation.

4.4.1   Iterational element of agency

In the iterational dimension of agency, the locus of agency lies in what Emirbayer and Mische refer to as the "schematization of social experience" (p.975). This is manifested in the actors' ability to recall, select and apply more or less tacit and taken-for-granted schemas of action that they have developed through past interactions. This does not suggest primarily habitual behaviour, but instead defines the way social actors engage with prior patterns or schemas of action. Consequently, the iterational element allows actors to sustain identities, meanings and interactions over time. Emirbayer and Mische distinguish between three different processes in the

ways in which actors orient themselves towards the past: *selective attention*, *recognition of types* and *categorical location*. To this they add *manoeuvre among repertoires* as a 'subtone' in the chordal structure of iteration. This best approximates the practical-evaluative dimension of agency and *expectation maintenance* that involves a "secondary" orientation to the future (see Table 4.1).

Table 4.1 – Components of the Iterational Element

Component	Description
Selective Attention	Actors selectively focus their attention upon a small part of the reality.
Recognition of Types	Actors identify familiar patterns within the emerging experience.
Categorical Location	Actors compose matrices of socially recognised categories of identity and value, and locate these typifications in relation to other persons, contexts or events.
manoeuvre among repertoires	a process of selection from practical repertoires of habitual activity
Expectation maintenance	Actors' knowledge of social relationships allows them to predict practices that could give continuity and stability

The *selective attention* component recognises that social actors are able to focus attention upon only a small area of reality. The locus of this attention is conditioned by knowledge from past collective experience, and consequently can single out the elements of response required to sustain a particular form of interaction. The *recognition of types* acknowledges that once attention has been focused upon this small area of reality, actors identify typical patterns of experience in an emerging experience and assimilate those new experiences to the old.

The *categorical location* component recognises that social actors not only identify similarities between past and present types of experiences; they also locate these typifications in relation to other persons, contexts or events within matrices composed of socially recognised categories of identity and value.

Another iterational process is *expectation maintenance*, which provides social actors with reliable knowledge of social relationships and a *pattern of expectations* which allows them to predict what will happen in the future. The patterns of expectations give continuity and stability to action, and reassure actors that actions in the past can

successfully be repeated, and also that other social actors can be trusted to act in predictable ways.

Also, Emirbayer and Mische (1998) suggest that social actors *manoeuvre among repertoires*. The employment of routines is not mechanically or situationally determined, but instead involves a process of selection from practical repertoires of habitual activity which may involve levels of ingenuity and resourcefulness.

4.4.2 Projective element of agency

The projective element of agency highlights the fact that human beings are able to challenge, reconsider and reformulate their schemas. Here, social actors do not merely repeat the structures and action of past routines but instead reconfigure and invent new possibilities in accordance with their hopes, fears and desires for the future. The imaginative construction of the future is critical to this process. As actors respond to the challenges and uncertainties of social life, they distance themselves from schemas, habits and traditions and then reconstruct and innovate upon those traditions, generating alternative possible responses to the problems being confronted, in accordance with evolving desires and purposes.

Emirbayer and Mische argue that the notion of projects has largely been ignored in empirical sociology due partly to its perceived subjective nature. They therefore assert that projectivity "needs to be rescued from the subjectivist ghetto and put to use in empirical research as an essential element in understanding processes of social reproduction and change" (p.991). As shown in Table 4.2, the elements within the projective dimension include narrative construction, symbolic recomposition and hypothetical resolution. In addition, secondary underlying elements include anticipatory identification and experimental enactment.

Anticipatory identification involves a process where human actors draw upon past experience in order to clarify motives, goals and intentions so as to locate possible constraints within the future and to identify appropriate courses of action. This anticipatory work is done by means of retrospective engagement with a prior stock of knowledge, as stored in typifications, repertoires and social narratives. *Narrative*

construction is based on the assumption that all social groups possess repertoires of stories or narratives that serve as cultural resources by which actors can develop a sense of movement forward in time. These stories have plots which help actors to visualise proposed resolutions to lived conflicts. Narratives provide maps of action, and can be used to experimentally posit new resolutions to emerging problems.

Within *symbolic recomposition,* actors take elements of meaning apart, in order to bring them back together again in new and unexpected combinations. Actors place themselves in a variety of possible scenarios, each with its own means-ends possibility, and in doing so expand the flexibility of their responses to a given problem. After surveying possible scenarios of action, actors propose *hypothetical resolutions* to respond to the moral, practical and emotional concerns arising from lived conflicts. Within *experimental enactment*, hypothetical resolutions may be put to the test in tentative or exploratory social interactions. Individuals accordingly try out possible identities without committing themselves to the full responsibilities involved.

Table 4.2 – Components of the Projective Element

Component	Description
Anticipatory Identification	Actors draw upon past experience in order to clarify motives, goals and intentions so as to locate possible future constraints and to identify appropriate courses of action.
Narrative Construction	Based on the assumption that all social groups possess repertoires of stories that provide maps of action and can be used to experimentally posit new resolutions to emerging problems.
Symbolic Recomposition	Actors take elements of meaning apart in order to bring them back together again in new and unexpected combinations
Hypothetical Resolution	Actors propose resolution*s* to respond to the moral, practical and emotional concerns arising from lived conflicts. Proposed resolutions may attempt to resolve several conflicts simultaneously and to incorporate different courses of action.
Experimental Enactment	Hypothetical resolutions may be put to the test in tentative or exploratory social interactions. Individuals may try out possible identities without committing themselves to the full responsibilities involved.

4.4.3   Practical-Evaluative element of agency

The locus of agency in the practical-evaluative element lies primarily in what Emirbayer and Mische refer to as the "contextualization of social experience" (p.94l) – which might best be understood as the way in which actors bring their past experiences and future orientations to bear on the present situation. Through negotiation and reflection, actors gain the capacity to make considered decisions that may challenge received patterns of action. This communicative process of deliberation, according to Emirbayer and Mische, is what distinguishes the "strong" situational moment of deliberative decision (characterised by greater capacity to exercise agency, and will almost definitely lead to a transformation of the situation), from the "weak" situatedness of "manoeuvre" processes, through which actors simply seek to adapt to a particular situation – which is therefore linked to the iterational dimension.

A central aspect of the practical-evaluative dimension is the role of judgment, which not only has to do with strategic decision-making (i.e., finding the most effective and efficient means to reach particular, pre-determined ends) but also has to do with decisions about the desirability of the likely ends. It suggests, in other words, that the practical-evaluative dimension entails judgments and deliberation both about the means and the ends of action.

Table 4.3 - Components of the Practical Evaluative Element

Component	Description
Problematisation	Actors recognise that the situation at hand is ambiguous, unsettled or unresolved, and that something must be done to render the given situation unproblematic, settled and resolved.
Charcterisation	Actors relate the problematic circumstances at hand to principles, schemas or typifications from past experiences
Deliberation	Actors consider how best to respond to situational contingencies in the light of broader goals and projects.
Decision	The resolution to act here and now in a particular way. A highly discrete and circumscribed choice is made.
Execution	Involves responding at the right times, with reference to the right objects, toward the right people, with the right aim, and in the right way

Emirbayer and Mische suggest that the internal structure of practical evaluation consists of three dominant 'tones' (see Table 4.3) – *problematisation*, *decision* and *execution* – and two secondary tones – the *characterisation* of a given situation against the background of past patterns of experience (which brings in the past dimension), and the *deliberation* over possible trajectories of action (which brings in the future dimension).

The *problematisation* component recognises that the situation at hand is ambiguous, unsettled or unresolved, and that something must be done to render the given situation unproblematic, settled and resolved. There are two elements within the problematisation component: characterisation and deliberation. Within *characterisation*, the problematic circumstances at hand must be related to principles, schemas or typifications from past experiences. *Deliberation* involves weighing up plausible choices in the light of perceptions and understandings against the backdrop of broader fields of possibility and aspiration. It involves considering how best to respond to situational contingencies in the light of broader goals and projects. *Decision* is the resolution to act here and now in a particular way. This doesn't necessarily reflect clear and fixed objectives, but could be provisional and adaptable. *Execution* involves the capacity to act in the most appropriate manner within particular concrete life circumstances. Execution could entail the fulfillment of a duty or the attainment of a particular vision at the expense of sacrificing an equally compelling duty or good.

4.4.4   Agentic orientation in analysing IT appropriation

Emirbayer and Mische's (1998) agency theory acknowledges actors' understanding of their contexts and their possibilities within these contexts, in a way that transcends the simple notions that actors are either mindful or mindless in their response to situational conditions (Howard-Grenville, 2005). In the context of organisations adopting new technologies, organisational members may resort to known and familiar work practices and/or tools. This iterational element of agency would then reflect actors' connection with past images in dealing with the new system, in a way that might lead to stability rather than change. In other words, the perception of the role of

technology in the workplace may restrict users from recognising new features offered by the new system. By the same token, positive past experiences with change programmes may lead to positive and innovative uses. Influences on agency could be seen in a collective image or in a spreading rhetoric promoted by certain actors (e.g., immediate managers or power users) in the sub-organisational context.

In some instances, a projective agentic orientation might prevail when organisational members consider learning and mastering the new system an opportunity for career advancement, or anticipate that structures and interdependencies embedded in the new technological system will lead to status promotion. This can be seen in the increasing importance users obtain by being consulted on technical issues related to the new system. Conversely, when other members anticipate the opposite, poor engagement with technology may dominate.

The evaluative-practical element of agency may surface in conditions of high work demands, which may leave no scope for the exploration of new opportunities. Also, this could be observed when members of a group desire to maintain peaceful relations with superiors who are in favour of the change to new technological platforms. In such situations, individual users would possibly interact with the new system only for the sake of meeting these demands.

Each of the above instances could result in different outcomes, and would most likely lead to varying degrees of realisation of planned organisational change. However, agentic orientation is understood to be dynamic. In this sense, actors' engagement with the system would shift in focus according to the changing situational contingencies. Accordingly, differnt organisational implications would possibly come about. Drawing upon Emirbayer and Mische's (1998) concept of agentic orientation allows us to assess differences in engagements with the IT systems; and by referring to the three agentic orientations—past, present and future—that explain how different temporal-relational contexts shape the way actors evaluate system affordances and constraints, it should be possible to comment on how the appropriation of IT emerges in a real organisational context.

4.5 Summary and Conclusion

This chapter has presented the relational framework guiding this research in terms of how to conduct the empirical investigation and how to theoretically analyse and discuss its findings. The basic tenets of this theoretical lens are summarised in the following points.

- Assessing organisational practice by examining organisations within their wider contexts.
- Examining the relation between action and context based on a stratified ontology that enables an analytical division between structures and agency.
- Acknowledging the role of the technology in enabling and construing action, without imputing it with agentic characteristics.
- Recognising the capacity of actors to make judgments among alternative courses of action in response to changing situational conditions.
- Focusing on the process of interaction between action, technology, and context, with an aim to developing explanation without resorting to structural determinism or voluntarism.

Aware of the ontological and epistemological underpinnings of the aforementioned features, the following chapter will turn to the methodological choices and the process of data collection and analysis.

CHAPTER 5

METHODOLOGY

5.1   Introduction

This chapter presents the methodology that guided this research. Research methodology is a broad term that describes an overall strategy of transforming a research focus into a research design (Mason, 2002). Importantly, research methodology is concerned with conceptualising an inquiry, engaging with the studied phenomenon, and constructing and justifying knowledge claims (Cecez-Kecmanovic, 2001).

The purpose of this study is to further our understanding of IT-associated change by studying the process of IT appropriation in organisational contexts. This entails conducting an in-depth investigation into how the IT system is interpreted and implemented in a real social and organisational context, and therefore how it impacts upon organisational life.

In the preceding chapters, theoretical debates around the relationship between IT and organisation were reviewed. The conceptual framework was developed, providing a direction for empirical research and for achieving the aims of the study.

This chapter begins with a discussion of the research assumptions and strategy, covering important considerations in the research design and data collection methods. This is followed by an outline of the process of data collection and data analysis, emphasising advantages and limitations among the approaches chosen.

5.2   Research Assumptions in IT and Organisations

Those researching management and organisations tend to articulate their research assumptions by referring to the philosophical term ontology (which asks whether the world's reality is objective, existing independently of humans, or whether it is subjective, existing only through human action), and the term epistemology (asking how to acquire valid knowledge about that reality). These philosophical positions unavoidably shape a research methodology, its strategies, data collection methods and data analysis techniques (Saunders et al., 2009).

In the studies of IT and organisation, most research has been guided by either a positivist perspective or an interpretive perspective. The positivist perspective is "*premised on the existence of a priori fixed relationships within phenomena which are typically investigated with structured instrumentation [...] in an attempt to increase predictive understanding of phenomena*" (Orlikowski and Baroudi, 1991, p. 5). In contrast to positivism, the interpretive (or social constructivist) perspective rejects one-sided relationships and denies the possibility of deterministic explanations of phenomena. Interpretive researchers thus attempt to understand phenomena through assessing the subjective and intersubjective meanings created by people as they interact with the world around them (Walsham, 1993; Orlikowski and Baroudi, 1991).

As can be noted from the above description, these two main philosophies of society entail specific conceptions of "causal structure". In IT impact research, the concept of causal structure refers to researchers' theory of the nature and direction of causality among IT, people, and organisations (Markus and Robey, 1988). Philosophical disagreements about the causal role of IT according to the above two perspectives are best captured by the following description by Markus and Silver (2008, p.613):

> *"The traditional view, often referred to as positivist, holds that causation can be inferred when the outcome is regularly preceded by the cause [...] This is the type of causality tested for in statistical analyses, where consistent associations are offered as evidence of causal relationships, and the absence of empirical regularities is taken as meaning that there is*

no causal relationship. In such a view, both IT artifacts and human actions may be understood as "causing" the effects observed. By contrast, a view commonly held by […] social constructivists is that the very notion of causality is an invalid application of a natural science concept to the social science domain. In the strongest versions of this view, only human intentions and actions (agency) can properly be thought of as explanations for social phenomena".

Provided that the aim of this research is to produce an understanding and explanation rather than prediction or mere description, this thesis takes a position distinct from both of the above perspectives. The analysis proposed in this research attempts to avoid dichotomist reasoning and move beyond the dualistic logic of objectivism and relativism, in order to advance our understanding of change and continuity in IT implementation projects. The position of this research is predominantly inspired by a relational sociology (RS) approach to organisational action (Emirbayer, 1997, Mutch et al., 2006, Delbridge and Edwards, 2013).

The RS approach aims at causal explanation, and thus offers a notion of causality that allows for the capturing of the underlying "why" and "how" questions posed in the IT-organisation relationship. The ontological status of this approach can be described as stratified (Mutch, et al. 2006, p.609). That is, it offers a conceptualisation of agency as a distinct analytical category that operates in relation to multiple levels of contextual conditioning structures (Delbridge and Edwards, 2013).

Pare et al. (2008) assert that researchers' ontological and methodological considerations cannot easily be separated from assumptions about causation. For this reason, the philosophical presumptions of this research will be further discussed by explicating the causal structure underpinning its theoretical approach. The subsequent methodological choices will be presented and discussed in the light of the guiding theory in the following section.

5.3 Guiding Theory: A Relational Sociology Approach

In order to clarify the philosophical bases and justify the methodological choices of this research, the relational perspective underpinning this research is analysed across three key dimensions first proposed by Markus and Robey (1988) for assessing the causal structure of theories of IT and organisational change. These dimensions are causal agency, logical structure, and level of analysis. This clarification is considered vital according to Markus and Robey (1988, p.596):

> *"Researchers interested in the consequences of information technology for organisations should make clear and conscious choices regarding the causal structures of their theories"*

Causal agency refers to beliefs about the identity of the causal agent and the direction of causal influence; logical structure is related to the choice of variance versus process approaches, and level of analysis concerns the entities at which concepts are defined and data are collected.

5.3.1 Causal Agency

Markus and Robey (1988) identified three conceptions of causal agency in IT and organisational change. First, the technological imperative views technology as the causal agent, whereby technology determines organisational action. In this view, actors' agency fades out of the analytic picture at the expense of technological constraints and external forces, over which social actors have little control. The second conception of causal agency, termed the organisational imperative, gives precedence to agency, and views actors as the drivers of social change. In such a view, organisational members (management, implementers and users) are assumed to have almost unlimited choice over technological options in both design and use, and are also assumed to be able to manage the consequences of technology implementation decisions.

The relational approach underpinning this research rejects both imperatives, and can be identified with the third conception of causal agency, named "the emergent

perspective". The emergent perspective holds that - due to the complex and unpredictable interactions between technological features, actors' intentions and the wider organisational context - one cannot predict IT impacts precisely. Thus, neither the intentions of individual actors nor the conditions of the environment can control the uses and consequences of IT. Organisational outcomes are seen to emerge from complex and continuous interaction among actors, context, and technology.

In consistence with the emergent perspective of causality, the relational approach avoids ascribing causality to either structure or agency. Alternatively, it recognises that social actors are embedded in contextual conditions and respond to situational opportunities and constraints in ways that are not captured by deterministic or purely voluntaristic arguments (Emirbayer, 1997, Mutch et al., 2006). In terms of technology, Emirbayer's Relational Sociology does not offer direct statements on technology. However, the line of reasoning advocated by RS - which privileges relationalism over substantialism - allows for accommodating the notion of technology as part of the situational conditions shaping action, without unnecessarily falling into technological determinism or boundless notions of interpretative flexibility of technology.

The methodological implication of this approach to causation is that researchers set off to explain how causes actually produce effects by producing narratives of actors' responses together with an explicit concern for the "situational mechanisms" within which these responses occur (Emirbayer, 1997, p.307).

5.3.2 Logical Structure

The logical structure of a theoretical approach refers, according to Markus and Robey (1988), to a hypothesised relationship between elements identified as antecedents and those identified as outcomes. Two models of this relationship exist in theories explaining IT and change: variance and process. Variance models see antecedents as necessary and sufficient conditions for the outcomes to occur. In process models, antecedents are necessary but not in themselves sufficient to explain a specific outcome. Also, contrary to variance theories, outcomes in process theories are not

conceived as variables that can take on a range of values; rather, they are seen as discrete or discontinuous events, and are represented as a change of state from one to another. As such, process theories provide a richer explanation as to how and why outcomes occur when they occur.

RS is intrinsically processual in nature, championing "a processual, relational view of the sociological enterprise" (Mutch et al, 2006, p. 613). Furthermore, utilising RS to explain IT-associated change requires the identification of the fundamental social relations and processes that underpin and influence organisational practice. This approach to research, which orientates our thinking towards dynamism and openness, clearly admits an inherent subjectivity in the production of knowledge, and thus gives precedence to qualitative methods of data collection and analysis.

5.3.3   Level of Analysis

Level of analysis refers to the entities about which the theory poses concepts and relationships. In the social sciences, levels of analysis have traditionally been divided into 'macro-level' and 'micro-level'. Macro-level analysis focuses on societies and formal organisations, while the micro level addresses individuals and small groups. Markus and Robey concur that technological change in organisations is a mix of micro- and macro-levels. The introduction of an IT system in an organisation, for example, is a macro-level event that affects the experiences of the individuals in the organisational setting; their engagement with the IT system has consequences at the organisational level. Markus and Robey contend that the use of mixed levels of analysis allows researchers to explore the dynamic interplay among individuals, technology, and larger social structure. More importantly, researchers need to define concepts and collect data at levels of analysis that are appropriate for the proposed theoretical propositions.

A relational analytical framework promotes multi-level analyses because it assumes that phenomena exist at different levels. It insists upon contextualising the exercise of agency by highlighting the broader settings in which action takes place (Mutch et al, 2006).

The aforementioned theoretical position of this research dictates particular decisions about research design and techniques. These will be discussed in the following section.

5.4 Research Design

Research design represents the logical structure of inquiry. The selection of the type of research design is primarily led by the nature of the researched phenomenon and the questions being asked. It is also directed by the researcher's perception of the phenomenon under investigation.

It has been illustrated earlier - among the research assumptions - that the present research is guided by an ontological view that acclaims actors' perceptions and considers their interpretations as meaningful properties of the social reality. It has also been asserted that a relational perspective that contextualises the exercise of agency by highlighting the broader settings of interpretations and actions is also important in understanding the social phenomenon under study. By the same token, a focus on the properties of technology holds the promise of a rich understanding of the IT appropriations and IT impact. These conditions require a focus on understanding the dynamics present in a single setting. Hence, the research approach that is cited as most appropriate to this type of enquiry is a qualitative case study research strategy (Eisenhardt, 1989).

5.4.1 The Case Study Strategy

It is the emergent perspective stressed in the previous sections that, arguably, makes the qualitative case study research strategy the most appropriate in terms of effectively examining the implementation process within its organisational and environmental contexts. It is hopefully the strategy most capable of detecting unfolding events over time, and delving into the complexity of the IT-associated change under study.

Case study design is considered an attractive choice when the phenomena under investigation are ambiguous and requiring rich, contextual, and real time data

(Benbasat et al., 1987; Eisenhardt, 1989). This could be taken to include all aspects of information systems in the organisational context (Walsham, 1995, p.15), and it becomes more relevant when the research objective is a moving target, such as users' appropriation of technology.

The flexibility of the case study design is also appealing. In contrast to the cross-sectional survey, the case study approach has the unique ability to deal with a variety of evidence, including documents, physical artefacts, interviews, and observation (Yin, 2009). Also, case study design can benefit from the prior development of theoretical propositions. Despite these considerations, it is important to consider these as opportunities, and realise that not all sources are relevant for all case studies (Yin, 2009).

Although the case study has key strengths as a research strategy, as well as a long and distinguished history in the study of organisations (Yin, 2009), critics of the case study approach voice reservations regarding its scientific nature and regarding the inaccurate ways in which case studies are often conducted. A frequent criticism of the case study approach is that its dependence on a single or few cases makes it incapable of providing a generalising conclusion. This claim, as set out by Yin (2009), implicitly contrasts case studies with those cross-sectional surveys where a sample is generalised to a larger population. Thus, from a statistical point of view, a case study is considered a sample of one, preventing the findings being generalised to describe a wider population. In response, Scholars like Walsham (1995) and Yin (2009) forcefully argue that the case study does not represent a sample, and that the research objective is not statistical generalization. In this sense, generalizations can take the form of concepts, theories, specific implications or rich insights (Walsham, 1995, Walsham, 2006).

Another complaint about the case study relates to the practical difficulties associated with the design and the scope of the case – specifically its ability to adequately and properly address the research problem (Yin, 2009). In order to address these issues, Benbasat et al. (1987) argue that case study researchers need to be explicit about their

research goals and choices. Also, researchers need to provide justifications for their research actions and decisions throughout the research process (Yin, 2009).

5.4.2 The Case Organisation

Selection of cases is an important aspect of the case study design. While the cases may be chosen randomly, random selection is neither necessary nor even preferable (Eisenhardt, 1989). Qualitative sampling seeks information-rich cases whose study can illuminate the phenomenon under study (Patton, 2005).

In this research, the case organisation is a large state-owned airline organisation in the Arabian Gulf region. The geographic location of the organisation was mainly chosen for practical reasons. The choice of the case organisation inevitably introduces some bias, and may not be fully representative. Nevertheless, the organisation has key characteristics that make it particularly interesting. For example, the fact that the organisation is in the process of privatisation suggests that it is under the interactive influences of both government regulation and market pressures. Also, the organisation has a well-defined hierarchy that allows for an analysis based on discrete organisational levels. Furthermore, the researcher's previous experience of working in the company offered an opportunity for a better understanding of the context of the study, and a better opportunity for accessing the requisite data sources.

The use of a multiple-case approach was considered, but multiple-case studies often require resources and time beyond the means of an independent researcher. Furthermore, finding several alternative comparable cases may introduce difficulty in terms of location and access. Moreover, approaching more than one organisation could have minimised the chance of generating rich enough data, thus compromising the prospects for real cross-analysis.

Additionally, the case organisation is composed of several business units serving different business areas, thus presenting an opportunity for the identification of logical subunits of analysis. Such an "embedded case study design" approach allows for comparison and contrast between embedded units and subcases, and significantly enhances the insights entering the overall study (Yin, 2009). This potential has been

actually realised in the course of conducting the study, as will be illustrated in a following section pertaining to the data collection process.

5.4.3 Methods of Data Collection

The research methods that have been employed in this research were principally qualitative. Qualitative methods are cited as useful in informing these types of in-depth enquiries (Saunders et al., 2009, Silverman, 2010). Also, qualitative research is viewed as advantageous due its iterative nature, enabling constant comparisons and reflections between the data generated and the theoretical prepositions.

The qualitative methods of data collection were selected to best suit the research conditions; these conditions include the nature of the proposed questions, the time frame of the PhD programme, and the available access to the case organisation. Taking these conditions into consideration, the exploratory and explanatory nature of the research was seen to be best addressed through semi-structured interviews, which offer an optimal balance between the potential for valuable insights and efficient use of time and resources. In addition, utilising this method allows the researcher to make use of field notes and observations at the research venue. The extent to which the latter practices is effectively employed is influenced by the type of access granted to the researcher. It is also possible to make use of other data sources - which can provide additional meaningful insights for the study. These sources include project documentations, internal circulations, and any published information about the organisation or the project. Following is a discussion of the main data collection methods.

5.4.3.1 Interviews

Interviewing is considered the most commonly used method in qualitative research (Mason, 2002). It is also a key ingredient of case studies. The style of interviewing that is utilised in the methodology of this case study is chiefly semi-structured. According to Bryman and Bell (2011), in semi structured interviews, the interviewer has a list of pre-established questions to be covered, but the interviewee has the freedom to choose how to reply. In case study research, the main advantage of this

type of interviewing is the flexibility it allows for deep exploration of certain issues while at the same time allowing for useful data comparison, especially where multiple levels of analysis are involved. One of the most commonly cited advantages of this form of interview is its flexibility of approach; it enables the researcher to focus on points of interest and ask the participant to elaborate, allowing for a deeper exploration of meaning (Mason, 2002). Related to this is the fact that valuable information could be obtained using the interview method – information that would not be possible to grasp through use of a survey method alone. These might include the comments passed during an interview, as well as the non-verbal communication which would not be apparent in any form of communication other than face-to-face.

In the present research, access to authorization from management was essential to commencing data collection in the research sites, but it was by no means sufficient to elicit information from the targeted informants. The fact that the researcher had previously worked in the organisation was also a double-edged sword for the purpose of interviewing people and securing detailed responses. On the one hand, it facilitated access to many employees and key information that would not otherwise have been easily accessible. On the other hand, it was a cause of suspicion for a few employees who were less open and reluctant to share detailed accounts about work practices or intra-organisational relationships. This reluctance, however, was not expressed explicitly; instead it was noticed in the course of interviewing a few participants. As far as the researcher is concerned, it was absolutely essential to minimise these negative conditions - which would reduce the richness of the accounts needed for such an in-depth study. In order to overcome the consequences of any possible lack of trust, the researcher repeatedly explained the sole academic objectives of the research, and assured all potential participants that he was committed to protecting their anonymity. In some instances, it was also beneficial to have a general conversation prior to the interview, allowing for discussion of issues that are not necessarily of direct relevance to the research subject, in order to create an environment conducive to more fruitful interviewing.

The interviews were conducted either in the informants' own offices or in another suitable place at the site (e.g. a meeting room). The interviews were facilitated by a

bi-language interview guide, which had been developed throughout the data collection process (see Appendix A). The interview guide involved a wide list of questions related to the implementation and use of the system, but this list was not strictly followed. It had been used to elicit responses and to open relevant discussions with the informants. A copy of the interview guide was usually handed to the interviewee, or even emailed prior to the meeting. This practice was found useful because it served the purpose of informing and reassuring the participant about the issued to be addressed. The participants from the case organisation were all nationals of employer's native country, using mostly Arabic language in their interviews, except for some instances when they felt more comfortable using English – usually to describe aspects relating to technological features or work processes. English was the language used in interviewing those participants from the implementer company who come from Western countries or non-Arabic Asian countries. Interviews were recorded when consent was given. In cases where consent to audiotape was refused, permission was sought to take notes.

The use of Arabic in interviewing demanded transcription and translation to written English. In these cases, I took a "meaning based approach" (Xian, 2008), whereby the understood meanings were written directly in English. During the data collection, I tended to transcribe interviews in the form of mini-headlines and brief descriptions attached to each interview. These scripts, along with the notes taken in non-recorded interviews and other field notes, were continuously reviewed, with the consideration of their full transcribing in the light of further data collection and analysis. The interviews conducted in the third phase of data collection (see next section) were all transcribed verbatim. The total number of arranged interviews conducted was 58, ranging from 30 to 90 minutes in length, with the typical session lasting just under an hour. Most of the interviews were conducted individually, but a few of them (six interviews) involved two or three participants. The total number of participants in these interviews was 67 interviewees. For details about the interviewees, see Appendix B.

5.4.3.2 Observation and Informal Discussions

In the course of the data collection, more than seven sites of the organisation's premises were visited. On-site visits allowed for observation of the work environment and informal discussions with employees. It was also possible to attend a couple of departmental meetings, which allowed for first-hand exposure to the interactions within these departments. Data generated from such observations and casual conversations were invaluable in providing input for formal interviews, and for understanding the IT-user interaction in a natural setting.

In some cases, it was possible to shadow participants whilst they used the IT system. In these cases, observational evidence was useful in providing additional information about the limits of, or problems with, use of the new systems.

In the process of this research, and during the multiple visits to different departments in the organisation, it was possible to speak to individuals at technical and managerial levels about many aspects of the technological change project. These informal discussions have been precious sources for understanding the historical background and contextual setting of practices and decisions. Due to the unplanned nature of these communications, no prior arrangement was made to record responses during the discussion. However, the researcher made notes soon after the discussion had finished, in order to capture the important points discussed in connection with the study.

5.4.3.3 Documents

Another data source cited in this research has been the secondary source of printed materials and relevant textual sources. A number of research participants provided documents and hand-outs describing the organisational structure of the company and its units. Other documents were helpful in explaining the process and timeline of the projects' implementation. Other forms of document included published materials and circulations often read in the context of the studied organisation (e.g., the company internal magazine and organisational bulletins). In addition, the researcher gained

access to other materials available on the organisation's intranet, which served, for instance, as reference on the procedures and policies of the organisation.

Keeping in mind that not all documents are necessarily accurate, precise, or complete recordings of events or activities, studying these documents helped, in many instances, to feed the research with valuable data on the internal and external context of the organisation, as wells as its history and shifting strategies.

5.4.3.4 Sampling Strategy

The strategy of sampling and selection of the research participants and relevant documents was mainly directed by data requirements, which in turn were guided by the research questions and inquiries. In this process, decisions of selection and sampling were also subject to the level of access obtained in the research venue. The primary research question of this research was to understand how employees receive and respond to a new IT system in the workplace. This inquiry required the researcher to seek information about the IT system in question, the individuals who interact with the system either in its implementation or in its use, in addition to the workplace environment, which include both the internal and external milieu. Keeping in mind these three trails, selection of interviewees and documents generally took the form of purposive sampling (Lincoln and Guba, 1985).

In terms of sampling of participants, I started by approaching members of the organisation who were in charge of the studied IT system. These members were considered "key informants" because they were in direct connection with all of the implementation activities, and with most of the individuals interacting with the studied system. The identification of these key informants was facilitated by the researcher's familiarity with the case organisation, and also by the researcher's prior knowledge of the process of IT systems' projects. The sampling, thereafter, was undertaken in a snowballing manner (Myers and Newman, 2007). The identified key informants were asked to recommend further key individuals who held responsibility in relation to the implementation of the system. Within the access and time constraints, I endeavored to interview all of the mentioned individuals. Although I was not able to reach all of these potential informants, I made sure to interview

representatives from each classification of informants (see Table 5.2). Whenever further categorisation of informants was revealed, the researcher ensured to gain their perceptions and experiences. This further categorisation was mostly linked to either the role in the organisation or the role in the project. Each category of participants was assumed to offer a distinctive and uniform experience (Mason, 2002). Hence, it was worth gaining access to their accounts and perceptions. The interview sample was also selected to include different organisational and demographic categories of employees.

The interviewees were selected from different occupational levels. This included technical and managerial levels of employees. The interviewees were also selected from different seniority categories, representing old and new organisational members. The participants were 100% male. Despite gender is a significant issue for research that emphasises social structure and human agency, it was almost impossible -for cultural considerations- to build this into the field research. Firstly, there was no (or very limited) participation of woman in the studied organisational units. Secondly, and most importantly, it was impossible for the researcher (as he is male) to extend observation and interviewing methods to include female workplaces.

Sampling of documents was done similarly to interviews, in that any time interviewees referred to a document or the researcher was informed of a document whilst engaging in informal conversations and discussions, a copy was requested. In many cases these documents were received. In reference to the on-line materials, the researcher attempted to collect all available textual data about the new technologies, the organisation, or the implementation project. A purposeful selection was undertaken, thereafter, according to perceived significance. This again was an instance where the insider role was of benefit because the judgment required to make a selection was made more dependable through the researcher's prior knowledge and experience.

5.4.4 Ethical Issues

In social sciences, research mostly involves human subjects and thus brings to the fore several ethical issues that are less significant in the case of physical sciences' research. In qualitative methods of inquiry, the need to carefully consider the ethical issues surrounding research into human-beings becomes more paramount (Mason, 2002).

It should be noted here that prior to conducting this study, ethical approvals have been sought in accordance with the University procedures for ethical research conduct. However, Fisher and Anushko (2008) argue that such formal approvals are but the first step and the researcher needs to be aware of moral and ethical considerations throughout the research project.

Primary issues that are of paramount concern within this project are linked to gaining the informed consent, voluntary participation, and safeguarding the confidentiality and anonymity of participants' information.

With regard to gaining the informed consent, the interviewees were presented with an officially approved consent form that provided sufficient information about the academic purposes of the study and the rights of potential informants in relation to their participation. Furthermore, participants were given an opportunity to ask questions and discuss any issue in order to make informed decisions in connection with their participation. In undertaking informal discussions and observation of the workplaces, the people involved in these discussions or observations were always made aware on a first instance, and reminded whenever felt necessary, of the purely-academic purposes for conducting these research activities. The principle of voluntary participation was always respected in that prospective participants were never put in a state where they would feel obliged to take part in the research activities.

In terms of the confidentiality and anonymity, the case organisation's name and the participants' identities are kept anonymous. Also, the materials collected remain confidential. As part of maintaining participants' anonymity, the researcher never shared the accounts told by one participant with another participant. This might have limited the opportunity of verifying the story reported by an informant. However, the

researcher learnt to find different ways of verification without revealing the identity of the informants.

In the presentation of findings, the identities of the participants have been safeguarded by the removal of any specific identifying details from the in-text quotes. This assurance of anonymity could have limited the relevance of some accounts, but the researcher ensured to highlight the context of the reported accounts in the writing of the findings as a means to mitigate the consequences of non-disclosure of the informants' specific details.

5.4.5   Limitations of Research Design

The research design adopted in this project is thought to be the most suitable, given the available resources of access to the field and the data collection time. However, it is acknowledged that there are a number of limitations related to the data collection methods, as well as the ways these methods are practically applied.

The reliance on the interviewing as the primary method of data collection allows the researcher to retrace a coherent account of the extended multi-phase project of IT implementation, but there may be limitations of interviews in this "relational" type of study. Freeman (2004) dismisses such a method for the analysis of social relations and networks on the grounds that they fail to explore the social contexts of respondents. Whilst accepting that other qualitative methods, such as ethnography, would possibly offer richer insights on the dynamics of interactions, it is argued that there is not an intrinsic shortcoming of interviews in this regard. Morris (2004) maintains that it is not the form of data collection that abstracts a respondent from their social context, it is the limited information that the researcher asks for. The researcher's approach thus must move from "the traditional focus on the individual to a relational analysis" (Morris, 2004, p.2). For a relational-sensitive interview, the researcher should ask about the respondent's relations with people in their social context, not only about their individual attitudes or motivations.

Another limitation is possibly related to the partially post-hoc nature of the data collected. The findings of the research are largely based on retrospective accounts of

events and activities, especially those related to the first phases of the project. These retrospective accounts allowed for capturing key episodes of the change process over an extended period of time. Nevertheless, respondents' reflections may have been affected by time and subsequent events (Cowley, 2006). A design that would allow for interviews to occur over an extended period of time and at each phase of the project would perhaps result in more accurate accounts of the events told by the interviewees. The results of the research could also gain more depth and credibility by a design that include a wider immersion in the field during the actual time of events and interactions.

Moreover, there are limitations and challenges associated with the conduct of interviews. The qualitative interview requires a great deal of planning, intellectual, and social skills (Mason, 2002). Furthermore, the interviewer must contend with the challenge of properly interpreting the interviewees' responses. Mason (2002) raises a warning of "data invention" by mispresenting participants' perspectives. In return, she places stress on drawing reflexively on the researcher's own experiences and perceptions. It is also important to consider any previous understanding of the topic in question as only preliminary (Hollstein, 2011). This can be an instrumental way to mitigate potential bias, acknowledging that the absence of bias is not guaranteed in any form of inquiry (Yin, 2009).

5.5   Data Collection Process

In "Qualitative Researching", Mason (2002) reminds us that decisions about design and strategy are ongoing and are grounded in the practice, process, and context of the research itself. She further maintains that researchers need to produce a research design at the start of the process, but that thinking about strategy and design should continue throughout the research process. This is because "qualitative research is characteristically exploratory, fluid and flexible, data-driven and context-specific" (Mason, 2002, p.24). In this section, I describe the process of data collection, reporting key activities of the fieldwork, and also highlighting key decisions in the process of developing and accumulating the empirical evidence.

The fieldwork had been undertaken over the period extending from March 2012 to March 2013. The data collection process can broadly be divided into three main phases, based on the manner and focus of the investigation.

5.5.1 First Phase of Data Collection

This phase broadly covers the first three months of the fieldwork period. It took on an exploratory nature, with the aim of building an overall picture of the drivers of the technological change project, and of gaining a better grasp of the roles and relationships both at an organisational level and also at the IT-change project level. This preliminary understanding of the case was crucial. It was acquired through reviewing secondary sources, and also through several visits to the IT department of the organisation.

The position of the researcher as an employee of the case organisation was a key in facilitating this preparatory probing. This came about through numerous channels. Firstly, the ability to access the internal website of the organisation offered materials about the history of the IT project and the organisation as whole. Secondly, informal conversations with members of the organisation allowed me to explore different perceptions about IT and associated changes, and also helped me to get hold of documents relating to the IT master plan. Thirdly, previously-held information about different issues of the organisation and the project were verified through open discussions with organisational members.

The outcome of this phase was a clearer understanding the organisational background and the socio-political context of IT change. It was also possible to identify those key elements and dimensions within and beyond the organisation that have had notable impacts on the process of IT introduction and implementation. These elements included, for instance, sources of influence on organisational strategy and management decisions, the position of the case organisation with respect to interacting institutions, and the cultural understandings of the interrelationships in the work environment.

In addition, it was possible to gain an appreciation of the overall structure and process of the IT change programme, and to identify a meaningful target for initial investigation into the IT change taking place in the case organisation. In particular, this target was the project of Overall Systems Integration (OSI). This project aimed at the integration of the multiple and heterogeneous systems within the organisation. This integration would be realised using an IT system that unifies and connects applications and resources. This pattern of middleware enables software applications which run on different platforms or environments, and which use different data representation methods, to communicate in a dynamic and timely manner.

The decision to explore OSI was assumed to provide an opportunity to come across various IT systems and visit diverse organisational settings - which was considered important in enhancing the explanatory scope of the case.

Towards the end of this period, I had been involved in negotiations with key individuals and "gate keepers", and ultimately I was able to secure a formal access to the selected research sites and informants. This point of time marks the beginning of the second phase of data collection.

5.5.2 Second Phase of Data Collection

This period was extended over almost three months. During this period, the researcher made several visits to the IT department, and began to conduct formal interviews with the various different types of informant in connection with the OSI project. I conducted a number of interviews with those members of the IT department who took key responsibilities in IT systems' introduction and implementation. I held interviews with the IT specialists and project managers representing the implementer company contracted to undertake the implementation of OSI. I also made visits to organisational sites other than the IT department, and interviewed key members involved in the introduction of new systems in their workplaces. Table 5.1 shows the number of interviews conducted during this phase, based on the affiliation of interviewees.

Table 5.1–Number of interviews in the 1ˢᵗ round of the 2ⁿᵈ phase, based on the affiliation of the interviewees

Implementer Company	IT Department	Business Units	Total
4	3	7	14

Given the central role of OSI on the organisation's technology landscape, the information obtained from interviews and visits, allowed the researcher to assess and decide which IT systems could be more appropriate and feasible for in-depth research. A couple of IT systems implementation projects were initially considered and assessed. Amongst these were the new software packages of CRM (Customer Relationship Management), and CMS (Crew Management System). The outcome of this assessment revealed that one of the main challenges of the IT overhaul project was the implementation of an Enterprise Information System (EIS). EIS is a set of information systems built on industry-specific best practices. EIS is implemented by many organisations to streamline processes, integrate data coming from heterogeneous sources, and to maintain a centralised database that facilitates management reports and decision making (Davenport, 1998). The focus of the research has accordingly gravitated towards investigating the project of EIS implementation.

The decision to include certain IT systems in the analysis and exclude others was based on the following two criteria:

i. The level of its significance to the research objective: the potential presence of multiple interacting organisational, social, and technical dimensions.

ii. The extent of the availability of and accessibility to critical data sources, which include individuals who can and are willing to provide in-depth accounts of the process and practice of implementation and use.

This relatively subjective assessment was complemented by seeking opinions from two members of the ITPMO (IT Project Management Office); that is, the management team in charge of the IT change project. These people had interacted with the key individuals responsible for the selection, implementation, and operation of several IT

systems. They were also in a good position to provide an overall outlook of the process and outcome of the implementation of different IT systems. Indeed, such an evaluation of the opening domains in the research setting is not unusual in non-positivist streams of research. Walsham (2006, p.321) writes:

> *[the] individual researcher or research team must make their own choices in the light of their own context, preferences, opportunities, and constraints*

The collection of data concerning the implementation of EIS was commenced by multiple visits to the IT division where the project is directed, and then complemented by visits to the beneficial departments. During these visits, respondents were selected, based on two classifying labels:

- The participant's role in the system's implementation
- The participant's role in the system's use

Subsequent investigation revealed further variations in the characteristics of informants under these two labels, which was related primarily to each participant's role in the organisation and the project. Those key informants were the IT personnel, who represented the connection between the implementation partner company and the end users of the system. Individuals from the implementation partner company are experts in using the system. They are responsible for configuration, customization, and setting it up for operational use. End users are those individuals who would be utilising the system in their daily work activities. Another category of key informants coming from those business units adopting the system was the Subject Matter Experts (SMEs). The role of an SME was to represent the business unit in the project, and to provide the implementation team with the necessary information about the current business processes and practices. In the post-implementation phase, SMEs are termed "power users" (individuals selected to help test the system before the go-live date, to become familiar with its operation, and then provide on-the-job training to other users). Table 5.2 summarises the roles associated with each group of informants.

Table 5.2 – Classification of informants

Classification of informants	Role in system implementation	Role in system use
Consultants from the implementer company	- the installation and configuration of the system	- Non
Personnel from the host organisation's IT department	- Providing technical advice to business users - Data migration from legacy systems to new systems	- Technical support
SME (Power users) from business units (Representatives of the business units in the implementation project)	- providing the implementation team with information about existing business processes - testing the system before going-live	- using the system - transferring knowledge about system functionalities to other users - First-line technical support for other users
Other users from business units (Users of the system who had not been involved in the implementation phase)	- Non	- using the system

The EIS implemented encompassed a wide range of modules grouped under numerous functional areas, including Financial and Accounting, Logistics, and Human Capital Management. The day-to-day implementation activities of each group of modules were overseen by a system manger from the IT department. These system managers were responsible for coordination between consultants of the implementer company, business users, the IT team, and the project management. Thus, access to the research informants began by approaching these system managers, who in turn directed me to key individuals in each of the above mentioned categories. This stage

of data collection was characterised by flexibility and openness. It involved a great deal of informal discussions around the project, and the context of implementation. Table 5.3 presents details about the formal interviews conducted during this stage.

Table 5.3–Number of interviews in the 2ⁿᵈ round of the 2ⁿᵈ phase, based on affiliation and role

Technical Support (Implementer Company)	Technical Support (IT Department)	SME/ Power Users	End Users	Another role*	Total
4	2	5	7	2	20

* Covers participants who don't fit under any of the named categories (i.e. trainer on the system, project coordinator)

The data collected at this stage reflected an overall experience of implementing several modules in multiple organisational departments. The evidence collected was considered satisfactory as far as macro-level analysis of the case and overall implementation processes are concerned. Significant knowledge about the EIS implementation process were thereby attained, and considerable familiarity with intra-organisational relationships and transactions accumulated.

However, each one of the EIS modules has a differentiated technical characteristic. Implementation of an EIS module was a stand-alone project with distinctive organisational purposes and a multitude of practices and interactions. In order to pay due attention to these particularities and to adequately explore the micro-level practices of the agents involved, the research had to be narrowed further, in order to concentrate exclusively on one of these modules. This research shift was also consistent with the aims and philosophy of the research, which gave great weight to individual behaviours and micro-level events and processes.

In addition, this research decision was taken after writing an interim report based on the data collected to that date. That report was submitted to the PhD annual review in September 2012. The feedback and comments from the two supervisors and an internal assessor helped the researcher to associate between data and theory and to

further define the scope of the study to focus on the implementation of one of the EIS modules.

5.5.3 Third Phase of Data Collection

Data collection resumed late in October 2012 after a roughly two-month detachment from the field. In this last phase of data collection, the focus had been shifting to the micro processes of technology implementation, and the ways that the new IT system shapes and is shaped by individual and group practices within the macro structural order of each organisational unit.

Accordingly, the focus of the research narrowed further to become exclusively concentrated on one of the EIS modules as a means to effectively examine the local appropriations and organisational changes associated with the IT system's introduction. In particular, the research began to focus on SYSLEARN, one module of EIS that is implemented in large organisations to manage training and education activities. SYSLEARN's implementation was deliberately selected due to the fact that the same IT system had been introduced in three differentiated organisational units (see Table 5.4 for a brief introduction of the focal units). Also, the data collected in the previous phase revealed that processes of implementation figured out differently in each case, which was considered advantageous for analytical purposes (Yin, 2009). Furthermore, this selection allowed for examining intra-organisational variation while holding constant certain critical contextual forces, such as culture, and social structure.

Table 5.4–A brief introduction to the focal units

BU1	The technical training department providing training to the on-ground technicians.
BU2	The aviation training unit providing training to the on-board crew.
BU3	The main training department of the airline providing training to all employees of the organisation in a variety of subjects.

At the beginning, the researcher approached the management of each business unit to obtain access to the research site and secure permission to interview key informants. Shortly afterward, access was provided through a forwarded email, or directly introducing the researcher to key members of the SYSLEARN implementation project. Those key members were approached, and then the researcher sought the contribution of further informants whose names were supplied by earlier participants.

Due to practical considerations, the data collection was sometimes undertaken in the three sites simultaneously. In the process of collecting data about the implementation of SYSLEARN in the three sites, further classification of informants was revealed. This classification was related to the occupation and position of employees within the organisational unit. The interviewing process followed this string in order to access the perceptions and understandings of different types of actor. Table 5.5 shows the number of interviews conducted in each site during this phase of the data collection.

Table 5.5–The number of interviews in the 3rd phase of data collection

IT Department	BU1	BU2	BU3	Total
3	7	6	8	24

The overall process of data collection continued in parallel with the identification of conceptual constructs and the convergence of the research inquiry. In this sense, the role of human agency seemed relevant to the case study. Thus the researcher attempted to follow the link between the actors' practices and issues concerning technology specifications and contextual elements.

5.6   Data Analysis

Although a clear distinction between data gathering and data analysis is commonly made in quantitative research, For Myers and Avison (1997), such a distinction is problematic with respect to qualitative research. This is because the initial data gathered stimulate thinking and analysis, and these thoughtful deliberations affect further data collection. In terms of this research, data analysis was a continuous process occurring during the activities of observations and interviews, even though

these mutual influences were not as conscious as they are reported as being here. This form of overlap between data collection and analysis allowed for a head-start with the analysis, prompting an exploration built on three overarching themes: Agency, Context, and Technology.

By the end of the research fieldwork (i.e., once further interviewing presented no significant new findings), issues of analysis and interpretation became paramount. Yin (2009) considers this stage of the research as the most difficult part of conducting the case studies. In order to mitigate this complexity, Yin (2009) suggests that the case study researcher employs clear strategies and techniques for data analysis.

5.6.1   CAQDAS: Seeking Computer Assistance

Because of the notorious challenge associated with the task of analysing complex and sometimes ambiguous qualitative evidence, "*investigators and especially novices do continue to search for formulas, recipes, or tools, hoping that the familiarity of these devices will produce the needed analytic result*" (Yin, 2009, p.127).

The author of this work was no exception; I sought to adopt a sort of "standardised" practice in approaching the collected data. This involved considering CAQDAS (Computer Assisted Qualitative Data Analysis). The software programs were sometimes used to code and manipulate qualitative data. Accordingly, training was received on the Nvivo 10 software package. Then Word document files containing the transcripts of interviews conducted in one of the organisational units was uploaded into NVivo for data analysis. The process continued by assigning chunks of data to pre-defined analytical categories. Initially, this way of tackling the data seemed appealing, but further standardisation and organisation of the data raised the concern in the researcher that the contextual dimension of the data was fading. Equally, the research quest for a holistic understanding of change processes and the exploration of inter-dependencies of human action became largely missing in the analysis. Consequently, I came to the conclusion that other alternatives of analytic strategy may be more appropriate than the de-contextualised categorisation underpinning software analysis (Atherton and Elsmore, 2007).

5.6.2 Processual Data Analysis Strategies

Aware of the processual, relational view underpinning this research, the researcher sought to consult analytical strategies better able to address the messiness and multiplicity of themes inherent in processual data. Langley (1999) indicates seven strategies for approaching the interpreting and analysing of processual data. These strategies have been labeled as narrative, quantification, alternate templates, grounded theory, visual mapping, temporal bracketing, and synthetic. Each of these has strengths and weaknesses (see Table 5.6). But they are considered more effective when combined because each strategy tends to provide different and complementary understandings of processes (Langley, 1999; Pozzebon and Pinsonneault, 2005).

Langley (1999) terms the grounded theory and alternate templates "grounding strategies". Both strategies involve the systematic comparison of data to gradually construct an explanation of an observed phenomenon (Pozzebon and Pinsonneault, 2005, p.1362). Grounded theory involves data-driven categories, whereas the alternate templates strategy involves theory-driven constructs. In a data-driven grounding strategy, analysis starts with empirical details expressed in interview transcripts and field notes, and attempts to build a theoretical structure "bottom up" from this base (Langley, 1999, p.700). In a theory-driven grounding strategy, the analyst proposes an interpretation based on a priori theoretical premises. This analytic strategy involves the top–down application of a priori theoretical lenses to a process data base (Langley, 1999). The researcher then assesses the extent to which the theoretical template contributes to a satisfactory explanation. Yin (2009) labels this process of confronting an a priori theory with case study data "pattern-matching".

In the present research, the analysis of the case study sought to combine more than one strategy in the pursuit of a careful and thorough data analysis. In particular, the narrative, temporal bracketing, and grounding strategy (Data driven and Theory driven) approaches have been adopted. I illustrate the use of these analytic strategies in the following outline of the significant milestones in the analysis of the empirical evidence.

Table 5.6–Seven strategies for analysing process data (Adapted fromLangley, 1999, p.696)

Strategy	Key Anchor point(s)	Fit with Process Data Complexity
Narrative Strategy	Time	Fits with ambiguous boundaries, variable temporal embeddedness and eclecticism.
Alternate Templates (*Theory-driven grounding strategy*)	Theories	Adaptable to various kinds of complexity. Different templates capture different elements.
Grounded theory (*Data-driven grounding strategy*)	Incidents (units of text) Categories	Adapts well to eclectic data and ambiguity. May miss broad high-level patterns.
Visual mapping	Events, ordering	Deals well with time, relationships, etc. Less good for emotions and interpretations.
Temporal bracketing	Phases	Can deal with eclectic data, but needs clear temporal breakpoints to define phases.
Quantification	Events, outcomes	Focuses on events and their characteristics
Synthetic	Processes (e.g., new products, decisions, change initiatives)	Needs clear process boundaries to create measures. Compresses events into typical sequences

5.6.3   First Milestone: Narrative and temporal bracketing

In the first milestone of data analysis, a combination of the organising strategies of narrative and temporal bracketing was adopted. I developed detailed narratives of the implementation story of each of the organisational units adopting SYSLEARN. This approach was meant to organise, analyse and make sense of the empirical material (Langely, 1999). It entailed providing stories that are based on the respondents' accounts of the implementation process and adjacent change practices. In so doing, an

in-depth description that illuminated and clarified events, practices and choices was offered. The temporal bracketing was applied in order to divide the narrative into comparable units of analysis across time. The bracketing strategy of data analysis was organised according to broad-ranging episodes of SYSLEARN implementation, and was clearly displayed in the structure of the narrative. The first bracket involved the situation prior to the system's introduction. The second bracket concerned how actors had engaged with system configuration at the customization stage, and the last bracket plotted the post-implementation events and practices. It is noteworthy, however, that these brackets do not necessarily have particular theoretical significance, but rather represent a way of structuring the description of events (Langley, 1999, p. 703). This process was replicated for each of the three business units, resulting in detailed accounts of the implementation processes.

This means of analysis bounds the elements to be considered (Action, Context, and Technology) within specific time periods, and enables the researcher to see how context (and technology) at one point can lead to actions that reconstitute contexts (and technology) in subsequent time periods (Langley, 1999). This aspect has a methodological importance, since the current research aims to understand the dynamics of IT-associated change.

The outcome of the above-outlined combined strategy is presented in Chapter Seven of this thesis, and can be viewed as a way of descriptively representing the process of implementation in a systematic organised form. As Eisenhardt (1989) indicates, a detailed written description of cases allows the researcher to become better familiarised with the case, and better positioned to identify unique patterns. Also, Langley (1999) suggests, data organising strategies could be the initial step in making sense of the process data. For the present research, this step was crucial in paving the way for further data analysis employing grounding strategies.

5.6.4 Second Milestone: Data-driven grounding strategy

In the second milestone of data analysis, a data-driven grounding strategy was employed (Langley, 1999). The grounding strategy was inspired by the guidelines of

Miles and Huberman (1984), which suggest that concepts are generated from reality, and emerge from raw data through systematic categorization.

This process began with the development of tables containing key illustrations out of the written accounts of the implementation process. I traced the narratives that were constructed in the first milestone to search for elements of the context that could explain actors' perceptions, choices, and responses. The aim of this investigation was to distil the conditions that might have constrained or enabled action. Each one of the three implementation stories contained incidents (presented in paragraphs or groups of sentences). These incidents were identified and categorised into various themes or sub-headings (These sub-headings were later used as sections and sub-sections during report writing). The categorization of themes did not rely upon a predefined code; it was emergent, cumulative, and data-driven. It focused on the parts of the data that recurred within and across the three studied subcases. In many instances, I would return to the original evidence (interviews' transcripts, field notes, etc.) to ensure that the relationship between the evidence and the proposed themes is satisfactory. Occasionally, new information demanded the revision of existing categories; for example, splitting one into two (e.g. "the workplace power relations" heading was split into "intra-organisation" and "intra-group" subheadings), or merging two categories into one (e.g. incidents of state regulations and interventions were combined under one category) or relabeling a category to better match its content (e.g. "strategy alignment" was renamed "IT strategy composition"). As the incidents accumulated, I began to write interpretations and explanations about the emerging categories, their properties, and their relationships. At the beginning of the process, categories were very close to facts and data (Lincoln and Guba, 1985, p.42), but they gradually tended to become conceptually informed, offering more than plain data.

The outcome of this process is found in Chapter Eight of the thesis, titled Contextual Conditions, representing an overall picture of the environmental, organisational, and technological domain of action. Agency issues were subsequently analysed via a theory-driven grounding strategy.

5.6.5   Third Milestone: Theory-driven grounding strategy

Theory provides one of the ways in which qualitative data can be analysed (Walsham, 2005). As asserted in earlier sections of this chapter, this research is infused with an overarching theoretical impetus to consider the underlying relationality of the social phenomenon (Emirbayer, 1997). Under this principle, the analysis of agency had been approached. The agency theory by Emirbayer and Mische (1998) has been employed as a theoretical lens, or a mode of sensemaking (Langley, 199, p.699), to understand the role of agency in IT-associated organisational change.

Although Langley (1999) notes that confronting data to alternate templates (theoretical lenses) can reveal the contributions and gaps in each, she further asserts that different theoretical interpretations are more like alternate readings, which focus on different levels of analysis and show different dynamics. Thus each represents an alternative, rather than a rival, mode of sensemaking.

In applying this analytical strategy, data from each individual subcase were individually scrutinised. Practices in relation to system implementation and use were extracted and then interpreted in the light of the theoretical concepts offered by Emirbayer and Mische (1998). This process consisted of two stages. First, I attempted to subject the data collected to the plausible interpretations inspired by the theoretical propositions of the research (i.e. with reference to the three analytic elements constituting human agency theory: iteration, projectivity, and practical evaluation). In the second stage, the theoretical constructs constituted the organising frame of analysis (Eisenhardt and Graebner, 2007). Each theoretical dimension (i.e. Iteration, Projectivity, and Practical-Evaluation) was demonstrated by evidence from the three subcases. This process took place by linking actors' practices to the agentic processes underlying each theoretical dimension.

The outcome of this theory-driven analysis is found in Chapter Nine of this thesis, and represents an explanation of technology appropriations and the associated organisational changes in the light of individuals' motivations, deterrents, and choices that are intrinsically informed by their relation to a wider set of contextual conditions.

5.7   Summary and Conclusion

This chapter has presented the key issues related to the process of conducting this study. In doing so, a coherent account of the formulation of this research has been provided, underlining the various decisions and practices that have been made in the data collection and the data analysis process.

It has been also stressed that, although the research design is reported in a sequential style, so as to help the reader understand the overall process, the decisions about research were effectively undertaken in an iterative manner that denotes the on-going reflection and assessment of research choices. In terms of the data analysis and associated inferences, undoubtedly an element of pragmatism pervades. Whilst recognising that the research will generate some themes or concepts that are transferable to wider contexts, the research account is to be seen as one plausible explanation rather than a definitive version of the social reality (Bryman and Bell, 2011). Most important for the purpose of this research is that analytical decisions have been carried out in a logical fashion, based on the overarching theoretical assumptions that guided the study. These assumptions concern why the research has been approached in this manner and how the conclusions have been derived from the research evidence.

The next two chapters will detail the research findings. Chapter Six will introduce the case by outlining the context of technological change, and Chapter Seven will expound the technology implementation processes in the three studied organisational units.

THE CONTEXT OF TECHNOLOGICAL CHANGE

In this chapter the emphasis is placed mostly on the macro-level, examining the national and organisational context, and locating the change project in its broader context. The importance of this presentation lies in specifying the motivations behind change, and highlighting how the interest and influence of certain actors are formed - according to their position in this broader context.

The first two sections allude to the national and organisational context, and the details of the strategic transformation of the case organisation. The section that follows is concerned with the role of technology in this organisational change, highlighting in particular the situation of the three studied organisational units.

6.1   The National Context

6.1.1   Brief Overview

The research venue of this study is Xlines; a state-owned airline based in one of the Arab Gulf Cooperation Council countries (AGCC or simply GCC). The GCC is an association of six states bordering the Arabian Gulf, namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates.

The GCC countries exhibit many similarities in terms of political system, culture, language, religion, and economic characteristic (The World Bank, 2010). These countries are traditional monarchies, with the state playing a visible role in economic activity (The World Bank, 2010). These countries are high-income, oil-based economies. Their public expenditures, derived primarily from oil revenues, have

increased significantly in the 2000s, allowing the governments to focus on developing the physical and social infrastructure required for private sector development (Sturm et al., 2008). Other common structural features of the GCC economies include a heavy reliance on foreign labour, and a young and rapidly growing national labour force (The World Bank, 2010). One of GCC's serious economy management challenges is the high youth unemployment (Ramady, 2012). A key strategy to addressing this challenge has been the "nationalisation" of the labour force, that is, controlling the employment of foreigners and improving citizens' participation in the labour market (Mellahi, 2006).

6.1.2   The Nationalisation Strategy

In the GCC context, strategies of nationalisation (i.e. preference of national employees) have been devised to address the increasing levels of unemployment among nationals, and the rising concerns of demographic imbalances in the population and workforce (Forstenlechner and Rutledge, 2010, 2011). See Table 6.1 for population and workforce ratios. In addition, the government job-provision for citizens is considered to lie at the heart of the social contract (Forstenlechner and Rutledge, 2011). As a result, GCC countries have developed policies that influence employment practices in public and private sectors, and have initiated steps toward nationalising their workforces (Randeree, 2012). These localisation efforts are implemented in practice through administrative procedures including recruitment strategies, education and training, and rewards systems (Randeree, 2012). In line with these HR strategic activities, The case organisation (Xlines) sought to attract national employees in all of its divisions, and offered them favourable employment terms (Source: The Company Magazine).

Prior studies revealed that the policies associated with nationalisation, such as increased employment security, have had negative practical impacts on several aspects of management and organisational structure. For example, Abdalla and Al-Homoud (1995) in a survey of management training and development practices in the State of Kuwait (a GCC member) point out that government policies guaranteeing high job security actually led to low performance, since staff only exert the minimum

effort required for executing a certain task. Furthermore, Alsarhani (2005), in a study of the nationalisation programme in Saudi Arabia, contends that long-life employment and the resultant job security may play a negative role in influencing employees' attitudes and work practices.

Table 6.1–GCC population and workforce ratios, as compiled from official sources between 2005 and 2010. Source: Forstenlecher and Rutledge (2011, p.27)

Country	2010 Population (mn)		Workforce (%)	
	National	*Non-National*	*National*	*Non-National*
Bahrain	0.51	0.54	36.1	63.9
Kuwait	1.04	2.43	16.9	83.1
Oman	2.39	1.02	28.7	71.3
Qatar	0.22	1.46	5.7	94.3
Saudi Arabia	20.94	7.75	50.5	49.5
Emirates	0.95	7.24	4.2	95.8
GCC	**26.05**	**20.45**	**38.3**	**61.7**

6.2 The Organisational context

The information about the organisational context, presented in the following subsections, have been compiled from various sources. These sources include the company's monthly magazine, internal newsletters and circulations, and the website of the company. Some information were reported and then verified during interviews or informal discussions with participants (Field notes). Other information were obtained from published sources cited in the text.

6.2.1 Historical Background

The airline organisation (Xlines) was originally founded as a fully owned government agency to provide air transport services. Over the years, this sole national carrier has played a vital role in the development of the state and its commercial exchange with the rest of world. Also, with a very limited rail network, the airline has taken the responsibility of providing connectivity between domestic cities. This process has

resulted in the formation of a huge base of operations, including facilities, ground and flight equipment, and trained personnel (Source: The Company Magazine).

The organisational structure of Xlines generally consists of several functional sectors, such as finance, human resources, maintenance and engineering, flight operations, training, IT, and sales. Each of these sectors is managed by a vice president (VP) who reports directly to the director of the company. In each functional sector, there are general managers who report to the sector's VP. Each general manager is responsible for supervising managers, who are in charge of the daily operations of their departments. The next management layer includes section managers, supervisors, and project managers. And finally comes the layer of the rest of the employees: the workers (Source: Field notes).

As a public institution, the organisation's operating budget is allocated by the state's government based on the provided services. In such secure financial circumstances, the organisation's efficiency tended to be only enough to provide services within allocated budgets. At the national context, the rapid economic development experienced by the state in the 1970s and the early 1980s due to the oil price surge, has allowed for the expansion of public sector employment. This consequently produced overstaffing, managerial problems, and low productivity (Madhi and Barrientos, 2003). This process is thought to have extended to our case organisation. Moreover, the national workers in the organisation (representing the majority of the organisation's workforce) enjoy considerable job security and are protected by due processes from arbitrary layoffs. This is a result of the state's HR policies - which allow employees to reach tenured status after serving a few months of provisional employment. Although the organisation's regulations mandate that annual appraisals are conducted for every employee, the result of the evaluation doesn't have direct impact on employees' salaries or allowances, implying that pay is not linked to performance (Source: Field notes).

These circumstances have resulted in the organisation being incapable of delivering profits for decades, only making modest margins during the latest few years - owing

primarily to a rapid increase in the airline's operations (Source: The Company Magazine).

6.2.2   Shift in Strategy

Throughout its long history, the organisation's strategies have not been directed towards profit-making as much as to contribute towards the state's development and citizens' wellbeing. As a previous chief executive stated:

'The commonly applied indicators of operating surplus or loss are not relevant yardsticks for gauging the performance [of Xlines]. This is more properly measured in terms of the airline's contribution to the improvement of living standards [in the country] and to the furtherance of industrial and commercial activity...'(Vandyk, 1995, p.187).

At the time, this vision was a reflection of the state's development plan, aimed at establishing an infrastructure that could support a modern economic base, and developing the human resources necessary to help bring about the planned economic prosperity (Source: Five-Year National Development Plan). This strategy, however, has seen a shift towards inviting greater private sector involvement in public enterprises; the government has declared its intention to privatise several key service organisations, including the sole national airline (Al-Omar, 1996).

Privatisation, the process of transferring the ownership or management of public enterprises, projects, and services to the private sector (Savas, 1987), has been an international movement that gained traction in the 1980s, led originally by the UK and the US, then quickly catching on in both industrial and developing countries. The desire for privatisation in GCC countries was prompted by several motives. The most prominent was the decrease in state revenues in the early 1990s due to the decrease in oil prices. Oil exports account for the vast majority of government revenue in GCC countries (Ugo and Iqbal, 2003). This problem was aggravated by the inability of the state budget to continue supporting public enterprises, and the need for relief from the financial burden (e.g. subsidies and debt requirement) of such enterprises (Al-Omar 1996). In the case organisation, the privatisation strategy took the form of transferring

ownership, by dividing the organisation into several independent strategic business units (SBU) then selling part of each SBU to strategic investors. This strategy was designed to fulfil several key objectives, chief among them being the reduction of costs in providing government services, and the improvement of organisational units' efficiency, because it is considered that efficiency can be better strengthened by subjecting projects to market forces (Source: Internal newsletters).

6.2.3   Strategy in Action

The privatisation programme of the airline organisation was initiated in the year 2000, when a contract was signed with a specialist international firm to carry out an extensive investigation into the financial, operational, and legal position of the organisation, and to develop a comprehensive plan that facilitates the privatisation of Xlines and makes it a secure company ready for potential investors (Source: The company internal website).

The consultant company identified two main issues that need to be addressed in order for the airline organisation to be able to compete in the market and attract potential investors. First, the number of employees (about 25,000) was considered excessive and therefore constraining to an efficient business operation. The consultant suggested a reduction of about 30% of the workforce in order for the organisation to run in an efficient way (This figure could be a reflection of the consultant's experience in other contexts). Second, the IT infrastructure and applications were found to be outdated and hindering the transition to the new vision of a growing and profitable organisation. An IT master plan was devised to replace legacy systems with new IT systems in almost all of the organisation's operations (Source: Internal newsletters). These recommendations were put on hold for a couple of years before the rapid increase in oil prices in 2005, and subsequent years allowed the government to allocate the budget needed to initiate the envisaged changes (Source: Field notes). The organisation embarked on two major programmes at about the same time, namely renovation of the IT infrastructure and applications, and a workforce restructuring programme.

Workforce Restructuring Programme: The organisation announced an early retirement incentive plan named "the golden cheque" whereby employees who had served for twenty years or more could choose to retire and get paid an attractive reimbursement for retiring early. This programme was meant to reduce the excessive number of employees without violating the government's strict regulations related to sacking national employees. At about the same time, the organisation began to attract skilled and younger employees on the basis of private-sector employment-contracts, which gave wider scope to the employer company in terms of HR redundancy policies.

The execution of the early retirement programme resulted in a significant reduction of more than one-fifth of the number of Xlines' employees. But it is assumed to have had considerable impact on the quality of the workforce in several critical units. In reality, many qualified employees who were able to find good jobs in other companies exploited this opportunity to receive the "golden cheque" and continue their career outside the organisation. On the other hand, many of those targeted by the programme have stayed, and the organisation was unable to force any of them to quit because of state regulations that strictly regulate the sacking of national employees. Later on, the scarcity of qualified and experienced employees in many areas represented a major challenge in terms of the conduct of organisational operations and projects, including the IT renovation project.

Information Technology Renovation: For decades, Xlines' relied on in-house development of IT applications. Whilst these application catered for operational activities, they lacked information management and data integrity - which caused many specific issues for Xlines. For example, information isolation led to inefficient business operations and inaccurate business data records - which created challenges for decision making. With the privatisation strategy, the organisation has become able to acquire the budget needed to pursue an advanced Enterprise Information Systems (EIS). The primary objective of the implementation of the Enterprise Systems was to achieve greater integrity, reliability, and timeliness of the information made available to the organisation's management. EISs are composed of integrated modules that link diverse business functions, such as logistics, finance, accounting and human

resources. Traditionally, software systems are designed to fit the business process of an organisation. With EIS systems, however, this sequence is reversed, in the sense that the business process must often be modified to fit the system (Chen, 2001). Although some customisation - to support specific organisational needs - is possible, the system's complexity usually makes major modifications impractical.

Further details about the technological and organisational changes linked with the introduction of EIS are presented in the following section.

6.3   The Technology Introduction

The previous part presented an overall picture of the broader context around which the technological change project has been introduced. It has been possible to reveal several issues related to the organisation's background, the regulatory system, the social relations, and the cultural understandings that have interweaved in the process of technology implementation. The following sections turn to the micro-processes involved in the introduction of technology. In particular, I focus on the implementation of SYSLEARN - one module of EIS that is implemented in large organisations to manage training and education activities. I outline the case of introducing SYSLEARN in three organisational units responsible for the administration of training activities in Xlines.

In what follows, I begin by presenting a background to an EIS implementation project, then an introduction about the studied organisational units. After that, I outline the drivers behind the technological change - which reveals how IT was promoted as a vehicle to support the management's aspiration to business regulation and advancement. I then delineate the work-flow fostered by SYSLEARN to illustrate how the new system is supposed to contribute in terms of actualising the visionary image of the organisation.

6.3.1   The Implementation Project

The project of EIS implementation had been led by the IT division, and all users' groups were invited to nominate their representatives (in the context of a system's

implementation, these employees are named SMEs: Subject Matter Experts). The criteria upon which these individuals have been selected varied from one business unit to another. Consequently, these individuals proved to be critical in determining the extent to which each business unit takes advantage of the implemented system, as will be further explained in subsequent sections. In the pre-implementation phase, the process was initiated by gathering information about the current processes from each user group to devise what is called "Business As-Is". The parties involved in this initial phase were the implementation partner (a company contracted to configure and implement the enterprise systems), the IT department, and the user groups' representatives. It was then followed by the realisation phase, whereby the processes were verified, documented and then approved by each group. After that, customisations of the packaged software were applied by the implementation partner so as to accommodate the unique requirements requested by each functional area. Afterwards, the modified systems were tested by the users before they signed acceptance, and the systems were migrated to production.

Project management directions were clear in terms of making every effort to minimise customisations on the delivered systems. This is because one of the declared objectives of the project was to make use of the "best practices" embedded in the new systems. Another reason was that subsequent upgrades to the system would take a longer time if extensive customisations were made to the original version.

6.3.2   The Subject Organisational Units

Training in Xlines is undertaken by three organisational units on the bases of training contents and training customers (see Table 6.2). Prior to the adoption of SYSLEARN, two of the training organisational units utilised a stand-alone desktop software system in the training administration (the technical training unit, and corporate training unit). In the aviation training unit, the technology used in the training administration had been limited to Microsoft applications such as Excel and Access - which had been only utilised in the storage and retrieval of training data.

Table 6.2–Organisational and technological characteristics of the studied business units

Organisational Unit	Function	Legacy System
Technical Training Unit (BU1)	A specialised training unit that provides training to technicians responsible for aircraft maintenance.	A stand-alone desktop software system
Aviation Training Unit (BU2)	A specialised aviation training unit providing training exclusively for pilots and cabin crew.	None
Corporate Training Unit (BU3)	A typical training department which provides training services to all employees of the organisation in a variety of subjects, including technical, personal, and managerial skills.	A stand-alone desktop software system

6.3.3 New Information System

SYSLEARN is one of the modules of the purchased enterprise system. It serves learning management purposes and operates within an overall enterprise information system. SYSLEARN is normally implemented so as to manage training across the extended enterprise, to track its completion and measure its impact. The organisation's management conceived of SYSLEARN's implementation as part of overall organisational change towards an integrated and efficient business operation.

The new system proposes a specific business process of training administration, and thus requires full consensus from multiple organisational units and groups. Ideally, the process of course registration is initiated by employees as they log on to the enterprise portal, which contains details of the corporate training and education offering. From here, they can register for courses. According to company-specific regulations, an approval process is triggered and the registration request routed to the employee's supervisor for approval or rejection. If the registration request is approved, the control is taken over by the registration office at the training unit where the demand for training is analysed. The required courses are then opened in the system and fed with the names and details of the trainees, along with training

resources such as classes and teaching materials, in addition to assignment of the right instructors. Trainers are then emailed with the details of the course. Upon the course's completion, the instructors "follow-up", i.e. record trainees' attendance and their results on the course. These results need to be electronically approved by the department/section manager. At the point at which the course is closed, this information ceases to be accessible for editing by instructors. The registration staff, however, can still access the course to issue certificates, and provide a variety of reports and statistics. This process is maintained by well-designed access profiles, whereby users of the system are only entitled to access the information and perform the tasks defined by their role in the training process. As such, each category of employees took part in the training administration process, in line with the inscribed system work processes and role distribution. Furthermore, the integrated nature of SYSLEARN means that, once a record is inputted onto SYSLEARN, it is automatically reflected on others of the organisation's systems, such as payroll and time management systems, triggering further actions according to the encoded organisational policies and procedures.

From the perspective of top management and the IT department, the (above described) process offered by the new system represents "best practices" of the industry, and thus offers an opportunity to reorganise business units around new concepts of economic and technological rationality. This means that SYSLEARN is associated with new concepts and formulations of the role of technology in the workplace. This new "work model" is further investigated in the following subsection.

6.3.4 New Work Model

Despite the legacy systems offering a means of operating the day-to-day training activities, and sufficiently fulfilling the reporting demands of certain units, their continued use was considered incongruous with the top management's view of technology as a strategic agent for organisational change and improvement. The legacy systems were largely lacking in terms of the analytical capabilities that would integrate all aspects of business activity and provide information for better planning

and decision making. Also, they limited the control mechanisms that would ensure data integrity and security. Above all, these systems were limited to department-wide communications; the management's vision was that all organisational systems should operate within an enterprise solution that integrates organisational data under one centralised database and allows information to be shared across all functional levels and management hierarchies. One of the IT managers (Participant No. 7) reflected on the rationale behind the introduction of the new enterprise integrated systems thus:

> *The old systems were out-dated and non-harmonised... They were actually hindering progress and development... For example, the old systems were incapable of providing real-time information to decision makers, and it was not feasible to develop and modify them... They were written in old programming languages on old platforms... These technologies are no longer taught at universities...and if we were to develop them, we would have needed big technical efforts, and yet it was not guaranteed they would deliver at a level close to market standards, especially since customers now are more IT conversant and looking for more and more online services......Also, the allocation and optimisation of resources had not been conducted in a dynamic and systematic way, but one based on personal ties and previous working templates... What is good about an integrated system is that it can minimise human intervention.*

As can be inferred from the above comment, which is also recognised in Enterprise Systems' implementation literature, the adoption of these systems is associated with new ways for designing tasks, jobs, and communications within the organisation and leads to new work structures and procedures (Kallinikos, 2004a). These new ways of organising potentially pose a threat to the embedded sets of relationships and structures encapsulated in the design and operation of the legacy systems. In other words, besides, the merits of driving the flow of information between all internal businesses and facilitating fast access to accurate information, the implementation of the enterprise information system was considered a key to infusing standardisation into the business processes and in guiding organisational activity. This is a crucial

distinction in the qualities attributed to technology prior to and following the SYSLEARN adoption (see Table 6.3).

Table 6.3 - Pre-existing vs. Anticipated attributes of technology

	Pre-implementation	**post-implementation**
Technology's role	administrative tool: supporting work practices, automating existing processes	strategic tool: ordering and structuring work practices
Technology's specifications	familiar, flexible, locally managed	complex, rigid, externally integrated
Technology's outcome	Data, i.e. static representation of facts and transactions.	Information to support decision processes, and coordinate internal and organisational business processes, and also interacting with markets and partners.

However, the true realisation of the new system's qualities will be dictated by the way individual users define and experience the new concepts introduced by the system within a specific social context, and the extent to which units' management and other categories of employees redefine their working positions and practices in relation to the new system's business processes. These issues will be tackled in the following chapter, which will provide a detailed description of SYSLEARN's implementation in the respective organisational units.

CHAPTER 7

THE PROCESS OF IT IMPLEMENTATION

This chapter concerns the process of introducing and implementing the new IT system in the three studied organisational units. In order to organise and make sense of the empirical data, the implementation process is presented in the form of a narrative of the implementation story in each of the subject business units. This narrative has been constructed based on the overall evidence gathered, including the interviews' transcripts, the field notes, and the textual materials. To ensure anonymity, direct quotes are referred to by the participant number. Details on each participant's affiliation and roles are listed in Appendix B.

The narrative is enclosed within few "brackets" of time corresponding to the flow of the project. These brackets are presented in four sections. The first section describes the work setting prior to the system's introduction. The second section relates to how technology had been perceived in the organisational unit. The third section alludes to the events and interactions taking place during the system configuration stage. And the last section illuminates the post-implementation events and practices. The chapter is concluded by a summary of the major issues in the implementation process.

7.1 IT System Implementation in BU1

7.1.1 The Work Setting

Technical training (BU1) is the training arm of the organisational business unit of the Technical Services department (TSV). TSV is one of Xlines' strategic business units (SBUs), offering maintenance, repair and overhaul of aircraft engines and components. It is set strategically to extend technical services to other airlines' fleets

on commercial bases. The role of BU1, which organisationally reports to the managing director of TSV, is to plan and conduct the training needs of the technical units.

As mandated by industry regulations, aircraft technicians (mechanics and aviation electronics specialists) have to attend specific sets of periodical specialised training and pass their exams, to maintain their licences and qualify to work on certain equipment, or undertake particular tasks as part of their job. Periodic audits on the maintenance units are conducted by national as well as by international aviation bodies, involving the inspection of technicians' qualifications, to ensure standards and regulations are always met. The violation of such regulations could result in the maintenance unit licence being revoked and consequently on restrictions to the airline's flights being applied.

In addition to the emphasis on ensuring regulatory requirements related to training, technical units strive to meet the daily operational needs of technical manpower. These circumstances have resulted in specific training practices such as "training in off-time", where night-shift technicians attend training courses in the same morning, and "Walk-in training" - whereby trainers are not necessarily pre-registered to some certain courses, but instead have the flexibility to join them (subject to availability), and "Training during vacation" - where technicians are enrolled in some courses that are less frequently held. These practices – designed to fulfil working demands and operational staffing needs - took place in coordination between BU1, technical management, and the individual trainees.

The administration of the training process was primarily undertaken within BU1, with the limited involvement of the technical units of TSV (training customers).The administration department at BU1 oversees technicians' licences and qualifications, producing a list of the technicians whose licences are due to expire, then handing it over to the training departments to arrange for classes and assessments in coordination with the respective technical units. Technicians are then scheduled for training, attending their courses accordingly. And eventually, printed versions of the training reports are sent back to the TSV management. Therefore, little computer and network

infra-structure facilities were demanded by, and allocated to, technicians - whose main job activities revolved around the core TSV business activities of operations and maintenance.

In BU1, there are two main categories of employees. The first category includes those administration staff responsible for overseeing technicians' licences and qualifications, coordinating with technical departments to schedule the required training, filing results, and keeping record of trainees' qualifications and licences. They are also responsible for processing training data - to produce particular reports about technicians' qualifications, in accordance with the stipulations of the regulatory institutions. In addition, they pass the assessments' results to the HR department of Xlines to process technicians' allowances and promotions in line with their internally-obtained qualifications and organisational policies. The second category of employees comprises the trainers and training supervisors (the training sections managers). These employees are usually senior technicians who have moved to the training unit to undertake the duty of teaching technical courses. Typically, trainers are only concerned with the development and teaching of the scheduled training courses, and are hardly concerned with the administration aspects of training. As such, the role of managing the training process was confined to the administration departments of BU1.

Training administration was formerly achieved through a blended environment of paper-based communications and stand-alone desktop software systems. After initial requirements were emailed by the managers of the technical units, administration staff devise the training schedule, assign the required resources, and organise the training courses. Once the training was concluded, they would receive the courses' details, manually recorded by trainers and signed by the training sections' managers, in order to upload them onto the legacy system.

The legacy system was a piece of stand-alone software (i.e. not integrated with other units or organisational systems) keeping record of all training data including, technicians' qualifications and results of courses and assessments. The design of the legacy system was focused on BU1's training needs, but training data would not

automatically transfer to other organisational units such as HR department or technical units. Therefore, data updates and reporting were achieved outside the system, through e-mails and other stand-alone system applications.

The relative simplicity of the legacy system allowed for technical problems to be resolved by members of the unit, without having to seek specialised technical support. But the system had neither authentication nor traceability features. It was also lacking in terms of data control and verification, hence data errors would be manually identified and corrected. Also, the legacy system was not equipped to handle financial transactions between the training provider (BU1) and the training recipients; these functions were deemed irrelevant to BU1's uncommercial work template.

In practice, the legacy system worked as a comprehensive data repository system for all training activities, allowing for the accommodation of some work practices that would not be facilitated if an advanced information system was in place. These features of the legacy system were important in explaining how BU1 individuals understood the role of technology in their work environment. For instance, Data inputted onto the system were not self-cross-referenced with other operational systems, but relied instead on individuals' inspection and scrutiny. Consequently, the door was open to possible manipulation of the data recording process. That is to say that technology was not only a data recording system; it also facilitated the operational characteristics of training, whereby administrators could modify the training protocols to suit the individual preferences of trainers and trainees. For instance, the system did not constrain the user from inserting two data records for one employee on the same date. The latter actually seemed a fairly common practice, as can be inferred from the following comment by one of the administration staff (Participant No. 46):

> *Usually, a trainee can have the certificate of course attendance if he managed to attend 80% of the course time… Some trainers exploit this flexibility… For example, if one is registered on a 5-day course, he could attend for 4 days, and then, on the 5th day, join one of our "walk-in" workshops, obtaining certificates for both classes.*

These practices were commonly admitted, because the minimum percentage for attendance was guaranteed, and operational needs were simultaneously fulfilled. The flexibility of the legacy system allowed for such practices, despite the potential to compromise training quality.

In terms of employees' involvement with the training system, the use of the legacy system was limited to the administrative staff of BU1. Traditionally, BU1 management would not interact with the legacy system, and would receive printed reports as needed. Much like unit's management, the trainers within BU1 had no role in using the legacy system. Although most of those involved with training had not taken on direct system-related responsibilities, they were essentially satisfied with the deliverables and with the level of automation offered by the legacy system.

7.1.2 Perceptions of the IT System

Technology's role within BU1 was mainly administrative in nature, allowing for the continuity of conventional work practices, preserving the distribution of roles, and establishing relationships between employees. The new system (SYSLEARN) was made available to BU1 to take advantage of its potential to provide more efficient and organised work processes, but the decision to adopt SYSLEARN had neither been initiated by the internal needs of the head unit of technical services, nor by its training arm (BU1). Indeed, the implementation was driven primarily by top management's directions aiming to integrate organisational units and processes via a unified enterprise system. Therefore, while the organisation's management viewed the technological change as part of an overall organisational change towards efficient business operations, the new system was viewed within BU1 as a technical fix or an IT project. In other words, SYSLEARN was considered merely a more advanced technology – one that presumably would offer additional features and better control over the pre-existing business processes. For this reason, there were varied opinions within BU1's management regarding the utility of the SYSLEARN implementation. For example, there were some managers who understood that - if SYSLEARN is well implemented - it could allow them to closely monitor training activities and resources, to access training data directly and generate more detailed and accurate reports. In

some cases, there were strong expectations placed on SYSLEARN to help improve managerial control and decision making capabilities. One training section manager (Participant No. 45) commented:

The old system is not enough for me, because I want to analyse information... Information is power; the information will spread... and you can have information from Finance, HR, and training... You can see how many people need to be trained in the next few months, or in the next few years. All information is available. Information can be seen instantaneously once you're granted access, because there's a centralised database, and instead of asking for reports, you can directly obtain them from the system.

Contrasting with the opinion expressed in the preceding example, the majority of BU1's employees were not convinced. They felt there wasn't a justified need to disturb the unit's daily work and human resources with SYSLEARN implementation, because the legacy system had been performing the job 'perfectly well'. This position is reflected in the following comment made by one of the training instructors (Participant No. 53):

Despite little problems, we used to have an excellent programme. So the question should not be whether the new system is good or not! The question should be: do you need the system? ... Why would I hire a 50-seat bus if there is only a handful passengers?

These contrasting views are actually a reflection of the differentiated meanings attributed to technology between - on the one side - top management, the IT department, a couple of managers in BU1, and – on the other side - the majority of stakeholders in BU1 (BU1's management, and most of the instructors). The advent of the new system was accompanied by new systems of organisation in terms of work and relationships. In contrast, the design and operation of the legacy system encapsulated numerous components of BU1's long-established business practices, structures, and relationships. This distinction is reflected in the qualities attributed to

technology prior to and following the SYSLEARN adoption (See Table 6.3). As will be illustrated later in the analysis of the case, these divergent perspectives proved to be crucial in understanding how individuals within BU1 engaged with the new technology in their workplace.

Despite these contrasting impressions about SYSLEARN's adoption, there has been a consensus that the new system demanded a great deal of technical knowledge and new skills. Also, the transition to the new technology was associated with uncertainty, and thus, there were real concerns about the disturbance of BU1's daily work or data availability - which could consequently pose real challenges to BU1's accountability to external parties. Furthermore, the new system was expected to redistribute roles and functions within the unit, in line with inscribed work processes. For example, administrative staff were assumed to give up any manual interventions with respect to training data. Also, trainers needed to acknowledge that their job duties will involve more administrative work using the new system.

7.1.3 IT System Configuration

The divergent perceptions amongst key stakeholders of the technological change project shadowed the first stage of implementation - which included collecting business requirements by "subject matter experts" from different organisational units. It was assumed that each unit would assign to it one of their most qualified personnel in order to achieve the best alignment between the work practices and the processes embedded in the new system. However, in the case of BU1, this critical stage had not been dealt with faithfully. Despite their lack of enthusiasm toward the technical change, BU1's unit's management had to respond to managerial directions to assign employees to participate in the implementation project; BU1 nominated their representatives, but only to convey a message of dissatisfaction. A member of the implementation project team (Participant No. 52) explained the situation as follows:

> *They didn't welcome the system at all…they were continually complaining about the system and they said it's a waste of time…top management*

pressured them into using the system…to them, SYSLEARN means double the work: an extra burden.

This situation was clearly resulting in less motivation on the part of BU1 to demonstrate its ownership of the system. Accordingly, the representatives didn't apportion dedicated effort into thoroughly describing the internal business practices, as required for the technical team to map them to the processes inscribed in the new system. Also, there was less intention to carefully study the options offered by the new system for the unit business processes. An IT member of staff (Participant No. 17) explained the logic behind this approach:

> *You have to modify the process so that you make use of the "best practices" of the new system... The new built-in practices were meant to provide integration between multiple systems and control over the processes.*

Another member of the technical team (Participant No. 51) commented on the contradiction between BU1 standpoint and the project's stated aims:

> *In BU1, they said, this is the process… and this the way we do it, and you have to modify the system, but the direction coming to us from the project management was to not modify the system; you should make every effort to minimise customisations on the delivered systems, they said, because extensive customisations on the original version mean that future upgrades would take longer time.*

As can be inferred from the above comment, the IT team were concerned about the technical complexities that could result from applying extensive modifications to the original version of the software. This approach had not been quite understood or accepted by the BU1 representatives, because their main concern was to ensure that the existing (reliable) practices would be supported throughout the configuration of the new system. This view is apparent in the following comment made by one of BU1's implementation team (Participant No. 47):

The implementer is pushing to the vanilla version [original version]; they filter your requirements and think on behalf of you, and they mostly reach the wrong conclusions... they say that once it's so customised, I cannot provide support for you. But they don't want to understand that users are more able to decide what is good for their business.

In response to these opposing views, BU1's representatives resorted to their established agreements with regulative bodies as a means to set forth a case for their needs. These needs were based on pre-existing work processes, and were usually fulfilled by direct outputs from the legacy system; this practice is expressed by the previous commentator (Participant No. 47) in the following statement:

We refused any process that would delay our work or make it complicated...for example: in the new system, our old data and the new inputted data could not be displayed in one single report - which is a bit of hindrance because we therefore need to recombine the two reports manually.

Consequently, the technical team had to admit these requirements, and it became ready to apply customisations to the system that would take these requirements into consideration. The IT member in SYSLEARN's project (Participant No. 51) declared:

BU1 had agreed with [an International agency] to produce a particular report for them, and if they didn't, then they would risk cancellation of their licences. So we decided to change [SYSLEARN] instead of going into the complications of setting new agreements with the regulatory agencies.

He further explained the process of system customisation as a matter of a balance between numerous factors, insisting thus on the role of management in enforcing the changes in practice:

Basically, the decision is based on the nature of change... if it impacts on the position and the regulation status of the airline (where you are responsible to international bodies) then there is no compromise; you have to modify the application. So this is their business best practice. But if it's something like

we are used to this process, then the management will tell people: from now on you have to do it this new way. But when government or industry's specific requirements are involved, you have to change.

Another factor that was crucial in the process of responding to the BU1 users' requirements was the migration of historical data onto the new system. This migration took place in a way that kept the old data (the training data compiled prior to the SYSLEARN installation) separate from the new data (inputted after the SYSLEARN installation). This meant that technicians' training history could not be generated in a single report and that therefore certain assessment procedures could not be accurately applied using SYSLEARN. The way to fix this technical problem was to organise the old data in a certain format, and apply further customisations on the system to accommodate the formatted data. This would require BU1 to make the entire data available to the technical team, and would also require more time for system customisation before the system's "go-live" scheduled date. The timeframe for the "configuration stage" was considered to be very tight, preventing data formatting and finer customisations from being practically feasible. The IT team member (Participant No. 51) continued to say:

> *The implementation time was obviously not realistic…We couldn't migrate 100% of the data. So they have data from before [the go-live date] which had been transferred in a format that they don't like…When we explain this to them - in terms of before go-live and after go-live - they simply don't listen to this terminology.*

In response to this situation, and given that the top organisational direction expected no change on the implementation schedule, the resolution was made to proceed with the system's "go-live" plan, and to arrange for further modifications to the system whilst SYSLEARN was in operational use. Later on, the impetus for SYSLEARN's implementation had relatively declined, and both parties settled (provisionally) on a state of incomplete data migration. The practical implication of this state was that BU1 could justifiably maintain the legacy system - so as to fulfil specific operational transactions that had not yet been configured in SYSLEARN.

In addition to the technical complexities encountered by the implementation team, the configuration stage saw a number of key members of the BU1 representation team withdrawing from the project due mainly to personal preferences either for retirement or movement to other departments. For instance, one of BU1 representation team opted for the financially attractive "early retirement scheme" (The programme promoted by the organisation's management to reduce the excessive workforce number as part of the overall organisational change strategy). Another key member found a career advancement opportunity in a new department established as a result of the organisational restructuring programme. Here, one of the BU1 representatives who joined the project in a later stage (Participant No. 52) comments on his role in the process:

> *The representative [of BU1] in the implementation project quit in the middle of the project, so management nominated me to participate in the project... They said to me: go to the IT department, work with them and see what the issue is.*

This instability of representation seemed to be a recurring issue, according to one IT manager (Participant No. 16) who was involved in EIS implementation project:

> *One of the challenges of the implementation was due to changes to the users' group representatives. People who were involved in the business process building were replaced in the project training workshops. And finally, those people who had conducted work on the system turned out to be users who were equally new to the whole project.*

In terms of the BU1 case, the instability of representation across the different phases of SYSLEARN's implementation played a major role in the poor definition of the business processes, and in less accurate accounts of critical procedures of BU1 work - the consequences of which will be examined in the following subsection, which deals with BU1's engagement with SYLEARN after it had become part of the work arrangement.

7.1.4 IT System Use

After the new system had been migrated to live operation, users were supposed to undertake work activities using the system. To begin with, the intention to involve training recipients (i.e. trainees or their supervisors at the technical departments) in the registration process was considered unfeasible because that workplace lacked the necessary infrastructure to operate the system - in terms of the availability of computer terminals and the connectivity to the enterprise system. This failure to address the resourcing issues for the project had been a concern for certain users – including some who originally expressed a level of enthusiasm about the new system.

Furthermore, given that representation in the SYSLEARN implementation project was confined to members of the training unit, many employees in the technical departments were largely ignorant about the new system. These issues were expressed in the words of more than one of BU1's members (Participants No. 53, 54, & 55), besides a training section manager (Participant No. 45), who stated:

> *Actually there are not many computers there, and there isn't a reliable network either, so they could not log-on to the system if they had access to computers…so it was frustrating… You probably find one or two who would know about the system but for most of them, I'm not sure if they are aware of the system, what it is, what are its functionalities, or how it would serve them.*

Therefore, the registration process continued to be conducted by the administration department within BU1, sidestepping the work flow of the new system, and undermining the efficiency approach of the system.

In terms of subsequent stages of the training process, BU1's management initially attempted to utilise SYSLEARN by, for instance, assigning to the instructors the task of "follow-up", i.e. courses' results entry, but later found that many instructors (with a few exceptions amongst computer savvy users) failed to live up to the challenge - either due to lacking technical efficacy or lack of interest and willingness. The training section manager (Participant No. 45) explained the situation as follows:

At the beginning, management encouraged use of the system... But users were not skilled enough on the system, so there were lots of mistakes; nobody was ready to take responsibility or to be held accountable for these mistakes, and, given that these mistakes could have an impact on business operations, management ceased to encourage its use except by those individuals working with the training administration.

The intention to confine access to the system to training administration staff was also influenced by the fact that training instructors had largely avoided undertaking the extra duties introduced by the system. These employees, due to their "permanent employment" status, felt no threat by ignoring some difficult or unwelcomed duties - because their job tenure was not at stake.

Another aspect is related to the difficulties faced by BU1 members in dealing with SYSLEARN's new interfaces and concepts. The technical complexity of the new system is described by one of the administrative staff (Participant No. 46) thus:

The new system is much more difficult in terms of interface and terminology…It's not like windows [MS-Windows]; you have to use the keyboard all the time, memorise the code of each transaction, otherwise you need to navigate into multiple screens. It's not friendly… its interface is not user-friendly at all, and its logic is very difficult.

These technical difficulties could have been minimised by education and training, as the implementation plans were designed so that representatives of each unit would attend a programme termed "train the trainer", and would then carry out training sessions for their colleagues. However, in BU1's case these plans had been negatively affected by the instability of the representation team, because individuals who had participated in the "train the trainer" courses later quit the organisation for early retirement, or transferred to other departments. Consequently, users were left to their individual efforts besides a few training sessions provided by IT personnel. The latter were mainly considered ineffective, as can be noted from the following comment by one of SYSLEARN's users (Participant No. 48):

There was no formal training... there was only what can be called an awareness session... They should provide proper training and also accept mistakes from users, and provide on-site support… but this hasn't happened. The training sessions we attended were not based on actual data; training was not connected to what we actually do. For example, they could have shown us the class attendance screen and taught us how to input data… but what they actually did was to talk virtually about these functions.

In addition to the technical difficulty of the new system, there were other issues related to the integrative nature of the system - which made every action on SYSLEARN reflected in other modules of the enterprise system. This issue of data integrity had sometimes been in conflict with common practices within BU1 - which put more emphasis on business continuity at the expense of integration and control. This contrasting emphasis between the logic of the system and the reasoning of some internal practices is illustrated in the following comment by a member of the training administration (Participant No. 46):

It happens that a trainee is registered for a 3-day course, and then he attends the first two days. On the third day, his supervisor calls him and tells him to quit the course and come back to work. What happens here is that he is recorded as absent on the remaining day. Based on our entry, the system considers him absent and takes further actions to deduct his pay accordingly while he's actually only withdrawn for operational needs.

These controlling aspects - stemming from the integrative nature of SYSLEARN - apparently contrasted with the simplicity and flexibility of the legacy system, which allowed more space to meet operational circumstances. Consequently, BU1's management requested that these controls were released to allow for more flexibility and to prevent conflict with other departments (Participant No. 52):

we then decided that we needed to record the status of the trainee as present or absent but we don't want to be involved in deciding the status of the employee in terms of the impact on their payment.

In addition to these features of the new system, administration staff saw that the data transition did not result in the required integration being realised between the historical data and the newly entered records. This meant that a number of critical work procedures related to technicians' assessments were not supported by SYSLEARN; this issue is mentioned by one of the administration managers (Participant No. 44):

> *Although the system is considered up and running, there are still critical requirements not doable by the system. We have to turn to the legacy system to meet these requirements.*

Eventually, these considerations, besides the management's concern with present demands of operations continuity, gave more credit to the flexibility of the legacy system in comparison to the technical complexity and controlling aspects of the new system. On the other hand, the management recognised that their trajectories of action needed to respond to the demands of the organisation executives: that SYSLEARN is to be adopted. The response of the unit's management was to install the system, but not necessarily to implement all of the work processes within the system, nor to pass on the responsibility for its use to administrative staff. Faced with the complexity of the new system, and taking advantage of the flexibility allowed them by their superiors, the administrative staff accepted the terms of system adoption, interacting with the system but only at the minimal required level; they continued to rely on the legacy system for their operational work. The tension between efforts to utilise the new system and the ongoing obligation to run the business resulted in using the legacy system as the primary software used to record training activities. At the same time, SYSLEARN was also being populated with data – created at the behest of top management's directions and also to satisfy the need for communication through the unified enterprise system when needed. A member of the training administration (Participant No. 46) contended:

> *We rely on the legacy system in the registration of courses. But we have to fill in the SYSLEARN system entries for trainees' results as well, so that their new qualifications are reflected in the HR master data.*

In conclusion, the utilisation of SYSLEARN was confronted with technical challenges related to the use of the system, as well as with other organisational challenges associated with the assimilation of new work processes. Whilst SYSLEARN was acknowledged as offering data integrity and seamless communication with other organisational units (such as the HR department) - as well as offering a more efficient way of training management - BU1's appreciation of these strengths was undermined by the level of importance and the urgency placed on these attributes by their main client (the Technical Services Unit). Therefore, BU1's management didn't perceive the ample opportunity in SYSLEARN to better serve their clients or external parties. The situation turned out to be that the two systems remained simultaneously in operation, and that the work flow and the business processes largely imitated the old practices and the previous distribution of roles.

7.2 IT System Implementation in BU2

7.2.1 The Work Setting

BU2 is a training centre that provides courses in two fields in particular: flight operations and aviation safety. BU2 enjoys relatively higher autonomy from an organisational point of view because. In contrast to BU1, it was described as an independent strategic business unit (SBU) in the new organisational structure of Xlines.

Training activities in BU2 are split into three departments, based on the type of training provided: flight training, ground training, and safety training. Each department is led by a manager, assisted by a chief instructor, who supervises a number of instructors specialising in their respective areas. There are also other supporting departments, which were established after the unit had assumed its independent status. The new departments include HR, marketing, finance, and the department of training scheduling which is responsible for training coordination and resources allocation (a task that used to be handled by the training-providing departments prior to the organisational restructuring).

The trainees (Training costumers) of BU2 are exclusively cockpit members (captains, assistance captains), and cabin crew members (flight attendants), and flight dispatchers (airmen jointly responsible with captains for the safety and operational control of flights). Like BU1's trainees, these employees are mandated by aviation regulatory agencies to take periodical courses to maintain their flying licenses. Monitoring of training demands is, however, the job of another division of the organisation: Flight Operations. In September every year, BU2 receives its annual training instruction from the flight operation of Xlines. Based on this instruction, a schedule for training is devised and further discussed before it is finally approved - with details of trainee numbers and types of courses published alongside numbers and categories of trainees. A couple of weeks before any course starts, the actual names of trainees are sent to the training unit. After the training is conducted, "completion" reports are sent back to flight operations management, and also to the HR department of the Airline, to update participants' qualifications accordingly.

BU2 employs over 200 employees, comprising two main categories (similar to BU1). The first category includes those administration staff who provide secretarial services to training departments and other administrative work that is not related to training management (e.g. purchasing). The second category of employees comprises trainers and training supervisors (training sections' managers). Whilst trainers are only concerned with the development and teaching of their scheduled courses, the training department management (sections' managers and departmental managers) are closely engaged with the administrational aspects of training. They plan and schedule training, distribute training loads, and are directly responsible for providing the training reports. This is not substantially different from BU1 in terms of the role and authority of its training managers. But unlike the case of BU1, this order has been challenged by the new technology in the BU2 workplace, as will be further explained in the subsequent sections.

In BU2, the technology used in the training administration had been limited to Microsoft Office applications such as Excel and Access, which had been utilised to store and retrieve training data. E-mails had been the means of communication with other departments. So, when SYSLEARN was introduced in Xlines, BU2's management saw it as an opportunity to capitalise on IT innovation to reinforce the strategic vision of the unit to become an international centre providing aviation-related training services to other commercial air carriers besides its mother organisation.

7.2.2   Perceptions of the IT System

As was largely the case in BU1, the new system (SYSLEARN) was made available to BU2 to be implemented and utilised in accordance with the overall organisational change strategy. However, in the case of BU2, there was no particular system to manage or automate training. This represented a remarkable distinction from BU1, where the availability of a training management system - albeit one not integrated with other organisational units and processes - allowed for an acceptable level of work automation. In BU2, however, the introduction of SYSLEARN met a perceived gap in the technological landscape of the unit. In addition, the strategic vision of the

unit - as a reputable centre providing training services to regional and international carriers - was crucial in providing a clear sense of technological change, with the appropriate drivers and consequences. For these reasons, the new system was welcomed and fully supported by the unit's management. This prospect was communicated to members of the unit in several ways, but it also saw a number of technical and organisational challenges, which will be further explained through describing precisely how SYSLEARN was implemented in BU2.

7.2.3 IT System Configuration

As mentioned in the previous section, the adoption of the new system was welcomed within BU2, and this resulted in genuine support for the change project from the unit's management. This commitment to the system's implementation was manifested in the readiness and willingness to take ownership of the implementation project, and was demonstrated in the allocation of an experienced and dedicated member of staff to represent the unit in the initial stages of implementation: collecting business requirements and system configuration. This arrangement offered the stability needed for accumulating knowledge and experience towards SYSLEARN's exploitation (in contrast to the case of BU1, where change among representatives had undermined the potential of the system's configuration). Here, a unit representative (Participant No. 16) comments on this role:

> *What this project needed is a "focal point"; someone who stands in between the IT department, the users, and the management, and who coordinates between these areas and follows-up on them… I had been playing this role… it's a very difficult task, because you intrude into other people's business… such an integrated system needs a focal person who coordinates the process until every party understands their role... it's a big responsibility and needs people who can distribute roles and work and who also have power to enforce change. It's a big, big challenge... I had been doing this role to some extent but it was not easy... It needs authority, and it requires intervention into others' work, and this introduces conflict... People see you as an outsider telling them their work and imposing new processes on them.*

The situation in BU2 was that the implementation team had been given full delegation and support, and that their recommendations were taken seriously by the unit's management. The unit representative (Participant No. 16) continued to say:

> *Our director is a big believer in the system, and most of these issues are resolved by his intervention… but management needs someone who tells them: this is the way it should be! This person should be an IT expert, and also aware of the business's nature and processes. Then the role of management is to use their power to enforce it, in order for the project to proceed and progress.*

In addition, the implications of the change brought about by the new system were continuously discussed and promptly dealt with. For instance, in response to the new business process brought about by SYSLEARN, BU2 established a new department called "training, planning and scheduling". The new department was populated by the best available administrative staff of the unit, and was assigned roles including allocating and organising training resources in line with SYSLEARN's embedded work model. One of the training departments' managers (Participant No. 49) explained the changes following SYSLEARN's adoption:

> *Our training processes have entirely changed to become SYSLEARN-based. For example, in the past, there was a position called chief instructor. The chief instructor was the section manager; he would be responsible for all training on a specified number of aircraft, and would build the schedule and assign the instructors whom he supervised. He would also generate the reports and track trainees… Now, training managers don't do this anymore. There is a designated department called planning and scheduling… this department has been established since the introduction of SYSLEARN… They receive the clients' requirements and distribute the load equally across instructors, so that their load is balanced … Therefore, instructors don't have their work assigned by the manager. Instead, they log-on to the system and find their assigned work, conduct the training, and then do the follow-up [recording the results of the course].*

As can be inferred from the above comment, the new department took over the functions previously undertaken by several training sections. And, given that these duties required thorough knowledge of each section's resources and capabilities, the system was configured with a training "catalogue" containing different types of resources including the qualifications and eligibilities of each instructor. The catalogue was intended to be updated periodically, thus enabling the planner of the new department to assign the courses to appropriate instructors without the need to consult training management. A member of the new department (Participant No. 50) commented:

> *A catalogue has been built into SYSLEARN to include every detail of the training requirements; all types of course and required resources, in terms of training hours, materials, and equipment, a list of all instructors, their qualifications, what they can do, what they cannot do... everything... so any employee [in the planning and scheduling department], by clicking on any subject, can view the names of the instructors qualified to teach it.*

The informants also contended that the building of such a directory was only possible given the stability of representation in the project - which allowed for business people and the technical team to develop a common understanding in terms of both business details and technical features. These considerations also paved the way for certain adjustments regarding the ambitious requirements of BU2 in terms of pushing the configuration process forward. Consequently, there was some compromise in terms of adapting the system to all of the unit business practices because each modification on the system would require extra work during implementation and would complicate future upgrades. This issue is mentioned by the unit representative (Participant No. 42):

> *We have been told by the implementers that extensive customisations would lead to problems in upgrading the system because the customised system would need significant time to be updated each time the system is due for upgrade... so we were advised to avoid customisations as much as possible... We have therefore conducted minor customisations on the system... and*

mainly our customisations had been on the reports, or the outputs produced by the system.

The result of such compromises is that SYSLEARN was not designed to cater for certain of the practices that are unique to BU2's business and the way training is conducted at the unit. BU2 receives training requirements based on a complete programme, consisting of several courses. Because these courses are differentiated in terms of their arrangements and resources, SYSLEARN considers each of them as a separate course. The training customers mandate that they are invoiced based on the whole programme, not on each course individually, and thus BU2 requires that the whole programme is treated as a single training course for the purposes of financial reporting. The following comment by a training department manager (Participant No. 49) explains how SYSLEARN was unable to accommodate these aviation-specific training practices:

Our training is unique… in any other training or educational institute, there are common norms… they start the course in the morning, finish at the end of their day... one instructor per class, one projector per class… We are different… our courses are designed into stages… in the first stage all trainees come together in one class with one instructor. After a week, they split into groups of two in practical classes. Each group with an instructor comprises a class, where they take practical training on flying… this takes several days. And then all groups get back together in one classroom… SYSLEARN doesn't cater for this… To accommodate this in the system, we have to define each stage as a separate course… We don't want this…We want the whole programme of training to be treated as one course, in order to generate meaningful certificates and reports… So, instead of one completion report, we generate six reports, and also six invoices… This is not right… It's like your children's school giving you a separate invoice for each subject your child studies!

In general, the configuration stage in BU2 was marked by cooperative relationships between business users and the technical support team. It was also associated with

significant changes in the unit's organisational structure, so as to align with the processes introduced by the system, as means of providing better control over the training processes. The system was also equipped with work rules and procedures (a System Catalogue) so as to offer an intelligent system where essential information is codified and made available to any type of user. Conversely, some compromise was made on BU2's side in order to reach a workable system ready for utilisation. The way SYSLEARN had been configured in BU2 proved to be important in informing the usage of the system and the organisational changes associated with its deployment - in particular, the role of such technological features as the system catalogue and the interface with other enterprise modules. The implications of these technical issues on organisational changes within BU2 will be further investigated in the following section - which examines the system's use in BU2.

7.2.4 IT System Use

Admittedly, the timeframe for the configuration phase had been tight, but SYSLEARN was designed to satisfy most of the unit requirements. The training process had been implemented according to the embedded work flow of the system. However, in the first months after the system's go-live date, the end-users had not easily accepted or appreciated the system's merits. This was due in part to technical issues and changes in work scope. Here, a training department manager (Participant No. 49) comments on the technical complexity of SYSLEARN:

> *People didn't really like it at the beginning, and showed great resistance to actively using the system… because all of us are "Microsoft-oriented" in the way we communicate with a computer… SYSLEARN comes with a different approach and a more complicated terminology and interface.*

With respect to the behavioural side, some instructors showed reluctance in undertaking the responsibility for data entry – a task which they had previously not had to attend to. One of the instructors (Participant No. 62) commented thus on the issue:

The first thing we faced with the system is that we have to do the "follow-up"… the instructor, after finishing his assigned training, needs to rest, not to take-up further duties, like inputting results or recording attendance… the instructor doesn't have time for this… classes operate across a full-day, so it's difficult… It's a headache to have to worry about the course after it has concluded… There are also other problems in the system… like once I had completed the follow-up but it was not reflected in the course status as completed… so you see, there is need for technical support to help us know how to use the system.

During these initial stages, some instructors would fill a paper form of the course results and have them inputted into the system by the admin staff of the scheduling department. Gradually, management sought to connect daily work activities with the use of the system. For instance, instructors might only be aware of their training duties through accessing the system, as stated by the unit representative (Participant No. 42) in this comment:

We want to reach a point where we could tell the training instructors: if you don't see the course recorded on the system, don't go to the class… If you don't see the trainee's name on the system, don't accept him in the class… but we are not yet able to reach this point… There's still some looseness. Despite this, we are progressing and we are close to reaching this point. This is our target.

On the technical side, it was found that the type of training provided by the implementer company and the IT department was not quite effective because *"it was intensive and all-inclusive, and hence users would leave the course with almost no benefit",* as mentioned by the representative of the unit. Therefore, BU2 devised their own training strategy. One BU2 representative effectively took on the role of user education and training; he designed and conducted customised training sessions in order to teach each group of users the functions they needed to perform their job without going into complicated detail - as explained in the following comment by the unit representative (Participant No. 42):

We decided to teach them only those functions they need to use: three to four functions on average. Each user needs to master them. At the end of these sessions, users don't necessarily understand the concepts of SYSLEARN but they know precisely how to do their tasks through the system. For example, the instructor is taught how to log-on, make a follow-up, and then log-off. That's it. No more, no less. It's because IT people don't get to the point… and we succeeded! People now don't actually understand the system, the concept of the system…but they know what to do… step 1, step2, step 3 and logoff.

Furthermore, training sessions were conducted based on demand, utilising the unit facilities to boost users' know-how of the system. The unit representative continued to say:

If we spotted an area where users complained about it or make repeat mistakes, we would set-up classes in here [BU2 premises] and we would teach people… In other technically advanced areas, we would ask the IT department to send us someone to train us… because, you know, we are a training centre; we have classrooms, internet connectivity, and everything, so we make use of them.

The implication of such a strategy is that the usage of the system increased with the passage of time. BU2's management frequently made requests from the IT department's "usage reports" - that give statistics regarding SYSLEARN's utilisation. Areas of under-usage were then identified, and respective groups were directed towards further utilisation of the system. One training department manager (Participant No. 49) stated:

We started to talk about the percentage of utilisations…statistics and studies based on the system reports… Management asked the IT department to give us a list of all the features that we are not utilising, and they gave us statistics about the areas of little use, so that people were pressured to make use of the system.

In addition, the unit's management started to link employees' appraisals and promotions with the performance reports generated by the system, and hence the system began to aid in the realising the management decisions that would directly influence users' benefits, as asserted by this training department manager:

> *Now, when any employee requests a promotion, we use the system to check his performance, hours of training, etc... We can now tell exactly how many hours each instructor has conducted, and can compare... we also monitor and trace fewer performing instructors, asking why one has conducted fewer hours, or more hours...because each and every training activity is now being put through the system.*

These conditions resulted in progressive utilisation of the system, which aided in overcoming the initial use obstacles. Also, the technical support team became more sensitive to BU2's needs and more pressured to offer quicker assistance when requested. These policies, seemingly, contributed to greater utilisation of the system, and eventually to BU2 members starting to feel genuine change in the process of training, as expressed by this training department manager:

> *The system has made a big difference in our work... the unit is now totally different from what it used to be; we can now produce powerful reports with no effort. In five minutes, I can make the quarterly report, the financial report, etc. Previously, to make the same reports, you would need to pressurise the departments to collect the data. And the final report would come up filled with mistakes... Now, one transaction can save all that hassle.*

It has been also noted - from reviewing the conversations with several informants - that the above comment, showing appreciation for SYSLEARN's adoption, was hardly contradicted amongst BU2's individuals. Indeed, it was common to hear SYSLEARN described as a necessity for business expansion and work enlargement which is felt positively by BU2 members. This argument of associating system implementation with business progression can be found in the following comment by one of the training sections' managers (Participant No. 57):

SYSLEARN has become the centre of our work…it's a training management system, and training is our business…Previously, our work was focused on creating training schedules, but now, in addition to that, we need to create correct invoices because we are attracting other airlines and need to have a reliable invoicing system in place... SYSLEARN helps us organise and expand our business.

It can be inferred from the above account that BU2 had exerted great effort in overcoming the technical difficulties of the new system, but SYSLEARN came also with other organisational challenges. For instance, in response to the new business process brought about by SYSLEARN, BU2 established a new department (planning and scheduling) to take over critical tasks that used to be in the hands of chief instructors. These tasks included timetable devising and allocation of instructors' work load. In defining training demands, the role also involved the authority of approving or rejecting vacations requested by the instructors. Here one of the new department's key employees (Participant No. 60) comments on the situation:

Previously, section managers (chief instructors) would assign instructors to courses and devise the table of training…But not anymore…Now, we receive the training demands. And we assign who teaches what, when, where, and for how long.

This new arrangement, however, was resisted by many section managers. These specialist employees - normally at higher levels of the organisational ladder - didn't trust administrative staff in the planning and scheduling department to adequately undertake this role because, according to them, scheduling is not only about timetabling of courses; scheduling of training requires "inside knowledge" of training needs and trainers' circumstances. This view was revealed by the unit representative (Participant No. 42), who is also a training section manager:

Section managers believe they are in a better position to know the particular qualities and circumstances of each instructor under their supervision…so they are better able to distribute work and assign duties in more than a

mechanical way, because training is not only about giving courses... They may assign an instructor to a different project or see benefit in excluding someone from conducting training for a certain period of time... This is why they have to coordinate matters and give justifications to other departments.

Furthermore, it was stated that staff from the planning and scheduling departments - who had mostly been hired as part of the state's policy to offer employment opportunities to all citizens - were employed at lower grades, because many of them did not hold a university degree, and they were unable to show consistent competency and dedication in work. The employment of more qualified employees would require the creation of new jobs – something which was beyond the scope of BU2's authority. A departmental manager (Participant No. 49) commented thus on the issue:

We have selected the best administrative staff members within the unit, and appointed them in the new department. But still, we would be doing much better if we could recruit better qualified staff.

However, these complaints about the competency of the staff in the new department are contested in the reports by these employees themselves (Participants No. 60 & 61). They insisted that the knowledge about training resources had now been codified within SYSLEARN. Thus, the system, they believed, would enable them to perform the task effectively:

The catalogue includes every detail of the training requirements. So if a new employee is to join the department, he would be able to know all of this information through the system. He can tell which instructor is qualified to work on which aircraft... he would also be able to tell the training requirements for any subject...the number of hours, etc.

Another dimension of the situation relates to the authority of section managers over employees under their supervision - which authority was considerably reduced after the responsibility for setting work load distribution was revoked from them. One of the administrative staffs (Participant No. 61) put it this way:

There has been some struggle on this issue; they still see that they are the bosses and they cannot be stripped of these authorisation powers... The situation here became such that every employee here is a manager... a small manager! In deciding who teaches and who doesn't ... it had become a management position.

Here, one of the training sections' managers (Participant No. 57) recalls the theme, saying:

Now, the manager of the section cannot directly give anybody a vacation! He has to send a request to the admin staff in the scheduling department to ask for their approval on the vacations of his employees!

As we can see in the comments above, there was some conflict over the changes introduced in roles and associated authorities - where different stakeholders proposed their various justifications for defending their positions. The assumption of the company management throughout this dispute was that the assignment of planning and scheduling to a designated department - as proposed by SYSLEARN - would: 1) contribute to better strategic planning and more equity in work distribution over instructors - which would eventually provide 2) a more efficient operation methods - leading to 3) the achievement of organisational objectives for development. This view is translated by a senior member of the planning and scheduling department (Participant No. 60) in the following comment:

This is the right direction because, when this role has had been conducted by the section managers, it has been a short-term plan. Section managers assign duties month by month based on that specific month's circumstances... but in the scheduling and planning department, we devise a year-long plan; we have a bigger view and we can decide when to give holidays and when work demands don't allow time off... So this function had to be assigned to this department, which is specialised in this area of work. And we also have to prevent bias and nepotism in assigning work duties... Now the work

assignment is done in this separate department that deals with all these issues
based on technical criteria, qualifications, and load distribution.

Clearly, this is a view that locates the introduced changes within the strategic transformation of the entire unit. This framing helped to gradually make the new arrangement tolerable and practically acceptable by the various different actors. Meanwhile, some negotiations continued occasionally to surface between the new departmental staff and the various sections' managers. But these negotiations seemingly reflected the increasing routinisation of the new order, rather than defying it. This can be deduced from the following statement of one of the admin staff (Participant No. 61) at the new department:

Section managers can and do negotiate with us on this issue (scheduling)…
for example, they say I need this or that instructor to be freed next week…
Also, in situations where a trainer doesn't show or falls sick, we wouldn't
know straight away... In such cases, human action is faster… here, the section
manager would resolve the issue and assign another trainer, but they would
then inform us to update the system accordingly.

Another aspect of SYSLEARN's utilisation relates to the inability of SYSLEARN to appropriately "define" a training course, as required by BU2's specific practices. Whilst this technical issue didn't impact the process of training per se, it had implications on the integrity between SYSLEARN and other enterprise modules, such as the "finance" and "sales" systems. For example, the completion report cannot be sent directly to customers once the course is completed. Also, invoices are generated per course, while customers require a single invoice for the whole training programme. This is explained in the following comment by a training department manager (Participant No. 49):

The idea behind the enterprise systems is to make an electronic interface
between different departments. So when the training finishes, this should be
reflected automatically in the sales and marketing systems, and the process of
invoicing should then be initiated… But because this interface is not properly

built, we have to export the output of the training on Excel sheets, and send it to the finance department, who then manually enter everything into their systems. So there is no linkage between these two important modules… The integration between the two systems is designed at the course level - which is not practical for us, because we want to have an invoice covering the whole programme.

Consequently, the invoicing cycle cannot be processed entirely within the system, and thus manual intervention was involved in the later stages of the process, in order to complete the cycle. This is seen as a provisional resolution to fulfil customer requirements without entirely bypassing the system. the unit representative (Participant No. 42) commented on this issue:

They (the implementer) told us that this can be done in the next version, but they asked for huge money… IT said they can work around this, and we are still waiting for their solution.

Overall, the utilisation of SYSLEARN had been largely influenced by the strategic vision for business growth, and the role ascribed to technology in this vision. Consequently, BU2's leadership sought to exploit the capabilities offered by the system to obtain more efficient and effective processes. This aspiration was reflected in an authentic support for the change project, which was demonstrated in the allocation of adequate resources, and the prompt response to several technical and organisational challenges. These prospects have been communicated to members of the unit in several ways both during the configuration and deployment stages. However, the conflicts involved in the implementation of SYSLEARN introduced work flow disjunctures and challenges to certain resilient professional hierarchies, in addition to instances of misalignment between the technology and some established practices. These factors undermined the previously-assumed control and integrity functions of the system. Despite these observations - which reflect an attempt to promote stasis over change – it can be seen that the overall setting, fostered by structural and technological factors, took significant steps toward organisational transformation.

7.3   IT System Implementation in BU3

7.3.1   The Work Setting

BU3 is the main training unit of the airline. BU3 is responsible for analysing the training needs of all employees in the organisation, designing and conducting training courses that cover a wide range of subjects, including finance, management, computer skills, and customer services. BU3 is directed by a general manager who reports to the airline's top management. The unit consists of several training departments and one department for training support. Each training department is managed by a section manager who oversees a subset of training activities, and supervises a group of instructors and administrative assistants. The training support department takes up the role of coordination with other organisational divisions to identify their training needs. The training courses are provided by instructors who themselves are payroll-employees of the organisation. These instructors had assumed their positions due to specialty in certain fields (e.g. finance), or having had a previous internal or external experience in their subject of teaching (e.g. customer services), or alternatively receiving on-the-job training and knowledge through periodical courses on the subject they teach. The other main category of employees in BU3 included administrative assistants. These employees are highly inferior in terms of qualifications and skills. The issue of their relative lack of skills is sometimes attributed to government regulations that encourage full employment, allowing for the recruitment of employees displaying varied aptitudes, employed merely so as to fulfil the regulations. The result of such an employment policy has been a surplus of administrative assistants in comparison to training instructors. This phenomenon was lamented by one senior employee at the unit (Participant No. 67):

> *At any respectable training centre, you would find one secretary and a number of trainers or instructors. But here, we have an army of administrative staff and a limited number of trainers…the reason being that the company is required [as a public organisation] to hire national employees to maintain a certain percentage of nationals amongst their workforce. And the easiest target here is administrative jobs, because they [the jobs] don't require specific degrees or special skills.*

These conditions have resulted in much reliance being placed on administrative staff, leading to many work tasks being transferred to secretaries and training support teams. Amongst those tasks that were entirely carried out by the training support team was dealing with the legacy system. The legacy system was a desktop application used to record and generate reports about the courses conducted at BU3. The administration team used to be the sole users of the legacy system. This distribution of roles in BU3 is later found to have impacted on how the new system was utilised, as will be explained further in the following sections.

In BU3, the training cycle commences by training analysis being conducted through meetings between the training support department and a coordinator from each division (typically coming from the administration department of the division). After identifying the training needs of all divisions, the outcome is passed to the concerned departments within BU3 (for example, the training needs on finance are forwarded to the department of finance training, etc.). Each department then devises an annual or semi-annual course schedule based on the predicted needs. Registration is then opened for all departments through a certain procedure, which takes the form of filling application forms which are then signed by a specific level of management. The application is then forwarded to BU3's training support department for confirmation. After registration is confirmed, letters are sent to the training candidates and their managers, providing the course timing and details. At the end of each course, instructors hand the rosters (the results in paper form) to the training support team, who input them into the system.

As can be noted, this is largely a traditional paper-based process; technology's use in the whole process is confined to the final stage, when results are inputted onto the legacy system. The users of the system were exclusively the administrative assistants at the training support department, who had been enjoying great flexibility in editing and updating the master data of the system, due to its non-integrative nature. This frequently resulted in entry errors or the duplication of records, because the system was a stand-alone one, not linked to the HR master data record, nor even to other versions of the legacy system utilised in the remote training offices. On the other hand, the system was easy to use, requiring little technical knowledge to maintain, and

hence technical support was barely needed. Overall, the system had been offering an offline electronic system to store training data, but largely lacked the features of a robust, integrated, and sophisticated information system.

7.3.2   Perceptions of the IT System

The first impression regarding the adoption of new technology in BU3 was generally positive. SYSLEARN was generally considered a significant improvement that would enhance work quality and make administrative tasks easier and faster. The perception of BU3's management was that an integrated system would surely enhance the efficiency of their work by automating a number of work processes. Examples of such processes include the coordination with other departments requiring training, and integration with the master HR database, which would eliminate entry errors and duplication. The following statement by a training department manager (Participant No. 59) refers to these aspects:

> *The new system should have a positive impact on work and productivity because we will get rid of all routine work and paper work - which consumed a lot of time until now. The registration department [training support] can now register double the number of courses, and most importantly without errors... Eventually, this work will be fully automated... The process will be one whereby the employee can himself request the course, then if his manager approves the request, it is directly passed on to the training department... There will be no need for forms, faxes, etc. And we won't need our personal connection details to be enrolled in one course or another.*

This view was also supported by a member of the training support team (Participant No. 56), who stressed the potential of the new system to offer a reliable database of training profiles for all organisational employees:

> *We were happy to have a new system because it makes our work easier. For example, the new system allows us to have a profile for each and every employee of the organisation where all the courses one attends are logged and*

stored. This was not available to us previously; training courses were recorded locally and were subject to loss and mismatch.

Despite the above optimistic views, some concerns were raised by BU3 management and key users in relation to the selected type of information system. Indeed, SYSLEARN was not considered the best choice to suit the technological needs of the unit. This impression was based on the fact that other airlines were using a different software package, and it was felt by many that top management should have sought their opinion in the selection criteria. The issue of the lack of involvement in the decision was pointed out several times. For example, in the meeting with the director of the unit, he tended to distance himself from the system choice by mentioning that the adoption of SYSLEARN was exclusively a top management decision. In line with this comment, a training department manager (Participant No. 59) expressed his opinion as follows:

> *If you asked people individually which system they would prefer, everyone would probably give a different opinion based on their particular needs, but if top management have come up with a decision, then you have to accept and trust that it is the most suitable and beneficial decision for the company.*

Broadly speaking, the idea of replacing the legacy system with a new and advanced information system had been largely endorsed within BU3. But the adoption of SYSLEARN in particular was subject to some reservation by the senior management of the unit, who favoured other alternatives. Nevertheless, in spite of this reservation, BU3's stance was generally to take advantage of the new system. Moreover, the managers of the unit were not in a position to object to organisational directions. Therefore, the implementation of SYSLEARN took place according to the project timeline. By the time the system was in operational use, several end-users found it difficult to deal with the new system - mainly due to its technical complexity. This type of user included both administrative staff and instructors who were content with the status quo and hardly willing or prepared to struggle with the anticipated difficulties of dealing with a new "advanced" system. Here, one of the administrative staff (Participant No. 65) comments on the difficulty of the new system:

The system is complicated; it has lots and lots of commands. I personally learn and practice. Other colleagues have felt unmotivated to learn the system - either because they find it complex or because of the negative perceptions towards the system that have spread amongst many employees.

Taken together, these multifaceted impressions involve a desire to harness technology in achieving work enhancement and task-facilitation. But they also indicate some reluctance to measure up to the implicit challenge in dealing with an advanced and more complicated system. These perceptions had been reflected on the process of system implementation, which will be explored in the following sections.

7.3.3 IT System Configuration

The process of implementation was initiated according to the project plan. BU3's management assigned a team of representatives to the implementation project. The team included a senior instructor and two of the training departments' managers, who were all in favour of technical change. This team had been introduced by the technical team to SYSLEARN's functionalities and work processes. Given the expressed enthusiasm of BU3's representatives to automate work processes by utilising the new system, the requirements of BU3 were focused on accuracy of data entry by linking the training system with the master HR data, and data integrity by having a central database for all training stations. The following comment, made by a member of the implementation team (Participant No. 58), indicates how these aspects were central to the definition of BU3's requirements:

The most important thing is that there are no entry errors, no more duplication… the system doesn't allow it… this wasn't the case previously. For example, if an instructor is based in city A, and had given a course in city B, the registration department in both cities would register the course in their individual legacy systems; they would input the same details of the very same course twice because there was no link… We had entirely separate servers. This is not possible now; the system doesn't allow duplicate entries for the same instructor at the same time.

Viewing these requirements from the perspective of the technical team, it can be said that data integrity was an inherent feature of any type of integrated enterprise system, and hardly necessitated any customisation of the system. Moreover, BU3's training programmes are not subject to external auditors, or special reporting mandates. Therefore, the default reporting functionalities offered by SYSLEARN have been quite sufficient for internal reporting needs. These conditions helped to perform an overall hassle-free configuration from a technical perspective. The following comment by a member of the technical team (Participant No. 51) confirms this position:

> *The implementation of SYSLEARN in [BU3] was the most stable amongst the training business units… They didn't have unfeasible requirements or complicated processes.*

Whilst BU3's implementation team was keen to exploit the data integrity features of the new system, they were more inclined to imitate the previous training cycle. In this way, they tended to maintain the procedures of training needs' analysis through meetings with training customers, instead of building an intelligent system that could aid in the assessment of training requirements. Also, they insisted on preserving the role of "the training coordinator" - an employee based in each organisational unit who synchronises between BU3's offerings and training applications. Technically, this role was configured in a sort of an extra approval layer added to the registration process. In the following comment, a member of the implementation team (Participant No. 58) explains how a training course is booked via the system:

> *The system process starts when an employee inputs an application for a training course, which will then be routed to the employee's manager.... Once the manager approves the request, it is supposed to be sent to the registration department, but we have introduced an extra level: the organisational unit coordinator. The coordinator verifies that the employee actually needs the training, that the employee's organisational level matches the course content, and that the course prerequisites are met, etc., before the request is directed to training.*

The added level of verification could have been achieved through the system itself had the training rules and policies been codified within SYSLEARN. This process, however, necessitates a well-designed overall training policy that covers all training aspects. This simply didn't exist, because the analysis of training needs was usually conducted through meetings between BU3 and the coordinators of other organisational units. The implementation team therefore opted to keep this practice of "negotiated" needs analysis, and allowed for a coordinator to intervene into the automated registration process, whenever needed. This means of intervention into training applications is considered necessary because *an employee may be applying for training for the sake of escaping from work for a time',* as stated by a member of the implementation team (Participant No. 58).

The effort to provide a paperless environment has also been extended from the course registration process to the internal processes of supplying instructors with a list of their assigned courses, the inputting of training results, and the printing of completion certificates. The following comment by the implementation team member (Participant No. 58) describes how these internal processes were conducted, and also describes the potential of SYSLEARN to automate the same processes:

> *The instructor used to receive a list of attendees; he would verify the names (spelling... etc.), and take attendance every day of the course. On the last day of the course, he would record the results and then pass the roster on to the registration department, which in turn would input it onto the legacy system, in preparation for printing the final roster and the attendees' certificates. Now, no paper work is supposed to be involved. The instructor himself can log-on to the system through his portal (profile); find his courses and the list of attendees. He has nothing to do with the checking of names because they would come directly from the HR databases. At the end of the course, he would log-on to the system, insert the results and save them, which means the course is electronically passed on to the registration department.*

As can be inferred from the above accounts, the configuration of SYSLEARN in BU3 was geared to offering a platform for automating several aspects of the pre-existing

training cycle, but did not necessarily involve those amendments to the training administration process that could possibly lessen human intervention in terms of, for instance, performing training needs' analysis (e.g. devising the annual list of training offerings) or the management of training resources (e.g. the distribution of the training load between the instructors). This view is confirmed in the words of a departmental manager (Participant No. 59), who was also a member of the implementation team:

> *We have tailored the system according to the process of our work. We have had meetings with the IT department and the implementer company, and we have domesticated the system to serve our training purposes.*

One implication of such an approach of "domesticating" the system could be that the implementation team seemingly overlooked the possibility of configuring SYSLEARN to include a training catalogue (similar to the case of BU2), that would contain detailed information about training resources, and thus could equip the new system with analytical capabilities able to aid decision making related to training resource distribution or training needs' analysis. Similarly, SYSLEARN could have been customised to automatically generate appropriate course offerings by comparing organisational position requirements with profile details for the employee in terms of qualifications. These analytical elements have been largely overlooked due to the lack of prior knowledge or learning about the system, but also due to the high pressure to deliver the system on time, and also due to the lack of supporting organisational functions such as "career path" or "talent management". These issues have been expressed repeatedly by members of the implementation team in sentences like *"I need it yesterday!"* in explaining how the rushing through of implementation tasks was the norm, and how *"people were overwhelmed by the scale of change and challenges"* in referring to the lack of proper awareness creation and technical preparation. These aspects have also been confirmed in the words of a project manager at the implementer company (Participant No. 22):

> *We had big support from top management… There is a plan to privatise the airline, and IT is central in this plan… The government of the country has put forward this plan, and offered ultimate support… everything: the money, the*

consultants… so you have full support but they also have certain expectations within specific time frames, so it is mandated that the project is delivered according to the devised timescale.

Another dimension of a system's configuration that could possibly determine realisation of its analytical potential is the extent to which historical training data are available, complete, accurate, and transferable to the new system. The evidence from the participants' accounts indicates that there was a sincere effort to migrate old training data onto the new system, but that the available data suffered from inconsistency and inaccuracy. A member of the implementation team (Participant No. 58) comments thus:

Training data were scattered over multiple sites, and we had to extract data from the servers at these sites, then organise, filter, cleanse them, and compile them into a format compatible with the new system.

This task was challenging, due to the pre-existing technical arrangement that consisted of multiple stand-alone, non-integrated versions of the legacy system, which allowed for duplications of entries and compromised the accuracy of data. As the interviewee above continued to say:

The migration of old data was a big problem because the old way of entering data allowed for errors and duplication.

Despite the above mentioned challenges, the data available on the legacy system were migrated "as-is" to SYSLEARN. This decision might have reflected BU3's intention to comply with the prescribed steps of the SYSLEARN implementation, regardless of the quality it delivered. In practice, the old migrated data were considered less critical in the operational use of SYSLEARN; BU3's perspective was that having the old data uploaded onto SYSLEARN would be good for archival purposes, but not essential to work continuity - neither essential at BU3 (i.e. future training planning), nor in training-targeted organisational units. This can be inferred from the following statement of a member of the training support team (Participant No. 56):

We can start working on the system and record new training courses without having the old data migrated to the new system. There is no pressing need to have the old data alongside the new data because these courses are mostly training for development... it wasn't harmful if an employee was enrolled on a course that he had already taken before. There is also no big risk if an employee was registered in, say, a marketing course, without attending the course that preceded it.

Consequently, the migrated data served as a partial documentation of BU3's training operations, but largely offered less potential for an intelligent system in terms of aiding decision making about training offerings and the assessment of training applications.

By the moment SYSLEARN was intended to be installed for operational use, BU3 was ready to abandon the legacy system and begin to use the new system in daily operations. The implementation team member (Participant No. 58) stated:

Once the new system had "gone live", the legacy system was phased out, and we immediately started to use only SYSLEARN... The old system was switched off, and the new system was switched on.

In conclusion, the configuration of SYSLEARN in BU3 was largely meant to transform the training processes from paper-based forms and applications to a system automating the application and processing of training courses. In contrast to BU1 and BU2, where specialised training is administered, the configuration of SYSLEARN in BU3 was generally consistent with the overall training management offerings of SYSLERN. Although BU3's implementation team didn't present specific requirements that would necessitate complex modifications to the system, the technical team was able to accommodate a number of pre-existing practices into the new process. Consequently, the new system was brought up to operational use, and the automated environment promised by SYSLEARN was put to the test in terms of the daily interactions of BU3's employees. This part of the implementation story will

be further explored in the following section, which pertains to the system's use after it had been upgraded from development to production.

7.3.4   IT System Use

The preceding sections explained how SYSLEARN had been generally perceived in a positive way by BU3's members, and how BU3's implementation representatives worked to make SYSLEARN a means by which to move towards automated training processes. SYSLEARN was designed to involve several groups of employees both within and outside BU3 in the training administration process. These potential users included individual employees applying for training courses, their managers, and the organisational units' training coordinators. Within BU3, the training support department represents the main users of SYSLEARN who take responsibility for completing the registration process and controlling the internal processes. There are also other roles assigned to the training of department managers (who use the system for scheduling courses and overseeing training), and instructors (who are made responsible for recording training results onto the system).

In practice, the initial registration continued to be undertaken by the organisational units' coordinators. BU3's registration department was found still to be receiving training requests via emails, and then registering the approved requests on the new system. According to a member of the registration department (Participant No. 64), this practice is attributed to the limited access to computer terminals in some of the organisation's sites:

> *We receive course requests via emails, and we enter the names of the trainees on the system… The [training] coordinators of each division send the training requests because in some areas employees have no access to PCs.*

This observation was also supported by a member of the training support team (Participant No. 56). This fact can be attributed to BU3's approach to training management - which is organised centrally, using a training coordinator at each organisational unit, as explained in the following statement:

We don't accept applications for training from individual employees. They have to come through their division's coordinator… The managers and training coordinators are better able to identify the training needs of the employees... The proposed system requires that the employee logs on to the system and requests their training needs and preferred time, but that the system should be customised according to our working process.

Therefore, while there was apparently keen interest from BU3's implementation team with respect to technically paving the way for a more automated registration process, this initiative was hampered by other aspects of the situation – specifically those related to the lack of technical resources, coupled with established views as to the role of different groups in the planning of the training programmes. Consequently, those SYSLEARN features that allow for electronic registration and approval were disregarded. The actual outcome turned out to resemble the previous registration process used by the legacy system. This was affirmed by the employee in the registration department (Participant No. 64) who made the following comment:

Training coordinators from each division provide us with the lists of applicants to each course… We deal only with those coordinators.

In terms of the internal processes within BU3, SYSLEARN is configured to allow each group of employees to undertake specific roles in the system (i.e. training support admin, instruction, the training of the various departments' managers, etc). This distribution of roles is supposed to be protected by the presence of separate access profiles for each user group, which contain permissions and access settings controlling what users can do with the system. In reality, however, the interaction with the system was mainly placed in the hands of the administrative staff of the training support team, in much the same way as in the previous working practice. A member of the support team (Participant No. 66) explains the process as follows:

We open the course in SYSLEARN, and then insert the names and details of the trainees, sending text messages to the trainees. On the day of the course, the instructor receives a list of the registered people. He takes attendance

throughout the days of the course, and finally records the results on the roster. The roster is then reviewed by the instructor's manager and signed. A member of the training admin staff receives the roster and makes a 'follow-up' [entering the results of the course into the system], then closing the course.

From a technical perspective, this means that the training support team are given full authority on the system - right from beginning of the cycle, when trainers are supposed to book courses, till the end of the process, where courses' results ought to be recorded only by instructors. In practice, these tasks are sometimes conducted by applicants and instructors themselves. But, in cases where they were unable or unwilling to do so, these tasks are conventionally undertaken by administrative staff from the training support team. One administrative staff member (Participant No. 66) stated:

A decision has been circulated by [unit's management] that instructors should take their assigned roles on the system and enter the courses' results themselves. Some instructors have abided by this decision. But others have not; they would send me the rosters and I would record the results into the system. It doesn't take me much time, though.

Here, the promise of SYSLEARN to provide control over the process was being undermined because the access profiles were not accurately assigned according to the presumed roles of each user group. In reference to the role assigned to the instructors in the system, some found it more convenient to upload their courses' results instead of passing them on to the training support department, as expressed by one of the instructors (Participant No. 63):

Sometimes, when you give a course outside the country, it is easier to log-on to the system from wherever you are and enter the results. But, if I was to hand the results to the registration staff, then I would have to find a way to pass the results on to the registration department. This is because the course would be open, and because the certificates cannot be issued until the results are entered into the system.

According to the researcher's discussions with a number of secretaries at the unit, and also the statements of participating instructors (Participants No. 58 & 63), the same situation applied to a few managers who likewise found it convenient to perform managerial tasks on SYSLEARN. Reportedly, these instances don't seem to have reflected the regular practice of the instructors or departmental managers, who tended to avoid the roles assigned to them by the system – either because they were unwilling to take up extra duties or because of their low technical skills. As one senior instructor (Participant No. 67) commented:

> *Instructors need specialised courses to work on the system. They have not undertaken proper training. Others meanwhile are old and don't get along well with the technology, they still have their documents written by secretaries because they don't normally use computers, let alone an advanced system like SYSLEARN.*

In other instances of instructors willingly taking on their part, the process was found to be hindered due to certain of the training departments' managers' reluctance to engage with the system, delaying the process of verification and confirmation. In some cases, this was a reflection of the availability of and over-reliance on administrative assistants. But, in other situations, this practice was attributed to the lack of computer skills on the part of some of the managers. Here an administrative assistant (Participant No. 65) is complaining about this issue:

> *A manager who should log-on to the system and process the task is not doing that, because he is used to manual work - where papers are prepared and presented on his desk for his approval and signature.*

Another aspect of use is related to the language of the system. The new system requires a certain command of the English language in order to handle it; the system's terminology, its interfaces, and help menus are all designed in English. This issue is mentioned in the following comment made by a senior instructor (Participant No. 67):

> *The new system requires a reasonable level of proficiency in English…*
> *Not all of the people here are good enough in English. Many courses are*

prepared and presented in Arabic, and people cannot easily learn the system because of the language barrier.

Consequently, the main users of SYSLEARN turned out to be the administrative support team. This was a phenomenon comparable to the previous work distribution system - where the administrative support team were the sole users of the (legacy) system. For their part, these users had not easily accepted and appreciated the new system. This was due in part to its technical complexity and linguistic difficulties, and also due in part to the change it brought to the scope of work. In terms of the technical knowledge, an intensive training workshop was arranged for the registration team of BU3 prior to the system' go-live date. According to a member of the implementation team (Participant No. 58):

It was an intensive three-day training course; the registration staff were able to upload the next annual training schedule. All the planned courses of the year had been inputted into the system, and each employee was able to input no less than thirty courses under the supervision of the technical team.

This training was an opportunity for these employees to gain first-hand experience of the system, and to train themselves on specific functions. But, because it was conducted before the completion of the system's implementation, it was less helpful during the day-to-day usage of the system. After the system was implemented, these employees received little further training, and were left to struggle to find their own ways to deal with the system. An administrative assistant (Participant No. 65) commented:

There was not enough support afterwards. So, when an error occurs, my work is halted, because there's no quick response from the system technical support team.

The implication of this inadequate grasp of the system was that work tasks were processed manually off-line and subsequently fed into the system. Also, because users found it difficult to extract certain reports from the system, data would be copied and

uploaded onto an auxiliary system (e.g. MS-Excel) in order to produce the required reports.

In time, the training support team were able to accommodate the system by using the essential functionalities. But they were not necessarily taking full advantage of the plentiful features offered by the system. Furthermore, they were able to bypass the controls of the systems by virtue of having full authority to change/update the recorded entries. The result of these broad authorities on the system was that, instead of activities being logged in according to the cycle mandated by the system, the users exploited their authorisation profile to re-open the course after it had finished, and changed the entries according to what had actually happened. A member of one of the registration team (Participant No. 64) put it this way:

> *At the end of the course, we receive the roster from the instructor and enter the names of the actual attendees and their results.*

Furthermore, the new system came with a goal of integrating the training activity with other HR systems. For example, when an employee doesn't show for the course, he is automatically marked as absent in the HR system, a fact which is then reflected in the salary statement of that employee. This feature of the system has been neglected because the registration department staff enter the names of the attendees at the end of the course. In other words, the system is being fed with training activities after they have been completed, instead of being fed with the system coordinates and the controls for the training programme.

The users were also able to find 'workaround' solutions to the control of the system, undermining the potential of the system to maintain effective training procedures. For example, the registration employees were able to manipulate the restrictions of the system, as was expressed by a member of the registration team (Participant No. 64):

> *It happens sometimes, that when a course is opened for 12 trainers (the maximum number allowed), the number of employees attending actually exceeds the maximum, because departments send letters requesting seats on the course even after it has been fully booked, or a manager might call. asking*

for an extra seat… what we would do is to re-open the course and change the max value to allow for extra attendees.

In general, SYSLEARN's implementation in BU3 allowed for the overcoming of certain of the limitations of the completely-replaced legacy system - such as improving the quality and accuracy of entries. However, most of the new system's functionalities were overlooked, due to the lack of technical proficiency, and also due to the limited assimilation of new processes and structures. Apart from some minor adjustments, the pre-existing interactions around technology remained largely intact.

7.4   Summary and Conclusion

The previous sections have offered a detailed account of SYSLEARN's implementation in the three organisational units of Xlines responsible for managing training activities. The presentation of the findings began by outlining the work context of each unit, followed by an interpretation of the perceptions about the new technology from the viewpoints of the research participants. The implementation process was then traced from the first phases of the requirements' definition and system configuration up until the system becoming available for operational use. The presentation of the process highlighted key events and interactions across the implementation process. Table 7.1 provides a concise summary of these issues.

Table 7.1a - Comparison of system implementation aspects across the studied business units:

	BU1	BU2	BU3	Remarks
Work Context	This unit provides specialised a type of training and represents a supportive (not an independent) department to a main technical business. Emphasis is on service delivery, regulatory compliance, and operational continuity, with less concern for control over processes, cost reduction, and resource utilisation.	This unit provides specialised type of training and enjoys a greater autonomy as an independent organisational unit. This structural change was paralleled by the expansion of its customer base, which led to an increased sensitivity to performance management, as it became increasingly difficult to cope with the existing work administration without a robust information system in place.	This unit administers typical non-regulated training, and assumes less autonomy from the overall organisational structure. The focus was on service delivery but there was willingness to improve internal processes and outcomes in terms of speed and accuracy.	The positioning of the actors and the unit is seemingly significant in informing the level of awareness and sensitivity to the IT change and the technology made available.
Perceptions of Technology	There was no clear motive for IT change; implementation was largely considered as a technical fix, and mostly dealt with as an "others' project".	A clear motive was identified to make the most out of the technology. Its implementation was approached as a window of opportunity.	A selective approach to new IT offerings was observable here. Implementation was generally accepted as a managerial instruction.	There was a perception of the adopted technology influenced by the role ascribed to technology in the organisational strategy and also by the relationships between the organisational groups.

Table 7.1b - Comparison of system implementation aspects across the studied business units:

	BU1	BU2	BU3	Remarks
IT System configuration	Participation in the configuration effort was approached with the tendency to give continuity to the role and functions of the legacy system. In supplying the unit's business requirements, and applying customisation on the new system, existing work practices were meant to be minimally affected.	A great deal of effort was extended to adjusting to the new system, making use of the technology features, and adopting its inscribed processes and structures. Instances of misalignment between the new system and work practices were dealt with as technical challenges to be resolved in the long run.	The configuration of the new system was meant to overcome the limitations of the legacy system and to facilitate daily tasks through automation of the business processes, but less consideration was given to the new business processes and organisational structures endorsed by the system.	The level of system preparation for utilisation was influenced by the degree of willingness at each unit to assimilate standard processes and structures in their local operations and work organisation, and also by the effort exerted in configuring the system to inscribe particular business rules.
IT System Use	The new system is being used in marginal processes whilst operational activities continue to be undertaken through the legacy system.	Initial use practices were confronted with a number of technical and organisational challenges, but these were dealt with promptly. This gradually led to the progressive utilisation of the system.	The appropriation of system functionalities was largely selective, with many functionalities are minimally used or entirely neglected. Despite the legacy system having been abandoned, the use practices of the new system generally imitated those pre-existing in the old system.	The system's utilisation was impacted by a number of technical and organisational issues, and by the way these have been dealt with. • The level of sophistication incorporated into the system design at the configuration stage • The extent of technology embeddedness in the work routines. • The availability of the technical infrastructure. • Policies for overcoming knowledge barriers. • The assimilation of new work processes. • The choices made by individuals and/or groups to admit/reject changes regarding work scope and associated responsibilities.

CHAPTER 8

CONTEXTUAL CONDITIONS

8.1   Introduction

8.1.1   Analytical Approach

The prime objective of the current research is to understand and explain the appropriation of IT in the process of an imposed organisational transformation project, and to comment on the extent of the change occurring in various organisational elements in various different settings within a seemingly unified organisational context. The detailed descriptive accounts of the implementation process in each of the three organisational units provided in the previous chapter represented the first milestone towards this understanding. These accounts traced the unfolding of events, scrutinised perceptions and decisions, and revealed the emergence of distinct patterns of response to the implementation activities.

The case study's preliminary analysis has demonstrated the role of interactions between multiple contextual influences and micro level processes in shaping these patterns of response, and outlining how the implementation project unfolded. To explain further, the evidence suggests that the various actors approached the tasks of IT implementation and use with different intentions and orientations. This observation calls our attention to the role of 'agential capacity' in shaping the flow of events. By the same token, the actors' practices were found to be open to the influence of contextual factors originating from the new technological arrangement, as well as from the position of these actors in relation to surrounding structures and entities. By building on these preliminary insights - which stress the importance of encompassing different levels of analysis - and by consulting the guiding conceptual framework, the case analysis proceeds in this part of the thesis by focusing on the interplay between

action, context, and technology, in order to reach an understating of the processes of IT appropriation. Following the adopted relational perspective, our comprehension of the intertwining of these dimensions is achieved by holding these dimensions apart, and examining the interaction between them (Mutch et al., 2006; Delbridge and Edwards, 2013; Mutch, 2013) - that is, to treat agency and the surrounding conditions of agency as separate analytical phenomena. This will allow the exposition of the basis of action, and an appreciation of how contextual conditions come to shape meaning and practices at the individual level. Accordingly, the analysis of the present case is approached at two levels, presented in two chapters. This chapter concerns the examination of the contextual conditions for action - which encompasses structural and technological conditions. The next chapter focuses on those micro-level interactions which expose agency-centred explanations of action.

8.1.2 Analysis of the context

Analysis of the evidence for contextual conditions was approached using a data-driven grounded strategy. The empirical evidence was examined in search of aspects of the context that repeatedly informed the practices of individuals and groups during the implementation and use of the IT system. The emerging issues were categorised into themes and sub-headings. The themes that have emerged from this stage of analysis originate in a variety of levels, but can be broadly categorised under three major headings.

- The broader socio-political context surrounding the organisation.
- The organisational context wherein the technology was expected to play a role.
- Technology-related issues.

In many ways, these elements are interrelated and overlapping. But for the purposes of clarity, the characteristics of each level are described separately here. It is also important to note that the attempt to distil these contextual conditions unavoidably entails methodological challenges and highlights limitations in the findings derived. However, it is argued that, through the careful specification of critical variables and

illustrative instances from the empirical evidence, the reader can corroborate the research notions and inferences.

In the following sections, the analysis of findings proceeds to illuminate those elements of the context that offered the actors varied possibilities of response to the activities involved in the implementation of technology. Analysing information in this way makes it possible to situate actors' appropriations of technology in the specific conditions of its own context. Locating these responses and engagements in their wider context facilitates in the task of understanding the actors' agentic orientations and in explaining the emergence of different appropriations and varied intensities of organisational change. The analysis is presented in a comparative discussion manner, looking at the implications of these contextual conditions on organisational practice within the three subject business units.

8.2   External Conditions

The data from this study emphasise the importance of the external environment in informing how technology is adopted and appropriated. This environment presents both constraints and opportunities for organisational actors. In this study, the influence of the broader context (including the society, the industry, and relationships with the government) appeared in the form of external pressures and cultural understandings that guided actors' interactions with other stakeholders within and beyond the organisation, and which consequently informed their patterns of appropriation.

By discussing how several aspects of the environmental context have enabled actors to pursue one practice or another, it becomes possible to understand an important dimension that informs how and why different appropriations of technology have occurred. It also becomes possible to trace the micro-processes of change to their macro origins.

A detailed analysis of the process of implementation identifies several elements beyond the control of the organisation which influenced the decisions and practices of

the actors involved. These elements are presented and explicated in the following subsections.

8.2.1   State regulations and interventions

The role of the state in governing the relationship between employees and employer is very evident in the case under study. First of all, provided that the organisation's budget is allocated by the government of the state, the government plays an exceptionally large role in the relationship between employees and employer. This governmental involvement coincides with an absence of trade unions and other such associations in the GCC countries' labour markets (Razgallah, 2008). These factors have contributed to further governmental overseeing of the labour market by setting in place legislation concerning the relations between employer and employees. In contrast to what is possibly common in other contexts, where this influence is mainly used to set frameworks on how negotiations between labour unions and employers' associations should function, the governments of the GCC countries play a direct role in managing the relationship between companies and their employees. One central aspect of these items of legislation - something which is directly related to this study - is the emphasis on "nationalisation"; i.e. the improvement of citizens' share in the labour market (Mellahi, 2006).

The data collected in the present study suggest that "nationalisation" policies have resulted in excessive recruitment in public organisations and strict restrictions on the sacking of national employees. These observed issues are considered to have negatively influenced work-related attitudes and practices, because national employees are given tenure status shortly after the commencement of their position, and generally cannot be dismissed until reaching retirement age. Whilst satisfaction through job security is often cited as a source of motivation for increased work effort (Yousef, 1998), evidence from the present study reveals that guaranteed life-long employment has led to a range of resistant practices that defy or undermine aspects of the work tasks brought about by the new system. Within the national context of the organisation, employment policies are considered to have enabled individual employees to acquire more active agency in the face of technological demands and

organisational hierarchy. Equally, management's choices are seen to have been reduced in terms of their ability to deal with individuals who respond negatively to the new working practices. The management themselves were aware that they lack powerful procedures to discipline an employee displaying unsatisfactory performance levels. Employees who fall short of the job requirements cannot be dismissed, but can only be warned or transferred to other departments.

According to the accounts of members of the implementing company and the observations of a number of business users, this observed phenomenon had implications on the technology implementation process. The initial implementation stage of the collection of business requirements saw little effort by some users from the business units and functional areas (particularly in the case of BU1) in terms of interacting effectively with the technical team. This stage was essential to defining business and system requirements, and thus demanded significant cooperation between technical team and business representative, in order to achieve the organisational goal of system implementation. Yet worse, it happened that some users didn't show up to the meetings discussing the business process analysis, or they refused to perform the test scenarios for the system functionalities. After the system had been migrated to production, users were able to avoid using the system, especially in the case of BU1, and occasionally by instructors and the holders of managerial positions in BU3.

Another aspect of the above mentioned government strategies was the over staffing of public organisations. This was an observed issue in the case organisation, resulting in the overstaffing of administrative positions - something which often led employees in management or professional positions (e.g. instructors) to delegate their assigned system-related tasks to administrative assistants. This inappropriate arrangement of roles and duties consequently undermined the proposed work processes and control mechanisms of the system.

In addition, the government's labour market intervention – intended to address the problem of an excessive workforce – was, in this case organisation, found to impose adverse unintended consequences. As explained earlier (see section 6.2.3), given the

protected-job status of national employees, the government had allocated the finance needed for an "early-retirement" programme aimed at reducing overstaffing by offering generous incentives to those employees who choose to retire early. Despite the success of the programme in reducing the overall number of employees by more than 20% after three years of its application, the overall effect of the programme – in terms of the appropriation of technology and associated organisational changes - was mixed. On the one hand, the organisation was able to infuse fresh blood into many of its units by hiring new employees, who can be more motivated and have no past experience that would pull them toward entrenched working habits. Additionally, these newcomers were employed on the basis of private-sector job contracts, which grant the employer wider scope for performance control and reward management.

On the other hand, it was noted that there existed an imbalance between the organisation's units in terms of the number of retirees. Moreover, the early retirement of a huge number of employees, including some qualified and experienced personnel, in a relatively short period of time, had led to a sort of "brain drain". That is, the loss of experienced and skilled human resources. These unintended consequences of the government intervention had indirectly impacted upon the quality and/or the quantity of the workforce in several critical units, including those targeted by the technological change. Some organisational units found it hard to allocate dedicated staff members to the implementation team due to the shortage of qualified staff. Whilst this particular issue was not reported in the three studied units in which SYSLEARN was implemented, it had indeed influenced other units in connection with them, either as suppliers or as recipients of information. The new enterprise system was meant to provide integration between multiple systems and functional units in processes and data. Thus the functioning of SYSLEARN was accordingly impacted.

Another consequence of the early retirement programme was the instability and decreased homogeneity of the implementation team throughout the project. It has been stated that there were only a few cases where the same users were involved throughout the implementation phases. The implementation project required continuous effort and commitment from the implementation team, but the change of team members due to their retirement or transferring to other departments further

impacted upon the implementation process. The evidence from this study suggests that individuals' withdrawal from critical stages of the project impeded the realisation of the system, and consequently the planned change outcome.

When the influence of the aforementioned government interventions is compared across the studied business units, some differences are identifiable. The influence of overstaffing can be observed more clearly in the case of BU3's administrative positions, due to the department's relatively uncomplicated business and the lower skill demand, which attracted more nationals' recruitment. The surplus of administrative assistants allowed for extra duties to be directed to them, and permitted other employees, such as managers and instructors, to refrain from system-related tasks.

In the case of BU2, whilst there were technical difficulties, the management was able, to a large extent, to offset the negative shadow of tenure employment on work attitude by linking daily work practices with mandatory use of the system. The influence of early retirement has been specifically noted in the case of BU1 where the unit representatives were changed more than once during the configuration stage.

BU1 and BU3 lost the services of key members of the implementation team after they had transferred to vacant positions in other departments. These individuals were trained in order to deploy the system and undertake on-the-job training from their colleagues through a "train the trainer" approach. Consequently, there were real challenges in providing end-users with the training needed to effectively utilise the system.

8.2.2   Industry Regulatory Pressures

Organisations operating in certain sectors have their unique ways of conducting common organisational practices. In referring to HR training and development, these unique work characteristics can appear in course structures or types of learning resource. They can also appear as normative pressures from industry regulators through business standards and guidelines, or through complex reporting procedures.

Organisations need to conform to these guidelines in order to gain recognition and accreditation (Scott, 2001).

In analysing the role of industry-specific requirements in the present case, it can be argued that, in some situations, misalignment between the new system offerings and industry-specific requirements provided actors with a useful resource and a legitimate frame of reference with which to negotiate - and sometimes reject - the organisational changes introduced by the system. By the same token, other situations revealed that misalignments were a constraint on actors' aspiration to utilise the new system to implement change.

In this sense, industry requirements were displayed as an important mechanism influencing the patterns of IT appropriation. They enabled the actors to engage in certain practices that proved critical in steering the implementation process, and constrained others in their engagement with the implementation process. In both cases, industry requirements coloured the use practices of the new system.

Although all of the organisational units of the present study offer exclusive training services, the type of training provided and the categories of employee targeted for training are different. Accordingly, the regulatory processes governing each business unit are varied in nature and intensity, based on the type of institutions, if any, that may exert a governing role over the processes or outcomes of the training activity.

In the present case, BU1 offers a clear manifestation of the role of industry-specific requirements in shaping IT appropriation, and the extent to which IT-associated change is possible. BU1 provides standard training to specialised personnel (i.e. aircraft technicians). Consequently, their business is conducted within specific professional guidelines and a highly regulated environment, where training processes and outcomes are monitored and assessed by international institutions and accreditation bodies. The regulatory body in the airline industry is IATA (the International Air Transport Association). IATA sets standards in many areas of the business to promote, alongside other aspects, safe and reliable air travel. The main instrument for safety is the IATA Operational Safety Audit (IOSA) programme. IOSA

consists of standards against which the operational and management systems of an airline are assessed. These standards are applied in aviation technical training in the form of continuous tracking to the qualifications and the licences of the technicians responsible for maintaining and repairing the equipment needed to make planes operate safely. The case in point here is that BU1 faced standardised requirements from the industry regulators, which necessitated certain reporting presentation formats and key parameters being included in these reports. Since the new system's offerings were incompatible with these requirements, BU1's management were able to bring into the technological discussion the pattern of the interaction between BU1 and aviation regulators in order to resist the full transition to the new technological platform, and thus were largely able to maintain previous work practices.

BU2 offers another manifestation of industry-specific characteristics incompatible with the new system features: Because SYSLEARN had been developed in the context of schools and training providers remarkably different from the aviation training environment, the system was unable to accommodate certain aviation-specific training practices. In particular, the definition of a training course was inconsistent with the aviation-training business requirements. The ensuing confusion resulted in limitations to the usage of the system in invoicing, and also in shortcomings in its integration with other enterprise systems. Here, the industry specific-requirements played a role in informing the extent of system use and the potential for change in organisational elements such as control and integration.

In contrast to BU1 and BU2, the case of BU3 represents a training environment where business is internally administered and assessed. That is, courses are designed, delivered, and evaluated based on internally chosen standards. Thus, the absence of external auditing and reporting requirements meant that little, if any, of BU3 actors' practices could be traced to industry-specific requirements. It should be noted, however, that IT appropriation, and the envisaged organisational change could have been influenced by practices enabled by other elements of the organisational or environmental context.

8.2.3   Social norms and cultural frameworks

The last category of influences on action stemming from the external context relates to the role of social norms and cultural frameworks in shaping practice in the process of a system's implementation and use.

The findings of this research indicate that social norms and cultural frameworks visibly shaped actions made by individuals and groups in the process of IT implementation. In particular, the issues of social ties and trusting relationships, hierarchal culture, and socially constructed meanings of occupations and positions, were all found to inform actors' interactions with and appropriation of technology.

In explaining how these norms and interpretive frameworks are implicated in organisational practices, the focus is placed on the overall technological change project. This is seen as vital, due to the integrated nature of the implemented system. The intra-organisational communication capabilities of the studied enterprise system confront actors with increasingly interdependent settings, making actions and choices of individual business units extend in influence to other units' engagements with the system. Therefore, although some of the observed practices were reported at business units different from the subject organisational units, the functioning of an enterprise system means that work processes are interrelated. Thus it can be said that users' responses and utilisation of other modules of the enterprise system inevitably impacted upon the usage of SYSLEARN in the subject organisational units.

An illustration of this inter-dependency and how it bears on organisational elements is found in the persistence of some organisational units on communicating their training needs by email or over the phone. These "off-the-system" means of communication are possibly related to cultural preferences in one-to-one dealings (Straub et al., 2003), and are assumed to have undermined the control and administration roles of the specific system under study. This can also be seen in the context of training administration; when the HR systems responsible for planning employees' development are under-utilised, the analytical elements of SYSLEARN that aid decision making are subsequently less exploited.

8.2.3.1 Personal ties and trusting relationships

The influence of social norms is observable in the leader-member relationship, where the relationship between organisational members is expected to extend beyond functional purposes. The implication of this socially-ingrained model of organisational transactions can be observed in performance assessment and attendance monitoring of subordinates. Usually, a supervisor feels unwilling to be "the bad person" in this social network - by taking tough decisions - even when such decisions are warranted. The social norms of the society within which the organisation operates can sometimes prevent managers from objectively assessing low performing workers if this assessment would influence their remunerations. This can be considered a social obligation, expected by subordinates. And managers in this context are more likely to fulfil it. This observable act can be referred to the unclear boundaries between the position and the occupant. In these situations, managers are subject to extraneous pressures to prioritise social obligations and personalised relationships over formally required impersonal relationships. This argument is supported by Abdalla (2006) who notes that in Arab organisations, criticism by evaluators can be taken personally and could therefore lead to some disturbance in the social harmony. He suggests that the social value of "criticism avoidance" has a significant influence on human resource procedures (e.g. performance appraisals).

One manifestation of this social structure that had direct implications for the appropriation of technology was found in BU1's response to the newly-installed electronic management of training attendance. Traditionally, a trainers' absence is handled by their managers "within" the department, without any effect on pay being incurred. This practice was maintained for operational purposes and also to retain a sense of harmony in the workplace. Once BU1 started to record attendance on the system, and once these entries were reflected on the finance system, absent trainees suffered salary deductions. The training clients raised their discontent and conflict surfaced between the technological controls and the influence of relationships. In searching for a consensus, BU1 preferred to avoid becoming involved in this political issue. Therefore, BU1 requested that the data link between SYSLEARN and HR systems was severed, in order to prevent conflict with other departments. Technically,

trainees' departments were allowed to override attendance entries that had previously been recorded by the training administration in BU1.

The case of BU2 offers a contrasting example of how personal ties are acknowledged but deliberately confronted by resorting to the potential of technology in mitigating human interference and reducing workplace conflict. BU2's management attempted to include system-generated "objective" measures of productivity (e.g. the quantity of training delivered, hours, courses, etc.) in evaluating instructors' performance. To them, this approach was hoped to provide visibility and a "scoreboard" for people to monitor their own performance level and therefore to limit the influence of personal ties on appraisals and promotion decisions.

BU3's use of SYSLEARN involves the accommodation of both technology and social structure with an emphasis on the compatibility between them. BU3's users tended to take advantage of technological features in enhancing their work quality. However, such technological controls could be easily sidestepped in order to maintain a smooth relationship with a colleague or to satisfy a late training request.

The above mentioned instances are indicative of the importance of social structure as an important influence on organisational action in relation to technology appropriation.

8.2.3.2 Hierarchical culture and bargaining power

Another dimension of the social norms and frameworks displayed in practice was the hierarchical culture. This dimension has to do with the relation between individuals' positioning and their reflection on the possible actions in their engagement the IT system and the overall the implementation project. Hierarchical culture is oriented towards a managerial command style in which managers govern work operations and dictate what subordinates do. The hierarchical culture means that communication is top-down, one-way in direction, and that managers are less concerned with feedback and negotiation (Weick, 1987). In explaining the dominance of this cultural framework in the national context, Atiyyah (1988) emphasises the influence of the political monarchical systems of GCC countries on social structure and organisational

behaviour. He notes that hierarchy and centralisation have influenced areas such as planning and decision-making in the usage of computers and technology in such organisations as this. In addition, Arab culture is characterised by high power distance and collectivism; the rigid hierarchy between the leader and subordinate is regarded as natural and proper (Hofstede, 1984). The norms concerning the influence of status and the privileges granted to leaders in Arab societies mean that employees are more likely to accept directions and commands from their superiors by mere virtue of their position.

Nevertheless, members of the case organisation are not dependent on their superiors in terms of job security or wages, and thus they seemed to possess an effective balance of power, due to their "protected workforce" status. Although this factor cannot strictly be taken as a counterbalance to the above-described cultural orientation, it can be considered as an enabling factor available to agents; it enables them, by reflecting on their position, to act beyond predetermined structures and cultural roles. In parallel to these conditions, there seems to exist an attitude of low-expressiveness, where subordinates are reluctant to voice their opinions and confront management's plans for change, even when these plans are perceived as unsuitable. This observed behaviour reflects cultural expectations of a certain communication style. In the GCC countries, leaders are held in respect, and subordinates show that respect by being passive and uncritical; they hardly ever disagree with or challenge the statements or decisions of more senior managers (Wilkins, 2001).

When this socio-cultural formula manifests itself in organisational practice, the balance between these two seemingly antagonistic concepts promoting simultaneously collectivism (e.g. top-down managerial culture) and individualism (e.g. bargaining power) becomes less straightforward. The analysis of organisational members' practices in relation to the appropriation of technology suggests that hierarchy is prevalent in informing action. But the evidence also demonstrates that bargaining power was individually exercised in instances where personal interests and needs took precedence over organisational goals. In congruence with the hierarchal and collectivistic culture, organisational members were likely to admit to the socially acknowledged value of authority and the importance of being members of a cohesive

group, and thus tended to effortlessly adopt managerial instructions. On the other hand, individuals were inclined to regain a sense of autonomy through passive resistance to new roles and duties, and by pursuing their interests without openly confronting managerial directions.

In line with the aforementioned cultural issues, the analysis of actors' engagement with the technical change project demonstrates the prevalence of the top-down decision-making style at the upper levels of management, and the tendency - at the lower levels of organisation - to comply with authority yet still to engage in non-confrontational resistance.

These aspects are exemplified in the SYSLEARN implementation project, where the planning of change and the selection of technology were entirely decided at the top organisational level, with little to no involvement from either lower managers or the technology users. Furthermore, the implementation schedule was devised at the project leadership level, which involved only high-level management representation. During the implementation, this schedule was never subjected to negotiation or feedback from the implementation teams. The high pressure to deliver the project on time, despite the technical and organisational challenges, is a reflection of the one-way communication style. At the other organisational end, the organisational units seemed to comply with the direction of the project leadership. The new technology was implemented in all organisational units despite the system sometimes being described as inconvenient or even unneeded.

Later on, engagement with the project's detailed requirements was subject to the internal calculations of each unit. In situations where some aspects of this change were identified as incompatible with departmental needs or personal goals, the actors tended to engage in covert resistance behaviour that possibly disrupted the implementation effort. For example, the actors in BU1 actually participated in all of the implementation stages but did not show sufficient authentic support or ownership to realise the organisational outcomes envisioned by the system. This passive resistance is seen in their inadequate effort to overcome the organisational and technical challenges during the implementation project. In addition, key employees

who represented BU1 in the implementation chose to withdraw from the project when personal gains were found elsewhere. Similarly, training instructors largely avoided undertaking the extra duties introduced by the system. These practices were also noticed in the response of certain groups or individuals in BU3 when faced with changes in the scope or nature of their previous roles.

In BU2, acceptance of the technology at the unit management level can be linked to the internal demand for change, as well as to compliance with organisational directions. In the process of system implementation and business process reengineering, BU2's management seemingly built upon the cultural resources of authority in their attempt to execute key organisational changes and overcome resistance.

8.2.3.3 Boundaries of occupations and positions

Another dimension of the social norms conditioning personal interrelationships is the situated role expectations of certain occupations and positions. Situated role prescriptions are assumed to specify what should and should not be done by actors (Lamb and Kling, 2003).

In the context of this case, two main categories of actors (i.e. departmental managers and training instructors) were found to have been influenced in their engagement with the new system by the roles and boundaries assumed by their position or profession. In particular, the administrative tasks brought about by SYSLEARN presented those actors with new practices outside their "cultural toolbox" that predispose actors to feel a fit within some actions but not others (Bourdieu, 1977 cited in Emirbayer and Mische, 1998).

In reference to departmental managers, it has been observed that a wide range of middle management staff were not used to undertaking managerial activities using technology; they had long been accustomed to printed reports prepared by administrative assistants. However, the roles assigned to managers by the new system included the utilisation of technology in business analysis and work supervision functions. These roles necessitated the user's possession of sufficient IT skills, and

also required that using computers becomes a daily routine and part of their job. Apparently, these requirements were not largely acknowledged and expected within the context of the case organisational units. By the same token, the training instructors saw SYSLEARN bring further administrative duties on them. Despite some instructors having shown approximate adherence to management prescriptions that required the utilisation of the new system, many others were more inclined to reject these duties because administrative work resides beyond their contextually assumed occupational boundaries. Therefore, both types of actor were able to draw upon these cultural frameworks in their response to the new technology, and to the associated rearrangement of roles and duties.

In BU1, potential users such as section managers and instructors tended to preserve their occupational identity, thus largely ignoring SYSLEARN, by maintaining their previous work practices. Also, the utilisation of the system in BU1 was partly influenced by end-users' (i.e. aircrafts' technicians) distancing themselves from the use of the system. In the workshops where the technicians conduct their daily work, the use of computers is not part of the job; technicians spending time on computers are not considered to be doing "real" work. The common understanding of proper work is linked to manual work, whereby technicians operate or repair equipment; the "soft" type of work associated with using computers is taken lightly and usually less highly regarded and rewarded.

In BU2, the influence of occupational boundaries was more related to the rearrangement of job content rather than job scope. The resistance on the part of section managers was not mainly directed against the system duties. It was actually expressed against a new business process that allows other groups to intrude into their occupational boundaries and privileges - that is, the training planning and workload distribution.

The case of BU3 shows little evidence of such intra-occupation conflict. The training sections' managers retained the role of scheduling and planning training, and the training instructors' use of the system was practically discretionary. These practices

were admitted due to the established views pertaining to what is expected within the boundaries of occupations and positions in the local workplace context.

8.2.4   Summary and Discussion

This part of the analysis has focused on the role of contextual influences in shaping actors' practices during the implementation of SYSLEARN. The preceding sections have presented the challenge of working within a complex external environment – one which consists of government actors and international organisations, as well as resilient cultural and social conventions. The analysis has shown how these contextual conditions presented both constraints and opportunities for the organisational actors. The key issues explained in this part are summarised in Table 8.1

The themes presented in the analysis of the external conditions on organisational action are found to be appearing to varying degrees in previous studies on IT implementation. In the main stream of factor-based analysis of IT implementation, the environment of an organisation is defined as the arena within which the organisation conducts its business - its industry, competitors and dealings with government (Zhu et al., 2003; Zhu and Kraemer, 2005). The findings of this study affirm the connection between these entities and organisational behaviour. The analysis of the findings of this study, however, involved other external conditions such as professional, cultural, and social values and illustrated how these are implicated at group and individual levels. In terms of the role of professional values, the analysis suggests that actors are more likely to engage with technologies according to their professional and occupational values, and their perceived roles within their work environment, not according to their system-assigned roles. This argument is supported by Lamb and Kling (2003) who contend that IT users relate to their affiliations more closely than how they relate to the IT. The other socio-cultural themes suggested by the analysis, are found to be displaying in a limited set of institutional studies that concern the interaction between IT and institutions (e.g., Gosain, 2004; Sia and Soh, 2007). Most of the other institutionalist studies focus on the identification and measurement of the institutional pressures that lead to IT adoption and implementation (Mignerat and Rivard, 2009). The analysis presented in this part has shown how these pressures

might extend to an individual level. The issue of government regulations in connection with employment of citizens, and the subsequent individual behaviours in relation to IT implementation activities, is a case in point. The analysis of the external conditions further suggests that these structural conditions can only inform, not decide, how to actors would respond to IT functions. For example, the social value of promoting consensus and reducing conflict is found as having influence on organisational action. However, organisational members in different units tended to appropriate technology in different ways in order to maintain this value. BU1 users chose to under-use the controls of the system, whilst BU2 users opted for utilising these controls. This finding is consistent with Avgerou's (2001) argument that institutional contexts generate diversity in outcomes rather than homogeneity.

Table 8.1a- Comparison of the implications of the external context across the three business units

External Element	BU1	BU2	BU3
State Regulations and Interventions: o *Overstaffing in public organisations* o *Life-long employment* o *Restrictions on the sacking of national employees.* o *Early-retirement incentive programme*	• Instability and decreased homogeneity of the implementation team throughout the project, due to transfers and retirement • Lack of commitment to the implementation project's demands • Lack of powerful procedures to control performance • Negative implications through the "train the trainer" programme	• Organisational challenges due to the hiring of less qualified administrative staff.	• The over-recruitment of administrative staff disturbed the balance of system-related roles and duties • Key users transferred themselves to vacant positions elsewhere • Lack of powerful procedures to control performance • Negative implications through the "train the trainer" programme
Industry Regulatory Pressures: o *Regulatory requirements of standardised reporting* o *Aviation-specific training practices and resources*	• incompatibility of SYSLEARN reporting features with the unit reporting requirements	• The system-defined training course is inconsistent with aviation-training business requirements	• No specific requirements

Table 8.1b - Comparison of the implications of the external context across the three business units

External Element	BU1	BU2	BU3
Social norms and cultural frameworks o *Personal ties and trusting relationships*	• The release of technological controls to prevent conflict with other groups and individuals	• The mitigation of personal ties influenced by employing system-generated measures	• Accommodation of both technology and social structure
o *Hierarchal culture and bargaining power*	• Business users non-involvement in the planning of change, nor in the selection and implementation of technology • Compliance with managerial prescriptions despite the system being described as unneeded • Reluctance to express objection and passive resistance	• Business users non-involvement in the planning of change, nor in the selection and implementation of technology • Management's exploitation of authority to execute certain organisational changes	• Business users non-involvement in the planning of change, nor in the selection and implementation of technology • Compliance with managerial prescription despite the system being described as non-ideal • Reluctance to express dissatisfaction and occasional passive resistance
o *Boundaries of occupations and positions*	• Managers' and instructors' reluctance to undertake extra duties (administrative tasks) • Aircraft technicians assumed they were not beholden to computer-related tasks	• Section managers' reluctance to give up key roles (workload planning)	• managers' reluctance to engage with the system • Instructors' avoiding the undertaking of administrative tasks

8.3 Organisational Conditions

Both the appropriation of technology in the three business units and the extent to which the system enabled change in these units can be found to be related to key facets of the organisational context. The focus of this part of the analysis is placed upon the managerial and organisational issues and structures that shaped organisational action in relation to the IT implementation and appropriation. In examining the organisational context of action, an analytical distinction is made between dimensions characterising the overall work setting of the organisation, believed to be defined consistently across sub-organisational units, and other facets of work featuring differently across the studied organisational units. To illustrate, the following analysis refers to the HR policies as an organisational characteristic of the case organisation. By contrast, the organisational unit's IT strategy is treated as a sub-organisational dimension that is locally defined within the particular organisational unit.

8.3.1 Workplace power relations

In referring to the workplace power relationships within the present study, the emphasis is placed on how different groups of actors engaged with several aspects of the implementation and use of technology when technology posed threats to the existing power structure. The argument set forth here, and substantiated by the empirical evidence, is that workplace power relations can both define and facilitate action. In other words, the existing power structure first informs whether the introduced changes are to be accepted or resisted; it then enables actors in a position of power to work in ways that best serve their interests. Whilst prior research has shown that actors' social position may enable them to initiate change despite pressures towards stasis (Battilana, 2007), this facet of the current study considers how actors relying on their power position work to maintain the status quo, despite pressures towards change.

To make the analysis more structured, those politically painted interactions are discussed at two levels: at the local setting of the three organisational units, and at an

intra-organisational level whenever these interactions are found to have influence on local appropriations of the introduced system.

8.3.1.1 Intra-organisational power relations

The influence of workplace power relationships has been observed in the process of the overall enterprise system's implementation at an organisational level. Power relations of notable importance in this regard are those between the middle management leading the individual business units and the IT department leading the project.

The implementation project was led by the IT department, but essentially needed the collaboration of individuals from the adopting business units, over which the project leadership had no hierarchical power. Therefore, the participation of these units was sometimes guided by the interests of those individuals who had the power to influence key requirements of the implementation process. Managers of some departments, and senior employees who held supervisory positions, felt their expertise and skills threatened in the face of the potential change. To them, the new arrangements would phase out old systems and working methods which they had mastered, and which signified their competency and authority. Those actors who used to be in the position of appointing individuals to become part of the implementation team utilised their relative power to negatively influence the implementation of technology in different forms at different phases of the project.

In the first phases of the project, some of the business units' managers chose to personally represent their departments, and then communicated a mode of scepticism towards the new system. Subsequently, the new system was looked upon within departments with suspicion and disregard. Other middle management decision makers tended to assign newly hired or less skilled employees to represent their departments in the early phase of the requirement definition. The justification for this was linked to the shortage of staff members (recall the early retirement of huge numbers of employees in a short period of time), or the need to retain expert members to carry out daily work activities. In this phase, users' requirements need to be effectively presented, and system offerings need to be keenly assessed. The implementation

phase of the requirements definition necessitated the participation of more experienced and better equipped individuals able to present and negotiate users' requirements for the new IT system. In many instances, such low-profile representation resulted in a poor balance between technical and business requirements. In subsequent stages, when proposed requirements and business processes were configured into the system, these representatives were less able to perform the required validation of the system's configurations, nor to decide on the extent of updates to the business processes. Reportedly, the lack of involvement of key users led to some processes being misconfigured by the technical team, consequently undermining system capabilities in the post-implementation phase.

These circumstances had negative implications on the implementation of individual modules across the organisation. Consequently, some of the installed modules were minimally used in certain instances, or almost entirely neglected in others. In an integrated enterprise system, if one module is improperly functioning, it creates a cascade effect, influencing the use of other modules of the enterprise system. The implications of this compromised integration on the subject units were reported in some of the transactions between SYSLEARN and these affected modules.

This is indicative of the role of intra-organisational power considerations in conditioning the interaction between the different parties involved in the implementation, and by extension the quality of the implemented system.

8.3.1.2 Intra-group power relations

At the sub-organisational level, users' response to some of the changes introduced by SYSLEARN were seemingly influenced by the power balance between different work groups in the workplace. In analysing users' engagement with SYSLEARN, it can be affirmed that actors were able to draw upon these power positions to selectively engage with the system-introduced practices, as in BU3's training departments' management, or in negotiating over the would-be revoked roles' and resources (despite little success) in the case of the training sections' managers of BU2.

To explain these interactions further, the perceptions of this power balance and the associated privileges of different work groups must first be highlighted. In both units (BU2 and BU3), training management is held by section or departmental managers at higher grade levels. In return, staff within the administration departments of both units are normally employed at lower organisational grades, undertaking the secretarial aspects of training management. In the social context of the present study, this difference in organisational level is associated with differential perceptions of job importance, and therefore contributes to establishing a status hierarchy among the work groups. Organisationally, it is also associated with a differential allocation of tasks and authority. Training managers would take the responsibility for planning training, scheduling courses, and distribution of work load. These tasks ascribe importance and involve a significant deal of authority when compared to the secretarial tasks performed by administrative staff. The business processes introduced by SYSLEARN would potentially break into this established order either by changing the content of a task or by changing the way it used to be performed.

The case of BU3 provides an example of how the automation of certain managerial tasks was resisted, because this automation would potentially disrupt the picture of a powerful and "all-knowing" manager. The workflow of SYSLEARN's training management programme increasingly required their continuous signing-on to the system to verify applications, approve results, and generally "e-supervise" the training process. Although the content of these tasks is consistent with managerial values such as control, the frequent lack of IT skills amongst managers meant that performing these tasks through the system was increasingly perceived as intimidating and eroding of their self-confidence. Consequently, these managers tended to avoid using the system. Instead, administrative assistants were granted wider system access profiles to undertake most of these tasks. Otherwise, the process would be reversed back to paper-based communications.

In the case of BU2, training managers were ready to overcome the technical challenge of dealing with SYSLEARN, but were faced with changes to their job tasks that led to a decrease in their authority. The new system processes stripped some the previous responsibility of a section manager by transferring the task of work assignment from

the training departments to administrative staff in a new planning department. This emerging situation involved a re-distribution of power, and was thus challenged by training managers. This opposition had been materialising in frequent attempts to dispute the decisions made by the planning department. This conflict called for higher level managerial interventions - which were always on the side of change.

In BU2, the introduction of new business processes was coupled with structural changes (e.g. a new department). It was also guarded by technical constraints in the form of confined access profiles to each group. Furthermore, the unit management intervention was salient in off-setting the power imbalance and enforcing change.

The case of BU3 is dissimilar. Despite there was a managerial attempt (at the level of unit management) to impose the new practices, this intervention didn't meet with much success, due to a number of technological factors (e.g. the inadequate configuration of profile access) and organisational influences (e.g. the excessive number of administrative staff).

8.3.2   HR Policy on internal mobility

The analysis of the SYSLEARN implementation process uncovers yet another organisational dimension influential in shaping organisational practices. The organisational human resource policy of free internal mobility is found to have enabled actors to engage in practices that were legitimate in their own right, but which had adverse impacts on the implementation project, the appropriation of technology, and consequently on the organisational outcomes of the system. In particular, the open internal mobility policy allowed members of the implementation team to withdraw from the project, and thus causing noticeable distraction to those activities related to the implementation of the system.

In the context of this case organisation, employees are allowed to apply to job openings at any organisational unit, as long as they can fulfil the post requirements of qualifications and years of experience. In other words, there are no restrictions on employees' transferring between roles and departments within the organisation. This organisational policy differs from the traditional system of an employee's career path

- that is characterised by managed moves, and largely determined by managerial discretion. This employment system is usually referred to as "internal labour liberation". It is found to have been increasingly adopted by large corporations since the 1990s, as a way of retaining talented employees and allowing them to seek opportunities inside rather than outside of the company (Kotorov and Hsu, 2002). In the context of the case organisation, mobility of internal employees serves also the mutual interest of a manager and an employee when conflict arises to the point of irreconcilability.

Whilst some companies put restrictions on employees' internal transfer by imposing the requirement of managerial approval, employees in the case organisation are free to apply for vacant positions that suit their career goals. This job opportunity system has been in place for a long time. But the significant organisational implications of this policy have only come into play since the introduction of two major organisational programmes, namely: the privatisation programme and the early retirement scheme. The organisation's privatisation programme was associated with massive restructuring of many organisational units, which opened up new positions and career opportunities at many departments within the organisation. The early retirement scheme resulted in the departure of large numbers of employees, thus creating many vacant posts and making them available to internal applications.

These conditions were not found to have impacted on SYSLEARN's implementation in BU2, possibly due to the fact that the project team members from BU2 were selected from among senior aviation instructors. These individuals are generally well paid. Also, they have accumulated their knowledge and experience in a specific field, and are therefore less likely to change job.

In contrast, the representation team of BU1 and BU3 included members in administrative and management positions. These individuals have accumulated more generic forms of expertise, and are more likely to change job should a better opportunity arise. During SYSLEARN's implementation in BU1, there were a number of changes made to the representation team due to employees' transferring to other departments (or opting for early retirement). In the case of BU3, a key unit's

representative moved on to a new post just after the "go-live" date of the system. The instability of BU1's representation during these implementation phases led to a poor definition of requirements and compromised technical knowledge of the system. By the same token, BU3 lost considerable organisational knowledge following this unit representative's transfer. The situation was further worsened by the system's training plan relying mainly on the project participants in a "train the trainer" approach. The implementer company provided technical training to participants, who were supposed to undertake the major part of training other users of the system within their departments. Consequently, inadequate system configuration and/or poor system training exerted noticeable impacts on the conditions of the implemented technology, and how it might be utilised.

Taken together, these observations direct our attention towards the role of human resource policies and their potential to influence the appropriation of technology and the organisational outcomes of technology.

8.3.3 IT Prevailing Strategy

An IT strategy involves managerial decisions about the role of IT in relation to the overall business strategy. An IT strategy also involves assessing the opportunities and capabilities of IT and the organisational changes required to deliver those benefits (Reich and Benbasat, 2000). The analysis of the evidence from the present case implies that, under varied influences, an IT strategy may dominate without necessarily being formally specified. The prevailing organisational unit's strategy on IT was found as having a bearing upon unit's members' engagement with technology. These predominating strategic positions have emerged under influences originating from upper management directions, as well as from the exchange dynamics with the clients of each business unit.

8.3.3.1 Vertical influences: upper management

IT literature has clearly demonstrated that, for IT projects to succeed, the support and commitment of top management are critical (e.g. Bingi et al., 1999; Liang et al., 2007). A central idea in this commitment is whether to approach the IT project as a

matter of changing software systems, or as a matter of repositioning the organisation (or the organisational unit) and transforming the business practices. The evidence from the present case indicates that the organisational executives clearly declared their overall organisational strategy (including the adoption of the enterprise information system) in both their statements to the local media and in their internal circulations to organisational members. According to these statements, a key objective of the enterprise information system's adoption is enabling organisational units to aspire towards strategic business development, in addition to achieving process integration and efficiency improvements. The degree to which this business-oriented IT strategy is consistent across different organisational levels is found to be relevant in informing business units' members' engagement with the implemented technology. Empirically, the alignment to this strategic stance is found to be subject to varied interpretations and assessments at different organisational units.

The analysis of sub-organisational engagement with the new system reveals the existence of varied perceptions and practices that - for the most part - reflect local priorities and sub-organisational strategies (or possibly lack of strategy). The analysis of organisational practices further reveals that the formulation of an overall approach to the IT project is informed by a combination of an organisational unit's own decisions and the extent of influence that the unit experiences from upper management.

In BU3, the actors' engagement with the implementation project indicate that efforts and attentions were directed towards addressing technical concerns with the legacy system. In other terms, the new system is expected to meet the technical needs of automation, increased accuracy, and data integrity. Accordingly, BU3's approach to the IT change was seemingly limited to replacing the legacy system with a more advanced information system. In this sense, the new system was largely considered as an IT project or as a technical solution. Another potential factor in the formulation of BU3's approach was the organisational reporting hierarchy. The IT project was also considered a managerial instruction assigned by a higher level authority. Consequently, BU3 sought to comply with the stated organisational objectives of the project. This can be seen in the alignment to the project phases and requirements.

However, the nitty-gritty of project requirements, such as business process reengineering and organisational restructuring, were found to barely have been followed. This situation represents a mechanical alignment to the overall organisational strategy of change, and also reveals the little attention paid to devising an autonomous business strategy in association with the new technology.

The case of BU1 represents a differing approach. BU1 is the training arm of the technical services unit of the airline organisation (TSV). In the privatisation plan of the organisation, TSV was declared as a strategic business unit (SBU) prepared to provide aircraft maintenance services to all airlines operating regular flights to the nation's airports. During this transitive period, the soon-to-be independent company focused on continuity of operations, placing much emphasis on its core functions: technical services. Although the management of training is accepted as a necessary condition for running daily operations, it was not at the forefront of their strategies - especially not the priority that a satisfactory level of automation should be present at the time of SYSLEARN's introduction.

From an operational point of view, time spent on learning new processes, allocating human resources, and implementing change comes at the expense of proper service delivery. Thus it is the time spent on such practices that is considered less crucial in the eyes of BU1's upper management. These circumstances created a perception of technological change as a distraction of attention and efforts, and a waste of time and resources. As a result, there was a contradiction between local unit requirements (business continuity) and overall organisational strategy (business development). In accordance with the mother unit's priorities, BU1's approach to IT change can be characterised by the lack of a business-informed IT strategy and in the little resonance it enjoyed with the overall organisational strategy. The absence of strategic vision led to inconsistent practices in relation to the implementation of technology. Consequently, the configured technology was inadequate in terms of allowing for change in the organisational elements.

Another factor that plausibly informed the IT strategy composition in BU1 was the general perception towards the attempt to introduce advanced technology in the

workplace. This perception was found to have been influenced by the upper management (TSV)'s support for the project. TSV's prospects were largely influenced by the failure of previous attempts to introduce technology into their departments. Staff were highly sceptical about the success of the project, and less willing to associate the proposed system with any long-range planning.

In terms of BU2, it was the repositioning of the training unit as an independent business entity that largely informed its decisions about technology. The autonomous status allowed by this organisational structure meant that BU2 was able to pursue its own strategy in distance from the vertical influences of upper management. Within BU2, the strategic vision of the unit - to become an international centre providing training services to regional and international carriers - was crucial in providing a clear sense of the drivers and consequences of technological change. In this sense, IT was approached as a strategic tool. Thus, the unit's strategy was in alignment with the overall organisational strategy. This unity in the IT strategy between the organisation's and the unit's management was translated into a real commitment to change. The representatives of the implementation project, supported by the unit management, took on the role of championing the technology. This environment was instrumental in setting up a business-informed IT strategy, which manifested itself in the decisions and practices that indicate ownership of the change, rather than mere compliance to (or conflict with) the proposed organisational change strategy.

8.3.3.2 Horizontal influences: exchange dynamics

In the context of the present study, organisational units provide training services to different types of clients (other organisational units or external customers), in a somewhat different exchange dynamics mechanism. These exchange dynamics have apparently been significant in the way organisational units have perceived the role of technology in their organisational strategy.

In those situations where the exchange dynamics tended to be comparable to a market-like exchange mechanism, the system implementation project was approached as a strategic tool for improving the business. Conversely, in other situations - where the exchange mechanism was not controlled by market-like mechanisms, and was

essentially guided by procedures and rules governing intra-organisational transactions - the system's implementation was largely perceived as a "technical project", whereby emphasis was to be placed on the technical capabilities of the system, with few implications for organisational strategy.

The former situation can be more readily observed in BU2. In parallel to SYSLEARN's adoption, BU2 had commenced in providing training services to the crews of other airlines during their short-stays in the country between flights. Also, the service provided to the mother airline had begun to be calculated on commercial bases, with the unit starting to assume its independence status.

The situation observable in the two other units was totally different. Both BU1 and BU3 provide training services as an intra-organisational transaction, and thus have no alternative users for their training services. Consequently employees were never in direct contact with real customers, nor by extension to the market. Moreover, BU3 had less competitive advantage compared with the other two training units with their niche services. BU3 was more broadly situated to serve a wide range of training activities – which were directed essentially towards internal customers.

8.3.4   Summary and Discussion

The preceding subsections have alluded to the second category of contextual conditions- the organisational conditions. The organisational elements surrounding the IT implementation process have been identified as workplace power relations, human resource policy, and IT strategy. Organisational actors have engaged with the adopted system in varied ways by reference to these conditions. The implications of the organisational context on practice are summarised in Table 8.2.

The analysis of organisational influences on actors' engagement with the IT in this study conveys issues that are echoed in several organisational-focused IT studies.

The analysis of how the introduction of the system has intruded in the distribution of power between different groups is consistent with the assertion of Robey and Markus (1984) that technology is inherently symbolic and value laden. The evidence analysed

also confirm that the relative power in the workplace is mirrored in actors' engagement with the implementation tasks, and actors' appropriation of technology, and can be a justification and/or a resource for actors to resist or embrace change. This observation is congruent with previous studies on the influence of workplace power relations on IT systems' implementation (e.g, Markus, 1983) and IT uses (e.g., Constantinides and Barrett, 2006). However, in terms of how IT is appropriated, the analysis of this case indicates that the relative power may prove ineffective in the presence of other situational elements such as managerial interventions or technological constraints. This observation affirms that the outcome of IT appropriation cannot be determined a priori, but instead emerges from the engagement of actors with various situational conditions.

The findings from the present case confirm the importance of factors such as the homogeneity and stability of the implementation team and the training on the system. Many previous studies support this claim (e.g., Bingi et al. 1999; Nah et al., 2001). The findings of this study, however, refer particularly to the HR policy of employees' internal mobility as a critical aspect influencing the extent to which these factors are maintained.

The analysis of the evidence indicates that an organisational approach to IT is significant in informing subsequent practices. However, there seems to exist what might be termed informal IT strategy prevailing in organisational units. This prevailing strategy is found to be only partially motivated by the overall organisational declared strategy. These findings seem to be consistent with other research which question the possibility of managing IT strategy in the face of multiple influences that pull the organisation in different directions (e.g., Ciborra, 1997).

Table 8.2 - Comparison of the implications of organisational conditions on the three business units

Organisational element	BU1	BU2	BU3
Workplace power relations o *Intra-organisational power relations* o *Intra-group power relations*	• Unreliable engagement with the implementation requirements • Compromised integration between SYSLEARN and other enterprise modules	• Compromised integration between SYSLEARN and other enterprise modules • Section managers' negotiating over the would-be revoked roles' and resources	• compromised integration between SYSLEARN and other enterprise modules • Managers' selective engagement with system introduced practices • Managers' resistance to the increasing automation of their job
HR Policy on internal mobility	• Key employees' withdrawal during system implementation, due to transfer, has led to poor requirements' definition and compromised technical knowledge	• There were no instances of the transfer or withdrawal of key employees'	• Key employees' transfer just after system implementation has led to poor knowledge transfer
IT strategy composition o *Vertical influences of upper management* o *Horizontal influences of clients*	• Technological change is seen as waste of resources and efforts. • Lack of business-informed IT strategy due to direct management priorities and previous IT failures • Lack of direct exposure to market mechanisms has weakened IT strategy formation.	• IT is a strategic tool • Independently approaching IT strategy in alignment with the overall organisational strategy • The increasingly market-like exchange mechanisms have endorsed IT strategy formation	• New IT is a technical fix and managerial instruction • Mechanical alignments to the overall organisational strategy of change are in accordance with the directions of top management • Lack of market mechanisms and competitive advantage weakened the IT strategy formation.

8.4   Technological Conditions

8.4.1   Introduction

This part of the analysis shifts the focus from the surrounding context of action to the influences originating from the technology's properties and the technological arrangements around the adopted system.

In this section, the focus of analysis is on identifying the input of technology into the organisational change process; that is, what is it in technology that plays a role in this process? By examining the implementation process of SYSLEARN, two issues are found to have largely shaped the way SYSLEARN was put into operation, thus informing the extent to which it formed an integral constituent of change on certain organisational elements. First, the implemented system is presented as packaged software. But it allows for 'tweaking', such that each organisational unit can configure the system - through a definition of requirements negotiated with the technical team - to reflect its particular business rules. This resulted in each "version" of SYSLEARN having distinct combinations of features and data, thus allowing users at one site to do things that others may find more difficult or unfeasible. Second, the system represents one module in an integrated enterprise system that links multiple organisational units and functions. Therefore, the functioning of the system not only relies on its features and contents but also on other aspects of the technological and human infrastructure which are not directly related to the constituents of the technology. These arrangements include servers, networking and other "hard" resources, in addition to the skills and expertise needed for effective use of the system. This overall integrated socio-technical landscape is vital in informing the operation and effectiveness of the applied system and its associated organisational changes.

The aforementioned outline indicates two important dimensions of technology that were repeatedly referred to in participants' accounts of the implementation process, and can be synthesised under two categories; namely, *technology content* and *technological context*. This categorisation is based on whether a technology-related element resides within the system as a transaction or a piece of data (*technology*

content), or whether it comes as an element of the surrounding technology-related conditions that influence the usability of the system (*technological context).*

Ahead of presenting detailed elaborations on these technological dimensions, it is useful to further discuss the above-mentioned issue of "software configuration and customisation", as it provides a valuable starting point when looking into the technology-related aspects of the process.

8.4.1.1   Software configuration and customisation

In developing information systems based on commercial packaged software, modifications to the original products are quite often required in order to meet the information processing needs of the user organisation. Modification of the packaged systems takes place at two levels: the configuration and customisation of the system (Davenport, 1998). Configuration involves adjusting the system using configuration tables, files, or editable rules to achieve the best possible fit with the internal processes. For example, the adopting unit can select the number of approval levels on a training request. This process also involves populating the system with reference data (a set of permissible values to be used by other data fields). This can also include configuring an access policy; i.e. restricting who can access what in terms of data and transactions. Although configuration allows the adopting unit to tailor the system to some degree, configuration options are limited.

Software customisation, on the other hand, offers more options because it involves modifications made to the program's source code to change or extend functionality (Davenport, 1998). However, customisation of packaged systems' is not usually straightforward, because it requires a higher level of technical sophistication, and may involve considerable costs and delays in system delivery. Whilst configurations do not affect upgrades to the next releases, customisations can make system software upgrades difficult, because there is always a chance the code won't work when newer versions and releases are introduced.

In cases where there is a misalignment between the software business processes and the unit work practices, a decision has to be made; either to change the work routine

to align with the system processes or to customise the software to accommodate the unit-specific practices. Another option could be to continue using the pre-existing system, and to build interfaces between the new and the old systems. This last route, however, could dilute the integration effort.

During the implementation of SYSLEARN in the three units, the IT team directing the project was pushing for a "vanilla" version of the system, i.e. adopting the original software without major customisations as a means of pushing the implementation process forward and also making use of the generic processes or "best practices" brought about by the system. Also, the implementation schedule was enacted strictly, according to top managerial directions, and therefore, only slight customisations were feasible prior to the cut-off date for system installation. Although post-implementation customisations are possible, the present case proved it was notoriously difficult because the system go-live date had already been "celebrated", and the implementation momentum had started to fade away. Also, the system modifications post-implementation were supposed to have been undertaken by the organisation's internal IT team without technical support from the implementer company, which had finished their contract by that time. The major reasons for relying on an internal IT team reside in the cost efficiency over time and strategic competence development. However, the application of further modifications to the system after the go-live date was a tremendous challenge for the internal IT team, given the many projects underway. The situation turned out to be that the organisational units continued to use SYSLEARN as it had been configured prior to going-live.

Our analysis of responses to the approach to implementation taken by the organisational units in the present case reveals that the issues of configuration and customisation were dealt with in varied ways, and shows that the role the adopted system came to play had been influenced by decisions of configurations and customisations.

The case of BU1 in this study shows how BU1's users resisted any reworking of the unit processes to fit the system requirements. At the same time, the application of

major customisations to accommodate the unit work routines was, for the most part, impractical. Also, the proper configuration of the system had been undermined due to the appearance of a number of technical challenges - including data migration and other organisational challenges related to the impact of such changes on the units' relations with external institutions. Consequently, there was a resort to the pre-existing system. Although this served to compromise the inherent qualities of the system, it could be assumed that BU1's users intentionally opted for this route because integration had placed restrictions on certain flexible working practices they had considered important to their business operations.

The case of BU3 reveals a similar attempt to align the system with the unit's internal routines. This situation, however, is quite different because this attempt took place within the sphere of configuration - in the form of broadened access profiles made available to certain type of user. The implication of these configurations was that the system was being gradually aligned to the unit practices in daily use and in associated interactions rather than in hard-coded customisation of the software.

In BU2, the engagement with issues of configuration and customisations was found to be remarkably different. The implementation team took every opportunity to make use of their configuration options. In addition to following the generic processes offered by the system, in a way described as "system-based" work flow, there was a substantial effort towards both the codification of business rules and resources, and the application of system reporting functionalities. In instances where conflict developed between the system's offerings and the unique way of doing business in BU2 - particularly in the generation of invoices - the resolution was to opt for an off-the-system data and information transfer. This apparently undermined the implied control and integrity of the system. In contrast to the situation in BU1, this compromised integrity was perceived as a challenge to be dealt with rather than a relief from integration restrictions.

The foregoing discussion highlighted key findings of the implementation process in terms of the configuration and customisation of the adopted technology. The following sections proceed to illustrate how the outcomes of these adaptations

produced identifiable technological properties, and how these properties contributed to shaping the conditions of the user-technology interaction.

8.4.2 Technology contents

Technology's contents refers to the distinctive constituents of technology. It alludes to those system forms and functionalities which result from choices made during the configuration process, as well as from the continued use of the system. The analysis of technology's contents aims to assess the contribution of technology in the appropriation process. That is, if and when it is used, and how this could bear influence on organisation. Mutch (2008) contends that technology possesses material properties that can limit freedom of action, whether or not these properties are perceived by the user. In spite of that, it is not to be seen as a structure in its own right, he says, but as a bearer of the marks of wider structures such as reporting hierarchies and functional boundaries (Mutch, 2008). On the backdrop of this representation, the concept of "technological embeddedness" (Volkoff et al., 2007) is found to be useful in analysing the contribution of technology in the appropriation process .

It is argued in this research that the contents of the focal technology - SYSLEARN - played a role in making change possible in certain instances, and in impeding the process of change in other instances, by embedding certain organisational elements within the system or failing to embed them in an adequate way. A technology's contents or those properties that are presented to the organisation's actors (the same actors involved in the configuration process or possibly new users of the system) are understood to be mechanisms that participate in the appropriation process. These mechanisms interact with each other and also with other mechanisms emanating from the context of implementation to produce the conditions of action.

In exploring these mechanisms, the analysis follows Mutch (2010), and Volkoff et al. (2007) in disaggregating the technological system, and in considering the organisational constituents contained as a means by which to examine the propensity for change offered at each level. The assessment of the IT system in the present case,

and the mechanisms that it brings into the domain of action, identify four main elements, presented as: embedded processes, embedded roles, embedded knowledge, and embedded data.

8.4.2.1 Embedded processes

Process embeddedness entails developing system transactions of work routines and work sequencing that together inform how business is to be conducted. That is, the system provides sets of explicitly defined steps that mandate specific data inputs so as to automatically generate specific outcomes. The order of these steps reflects how these routines need to be performed, and also stipulates the connections between them. For example, the registration process can be embedded into the system in several system transactions, each of which mirrors one single step of the work routine, including, for example, "course opening", "application to a course", "approvals", and "registration confirmation".

Whilst the logic of an enterprise system is to align work routines with the so-called "best practices" of the introduced system, the degree to which this embeddedness is achieved is subject to negotiations between multiple actors during the configuration stage of the system. Once configured in a certain way, the embedded transactions dictate a certain way of performing work tasks. Although, the outcome of change in the work process is also related to other technical and contextual elements, and most importantly to users' enactment of the new arrangement, process embeddedness represents an observed mechanism through which technology stands to facilitate or constrain a specific appropriation pattern.

As the evidence presented in the previous chapter indicates, the embedding of business processes within SYSLEARN was received with open resistance in BU1. It was reported that SYSLEARN was overly restrictive and was interfering with workers' usual loose working practices. On the other hand, process embeddedness had been relatively successful in the case of BU2 and BU3. However, those cases offered examples of two contrasting appropriations and differing organisational consequences.

In BU2's case, the process of opening courses, conducting registration, and recording results largely followed the system's own proposed process - to the extent that instructors could now only become aware of their training duties through accessing this system. In addition, their performance appraisals were linked to output from the system, meaning that training tasks became visible and credited only if they have been uploaded onto the system. Furthermore, there were changes made to the unit's organisational structure by establishing a new department so as to align the unit work with the system-introduced processes. These conditions allowed for more managerial control and also streamlined the training process.

In contrast, the case of BU3 offered an example of how process embedding can sometimes obstruct the work routine if not properly managed. This was evident in the registering of training courses, where the process was delayed because of the decision by some managers to log-on to the system less frequently and therefore put the process on hold for a certain period of time.

In both cases, the user's choices in performing system-based work routines is likely to be limited because the embedding of business processes happens prior to the system's use, in the form of hard-coded transactions inputted into the system. This creates a physical restriction on action (Mutch, 2008). As a result, users have less flexibility in intervening in the process; they are unable to deal with these restrictions from within the system.

8.4.2.2 Embedded roles

The implementation of enterprise systems is a process that includes defining roles for each group of users. Users of the system are only authorised to perform a fixed set of transactions that are linked to their role in the system. This "role embeddedness" is protected by an access profile granted to each user-id accessing the system. For example, prior to SYSLEARN's implementation, recording courses' result had been considered an administrative task and was conducted by administrative staff at the three business units. The new system, however, defines the same task differently and assumes that it is undertaken by the course's instructor. The implementation of this

role-distribution feature means that administrative staff are no longer able to perform the transaction of entering results based on their assumed access profile.

The configuration of this feature of the system in one business unit dictates how the system might be appropriated, and thus offers the potential for the system to endorse control measures over the training process, and consequently to enable change in the organisational setting of that particular business unit.

An example of how this technical mechanism is put into work is found in SYSLEARN's implementation in BU2, where the role of planning and organising training resources (including instructors) was appointed to the administrative staff of the newly established "planning and scheduling" department. Previously, the assignment of this role was based on the common understanding and conduct of the responsibilities assigned to each group of users. That is, chief instructors were responsible for the planning and distribution of training resources, while administrative staff took on responsibility for the data entry. After the embedding of new roles into the system, this planning role was revoked from the chief instructors, granted instead to admin staff. This form of role re-assignment had further consequences on the role-associated authorities, and also on the power relationships between different groups within the unit.

In addition, the embedding of roles and the assignment of certain transactions to specific groups had further consequences on organisational expertise. By embedding well-defined roles within the system, the employees could not operate outside their assigned roles. To be precise, the chief instructors in BU2 were no longer undertaking the task of workload assignment, because this role has been transferred to the training planners. Whilst having static and well-defined authority was consistent with the system-introduced "best practices" (e.g. clear and limited employee responsibilities), it arguably contributed to a loss of organisational expertise, because chief instructors were more able to make decisions and to respond more flexibly to dynamic workloads.

Speaking about the role of the contents of technology (i.e. embedded roles) in facilitating specific set of appropriations, and enabling certain organisational changes doesn't mean that these technological mechanisms are self-operating. Rather, their functioning may be side-lined in the presence of other contextual influences.

The case of BU3 offers an example of how the potential of technology's contents can be dismissed in a system's use, even when configured to a well-defined role distribution. In BU3, despite administrative staff from the training support team assuming the role of devising workloads and assigning training duties, this task continued to remain in the hands of the training departments' managers. The managers kept on devising the workloads "off-the-system" and then handing them to the training support team to perform the data entry part. In this instance, embedded roles were bypassed in system's use, owing to an inadequate organisational commitment to the new arrangement.

Another example is found in BU3 (and in BU1, as well). In both cases, the role of entering course results was to be assigned to instructors according to the system. However, in reality, the administrative support team would receive printed results and input them onto the system. They operated in this way by virtue of having broad authority on the system. Administrative staff in BU1 and BU3 were given wide access profiles to perform transactions beyond their new assumed roles.

8.4.2.3 Embedded knowledge

Knowledge embeddedness involves an attempt to incorporate elements of organisational knowledge within the system, in order to make it available for individuals and groups to access and use it, and in order to support action within the organisation. This incorporated knowledge could serve as a criterion on which to analyse, judge, and make complex decisions independently of human intervention or awareness. Such a codification of knowledge helps to equip the system with "functional affordance" (Markus and Silver, 2008) that allows it to analyse and learn from past entries and transactions. Knowledge embeddedness is supposed to endorse the mechanisms of process and role embeddedness by providing the holders of newly defined roles with the knowledge needed to perform their assigned tasks.

This way of embedding knowledge into the technology was detected only in the case of BU2. The process of SYSLEARN's configuration in BU2 involved building a comprehensive directory called a "catalogue", containing entries of all the units' resources and specifications, as well as the names of all training instructors and their competencies. This work catalogue was meant to support the planning and scheduling of tasks to be performed by administrative staff. Thus, these members of staff are enabled to perform duties that are typically undertaken by a different work group. This can lead to tension between members of different groups, as was noticed in the case of BU2's chief instructors and administrative staff. It was also the reason behind BU1 and BU3 giving less attention to such undertakings.

Despite the validity of the concept of 'embedding knowledge' being challenged by the difficulty of finding those parts of the knowledge which are hard to capture and document, i.e. tacit knowledge (Hansen et al., 1999), the empirical findings of this case support the idea that embedding knowledge within the system has constituted a base for patterns of appropriation capable of contributing to the routinisation of IT-associated organisational change.

8.4.2.4 Embedded data

Embedding data involves populating the system with a detailed record of unit operations and business activities. Although this property can be found in the legacy systems (particularly those used in BU1 and BU3), there are significant differences between the data conditions existing in the legacy system and those in the new system. In contrast to the legacy system, embedding data into SYSLEARN is characterised by timeliness and integrity. That is, data are recorded in real-time in integration with the unified database to minimise the occurrence of erroneous and replicated data. Examination of the data issue involved in the implementation of SYSLEARN reveals that embedded data can have organisational consequences only when certain conditions are met to a sufficient level. The availability and quality of the embedded data can enable certain organisational practices, whilst the absence of certain data or the compromised quality of those data can result in use practices being hampered.

The evidence collected from the current case indicates that embedding data was a critical aspect in the emerging appropriations of the system. For example, the availability of quality data regarding SYSLEARN (the system tracking who did what and when) allowed BU2's management to link employees' appraisals with the performance reports generated from the system, thus furthering decision-making and managerial control within the unit. The embedding of data in BU2 took place gradually, as the usage of the system had progressed since its first implementation. Also, BU2's decision to choose the system's start-up as the initial point for accumulating and embedding data helped to ensure the existence of a high-quality, reliable database.

On the other hand, BU1's historical data were central to the unit's operations. The embedding of old data was not accomplished, due to the emergence of a number of technical and organisational issues. The data migrated from the old system were inconsistent with the new data's structure and format. This led to data fragmentation on the new system, requiring significant efforts from users to assemble large amounts of the historical data before the IT support team would apply sophisticated technical manipulations to make the data usable on SYSLEARN. This major task was simply unfeasible within the time and human resources available to the implementation project. These circumstances resulted in the lack of complete data being made available for embedding on the system, consequently limiting the role of embedded data in facilitating the use of the new system.

The case of BU3 is not very different from BU1. Despite comprehensive historical data having been incorporated into the system, this effort was undermined by the inaccuracy and redundancy characterising the migrated data. As a consequence, the embedded data fell short of producing a reliable data source or an adequate enabling feature of SYSLEARN in BU3.

8.4.2.5   Summary and Discussion

In this part of the analysis, the aim has been to examine the role of technology in enabling or constraining organisational action. This has been approached through reference to the constitutive properties of technology. It has been proposed that

technology's contents, by incorporating functional properties that enable and constrain human agency, may be seen as one dimension of the overall conditioning scene. The influence of technology's properties on the use of IT does not operate independently from other contextual and technological arrangement of such use. The assessment of SYSLEARN at the implementation phase, as well as at the post-implementation usage phases, allowed us to see variations in the technology contents in the three implemented versions of the system. These variations are assumed to have been instrumental in shaping how the IT system is being appropriated. The nature of these functional properties at certain instances of the appropriation process is summarised in Table 8.3.

The analysis of technology's contents describes a range of possibilities by which an implemented system may invite action. These possibilities are built on the concept of "technological embeddedness" (Volkoff et al., 2007). When applied to the adopted system in the present case, it has been found that actors' engagement with the implementation tasks and further uses of the system have resulted varying levels of embeddedness of organisational elements into the system. The embedded organisational elements comprise business processes, employees' roles, organisational knowledge, and business data. Once these elements are embedded, they begin to resemble material conditions able to forbid/allow certain actions. Further appropriations of the system may result in an increasing level of embeddedness, or might reduce that level. In this way, technology appropriation is both influencing and being influenced by the level of embeddedness. Understanding the concept of embeddedness in terms of its changing levels represents an important way of understanding and utilising the original concept introduced by Volkoff et al. (2007). This understanding is vital to our perception of technology appropriation as a process that evolves over time. Further discussion on the characteristics of technology in this theoretical position is provided in Chapter Ten on technology appropriation and organisational change.

Table 8.3 - Comparison of the business units in reference to the contents of technology

Technology's contents	BU1	BU2	BU3
Embedded processes *Developing system transactions of work routines and work sequencing that together inform how business is to be conducted.*	• Resistance to adoption of the system's processes in the configuration stage • Little to no process embedding.	• Business processes largely followed the system's own inscribed process. • Adaptations on organisational structure to align work with the system introduced processes. • Gradual alignment of users' enactment with the system process	• Attempts made to embed processes into the system in the configuration stage • Flexible uses have put limitations on the process of embeddedness
Embedded Roles *Defining roles for each group of users. Users of the system are only authorised to perform a fixed set of transactions - which are linked to their role in the system.*	• Limited roles embedding into the system	• Roles distributed within the system • Roles protected by well-defined access profiles • Users cannot operate outside their assigned roles.	• Roles are distributed within the system • Roles are NOT protected by well-defined access profiles. • Users flexibly operate outside their assigned roles.
Embedded Knowledge *Incorporating elements of organisational knowledge in order to support system utilisation*	• No knowledge embedding into the system	• Building a comprehensive directory of unit resources • Meant to support planning and decision making	• No knowledge embedding into the system
Embedded Data *Populating the system with a detailed record of unit operations and business activities.*	• Historical data are significant in work done by the system • Imperfect embedding of historical data • Data fragmentation	• Historical data are not central to system functioning • Embedding of operational and analytical data • Effective data embedding	• Historical data are less central to system functionality • Embedding of operational data • Data embedding serves only documentary purposes

8.4.3 Technological context

The technological context describes both the organisation's internal technologies and its existing technology-related resources, which can constrain or enable IT use, and the organising process around technology. It should be noted, thus, that while the technological context can be viewed as another dimension of the internal organisational context, this dimension has been analytically singled out because of its direct relevance to the appropriation of technology.

The role of technology in the present study is found to be related to the technological context of the organisation, as well as to the particular technological arrangements existing within each of the studied organisational units. As the empirical evidence suggests, the technological context can be analysed around the following themes: legacy system impact, technical competency, and the technical infrastructure.

8.4.3.1 The impact of the legacy system

The role of the legacy system in the business operations of the studied organisational units was found to be central in informing the extent to which SYSLEARN came to play a sound role in the studied units. In this context, the legacy system can be understood as incorporating objective and subjective elements, which might directly or indirectly have influenced users' engagement with SYSLEARN, and consequently impacted upon the organisational outcomes associated with its adoption.

In reference to the subjective status of the legacy system, the relative technical simplicity of the legacy system in BU1's and BU3's units, and the lack of a training administration system in BU2 meant that users across the three units were confronted with perceived technological complexities (in terminology and interfaces), as compared to the pre-SYSLEARN period. This suggests that the legacy system's influence might be seen as coming from users being accustomed to and attached to uncomplicated ways of performing work tasks. The new technical complexities can be assumed to have built a psychological barrier – one which was not necessarily related to dissatisfaction with SYSLEARN's own offerings as much as to subjective perceptions about the 'difficulty' of the new technology being introduced. Another

subjective element relates to the extent of satisfaction with the legacy system. The case of BU1 provides evidence of how satisfaction with the existing IT system led to the prevalence of fewer positive views being expressed and to a reluctant engagement with the newly acquired systems.

In addition, the legacy system's influence can be ascribed to a number of objective elements inherent to the legacy system. First, the old system was a desktop stand-alone system (in BU1 and BU3; there was no prior system in BU2), meaning that the legacy system had little to offer in terms of specifying a workflow and the assignment of work tasks. Indeed, these circumstances offered the units' actors the freedom to organise work routines at a distance from the technological conditions. In some situations, these work arrangements turned out to be in conflict with the work organising processes proposed by SYSLEARN, and consequently impacted users' engagement with the system. Other elements can be understood to stem from the data migration from the old to the new system, and to use practices prevalent with the replaced technology. These two elements were found to have exerted varied instantiations and effects across the studied units.

The case of BU1 reveals the significant influence of use practices associated with the legacy system. These practices had been rooted in the significant flexibility allowed by the previous technology – such that the new, formal control measures and data integration became impediments to the running of the business as it used to be run. The data migration issue was also significant in BU1, because the operation of the new system was reliant on the availability of data for both historical and new operations.

BU3's case provides similarity with BU1 in terms of the noticeable impact on users' engagement with SYSLEARN of the previous use practices associated with the legacy system. The data issue, however, was found to be less significant, presumably due to the reduced centrality that historical data assumed in BU3's organisation and decision making.

In BU2, the legacy system could generally be considered to have been less influential in terms of use practices and data. First, the absence of a prior training administration information system meant that BU2's users were freed from any psychological attachment likely to hamper their engagement with the new system. Moreover, in contrast to BU1, those historical data that determined trainees' entitlement to specific training courses were actually being dealt with by training clients, meaning that SYSLEARN's functioning was detached from the influence of integration between new and old data.

8.4.3.2 IT competency

IT competency relates to the IT skills and abilities of an organisation's members, and the ways organisational units deal with issues of learning and training on the system. Here, technical competency encompasses broad IT skills as well as specific competencies on the adopted system. In this sense, technical competency is not only concerned with the end-users' ability to use the new system, but also related to the overall IT knowledge that proved in this case to be critical even in the early stages of the implementation process. This is particularly important in the case of customisable software packages such as SYSLEARN, due to the demand for the significant involvement of business users in providing the business knowledge capable of feeding into the configuration of the system. Therefore, business users are expected to possess a sufficient level technical knowledge besides their business knowledge.

The above image of a dual skill was hardly detected in the case of BU1. BU1's implementation representatives were senior level employees and managers possessing sufficient functional expertise. On the other hand, these functional experts reportedly lacked the IT knowledge sufficient to feed positively into the configuration of the implemented system. One possible cause could be that significant numbers of employees within BU1 were senior technicians transferred from aircraft maintenance workshops to undertake teaching duties related to their specific fields of expertise.

The case of BU2 represents a contrasting example, where instructors generally possessed good levels of IT skills, owing to their frequent interaction with advanced electronic systems in the training environment. Such technical experience was

displayed in this department's understanding and appreciation of the system in the early stages of implementation. It can also be suggested that SYSLEARN was subsequently received more positively in BU2 due to the relatively higher levels of IT awareness amongst the users there.

The case of BU3 reveals that technical competency was more critical in the post-implementation stage. Despite the effort of BU3 representatives in the configuration process, the lack of adequate technical knowledge amongst most of BU3's users apparently undermined the utilisation of the system there.

The issue of IT competency is also related to users' command of the system, and how the adopting organisation deals with the issues of learning and training on the system.

In the present study, an inadequate command of the system was reported as an issue for most of the users at the three units. This was essentially related to the low quality of formal training offered at the organisational level. According to the accounts of most of the research participants, training programs were too abstract, limited, and poorly planned and coordinated. Consequently, both use practices and the level of users' command of the system were subject to adaptations; this problematic situation was addressed locally within each unit.

In assessing how the studied units dealt with the learning problem, two differing approaches were identifiable. BU1 and BU3 had almost completely relied on the formal training sessions provided by the technical support. The outcome of these training sessions was minimal, and thus had little impact on increasing the IT competency of the system users within either unit. In contrast, BU2 took a proactive approach to fostering users' command of the system. BU2's approach to training included internally designing and conducting customised training sessions, whereby each group of users was only taught the functions they needed to perform their job, without going into the details of the system. Also, these training sessions had been arranged spontaneously whenever users had repeatedly faced technical challenges in certain aspects of the system. During these internal sessions, familiar users would share their knowledge with less conversant colleagues. This approach of ongoing

guidance, aiming to promote know-how regarding the system, and to sharpen the system's use, resulted in an increased unitisation of the system over the passage of time.

8.4.3.3   Technical infrastructure

The technical infrastructure includes those technical resources that provide a foundation for the functioning of the system, even though these resources may exist and are managed outside of the system itself. The technical infrastructure includes computers, networks, integration applications, and communication platforms.

The data collected from the sites of the three organisational units (participants' accounts and direct observation) indicate that a well-developed IT infrastructure was available to the organisation's actors. Apart from common technical glitches, the physical assets necessary for the functioning of the system (i.e. hardware, software, networking, etc.) were allocated to an adequate level. However, the issue of the technical infrastructure was particularly relevant in the case of users of the system working outside the focal organisational units - that is, the training-targeted employees and their departments. Those training customers training in BU1 and BU3 were supposed to undertake certain tasks directly (e.g. registration) using the integrated system that feeds into SYSLEARN. However, the limited access to essential resources such as networked computers at their organisational sites restricted the scope of their involvement with SYSLEARN. The presence of "non-networked" organisational nodes describes users communicating "off-the-system" with their training provider units. A similar observation was detected in BU2, but in relation to a different technical obstacle. In monitoring the training requirements of aeroplane crew members, the Flight Operations department (BU2 internal customers) utilised their own software system. Despite the availability of ample technical resources at these departments, technical support was unable to establish the needed electronic interface between the two information systems. This lack of integration meant that training users could not upload their training needs directly onto SYSLEARN. And nor could they access the training completion reports in real-time.

The implication of such deficits existing in the technological infrastructure was that in both cases data were subject to loss, error, and human manipulation. This could potentially result in compromised data integrity and in deficiencies of control over processes, which would impact how the technology is appropriated, and consequently undermine the organisational outcomes of the implemented system.

8.4.3.4 Summary and Discussion

This part of the analysis has singled out those technology-related aspects of the organisational context that have impacted upon users' uptake of the system. By and large, these findings corroborate with IT implementation studies that have recognised the technical resources within organisations as key enablers for successful implementation of IT systems (Zhu and Kraemer, 2005), and those suggesting IT systems are more likely to be utilised in organisations where staff possess satisfactory levels of IT skills (Lee and Lee, 2004). The processual approach of this research has allowed for elaboration on how these aspects are implicated in the implementation and use of technology. For instance, the findings of the present case refer to internally designed and customised training sessions as a successful approach to complement formal training. It has been also noted that users are expected to assume roles in the implementation of a new system beyond the passive roles of functional experts in the development projects of traditional systems (Soh et al., 2000).

The aspects identified as technology-related conditions influencing appropriation patterns and the process of organising around the technology are presented in Table 8.4, with a neat comparison across the three organisational units.

Table 8.4 - Comparison of technological context dimensions across the business units

Technological context dimensions	BU1	BU2	BU3
Legacy system's impact: *Organised around the old technology*	• Satisfaction with the old system offerings • The transition from simple to complex technology • The transition from isolated stand-alone systems to an integrated database • The transition from flexible to rigid work processes	• No previous information system	• Eagerness to minimise data inaccuracy and redundancy • The transition from simple to complex technology • The transition from isolated stand-alone systems to an integrated database • The transition from flexible to rigid working processes
Technical competency: *Overall IT skills, abilities, and knowledge about the system*	• General lack of adequate IT knowledge amongst users • Reliance on formal training sessions provided by the technical support staff	• The presence of skilled IT implementation representatives • Good level of IT knowledge amongst users • Internally designed and repeatedly conducted customised training sessions	• General lack of adequate technical knowledge amongst users • Reliance on formal training sessions provided by the technical support staff
Technical infrastructure: *The surrounding technical resources and the available infrastructure within the organisational unit*	• IT infrastructure allocated to an adequate level • Customers lack of connectivity and/or basic computing requirements	• IT infrastructure allocated to an adequate level • Lack of direct interface between SYSLEARN and other enterprise systems.	• The presence of an IT infrastructure allocated to an adequate level • Customers lack of connectivity and/or basic computing requirements

8.5 Overall Summary and Conclusion

This chapter presented the second milestone in the case analysis. Analysis of the process of IT implementation has revealed the significance of contextual influences originating from both within and beyond organisational boundaries. These influences are undoubtedly interrelated in practice. However, they have been singled out here in the quest for more clarity and organisation.

Analysis of the contextual conditions suggests that influences on organisational practice can be classified broadly across three distinct - but also related - levels: the external level, the organisational level, and the technological level. The organisational level concerns those organisation-specific elements that proved to be critical in actors' engagement with the implemented system. This level involves elements of organisational resources, structure, strategy, and intra-organisational relations. The external level concerns those elements beyond the organisational boundaries which are possibly found to have shaped organisational action. The elements cover interaction with state authorities, policy makers and industry sector regulations, as well as broad social and cultural frameworks. The technological level is related to "technology's contents" and the "technological context". Technology's contents refer to those properties of a system designed to control or facilitate user-system interaction. For example, in the form of a set of transactions or a piece of data. Technological context relates to those elements of the surrounding technology-related conditions that have influenced the design or usability of the system.

These multi-levelled elements offered the conditions for action throughout the implementation process. However, the recognition of the contextual condition does not negate the need for addressing the role of agency. Thus, it is certainly possible for individuals, informed by similar conditions, to make distinctive choices within those same situations. Actors' interactions with these contextual conditions have given rise to certain practices and responses during the configuration and appropriation of the IT system, and consequently have informed the extent of change with respect to work and organisational elements.

The case analysis will continue in the next chapter by examining these interactions and focusing on the micro-level processes of technology appropriation and organisational change.

CHAPTER 9

MICRO-LEVEL PROCESSES

9.1   Introduction

The preceding chapter has provided a detailed discussion of the contextual conditions surrounding the IT implementation process. The outcome encompassed a range of economic, cultural, socio-political, and technological arrangements that constitute the enabling and constraining conditions for organisational action.

As has been explained earlier in the thesis, this research adopts an emergent perspective in approaching the relationship between technology, context, and agency. Accordingly, these elements, identified at the macro- and meso-scales, are not assumed to offer a complete explanation of how IT is appropriated and how IT impacts upon organisational activity. Therefore, this chapter turns to the micro-level processes, setting out to examine the agential capacity related to these preconditions.

The analysis in this chapter aims to clarify the role of human agency in relation to technological and structural contingencies. This clarification offers another foundation (besides the exposition of contextual conditions) for the next chapter - which will attend to the interplay between the implemented technology, the contextual conditions, and the three dimensions of agency, and will then offer an explanation of the process of technology appropriation, and comment on the status of change in the organisational settings studied.

To understand the role of agency in how technology is appropriated, the analysis of micro-level interactions has been approached by utilising the conceptualisation of agency introduced by Emirbayer and Mische (1998). This theoretical device is organised around the notions of temporality. That is, actors are understood to be

simultaneously drawing from the past (habit, prior experiences, interpretive schemes), the present (the situation-at-hand, the resources and artefacts available, etc), and the future (projections, expectations, fears and desires) to inform their current practice. This dynamic connection between agential capacity and contextual conditions provides an explanation of the patterns of technology's appropriation, and offers an understanding of how, thereby, change or stasis may emerge.

9.2 Analysis of agency

In applying this theory-driven analytical strategy, the implementation process and associated practices of each individual organisational unit have been scrutinised individually. Illustrations of key practices and incidents of the processual data have been subjected to interpretation using open coding as the analysis technique. Open coding can be considered as an interpretive process through which data are split during the analysis into parts or categories. The prime reason for using open coding is to decompose the data into the categories underpinning the theoretical propositions of the research. This process was carried out in two stages.

In the first stage, I attempted to subject to meaningful interpretation, the key incidents and practices of the processual data. These interpretations were then translated into first order themes, which could transform the original raw data into theoretically informed interpretations. Tables 9.1, 9.2, and 9.3 each show, respectively, a master list of the proposed themes of the processual data for each of the three subject units.

After building the foundations of the coding scheme in the first stage - where data had been coded into first order themes - the second stage was concerned with associating these statements with suitable theoretical concepts. It is noteworthy to mention that these associations have been developed by scrutinising the various actors' practices with reference to the three analytic elements constituting human agency: iteration, projectivity, and practical evaluative elements. These elements correspond to the different temporal orientations of agency as actors engage with and assess implementation activities. Having applied this process, the findings emerged into the second order themes contained within the three broad dimensions of iterational,

projective and practical evaluative agency. The representation of these associations is shown in Figures 9.1, 9.2, and 9.3, respectively.

The section which follows will tackle each one of these theoretical dimensions by referring to their analytical components. This elaboration on the internal structure of each agentic orientation aids in understanding the agentic processes of appropriation of technology.

Table 9.1 - First Order Coding – The Case of BU1

Operating practice	Interpretation	Proposed Theme
Most of BU1's users were anxious about abandoning the legacy system	The various actors failed to construct images of the future in connection with the new system, and thus were not ready to give attention to, nor respond to, the emerging situation (the new system)	The routinisation of experience
Some actors displayed positive expectations with respect to the system's potential- specifically in terms of managerial control and decision making capabilities. These staff were ready to embrace the new system	Possible trajectories are located against the backdrop of prior experience	Potential opportunities were appreciated and approached
The department's managers hardly ever used or logged-on to the new system; management-related tasks (such as generating performance reports) were instead delegated to administrative assistants	Role distribution in the formal structure and technology was replicated through the enactment of roles and responsibilities in the new system	The re-emergence of familiar roles and relationships
Instructors neglected to use the new system to record course details	Use of the system was recognised and located in relation to instructors' professional identity. It was developed around preparing and presenting training, and was thus hardly associated with conducting administrative work (data entry on the system)	The re-activation of past collective experience
It turned out that administrative staff were the sole users of the new system. They tended to interact with the system at the minimal level required, and continued relying on the legacy as the primary system	Attention was focused on maintaining securing stable and reliable practices, but also the new emerging situation (the new system) required particular attention, in the sense that other social actors (the management) could now be trusted to act in positive ways in response to enactment decisions.	The realisation of 'expectation maintenance' through fine-tuned judgements
Interaction with (i.e. reporting to) key stakeholders (upper management ,external accreditation bodies) was achieved via outputs from the legacy system (not the new system)	Reluctant to give up activities developed in prior interactions. Assured by stability and order.	Maintenance of the central practices of the business
the new system was used to communicate with other organisational units such as the HR department	The new system was being used in certain intra-organisational processes which can be considered non-operational activities	The reconfiguration of business peripheral practices
both systems were up and running, and both were being fed with training data	The unit's management understood that having the new system active, regardless of the extent to which it was being utilised, was needed, if only to conform with top management directions	Balancing between external expectations and internal judgements and choices

Table 9.2 - First Order Coding – The Case of BU2

Operating practice	Interpretation	Proposed Theme
Users found it difficult to break their old ways of interacting with technology, and turned away from the new system	The various actors failed to identify and recognise the association between the emerging experience (the interaction with SYSLEARN) and prior experiences	A re-connection with typical patterns of experience
Users utilised only a few of the transactions that related directly to their system-assigned tasks	There was engagement with selected usage activities without commitment to the whole project.	Tentative and exploratory enactment
Daily work activities were linked with the use of the system (trainers needed to log-on to the system in order to access the training timetable)	The actors were faced with alternative constructions of technology, which differed from their prior experiences	An emphasis on appropriating the new work model
A new department was established - in accordance with the system business process	The implementation project was embedded within the organisational structure of the unit	A re-composition of roles and responsibilities
A common discourse spreading around the strategic transformation of the unit within which the new system utilisation was located.	The actors' interpretations and actions are guided towards the intended change processes by virtue of their varying subscription to the overall change project	Locating the system's use in relation to a shared visionary discourse
Some (marginal) business processes were negotiated between chief instructors and planners at some distance from the new system's prescribed solutions	The actors engaged in social rituals that ostensibly reflected the previous order but which nonetheless exerted little impact on the evolving use and implications of the new system	A considerate response to situational contingencies
Manual intervention was involved at some stages of the process	The actors sacrificed a compelling good (process complete integrity) in order to make use of the available features of the system.	The execution of pragmatic provisional enactment
Internal recruitment to the new department occurred mostly amongst non-specialised employees, and providing them with focused training on the system	The compromising of ideal resource requirements in order to establish the new setting	Practical responses to the system's resource requirements

Table 9.3 - First Order Coding – The Case of BU3

Operating practice	Interpretation	Proposed Theme
BU3's management and key users considered the adoption of an advanced technology a significant contribution to work quality	The actors constructed images of the future in connection with the new system	The identification of Potential opportunities
BU3's management didn't see SYSLEARN as the best choice but decided instead to take advantage of the system, especially since they were not in a position to object to organisational directions.	The actors reflected upon the plausible choices, considering how best to respond to the situational contingencies	A deliberation upon plausible choices and the actions made accordingly
Due to certain circumstances, including the high pressure to deliver the system on time, the implementation team were selective in dealing with the functionalities that could be configured into the system and also compromised on data migration quality	They struck a balance between external expectations and internal judgements and choices	Balancing between multiple expectations
The implementation team and end users chose to maintain certain work practices, such as training analysis, through meetings, as well as "off-the-system" communications	They maintained practices and structures that responded to socially recognised values.	Incorporation of past interactions into the new order
Some instructors and managers were engaged faithfully with the system, desiring to be in control over their jobs	The actors observed the opportunities and resources available in the new situation	Potential opportunities are appreciated and approached
The administrative staff continued to undertake tasks passed on to them by their managers or instructors	The actors' knowledge of workplace relationships allowed them to take on practices that could offer continuity and stability	Implementation of 'expectation maintenance', sustaining identities and social interaction
Some training departments' managers' avoided tackling technical tasks, maintaining their usual distance from the technology.	The actors' attention was conditioned by past collective experiences of their prior confidence and knowledgeable performances	Maintaining particular forms of perception and interaction
The training support team utilised the system in terms of basic functionalities, but did not necessarily take full advantage of the system's features	The actors were able to satisfy a duty, fulfil a specific vision and also sustain particular structures and practices	A resolution to act and respond to multiple demands

Figure 9.1- Second Order Coding – The Case of BU1

Routinisation of experience	
Re-production of roles and relationships	
Re-activation of past collective experiences	Iterative Agency
Maintaining the central practices of the business	

Potential opportunities are appreciated and approached	Projective Agency

'Expectation maintenance' - finely-tuned judgements	
Balancing between external expectations and internal judgement and choices	Practical-Evaluative Agency
Reconfiguration of business peripheral practices	

Figure 9.2 - Second Order Coding – The Case of BU2

Re-connection with typical patterns of experience	Iterative Agency

Tentative and exploratory enactment	
Emphasis on appropriating the new workmodel	Projective Agency
Re-composition of roles and responsibilities	
Locating action in relation to an acceptable discourse	

Considerate response to situational contingencies	
Practical responses to system resource requirements	Practical-Evaluative Agency
Execution of provisional enactment	

Figure 9.3- Second Order Coding – The Case of BU3

Incorporation of past interactions into the new order	
Expectation maintenance and sustaining identities and social interaction	Iterative Agency
Maintaining particular forms of perception and interaction	

Identification of potential opportunities	
Potential opportunities are appreciated and approached	Projective Agency

Deliberation upon plausible choices and acting accordingly	
Balancing between multiple expectations	Practical-Evaluative Agency
The resolution to act and respond to multiple demands	

9.3 Agentic Orientations

Analysis of actors' engagement with the new system indicated the relevance of agentic orientations in explaining how technology is appropriated. Actors' past experiences, present contingencies, and evaluations of future possibilities all significantly influenced their actions throughout the process of implementation.

In the following sections, the agentic orientations suggested by the previous coding are further explained by revealing the underlying agentic processes involved in the construction of these orientations (see sections 4.4.1, 4.4.2, and 4.4.3 for exposition of these agentic processes). In doing so, the role of human agency becomes more transparent. It becomes possible to see how the actors are able to sustain identities and structures over time, to reconfigure and invent new possibilities in accordance with their desires for the future, or alternatively, to act to resolve the matter at hand by appropriations that respond to situational contingencies.

These agentic orientations are explained in relation to the previously identified contextual conditions, and by reference to key practices and incidents involved in the process of implementation of the IT system in the three organisational units studied.

9.3.1 Iterative Agency

Iterative agency processes relate to those practices that connect us to the past in response to present problematic situations. The result of such iterative processes occurs in the form of persistent structures and continuity of practices. In such circumstances, the actors in this context were able to appropriate the new system by resorting to past patterns of thought and action.

In the case of BU1's engagement with SYSLEARN, in the initial stages of implementation - which were intended to align BU1's work practices with the processes embedded in the new system - BU1's representatives chose to *focus attention* upon the pre-existing, reliable practices which were developed over the course of their *past collective experience.* This form of engagement can be seen as related to the industry reporting requirements, which exerted a substantial influence

over the actors' perceptions, and also to the intra-organisational power relations, which meant that BU1's priorities were to be aligned to upper management strategy of service delivery and business continuity.

Although there had been some recognition that SYSLEARN could make significant improvement to their work, this area (of projectivity) received little attention because it was characterised by vagueness and ambiguity; the relevance of the assumed "best practices" of the new system was less clear to BU1's actors due to the presence of a number of technological conditions, including the less IT competency in the part of the individuals involved in the implementation project. This activity of directing attention towards reliable past practices instead of future potential was an agentic process aimed at sustaining particular order (the legacy system), which proved to offer stability and smooth interactions for the other parties involved in BU1's work (e.g. the upper management and the external regulatory bodies).

Furthermore, this process of "*selective attention*" can provide an explanation of the reluctance of BU1's key actors to "buy into" the organisational vision of change. Upon the advent of SYSLEARN in BU1, the management continued to avoid the system's use and continue to abstain from direct interaction with technology, thus preserving practices that were prevalent with the legacy system.

This iterative agency can also explain trainers' reluctance to admit the roles and responsibilities assigned by the new system. In particular, the administrative tasks brought about by SYSLEARN presented the trainers in BU1 with practices outside the assumed boundaries of their role as trainers. In this particular situation, actors were involved in the agentic process of categorical location, but could not locate the new tasks within their socially recognised categories of identity and value. A similar logic (with opposite implications) applies to the administration staff working in BU3. Those individuals continued to undertake tasks passed on to them by their managers or instructors, despite these tasks being outside their new duties. They behaved in this way because they were able to identify the behaviour of "accepting duties from superiors" within their social understanding and common perceptions of boundaries between occupations and positions.

Despite some instructors having shown approximate adherence to the management prescriptions that required the utilisation of the new system in the early stages of SYSLEARN's deployment, others, who were approaching their retirement age in another few years, considered the (anticipated) struggle of learning a new and complex technology to be unwarranted. Having earned their tenure and feeling secure in their jobs, their engagement with SYSLEARN resembled yet another iterative agentic response. It can be said that these practices denote some sort of *expectation maintenance*, whereby actors, relying on their knowledge of the nature of workplace relationships, and trusting that others (the management) would act in predictable ways, were able to engage with SYSLEARN in a certain way or another.

Another instance of iterational agency - which also incorporated a subtext of practical-evaluation agency, can be spotted in the specific interactions of administrative staff with SYSLEARN's systems. These individuals initially attempted to use SYSLEARN, but quickly became overwhelmed by the complexity of the system, then turning away from SYSLEARN and resorting to previous ways of working. But because they had to ensure the appropriateness of their response to the organisational situation - which mandated the utilisation of the new system - they tended to appropriate the new system marginally; they also tended to incorporate some elements of the legacy system (including the lack of system controls) in their interaction with the new system. In examining these appropriations, the agentic element of manoeuvring between repertoires is displayed, highlighting practical selections from habitual activities, thereby enforcing the status quo, defying engagement with the new system.

In the case of BU2, there was exhibited a slightly similar initial resistance to change amongst users of the system. Both administration staff and instructors tended to re-connect with the typical patterns of technology used (based on a Microsoft Windows-style approach to human-computer interaction), and therefore mostly stopped short of truly engaging with SYSLEARN. Instructors, in particular, were more inclined to relate to the previous order in the face of the further administrative work assigned to them by the new system. This tendency reflects actors' inability to identify and recognise any association between the emerging experience and prior experience. In

response, some actors (instructors), recognising the type of relationship existing between instructors and admin staff in the social memory, tended to leave the role of "inputting results onto the system" to admin staff - in a way that reproduced (albeit temporarily) the pre-existing order. This was an iterative process of agency - whereby actors "identify typical patterns of experience and predict their recurrence in the future". By the same token, the section managers (chief instructors) who used to devise instructors' timetables - a function that gave them authority over employees under their supervision and which was revoked in the new order - sought to preserve their identity and status by further negotiating and challenging the decisions made by the scheduling department staff.

The actors in BU3, in their engagement with the system's configuration, chose to *assimilate new experiences to the old* by incorporating past interactions into the configuration of the system. To explain further: actors maintained the mediating role of a "training coordinator" by adding an extra layer of approval into the registration process. This is not only a reflection of the persistence of the visible structure of an intermediary position; it might be also an indication of the resilience of other, less visible, structures influencing this process, such as the hierarchical culture displaying the authoritarian way of dealing with employees' (training) needs.

This agentic process can also be seen as connected to BU3 managers' tendency to refrain from supervising the training process via the system. This came to happen despite this task being consistent with their identity and value as managers, because their attention was focused on a small area of reality. The locus of this attention was conditioned by past collective perceptions of an authoritative manager. In their situation, their relative lack of IT competency meant that they were unable to sustain that perception by interacting confidently and authoritatively with the new technology.

Consequently, many technical tasks were delegated to administrative staff. These employees were flexible in undertaking the assigned tasks, in order to meet the expectations of their superiors. This form of response is seen as an iterational agentic process of *expectation maintenance*, whereby actors sustain identities, meanings and

interactions over time. Actors' knowledge of social relationships in the workplace allow them to admit practices that give continuity and stability.

Also, BU1's administrative staff made selective choices from the system proposed practices, and thus only singled out those elements of response that could serve the objective of work automation, while simultaneously sustaining the pre-existing social order. A manifestation of this selectivity is found in the process of course registration, which involved previous means of communications and interactions from outside the system. This iterative agentic process is considered to have been shaped by a number of contextual and technological conditions. For example, the importance of the social ties binding individuals in other organisational units meant that an employee could seek to circumvent technical procedures. This means of sidestepping the system was possible due to the lack of any effective "role embeddedness" or "process embeddedness" within the technology.

In comparing the three units, it appears that the prime difference characterising iterative agentic processes in the actors' engagements is that, by and large, the actors in BU1 and BU3 appropriated SYSLEARN by selective attention to those elements of the new system that resembled the legacy system, and also those which gave continuity to the social order. This selective approach allowed them to "get things done through habitual activity", especially in the case of BU1.

This process was limited in BU2 actors' engagement, partly due to the absence of prior technology existing there, and also due to certain properties of the system. The technology's contents in BU2 conditioned the interaction around the system by constraining roles and processes, and also by equipping actors with data and knowledge. BU2's actors were only engaged in some form of *typification* of persons and relationships through their instinct to assimilate the new experience with the old. In this iterative agentic process, they attempted to reproduce the previous relationships between the actors. This can be detected in the section managers' attempt to reproduce the type of relationships between them and the administrative staff, in a way that sustained their authority and status. However, these agentic orientations were subject to the evolving experience of BU2 in relation to the system.

Consequently, these iterative processes were superseded by other agentic orientations, as will be shown in the next sections – which pertain to processes characterised by actors' projective and practical-evaluative orientations.

9.3.2 Projective Agency

Projective agency is a term associated with practices that have been configured in relation to actors' hopes and desires for change in their engagement with technology – in this case in the implementation and use of SYSLEARN.

The information obtained from interviews about how BU1's actors engaged with the new system suggests that there were practices that could have been matched to some sort of future vision. These instances of projectivity can be found in the expectations placed by some of BU1's actors on SYSLEARN, to help improve managerial control and decision making capabilities, and was reflected in the initial attempts to abide by the system's work process in what can be understood as *experimental enactment*. In subsequent points of time during the system's usage, these foresightful agentic processes were confronted with some unanticipated practical implications – specifically in aligning the unit processes with the system, such as instructors' rejection of "administrative work" assigned to them, and more controls and limitations hindering the training process. Consequently, this tone of projectivity turned out to be sounded less forcefully, leading to a re-evaluation of practices in response to the emerging situation (which will be further explored in subsequent sections).

In contrast to BU1's case, practices resembling projective agency can be identified more potently and readily in the implementation and use of SYSLEARN in BU2. In analysing the accounts of BU2's participants, it can be said that BU2's management clearly distanced themselves from the unit traditional way of conducting the work, and began instead to reconstruct new images of the work processes in accordance with the strategic repositioning of the unit. This effort can be seen as associated with an agentic process characterised by foresight, which gave shape and direction to their engagement with the technical change project, and consequently influenced the

context within which SYLEARN's configuration and implementation took place. This projective orientation also materialised in several managerial interventions that gave impetus to the utilisation of SYSLEARN in the direction of the intended change. An example of such an intervention is the establishment of a new department in accordance with the system's business process. This way of "restructuring" the unit's organisational design possibly facilitated yet another future-oriented agentic process of *symbolic recomposition*, whereby actors were made to feel relatively free from certain prior schema and symbolic codes of practice (connected with the previous organisational structure), becoming more prepared to appropriate a new set of operations and redefining relationships connected with the new order.

Moreover, the BU2 participants' accounts of the new system reveal, for the most part, that SYSLEARN was located in relation to a visionary narrative that had been disseminating amongst BU2's employees, and which increasingly informed their use practices. For instance, the instructors believed that SYSLEARN could open a new window for accessing training duties immediately and easily, and that it could possibly be the only way of accessing information in the future. The administrative staff, for their part, saw an opportunity in the new arrangements in terms of greater task importance and status promotion. In both instances, it can be said that the actors were involved in an agentic process of anticipatory identification, through which they were drawing on their past knowledge and experience of work and relationships in order to understand future opportunities and constraints, and thus to identify appropriate courses of action in relation to SYSLEARN's use. To explain further, if we imagine new recruits joining the scheduling department, we cannot expect they would possess the same social memory relating to the pre-existing relationships between instructors and administrative staff, and thus would not have had the same motive as other administrative staff to positively appropriate a new system that potentially alters the relationship in their favour.

Despite the presence of the aforementioned future-oriented agentic processes - which could possibly stimulate practical change and engagement with the new system - the actors' practical responses were influenced with the technical difficulties associated with using SYSLEARN. This problematic situation called for an emphasis on

experimental enactment. This was yet another projective agentic orientation characterised by a subtext of practical-evaluation. The experimental enactment aimed to gradually embed change in working practices. This meant putting the system to use in a tentative and exploratory manner, whereby users utilised only those limited transactions that related directly to their tasks. To aid in this process, BU2 devised their own strategy of training, whereby customised training sessions were being conducted in order to teach each group of users the functions they needed to perform their job without being bogged down into the complicated details of the system.

The case of BU3 demonstrates, to some extent, the existence of projective agentic orientation. By way of illustration, BU3's management and key users were involved in imaginative construction of facilitated processes and better work quality, in their engagement with the system configuration activities. This form of engagement can be seen as an a*nticipatory identification* agentic process, whereby the actors drew upon the past experience of "less efficient" workplace technology, as part of clarifying their motives for adopting the new technology. These motives, however, were constrained by this "technical view" (as opposed to a "strategic" view). Thus they mostly selected courses of action that could pave the way for greater technical exploitation of the system (enhancing efficiency through automation of the business process). And they provided less strategic utilisation (resource analysis and decision making). Another instance of projective orientation is observed in the response of a number of managers and instructors who found it convenient and opportunistic to deal with the new system in fulfilling their desire to be in control.

As the foregoing analysis suggests, projectivity appears to have been the most resonant tone in the BU2 actors' engagement with the new system. Also, some actors within BU1 and BU3 were engaged in projective orientation. However, the process of SYSLEARN's implementation came across certain situational circumstances that seemed to influence this future-oriented mode in a way that called for changing conceptions of agentic possibility. These possibilities are explored in the following section.

9.3.3 Practical-Evaluative Agency

Practical-evaluative agentic orientation can explain how actors' practically make judgements about certain aspects of a system's configuration or use. In these specific circumstances, the actors were involved in activities that meant resolving the inconsistent demands of a situation. When actors were involved in such situations, they brought to the scene characterisations from the past and deliberations upon the future, in order to make practical judgements about the problematic situation of the present. These practical judgements led to empirical interventions that produced a (provisional) state of settlement between all the parties involved in the situation - meaning that certain elements were accommodated in the workplace. In the state of accommodation, actors did not merely reproduce past practices or absorb new templates in their interaction with the new system; they responded to the challenges of their context as well as exercising their particular preferences and motivations; they chose to draw on past experiences at times, and tried to pursue alternative possible trajectories of action. Therefore, it is possible to discern trends of both change and continuity in the resolved situations.

In BU1's case, after the initial stage of resistance, the BU1 actors began to understand that the situation at hand could not be settled by simply maintaining pre-existing practices and defying or ignoring the new system. They recognised the need to apply certain adjustments, in order to overcome the problematic situation surrounding their intention to retain habitual patterns of actions in the face of the influential circumstances represented by SYSLEARN's adoption. This *problematisation* became evident when BU1's representatives - who had been determined to maintain the routine and stable practices connected with the legacy system - were confronted with the SYSLEARN implementers' project to introduce measures of integration and control (built-in system processes). The position of BU1's representatives was that the new system would reconfigure certain standard reports and procedures. Hence, they started to engage with SYSLEARN's implementers in a dialogue implicated in common values and interests. To illustrate, issues of "compliance to regulative bodies" and "continuity of operations" were brought into the discussion so as to maintain the status quo. These practices can be said to have involved an agentic

process of *characterisation,* whereby actors relate problematic circumstances to principles or schema from past experiences. It can also be assumed that an agentic process of *deliberation* was involved in the situation, because BU1's actors were also considering the implications of dismissing SYSLEARN altogether. BU1's actors realised that they were not in a position to challenge the organisational mandates. But they understood that having the new system operative - regardless of the extent to which it was being utilised - could reflect a form of conformance to the management's directions. They also recognised that future communication with other enterprise systems would need to be conducted through SYSLEARN. These evaluative elements of agency are crucial in explaining how actors resolved the situation, and how they were able to define what aspects of SYSLEARN can or cannot be admitted. Consequently, the new system was installed and continued to be utilised in non-operational activities, and the legacy system continued to be used as the primary software used for training management.

In BU2's case, the initial enthusiasm towards the adoption of SYSLEARN was confronted with a number of situational factors leading the actors to reshape their projective agentic orientation by introducing elements of evaluation and practical judgement. The newly formed agentic orientation opened up spaces for negotiation between the different actors. These negotiations can be identified in a number of instances across SYSLEARN's implementation in BU2. During the configuration stage, BU2's representatives were considering the implications of extensively customising SYSLEARN in further upgrades of the system. They thus became prepared to accept compromised solutions (manual interventions) to accommodate certain business processes (such as invoicing). This compromise potentially subverted the system's controls and data integrity, but it was accommodated as a means of establishing the new order, and of responding to customers' demands. This can be understood as a practical agentic process of *deliberation* upon possible choices in the light of broader objectives.

Another manifestation of practical-evaluative agency can be observed in the way BU2's management staffed the newly established department (planning and scheduling). Although BU2's management recognised the central role of the new

department in realising SYSLEARN's utilisation, they tended to compromise on the competency of the recruited staff. The decision to recruit considerably fewer qualified employees from within the unit was made in the face of the contextual contingencies, thus pointing to a practical resolution of the situation. An unintended consequence of this decision was the occurrence of an inter-group conflict between the section managers and the administrative staff of the new department.

The case of BU3 arguably provides the most observable evidence of practical-evaluative agentic orientation. Initially, BU3's management considered SYSLEARN sub-optimal in terms of meeting their technical demands. However, due to the less privileged position they enjoyed in the organisational hierarchy, and also given the social value of status and authority, they decided to show compliance with the organisational directions, taking advantage of the system accordingly. This form of response can be seen as an agentic process of deliberation and execution, whereby actors consider how best to respond to situational contingencies, and act in the light of broader goals and projects. Likewise, the issue of data migration - which involved significant obstacles, but which BU3's actors decided to move on from, accepting the "here and now" circumstances - involved pressure to deliver the system on time, in compliance with the mandates of the top management.

9.4   Summary and Discussion

This chapter has presented the third milestone in the case analysis process, addressing the micro-level aspects of the phenomenon under study. The aim was to highlight the extent of agential capacity in relation to contextual conditions and technological arrangements. The micro-processes of user-system interaction have been tackled using the temporal-relational conception of agency in order to examine how the organisational actors made sense of and responded to the IT implementation activities and associated events. Thus, it has been possible to see how human agency largely shaped the ways in which IT was introduced, engaged with, and incorporated into work practices. The three elements of human agency (Emirbayer and Mische, 1998) were found to be relevant in actors' appropriation of SYSLEARN. Albeit to varying degrees of intensity at different instances of time, actors enacted SYSLEARN by

drawing from past experiences, future expectations, and the demands of their present situations.

The analysis of the findings in relation to how actors appropriate the adopted system matches studies of workplace technologies in their argument that the same technology may engender varied appropriations within comparable organisational settings. In particular, the research results, in this part, exhibit similarity to Orlikowski's (2000) research that demonstrated how users were able to engage in distinct types of technology's use in practice, resulting in instances of both change and maintenance of organisational structures. Indeed, this conclusion is identifiable in most structurational-based evaluations of the role of human agency in organisational consequences of technology. Such studies usually attend to both habitual and innovative uses of technology, despite their regular emphasis on the transformational capacity of human agency (Orlikowski, 1996). Distinctively, the analyses of human agency in the present case illuminate situations chracterised by yet another element of agency. That is the practical-evaluative element which explains how actors may respond to situations where pressures pull them to different directions. In these situations, neither past nor projective patterns of action can be enacted without adjusting to present contingencies.

The focus on human agency in this research may be more compatible with multi-orientated analyses found in studies such as Boudreau and Robey (2005), and Chu and Robey (2008). An important distinction, however, is that these studies examine uses of IT systems after they have been configured, and migrated to production environments. By contrast, the analysis of human agency in this study extends to include actors' engagements with technology prior to the stage of operational use. Although the patterns of appropriation are largely dynamic and emergent in practice, Leonardi and Barley (2010, p.38) contend that divorcing studies of use from the preceding events and decisions in relation to adoption and configuration, makes it impossible to determine whether patterns of use are shaped by dynamics of power, control, and conflict that set the context of use. This issue has implications for studies that examine configurable information systems, such as the present one, since users of the system are effectively involved in decisions of configuration and customisation.

Clarification of the role of human agency in relation to technological and structural contingencies has offered another foundation (besides the exposition of contextual conditions) for the discussion of the interplay between the three dimensions of agency, the technology, and the context of action. The next chapter will closely examine the mechanisms emerging from interactions between these multi-lateral aspects, as a means of explaining the IT appropriation process, and commenting on the extent of IT-associated change.

CHAPTER 10

APPROPRIATION OF TECHNOLOGY AND ORGANISATIONAL CHANGE

10.1 Introduction

This chapter presents an overall discussion of the key themes that emerged from the analysis of the case study data presented in the previous parts of the thesis. It is timely at this stage to iterate the primary aim of this research - which is to advance our understanding of the organisational change associated with IT systems' implementation. This aim has been approached by detecting the process of IT appropriation by the members of three organisational units, and by integrating a) those micro-processes of agency involved in the interactions with technology with b) the broader structural context. This entailed combining an action-based and a position-based approach (Delbridge and Edwards, 2013) in examining the organisational response to technological change. These adopted relational perspectives allowed for developing a conceptualisation of the relationships across levels (macro and micro-levels) and between contextual conditions and action. The explanatory utility of this approach is realised in disclosing the multi-layered mechanisms in which action is implicated, and the ways in which agency collides with questions of technology and structure. This representation of the conditioned action has the potential to deliver explanations of constraints and enablements sufficient to elucidate how IT is appropriated and how organisational change might emerge out of these appropriations.

Substantively speaking, the revealed mechanisms, when linked with the series of events and activities detailed in the previous chapters, state how and why certain organisational outcomes followed from a set of initial contextual conditions. In this

way, this chapter provides a synthesis of the evidence and serves the explanatory focus of this research. The specification of these mechanisms, however, doesn't mean that actors only operate within predetermined structures and scripts. Rather, actors, operating within such plural settings, are able to connect variably to these arrangements. This agency-structure interaction informed how actors in different positions engage with technological and contextual conditions, and consequently how organisational realities developed through these varied appropriations.

The following section will address the role of technology in the process of change. This will be followed by an outline and discussion of the proposed explanatory mechanisms, which is then followed by revisiting of the agentic dynamics in relation to these mechanisms and the resulting appropriations in the three sites of the case organisation.

10.2 Role of Technology

The role of the IT system manifests itself in the change process across two dimensions. The first is technology contents, and the other is the organisation's technological base. Technology contents relate to the extent to which organisational elements are being embedded within the system. Therefore, technological embeddedness (e.g. Volkoff et al., 2007) is the term that represents the main mechanism through which technology bears upon practice. It has been shown through the analysis of the technological conditions of action that the extent to which a new technology is embedded into work practices and business processes is an important way of understanding how IT might be appropriated and implicated in organisational change. By being embedded with organisational elements such as business process and organisational knowledge, technology becomes an integral constituent of the daily actions and interactions of organisational members.

As the relational perspective suggests, the embodiment of organisational procedures or roles in technical form does not imply inherent organisational consequences; technology can only provide the possibility for organisational action, with actors possessing the capacity within their situational conditions to engage with it

differently. In this sense, technological embeddedness can be seen as an emergent property of the actor-context system that loosely defines what can or cannot be done. This view exhibits similarity with the theoretical concept of affordance. The concept, in one of its forms, is also rooted in a relational ontology, giving weight to the material as well as to the social (e.g., Zammuto et al., 2007; Markus and Silver, 2008; Leonardi, 2013b). The analysis proposed in this research, however, identifies particular technological constellations, and explicitly refers to actors' situated engagement with them.

The reference to technology in this research is completely different from the notion of "material agency" (Pickering, 1995) that displays in ANT-based explanations of the role of technology. ANT uses the concept of material agency against human agency. Thereby putting technology on the same footing as individual actors. This stance is problematic as far as the ontological position of this research is concerned.

For this research, technology offers one dimension of the conditioning environment for action, but the position of human agency is preserved in the appropriation of these conditions, and the organisational consequences of such appropriations. The idea of embeddedness is useful in stressing this view. Embeddedness implies that actors are effectively involved in the process of embedding. It also entails the possibility of *de-embedding,* which indicates decreasing levels of embeddedness, and therefore minimised role of technology in enabling or constraining action. This view reflects the emergent and dynamic role of technology across time and space.

The other dimension of the role of technology is related to the organisation's technological base, that is, the extent to which new technology is integrated with the overall organisational infrastructure. It is thus a techno-contextual property that can enable or constrain utilisation of technology and organising around technology by granting or denying the resources required for action. The analysis of organisational and technological conditions outlined in the previous chapters has shown that technology context is linked to prior technological arrangements, as well as to the surrounding technical infrastructure and human IT skills.

The argument highlighted in this discussion is the primacy of the integration between these elements, and how this integrated whole interacts with other situational mechanisms in deciding its potential to act as a constraint or as an enabler of action. It is suggested that the integration of these technological conditions resembles an organisational structure that takes shape out of the combination of pre-given properties (e.g. the organisation's technological assets), emergent properties (e.g. the skill profile of managers and employees, and customised software applications), calculated interventions (e.g. projects for promoting technological know-how), as well as opportunistic events (e.g. individual initiatives). An interacting element is also the legacy of prior technologies. This legacy comprises an amalgam ranging from technical experience and skills to perceptions of the role of technology. This legacy manifests itself in the way users connect with new technologies.

Taking these elements together, it can be concluded that the role of technology is not pre-given but is instead fashioned and re-fashioned from human activity, since actors interact with each other and with technological arrangements surrounding them. This mutual adaptation is also informed by actors' position in relation to particular values, structures, and history.

This conceptualisation of the role of IT in organisational action (e.g., appropriation of technology) stands in contrast to social constructivist perspectives, and some extreme positions on human agency– which fail to recognise, or deny to acknowledge the specificities of particular technological arrangements and the constraints they might impose in practice. By the same token, the contention that organisational elements can be embedded into technology, and therefore can represent a shaping role on action is entirely different from technological deterministic views of the role of technology - in the sense that these embedded elements, in the argument of this research, are outcomes of an evolving interaction with technology. This conceptualisation is also distinct in that it conceives of technology as one element of a wider socio-technical system that shapes, but doesn't govern, human response.

10.3 Interacting Mechanisms

In order to serve the purpose of offering a multi-levelled analysis of organisational practice associated with IT implementation (Markus and Robey, 1988; Boudreau and Robey, 1999; Barrett, 2006), the analysis in this section articulates a number of mechanisms that are assumed to offer an explanation of why and how actors appropriated technology the way they did. The articulation of mechanisms in this discussion is compatible with Sorensen's (1998, p.240) definition of a "mechanism" which states that it is a conceptualisation of what "goes into" the process, or an account of how change is brought about. The proposed mechanisms identified are linked to the economic, social, cultural, and technological conditions thoroughly outlined and discussed in earlier chapters. These macro/meso structural contexts were transmitted to the organisational level as opportunities for and constraints on action. The processual approach adopted in this research has allowed for detecting this complex pattern of mechanisms. It has also made it possible to explore how these mechanisms interact in practice.

The analysis of the empirical evidence suggests a number of reoccurring mechanisms. One mechanism is the competition among values in practice, which offers actors with differing templates the chance to embark on one project or another. Another mechanism is the multiplicity of structures (formal and informal structures) that appear to shape organisational action. The administrative heritage of work practices, incorporating human interactions in the workplace, is yet another of the mechanisms in play. It frames thought and action in connection with the past. And finally, there is the strategic positioning - which prompts actors to consider future possibilities.

10.3.1 Competition among values

One element that had a significant influence over the implementation process in the three units was the competing values which informed actors' interaction with technology and its associated changes (e.g. welfare state vs. market regulation, efficiency and control requirements vs. social cohesion and consensus).

In order to make their way through this relatively complex minefield, actors analysed their position and undertook actions that served the dominating value in the time and space of action. These actions were sometimes shaped by individual interests. At times, this came in alignment with overall organisational change initiatives, while in some situations, this worked against the change programme.

By way of illustration, the influence of the changed economic situation of the state was reflected in management practices that alternated between the two rival ideals of welfare state vs. market regulation. It has been shown, for example, that the issues of "overstaffing" and "life-long employment" were closely connected to social policy, and strongly marked by the principle of the welfare state. The state's strategic shift to privatisation indicates a reconsideration of this value and the tendency to give precedence to efficiency and productivity priorities, which typically feature more potently in market-based environments.

These competing values can be recognised throughout the implementation project as giving more impetus to organisational change at certain times, and decelerating the process at others. In this regard, one could argue that the introduction of the Enterprise Information System was essentially a market-based decision, because it was initiated by consultations offered for the privatisation programme in order to attract investors to the organisation's businesses. A parallel decision could have been the reduction of the workforce through compulsory redundancy due to technological change and the existing situation of overstaffing. However, the value of the welfare state took precedence over market-based decisions. Accordingly, there was the voluntary early retirement incentive - a clear manifestation of the role of the welfare-state. This latter approach, it is argued, has the potential to offer the reassurance needed to ensure the middle management's and workers' commitment to change, and thus its successful implementation (Nah et al., 2001). However, this approach didn't result only in the reassurance of employees. Indeed, it negatively influenced the process of IT implementation, through the unintended outcome of "brain drain", with employees departing on terms that managers hadn't planned for. In response to the downsizing programme, employees dealt with the "leave" decision in a way that

served their own individual interests, but which didn't necessarily serve the managerial aims inherent to the early retirement incentive.

Likewise, the same opposing values permeated the post-implementation period. The view of employment being a social right offered by the government had given rise to a sloppiness of behaviour amongst employees and to a dearth in the powerful procedures necessary to control performance. This severely impacted upon the process of change and on acceptance of duties. On the other hand, some of the individuals and groups came to see that it was in their best interests to subscribe to the technological change, and therefore worked to enforce the process of change.

The concept of competing values can be also stretched to explain a range of responses. This becomes evident in actors seeking a balance between technical control - serving the efficiency value - and flexibility - serving social cohesion and operational continuity. By way of illustration, the value of social cohesion in the workplace played a clear role in resisting the implementation of technology-based control procedures that could result in financial loss for individual employees, or could negatively impact upon the informal exchange of services amongst employees in different departments. Conversely, the use of certain technology features was applauded when it helped to promote a sense of fairness, contributing to better social harmony and a broader acceptance of managerial decisions.

In addition, it has been noted that members of the individual units identified more with the consensus achieved within the unit and less with those management-endorsed initiatives that were not backed by internal consent. The value of social cohesion played a critical role in organisational change outcome, by forming consensus and mobilising efforts which worked either for or against change. This observation is supported by the deferential organisational outcomes displayed across different units.

This can be also observed in actors reflecting on whether to accept a generic IT system – one that can be readily installed and upgraded, or a thoroughly configured system – one that offers optimal solution for business needs, but which would complicate forthcoming upgrades to the system.

10.3.2 Multiplicity of structures

The discussion of the contextual conditions in the present case has shown the presence of multiple structures (formal and informal) that informed organisational action. These included the formal organisational structure of the managerial hierarchy, and the established professional hierarchy existing between individuals from different occupations. In addition, the assignment of leadership (over the implementation project) to certain departments created further structuring between organisational units.

These multiple structures offered the organisational actors relatively differentiated power in the workplace. Consequently, the exercise of their power in response to the IT system's implementation and use played a role in facilitating or impeding the organisational changes associated with the technology's implementation.

It has been stated that the organisational hierarchy was enforced by cultural expectations and acceptance of the "one-way" communication style. By the same token, these coupled structures were rendered susceptible to collapse by the presence of total job security – a policy which inevitably balances power restructuring in favour of individual employees. It has been illustrated that this multifaceted structure was found to affect employees' response to the IT system in numerous situations.

In terms of the utilisation of the new system by employees of different professions, it has also been shown that the professional hierarchy that governed the relationship between the occupations played a role in the actual take-up of the system and the subsequent change in practices. This observation is similar to the case by Jensen et al. (2009), where professional experiences were found to be influencing actors' engagement with the adopted system.

Similarly, the interpretation of practices by reference to contradicting structures is found in institutionalist approaches that concern the interaction of different institutional logics or between the IT and institutions, and the role of these dynamics in the emergence of practice (e.g., Gosain, 2004; Soh and Sia 2004; Sia and Soh 2007). Consequently, actors' engagement with such conflict is assumed to impact

upon technology appropriations and to pose barriers to desired adaptations in business processes.

10.3.3 Administrative heritage

Organisational administrative heritage relates to established ways of organising and managing. In the present study, the state bureaucracy and local socio-cultural norms can be regarded as pivotal influences on the establishment of this administrative heritage. In the analysis of contextual conditions of practices, it has been illustrated that organisational administrative heritage played a role in assessing significance, in prioritising resources, and in informing negotiation over implementation decisions and practices.

One important facet of this administrative heritage is the tendency towards centralised decision making. As has been discussed earlier in the thesis, this issue had implications for technological change decisions, starting from system selection to engagement with the implementation stages and use practices. It has been also stated that this organisational element can be interpreted by reference to the overarching cultural understanding and social norms in the national context. This observation confirms prior research that demonstrated the role history and culture can play in the success or failure of IT implementation projects (Pozzebon and van Heck, 2006; Xue et al., 2005).

Another element of organisational heritage is the limited co-ordination and communication between different units within the organisation. This element relates in particular to the relationship between the IT department and other functional business units targeted by the change. Assessment of the responses of the individual organisational units has indicated that certain groups openly resisted the introduction of new technology. Although this practice can be linked to business strategy and operational needs, it is argued that the isolated operation of different departments allowed for tension to develop, and that this impacted upon the implementation project. This issue is also connected with previous attempts to introduce technology to the workplace. In those situations where these projects had met little success,

organisational units were reluctant to subscribe to further technical change. They therefore received the change initiative with profound suspicion.

Yet another aspect of the organisational administrative heritage concerns those HR policies which allowed for flexible mobility across the organisation's various departments. It has been noted that this particular issue had left the project leadership and organisational management ill-equipped to deal with issues of inconsistent representation from functional units, which had adverse consequences on the system implementation activities. Another consequence has been the difficulties experienced in the training plans. Training is an obvious choice for overcoming knowledge barriers (Bingi et al., 1999), but in the present case, the training plans on the system, which was largely based on "train-the-trainer" approach, faced difficulties partly due to the HR policy of flexible mobility of employees.

These observations point to organisational administrative heritage as an important mechanism in facilitating or constraining the implementation of new practices associated with new technologies.

10.3.4 Strategic positioning

Strategic positioning relates to decisions about the role of IT in relation to the overall business strategy. The analysis of organisational perceptions of the business in terms of the value of IT in the present case identified strategic positioning as a key mechanism for the organisational change associated with the adoption of IT. An organisational strategy that is led by business expansion is commonly considered to enforce change processes. Such change is further compounded if consensus over this positioning exists amongst the various organisational members. This enforcement is materialised in the actions taken to address problems encountered during the implementation or use of the system. On the other hand, the lack of a business-orientated strategy or of an operation-orientated focus may mean that less mobilisation effort is diverted towards the adoption of a technology and in dealing with the challenges of its implementation.

This strategic facet is comparably presented in Tallon et al.'s (2000) study of a strategic alignment between IT and business foci. Their results suggest firms focusing on both market and operations are perceived to gain the highest level of IT business value. The findings of the current research confirm the association between the high level of IT value to the business, and the organisational focus, in terms of both market and operations (as in BU2). Analysis of the present case was able to further the discussion on the business oriented strategy by offering a two-dimensional typology of the vertical and horizontal factors that could explain how and why such strategic positioning is formulated. The horizontal factors include the influence of organisational customers on business strategy, while the vertical factors relate to organisational design and to the extent of autonomy in the formation of the business strategy (see Chapter 9.2.3.3 for a detailed analysis).

10.4 Technology Appropriation and Organisational Change

Having outlined the role of technology, and having also identified a range of high-order mechanisms able to greatly inform micro-level interaction, this section offers an explanation of how these mechanisms have interacted with agentic orientations and the situated actions of the organisational members in informing the meanings, configurations, and uses of the focal IT system (i.e. appropriation), and how they subsequently shaped IT impact on organisational elements such as business strategy, work routines, organisational structure, and performance.

In contrast to the mainstream of IT-enabled organisational change literature - which associates change with planned interventions and control over a range of factors (e.g., Hong and Kim, 2002; Al-Mashari et. al., 2003) - the emergent perspective adopted in this research considers change as an indeterminate outcome of practice (Orlikowski, 1996), thereby drawing attention to the dynamic nature of the relationship between IT and organisation. In this sense, technology appropriaitons and organisational change emerge from the interaction of IT and users in particular structural and technological circumstances. Central to this perspective is the argument that human agency involves the capacity both to sustain structures and to transform them.

The following sections offer an account of this emergent picture by tracing the appropriation of technology over time and by labelling the continuous stream of change at certain periods of organisational life with a statement describing the overriding collective mode in organisational practice. The transition from one state to another reflects some change in the interacting mechanisms and/or the level of technological embeddedness, and thus marks the opportunity for a shift in the dominant agentic orientation amongst actors.

The major objective of this representation is to take a step further by progressing from simply attributing change to agency to providing a more compelling theoretical account - one that suggests ongoing adaptation and adjustment in agentic orientations in the face of changing conditions. This representation is pivotal to our understanding of how and why change occurs, when it does occur. And this comes about by observing the specific ways in which the actors responded to situational circumstances in their appropriation of technology, and the subsequent instances of change or stability in organising in the focal organisational units.

10.4.1 Patterns of Appropriation and Change in BU1

The appropriation of technology in BU1 emerged with the transition from a) an initial resistance to technological change, to b) a provisional state of relative acceptance, whereby the organisational order was prone to change, and then to c) another state of reconnection with the past, when the situation had almost returned back to its origin, despite the presence of the new system. The BU1 actors initially chose to openly resist the technological change. But later on, under certain structural and technological circumstances, they had to "walk with" the current of change sweeping the organisation. Consequently, the new changes were contested and the previous patterns of organising have been maintained.

10.4.1.1 Resistance to Change

The initial plan of BU1 management was to assign some experienced and enthusiastic members from BU1 to undertake the task of defining the business requirements that feed into the IT system. This plan produced a response from the BU1 decision makers

that was less passionate than expected; they showed less motivation to demonstrate ownership of the project. This divergence between expectation and responses can be explained by referring to the competing values that each group draws upon. On the one hand, the project leadership, coming from a technical background and motivated by the market-based organisational objectives of the project, sought to implement a typical consultant-led configuration stage, whereby generic system features are adopted with few modifications to accommodate the business unit's particularities, but with allowance for smoother subsequent system upgrades. On the other hand, members of BU1 were indeed drawing upon different templates. These templates included a focus on the present contingencies of fulfilling operational demands without interrupting the technological change. And their obligations were to align themselves with the regulatory reporting requirements not afforded by the new system. In addition, they were able to reflect on their position as secured employees and decide on the extent of the cooperation they wished to deliver in the implementation activities. This latter aspect of the context had unintended implications on the stability and homogeneity of the implementation team, which further disrupted the change project. Technology was also another factor in play, as represented by the data. In BU1, the lack of homogenous historical data, which usually represent an integral part of the technological base, was actually a barrier to change.

Within these technological and structural conditions, the BU1 members in contact with the project were able to negotiate the role of technology in their unit. By drawing upon the pre-existing, reliable practices that served their current needs, instead of considering the future potential of the system, these key actors were able to resist the prescriptions offered by technologists. The role of technology itself was largely absent at this stage, as most users were unaware of the new system, let alone aware of its effects.

10.4.1.2 Walking with the current

As the project continued, the BU1 actors' attentions were gradually influenced by the accumulated change in the technological base being translated across the airline. In

this way, technology started to be embedded in the organisational routines, and thus began to shape intra-organisational transactions. This situation resembled an emergent constraint on the interaction of BU1 with other organisational units. Their communication with other units such as HR was suffering due to their isolation from the enterprise system.

In parallel to these changing technological conditions, there was the structural influence of the organisation's top management on BU1. Thus the BU1 management were in a weaker position to maintain their resistance. Here, we can notice the change in balance between the power of direct upper management (against change), and that of top management (for change), which indicates the prevalence of a multiplicity of structures. The BU1 actors recognised the need to apply certain adjustments in order to overcome this problematic situation, and thus began to attend to the new changing situation by accepting technological change. Accordingly, the new system was migrated to production in line with the project schedule devised by the top management.

This development reveals a shift in the way actors connected with their context when the evolving situation required them to make evaluative judgements about emerging events. In particular, the actors' dominant agentic orientation changed from being dominated by past dispositions and experiences towards a more practical position. This shift was made in response to the perceived problematic situation. Therefore, the new system was set up so as to be part of the organisational order and to become embedded in internal and external workplace interactions - that is, the new duties assigned to the BU1 employees and the unit's transactions with other departments. However, the long-term outcomes of the IT-enabled change to such organisational elements as structure, strategy, and performance have yet to be tested by observing actors' engagement with the new order and willingness to break their old habits.

10.4.1.3 Re-activation of past experience

Despite the new technological conditions, the actors within BU1 were still able to exercise considerable discretion in their use of the system. The actors' uptake of the new system and associated organisational changes were influenced by a number of

factors. From one angle, actors were able to look ahead and seek a new vision of the unit business by building on new system offerings. But actors were constrained by certain technological issues, such as networking and technical efficacy. From another angle, workplace practices were simultaneously informed by competing values of control and flexibility. They were influenced by a broader social context that gave rise to flexibility and informality – both of which characteristics were in contrast to the system-introduced control mechanisms. They were also informed by hierarchical pressures and industry demands, focusing on the present operational demands, rather than on strategic targets. In this situation, they found it difficult to reconcile their hopes with their current experience, and therefore an element of iterative agency becomes prominent in our analysis of their situation. At the same time, certain other actors who were against change were endorsed by enabling structural conditions such as their employment relationships - which shaped how they dealt with the new system, while also offering them resources in pursuing their choice of avoiding the system or rejecting change to their roles. These circumstances placed the pro-change actors in a position where their projective agentic orientation had reverted to the present. This standpoint was informed by mechanisms of informal workplace structures and administrative heritage that encouraged inertial practices. They were more prepared to revert back to habitual action in order to maintain their pre-established social and inter-occupational relations.

These habitual activities were reflected in the business unit's engagement with the system. The new system was present in the overall picture, retaining a marginal position in non-operational activities, but largely absent from real influence on organisational strategy or performance. Therefore, the resultant change in business processes, workplace structures, and organisational performance was very limited, and the prior connection between the legacy system and work processes was reactivated and reinforced.

10.4.2 Patterns of Appropriation and Change in BU2

Technology appropriation in BU2 can be seen as having emerged from an initial state of embracing technological change, to another state characterised by building on the realised changes but also by a few areas of compromise.

At the outset, the projective agentic orientation was dominant and prevailing, as key actors within BU2 were clearly oriented towards the future in terms of their IT appropriation. Consequently, genuine changes materialised in the organisational order. Later on, the actors' orientation saw adjustment, due to an emerging conflict. Accordingly, the momentum of change decreased, but the forward direction of change persisted.

10.4.2.1 Embracing change

The adoption of technology came along with changes to the organisational strategic positioning in BU2. There was also limited administrative heritage in terms of technological involvement in business processes. These mechanisms gave impetus to an agentic orientation that was mostly characterised by foresightedness. The dominant orientation at that time gave shape and direction to actors' engagement with the technical change project, and allowed for BU2 to openly embrace the change. Another mechanism in play was the lack of contradiction in values amongst stakeholders involved in the implementation of the system in BU2. Furthermore, the social context in the project was defined in terms of the primacy of the IT-enabled strategic change of the unit businesses. Therefore, the unit representation team was more inclined to subscribe to this vision. This future-directed orientation was also aided by the fact that these individuals were equipped with technical and functional expertise that allowed them to engage confidently with the change effort.

The presence of this combination of individual and contextual factors helped to promote a projective orientation in the implementation activities. Accordingly, the economic feasibility of the project had been demonstrated, and the technology had been acquired. Once the new system had been implemented, more energy was devoted to lowering technical and behavioural barriers through a series of activities.

These activities reflected the domination of a projective agency in which the focus of action was on future possibilities. On the technical side, users were involved in an initiative of mutual education and knowledge sharing that provided a platform for transformational change in terms of users' engagement with the system. As a result, technological barriers were considerably lowered and technology's presence further ingrained in the organisational order. On the behavioural side, intentional interventions were manifested in certain organisational elements (such as promotion and appraisal) in a way that positively influenced actors' engagement with the new system.

The resultant changes on organising were evident in modifications to the organisational structure that carried a re-composition of roles and responsibilities amongst the unit members, and also resulted in significant change in business processes and work performance.

10.4.2.2 Progress and settlements

The change in work routines and inter-relations gradually became entrenched in the organisational life of BU2, but the process presented some organisational challenges to the power structure as it existed among the different occupations in the workplace. These challenges left their marks on actors' agentic orientation in a way that allowed for some practical engagement to take place.

Organisational changes in tasks and associated authorities were sometimes contested by the professional authority of certain actors (chief instructors), who sought to preserve their authority in the face of other actors (specifically administrative staff). The latter were knowledgeable of the potential benefits of the new arrangements, and thus were able to draw upon the technological features recently embedded in the work routine; it helped them to establish their developing authority. This effort was also endorsed by managerial involvement - which concerned the evolving business strategy. However, the shift in authority didn't accurately mirror the shifting that took place in the fulfilment of tasks. In practice, there was continued negotiation over "who does what" – negotiation that allowed for previous practices to surface periodically,

illustrating the presence of an evaluative element of agency, and resulting in pragmatic settlements of change in the organisational structure.

The progress in organisational performance attained through the system's utilisation was subject to another state of deliberation and evaluation that resulted in adjustments being made to the projective agentic orientation. Actors had to respond to the competing values of a) a scalable, generic solution or b) an intensively configured, localised system. Under such technological conditions, the evaluative element of agency became noticeable, and actors settled practically on the former solution in a way that slightly undermined the performance achievement.

Despite these instances, the overall change facilitated by the new technology took significant forward steps in terms of business processes, workplace structures, and organisational performance.

10.4.3 Patterns of Appropriation and Change in BU3

Technology appropriation in BU3 can be seen as the outcome of a series of pragmatic responses to contextual conditions, which reflect the dominant practical-evaluative orientation on the part of key actors within BU3.

Initially, the actors sought to cope with the slippage between internal and external perceptions of technology. By the time of the first period of interaction with the technology, a common understanding of the technology had been developed between the key BU3 actors and the project leadership - which was grounded in an aspiration for more efficient and convenient work functions. This common understanding offered the basis for admitting change. The situation continued and developed in a way that permitted further changes, but which also presented some challenges in accommodating the associated instability in the distribution of duties and authorities. This situation allowed for the emergence of both change and stability across the organisational elements.

10.4.3.1 Finding a common understanding

This state represented the practical response in BU3 to the divergence that appeared between external prescriptions for technical needs and internal judgements and choices. The key actors in BU3 tended to lower their contracted images of the future in connection with technology. These images were influenced by the formal organisational structure, in the sense that they opened up a space for admitting the proposed technology.

The search for common understanding continued in those implementation activities related to configuration efforts and system use. The presence of technology brought with it the potential for improvements in business performance. But this required changes to be applied to organisational routines. There was indeed an attempt to apply such modifications, but the fact (and the awareness) that further rebalancing of the distribution of roles and duties must follow led actors to re-evaluate the extent of possible change.

Due to the lack of definite strategic positioning, the actors' expectations were still informed by a previous reading of technology - one which was centred on the automation of existing practices. It was also difficult to escape the administrative heritage of the unit, which was characterised by informal and flexible interactions with other departments. It was also quite a challenge to redefine roles and associated authorities in accordance with the new working templates without creating much disturbance to the pre-established structures between employees. What was practical at the time was an arrangement that would accommodate new business processes but also maintain practices that responded to socially recognised values and workplace structures. The resolution to this dilemma was in reaching a common understanding between the actors from the different occupations - allowing the system to be utilised and allowing for system-introduced work processes to be admitted, but also leaving the door open for individual interventions, and keeping largely unaffected the pre-existing balance between the various occupations. This arrangement meant that technology, as embedded in work routines, was compromised by unguarded access profiles. This solution allowed for system-related tasks to be informally delegated

away from the managers, who were unwilling to take up extra duties, or lacked the necessary technical skills, to the administrative assistants, who submitted to this delegation in order to meet the expectations of the organisational and social structure. The former thereby continued to preserve the authority associated with these tasks without taking on the technical duty.

The foregoing practices clearly reflect the practical-evaluative agentic orientation that guided the actors to adopt normative judgments among alternative possible courses of action in their engagement with the IT system's implementation and with associated changes. In terms of the organisational implications of these settlements, there were changes to the business processes after the system's implementation, but there was not much change in terms of power distribution or organisational structure. There was also some improvement in performance, but it fell short from what had originally been anticipated.

10.4.3.2 Pragmatic improvisation and accommodation

The administrative assistants at the lower end of the organisational hierarchy received little attention to improve their technical skills in preparation for dealing with the technical complexity of the new system. Furthermore, the departure of key system users undermined the learning and socialising aspects of the new experience. However, the common understanding achieved between the different workplace occupations at the time of their connection with the system allowed the administrative assistants to hold some autonomy in the system's use. The mode in which these actors connected with their new duties reveals the significance of multiple and shifting agentic orientations. Those who felt more comfortable in sustaining prior flexible interactions tended to define the new duties in terms of their alignment with past patterns of action, and thus reconnected with previous means of communications outside the system. Others were largely orientated towards the present contingencies of dealing with the technical complexity, becoming selective, incorporating improvised techniques, and working around the controls of the system. Other actors, however, recognised the benefit of connecting with the new experience. Accordingly,

their engagement with the system was characterised by an effort to learn and persist in attempting to apply their functional knowledge to use of the system.

The result of this multiple agentic orientation was that BU3 was able to accommodate the new system by utilising certain essential functionalities, involving key end-users, and aligning itself to the general organisational direction. On the other hand, the potential of the system to operate effectively and efficiently was not fully achieved. Due to the negative implications of this selective utilisation, the integrity of the system was compromised. The impacts of IT on organisational performance and organisational strategy were minimal. BU3 saw limited assimilation of new processes and structures.

10.5 Summary and Conclusion

This chapter has discussed some of the themes that emerged from the analysis of actors' engagement with the introduced technology in the three studied business units. The discussion started by providing an explanation of the role of technology in the change process. It then contended that the role of technology is indeed subject to its interaction with a range of mechanisms. The enabling and constraining character of these mechanisms is understood through reference to the relationships between actors and their context over the passage of time. In this relationality, actors are considered variably oriented to the past, the future, and the present in terms of the way they connect with practice (Emirbayer and Mische, 1998).

This temporal-relational perspective on agency was then utilised to examine the process of technology appropriation, and to comment on organisational change in the three business units that comprise the case under analysis. In BU1, despite the transformation agenda, key actors were able to oppose technological change. Over time, under a variety of contextual influences, the new system had been implemented but hardly utilised, thus exerting little bearing on real organisational change. In BU2, the strategic orientation of key actors informed interactions with technology, allowing for significant adaptations to the organisational setting, which further enforced the state of change, in spite of minor adjustments being made in response to situational

contingencies. In BU3, actors were able to accommodate the technology in the workplace without committing to the entire project. The technical changes were visible, but minimal organisational changes were observed.

The discussion of how technology had been appropriated in the three business units revealed the significance of multiple agentic orientations, and clarified how these orientations reflected the interplay between individual action and the range of enabling and constraining mechanisms. This way of understating IT impact on organisations goes beyond categories of success and failure and captures the emergent nature of the organisational change associated with the adoption of IT (Orlikowski, 1996).

Based on the empirical findings, actors' appropriations of technology and the ensuing organisational changes were hardly anticipated ahead of time -neither by the intentions of individual actors nor by the conditions of the situation. Analysis of actors' agentic orientations, and their shift over the passage of time, has allowed us to see how agency was intertwined with certain contextual and technological conditions in producing the aforementioned engagements that gave rise to varied responses - ranging from resistance, to accommodation, to approval and embracing change. It has been also possible to identify unintended consequences of certain events that actors had no role in making. Even though, actors were able to incorporate these unintended consequences in their engagement with the IT implementation activities. By discussing how these actors related to these different conditions, it has been possible to understand how and why different appropriations of technology occurred. And it has also been possible to trace instances of both change and continuity in organisational elements.

The following chapter will summarise the research findings, record the research contributions, discuss the theoretical and practical implications, and reflect on the research limitations.

CHAPTER 11

CONCLUSION

11.1 Overview of the Research

Information technologies are commonly adopted in order to enable significant organisational change. Therefore, major programmes of organisational transformation are found to entail introducing new technologies. The consequences of technologies, however, is thought to be largely shaped by the way organisational members receive, interpret, and engage with these technologies in practice.

The aim of this research, thus, has been to develop our understanding of IT-associated change by examining how organisational members respond or "appropriate" technology in such cases of top-down organisational and technological change projects.

The research commenced by critically reviewing the differing meanings attributed to organisational change (Van de Ven and Poole, 2005; Barrett, et al., 2006). This critical literature review has been concluded by highlighting the importance of viewing change as an unfolding process emerging from local situated practices rather than as a planned and calculated intervention. In studies that concern IT-associated organisational change, researchers are also confronted with the question of agency: Is it technology (or other external forces) that make change happen? or, is it exclusively the interpretations and actions of the people involved, that determine the organisational consequences of technology?

Building on this theoretical background, the research then turned to the existing empirical research on the implementation and use of IT in organisations in order to observe how these issues have been dealt with. The literature surveyed were found to

be varied in terms of the focus of analysis and the deduced implications. In particular, the existing studies seem to approach this phenomenon either from an agency-centred perspective (Orlikowski, 2000), or a macro-contextual approach (Currie, 2009; Mignerat and Rivard, 2009). More recent studies began to encompass the notion of materiality in their explanations (Markus and Silver, 2008; Faraj and Azad, 2012; Robey et al., 2013). The conclusion derived was that IT-Organisation analyses are better served with theoretical and methodological lenses that allow for investigating the interconnection amongst levels and entities (Markus and Robey, 1988; Boudreau and Robey, 1999), and thus equally attend to issues of agency, technology, and the broader context within which organisations operate.

Accordingly, the present research has adopted a processual approach, and devised an original conceptual framework to examine the appropriations of technology and the associated organisational change. The conceptual framework combines a relational perspective on the relation between agency and structure (Emirbayer, 1997; Emirbayer and Mische, 1998), with critical realist conceptions of the role of technology (e.g., Volkoff et al., 2007; Mutch, 2010). This overall approach is underpinned by a stratified ontology (Mutch et al., 2006) that endorses the method of analytical dualism. In this analytical strategy, elements of agency, structure, and technology are separated out, whilst recognised as being ontologically interrelated. This analytical approach allowed the researcher to be explicit about the structural elements, the agential components, and about the nature and properties of technology.

The devised conceptual framework guided both the empirical investigation and the analysis of the research findings. The study examined an instance of IT implementation that was endorsed by a major organisational transformation in a large airline firm. The investigation started by delineating the contextual macro-issues of the technological change. The study then focused on the actual practices and decisions of organisational members in relation to the adopted IT system. The case study analysis provided an adequate foundation to examine different appropriations of an allegedly common enterprise system.

The analysis of the evidence allowed to realise the research objective of furthering our understanding of the processes of IT-associated change. This understanding has been reached through a micro-macro analysis of how members of three organisational units within the firm have appropriated the adopted IT system. The findings showed the processes of IT appropriation evolving out of the interplay between actors and structures across time. The analysis of the three organisational settings revealed that IT-associated change comes about as an emergent accomplishment, through actors continuously reflecting on their position within unfolding technological and structural contexts.

11.2 Revisiting the Research Questions

In what follow, I will revisit the research main question and the key main issues explored by the research and summarise the research inferences with respect to these inquiries.

The main question of the thesis was:

> *How organisational members appropriate a technology that is authoritatively imposed by top management?*

Based on the empirical findings, how organisational members appropriate technology is neither explained by the intentions and interpretations of individual actors nor by managerial decisions and plans. Analysis of how technology has been dealt with showed that technology appropriations were emerging from the practices of organisational members who were enabled and also constrained by particular structural and technological conditions. These appropriations were changing over the passage of time as the position of individuals and groups kept shifting in relation to the conditions of technology and context. By discussing how organisational members related to these changing conditions, it has been possible to understand why and how different appropriations of technology occurred. The identified appropriations were varied incorporating instances of resistance, accommodation, as well as approval and embracing of change.

In addressing the research's pivotal question, a number of issues had been observed. The implications of the research in reference to these issues are summarised below.

- *The role of technology's properties in the process of IT appropriation.*

Technology has the potential to enable and constrain certain appropriations. The extent to which this potential is realised is reliant on the specific ways in which organisational elements are configured and embedded into technology. Once embedded, such configurations start to represent an element of the objective context for forthcoming practices. The extent of embeddedness informs whether technology is representing a barrier or an affordance to action. This embeddedness is not a by-product of the implementation of technology. Indeed, it is shaped by the level of integrity between the focal technology and further technological conditions at the time of user-technology interaction. This embeddedness is also subject to socially informed activities that transcend the boundaries and limitations of technology. Furthermore, this position is not fixated, precisely due to the changing situational conditions, which open new possibilities, and permit actors to re-assess their position, and the form that technology takes becomes subject to further embedding (or de-embedding), which has also implications on subsequent practices.

- *The nature of the context and its implications in shaping the process of IT appropriation.*

The analysis of the evidence revealed a wide range of contextual elements informing how organisational actors engaged with the IT system, and how they dealt with the new conditions brought about by the IT system. These elements have been thoroughly discussed in Chapter Eight of the thesis, comprising a range of economic, cultural, and socio-political insights. These contextual conditions were manifested at the organisational level in the form of enablements and constraints on action. By exploring how actors interacted with these conditions, it has been possible to reveal a number of the mechanisms in play. These mechanisms were related to the competition amongst opposing values, and to the presence of a multiplicity of structures, in addition to the influence of the administrational heritage and the strategic positioning of the organisation.

- *The position of human agency in the processes of IT appropriation and organisational change.*

The analysis of the micro-process of organisational action informs us that actors are not simply passive recipients of change prescriptions. Rather, actors continuously reflect upon their choices as they respond to ongoing situational changes. Actors' engagement with technology is simultaneously informed by orientations towards their acquired habits and towards a questioning of the experience. The resultant position is subject to an ongoing adaptation and adjustment in agentic orientations in the face of changing conditions When the situation shifts, actors are able to relate to the emerging conditions in terms of the new possibilities for action, and can thus respond differently according to this emerging situation. These responses largely inform how technology is being appropriated and re-appropriated and thus can give an indication of the direction and pace of organisational change.

In conclusion, the adopted processual, multi-levelled perspective facilitated the investigation of both the process and the context of technology appropriation. It offered a rich account of the micro-activity within its broader context. Through this examination, it has been possible to explore the dynamic interplay among individuals, the technology, and the conditioning contexts, thus allowing us to see how different appropriations of technology have emerged, and how these appropriations have informed the extent of change in the organisational experience.

11.3 Research Contributions

The major contribution of this research is the delineation and the application of a process-based theoretical framework that carries the potential of significant explanatory power. This original conceptual framework, combining a CR-inspired view of technology with a relational view of the agency-structure relationship, draws our attention to the enabling and constraining character of technology, as well as to the reflective nature of technology's use in relation to the broader structural context. This theoretical device offers a way of ensuring that in-depth descriptions of organisational micro-processes are not abstracted from the context of action. It also

restores a focus on the IT artifact as a key dimension in IS research and theory. Taken together, it offers fruitful avenues for investigating and understanding the interrelationship of technology and organisation.

This research also contributes to the explanations of technology in organisational studies. By applying the concept of technological embeddedness, it has been possible to provide more clarity about the form technology takes in practice, and the mechanisms it brings into the domain of action. Understanding the concept of embeddedness in terms of its changing levels over time represents an important extension to the original concept introduced by Volkoff et al. (2007).

Another key contribution of this research is the unpacking of the concept of agency and the utilisation of the underlying components of agency in scrutinising actors' appropriation of technology. This approach helped to generate a deep understanding of the role of human agency, and the varied means by which actors perceive and respond to the enablements and constraints of their context. This research constitutes one of few IS research studies to utilise the temporal theory of human agency (Emirbayer and Mische, 1998).

11.4 Theoretical Implications

The implication of this research – in terms of how we might understand and theorise IT-associated change - can be concluded according to two lines of argument.

The first argument is the need to incorporate a relational element that acknowledges the dynamic relationship between agency and context. This dynamic relationship can be better approached through employing a relational perspective that keeps apart action and context, and explores their interaction throughout the change process. This analytical dualism requires a stronger conceptualisation of structure than that found in other processual approaches to IT-associated change (such as, structuration theory). Structuration-based explanations omit the distinction between agency and structure, thus leading to a focus on agential knowledgeability that tends to neglect broader structural influences. By contrast, the relational sociological approach allows for more clarity in appreciating how situational conditions mediate action. This comes about by

analysing structure as a separate entity, which allows for a better appreciation of organisational history and underlying social structures. Hence, it offers a more plausible assessment of the mechanisms explaining how and why change occurs.

Also, in order to better understand the complex interaction between actors and their circumstances, it is useful to transcend the conceptualisation of agency as constantly mindful, future-oriented or otherwise mindless, past-oriented by moving to a more dynamic view – one that attends to the connections between agency and structure over time, and the potential for shifts in the dominant agentic orientation under changing circumstances and emerging events.

The second argument is the value of considering the input of technology into organisational change processes by referring directly to the aspects of technology that could make a difference. This aspiration can arguably be realised through increased clarity regarding the form that technology takes in practice. In this regard, the relational approach, combined with notions of stratification and emergence borrowed from the philosophy of Critical Realism, allows us to speak clearly about the emergent forms that technology takes in practice, and about how these forms are implicated in contextual conditions and agential capacity. This representation of the role of technology in how IT is appropriated and thus implicated in organising appears in contrast to process-centred explanations based on theoretical devices such as Actor Network Theory. These explanations tend to downplay the larger macro context in which negotiations over technology and change take place. In the relational approach adopted here, the effect that structural contingencies have on micro-action and technological form is adequately brought to the fore of the discussion, and therefore the extent to which technology influences change is made explicit.

11.5 Practical Implications

The main implication of this study to management practitioners is that change in organisation doesn't necessarily and inevitably follow IT adoption. Moreover, the initial acceptance (or rejection) of IT systems by end users does not seem to persist without further modification of response. An ongoing assessment of the anticipated

outcomes therefore needs to be undertaken. This assessment should not only consider the technical challenges but also the social and political aspects of IT introduction. This could help organisational policy makers identify the challenges and acknowledge the sources of conflict, if any, between organisational and individual objectives. Without properly attending to the varied consequences of IT, it is unlikely that IT will bring about significant organisational change.

Another implication for IT decision makers in organisations is the need to reflect on the relative value of implementing packaged enterprise systems that incorporate standardised processes. Despite their wide uptake, these standardised information systems occasionally counteract particular work operations that could be vital to business regulatory position or business competitive edge. In general, this implication speaks to the issue of alignment between IT resources and business requirements (e.g., Chan et al., 2006), but also underlines the importance of seeking the input of stakeholders at different organisational levels.

11.6 Research Limitations

The contributions of this study are limited in part by certain aspects of the research design, and in part by some practical concerns.

The findings of the research are partly based on retrospective accounts of the implementation activities. These retrospective accounts allowed for capturing key events of the change process over an extended period of time. However, retrospective reports, according to Cowley (2006), may be distorted by subsequent events.

Another limitation is related to the multi-level research design employed. The task of pursuing rich and detailed accounts of micro-level interactions, coupled with the aim of carefully attending to the broader context of these interactions, was limited by the time constraints of the study, and also by certain methodological challenges, in terms of opening up the broad context of organisational action. Here, the researcher has unavoidably been compelled to make some compromises in terms of the inclusion of the wide contextual elements surrounding organisational practice. In the words of King et al, (1994, p.147) the aspiration is to: '*[open] the context enough to let in*

observably powerful and important forces in social change, but nonetheless [draw] boundaries around them and [force] some kind of order onto them so they can be handled systematically in analysis'.

It is also accepted that despite the research casts light on some aspects of the participants' identities, it is acknowledged that these individuals are members of a greater society and are possessing other qualities and attributes (e.g., social background, economic status, etc.). These elements are undoubtedly informing how humans reflect and decide, but they were not directly investigated as the researcher had to limit the analysis to a manageable set of issues.

A further limitation, perhaps applicable to most studies of organisational change, especially those adopting an emergent perspective, is the fact that change itself is an ongoing process. Indeed, shedding light on particular episodes of organisational life, and the interpretation of various engagements with the introduced technology, does not suggest that the actors involved have stopped changing or reflecting on their means of engagement. Indeed, there have been various changes to the contextual conditions since the moment the researcher concluded the field work. An example of these was the re-evaluation of the "early retirement" scheme. This change entailed applying more criteria to serve the organisational objectives of the transformation programme. Also, the technological scene itself is known to be subject to rapid development and significant change. These emerging situations - in terms of the technological and the organisational context - would certainly confront organisational actors with new challenges needing to be addressed, and would perhaps also result in new organisational realities.

REFERENCES

Abbott, A. (1988). Transcending General Linear Reality. *Sociological Theory*, 6(2), 169-186

Abbott, A. (1995). Sequence Analysis: New Methods for Old Ideas. *Annual Review of Sociology* 21, 93-113.

Abdalla, I. A., and Al-Homoud, M. (1995). A survey of management training and development practices in the State of Kuwait. *Journal of Management Development*, 14(3), 14-25.

Aladwani, A. M. (2001). Change management strategies for successful ERP implementation. *Business Process management journal*, 7(3), 266-275.

Al-Mashari, M., Al-Mudimigh, A., and Zairi, M. (2003). Enterprise resource planning: A taxonomy of critical factors. *European journal of operational research*, 146(2), 352-364.

Al-Omar, F. A. (1996). Privatization in the Gulf Cooperation Council (GCC) countries: the need and the process. *Islamic Economic Studies*, 3(2), 36.

Alsarhani, K. (2005). *Saudiization and job performance: opportunities and constraints in the management of Saudi national employees in the public sector* (Doctoral dissertation, University of Glasgow).

Archer, M. S. (1995). *Realist social theory: The morphogenetic approach*. Cambridge university press.

Atherton, A., and Elsmore, P. (2007). Structuring qualitative enquiry in management and organization research: A dialogue on the merits of using software for qualitative data analysis. *Qualitative research in organizations and management: An International Journal*, 2(1), 62-77.

Atiyyah, H. S. (1988). Computer impacts on Saudi Arabian public bureaucracy. *Organization Studies*, 9(4), 511-528.

Avgerou, C. (2001). The significance of context in information systems and organizational change. *Information systems journal*, 11(1), 43-63.

Avgerou, C., and McGrath, K. (2007). Power, rationality, and the art of living through socio-technical change. *MIS quarterly*, 295-315.

Avgerou, C., and Walsham, G. (2001). *Information technology in context: Studies from the perspective of developing countries*. Ashgate Publishing Company.

Azad, B., and Faraj, S. (2011). Social power and information technology implementation: a contentious framing lens. *Information Systems Journal*, 21(1), 33-61.

Bada, A. (2000). Institutional intervention in the adoption of computer-based information systems (CBIS): The case of the Nigerian. in organizations and developing countries. In C. Avgerou and G. Walsham (Eds.), *Information technology in context: Implementing systems in the developing world* (pp. 168–181). Aldershot, UK: Ashgate.

Baillette, P. and Kimble C. (2008). *The concept of appropriation as a heuristic for conceptualising the relationship between technology, people and organizations*. Paper presented at the UKAIS Conference, Bournemouth, UK.

Barker, C. (2003). *Cultural studies: Theory and practice*. Sage.

Barley, S. R. (1986). Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments. *Administrative Science Quarterly*, 78-108.

Barrett, M. (2007). ICTs, Organizational change and new modes of organizing. In A. Salazar and S. Sawyer (eds.), *Handbook of information technology in organisations and electronic markets* (pp.39-55).

Barrett, M., Grant, D., and Wailes, N. (2006). ICT and Organizational Change Introduction to the Special Issue. *The Journal of Applied Behavioral Science*, 42(1), 6-22.

Battilana, J. (2007). Initiating divergent organizational change: the enabling role of actors' social position. *Academy of Management Proceedings*, (Vol. 2007, No. 1, pp. 1-6). Academy of Management.

Bauman, Z. (1997). *Hermeneutics and modern social theory. Anthony Giddens: Critical Assessments*, 1, 211.

Benbasat, I., Goldstein, D. K., and Mead, M. (1987). The case research strategy in studies of information systems. *MIS quarterly*, 369-386.

Bhaskar, R. (1978). On the possibility of social scientific knowledge and the limits of naturalism. *Journal for the Theory of Social Behaviour*, 8(1), 1-28.

Bingi, P., Sharma, M. K., and Godla, J. K. (1999). Critical issues affecting an ERP implementation. *IS Management*, 16(3), 7-14.

Bondarouk, T. V. (2006). Action-oriented group learning in the implementation of information technologies: results from three case studies. *European Journal of Information Systems*, 15(1), 42-53.

Boudreau, M. C., and Robey, D. (1999). Organizational transition to enterprise resource planning systems: theoretical choices for process research. In *Proceedings of the 20th international conference on Information Systems* (pp. 291-299). Association for Information Systems.

Boudreau, M. C., and Robey, D. (2005). Enacting integrated information technology: A human agency perspective. *Organization Science*, 16(1), 3-18.

Braa, J., Monteiro, E., and Sahay, S. (2004). Networks of action: sustainable health information systems across developing countries. *MIS Quarterly*, 337-362.

Bryman, A., and Bell, E. (2011). *Business research methods,* 3rded. Oxford university press.

Cabrera, A., Cabrera, E. F., and Barajas, S., (2001). The Key Role of Organizational Culture in a Multi-System View of Technology Driven Change. *International Journal of Information Management*, 21(3), 245-261.

Cecez-Kecmanovic, D. (2001). Doing critical IS research: The question of methodology. *Qualitative research in IS: Issues and trends*, 141-162.

Cecez-Kecmanovic, D., Galliers, R., Henfridsson, O., Newell, S., and Vidgen, R. (2014). The Sociomateriality of Information Systems: Current Status, Future Directions. *MIS Quarterly*, 809-830.

Chan, Y. E., and Reich, B. H. (2007). IT alignment: what have we learned? *Journal of Information technology*, 22(4), 297-315.

Chen, I. J. (2001). Planning for ERP systems: analysis and future trend. *Business process management journal*, 7(5), 374-386.

Child, J. (1972). Organizational structure, environment and performance: the role of strategic choice. *Sociology*, 6(1), 1-22.

Cho, S., Mathiassen, L., and Nilsson, A. (2008). Contextual dynamics during health information systems implementation: an event-based actor-network approach. *European Journal of Information Systems*, 17(6), 614-630.

Christiaanse, E., and Huigen, J. (1997). Institutional dimensions in information technology implementation in complex network settings. *European Journal of Information Systems*, 6(2), 77-85.

Chu, T. H., and Robey, D. (2008). Explaining changes in learning and work practice following the adoption of online learning: a human agency perspective. *European Journal of Information Systems*, 17(1), 79-98.

Ciborra, C. (2002). *The labyrinths of information: Challenging the wisdom of systems: Challenging the wisdom of systems*. Oxford University Press.

Ciborra, C. U. (1997). De profundis? Deconstructing the concept of strategic alignment. *Scandinavian journal of information systems*, 9(1), 2.

Constantinides, P., and Barrett, M. (2006). Negotiating ICT development and use: The case of telemedicine system in the healthcare region of Crete. *Information and Organization*, 16, 27–55.

Cooper, R. B., and Zmud, R. W. (1990). Information technology implementation research: a technological diffusion approach. *Management Science*, 36(2), 123-139.

Cousins, K. C., and Robey, D. (2005). Human agency in a wireless world: Patterns of technology use in nomadic computing environments. *Information and Organization*, 15(2), 151-180.

Cowley, E. (2006). Remembering the impressions of others as our own: how post-experience decisions can distort autobiographical memory. *Applied cognitive psychology*, 20(2), 227-238.

Currie, W. (2009). Contextualising the IT artefact: towards a wider research agenda for IS using institutional theory. *Information Technology & People*, 22(1), 63-77.

Davenport, T. H. (1998). Putting the enterprise into the enterprise system. *Harvard business review*, (76), 121-31.

Davidson, E. J., and Chismar, W. G. (2007). The interaction of institutionally triggered and technology-triggered social structure change: An investigation of computerized physician order entry. *MIS quarterly*, 739-758.

Dawson, P. (2003). *Understanding organizational change: The contemporary experience of people at work*. Sage.

Delbridge, R., and Edwards, T. (2007). Reflections on developments in institutional theory: Toward a relational approach. *Scandinavian Journal of Management*, 23(2), 191-205.

Delbridge, R., and Edwards, T. (2008). Challenging conventions: Roles and processes during non-isomorphic institutional change. *Human Relations*, 61(3), 299-325.

Delbridge, R., and Edwards, T. (2013). Inhabiting institutions: Critical realist refinements to understanding institutional complexity and change. *Organization Studies*, 34, 927-947.

Dery, K., Hall, R., and Wailes, N. (2006). ERPs as "technologies-in-practice": Social construction, materiality and the role of organisational factors. *New Technology Work and Employment*, 21(3), 229–241.

DeSanctis, G., and Poole, M. S. (1994). Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science*, 5(2), 121-147.

DiMaggio, P. J. and Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48, 147-160.

Dobson, P. J. (2001). The philosophy of critical realism—an opportunity for information systems research. *Information Systems Frontiers*, 3(2), 199-210.

Doherty, N. F., Coombs, C. R., and Loan-Clarke, J. (2006). A re-conceptualization of the interpretive flexibility of information technologies: redressing the balance between the social and the technical. *European Journal of Information Systems*, 15(6), 569-582.

Edwards, T. (2015). Institutional theory: reflections on ontology. In R. Mir, H. Willmott and M. Greenwood (eds.), *Philosophy in organization studies: life, knowledge and disruption*.

Edwards, T., and Jones, O. (2008). Failed institution building: Understanding the interplay between agency, social skill and context. *Scandinavian Journal of Management*, 24(1), 44-54.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.

Eisenhardt, K. M., and Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of management journal*, 50(1), 25-32.

Emirbayer, M. (1997). Manifesto for a relational sociology. *American journal of sociology*, 103(2), 281-317.

Emirbayer, M., and Mische, A. (1998). What Is Agency? *American journal of sociology*, 103(4), 962-1023.

Faraj, S., and Azad, B. (2012). The materiality of technology: An Affordance Perspective. In P. Leonardi, B. Nardi, and J. Kallinikos (eds.), *Materiality and organizing* (pp. 237–258). Oxford: Oxford University Press.

Fasano, U., and Iqbal, Z. (2003). GCC countries: from oil dependence to diversification. *International Monetary Fund*.

Faulkner, P., and Runde, J. (2012). On sociomateriality. In P. Leonardi, B. Nardi, and J. Kallinikos (eds.), *Materiality and organizing* (pp. 49–66). Oxford: Oxford University Press.

Feldman, M. S., and Orlikowski, W. J. (2011). Theorizing practice and practicing theory. *Organization Science*, 22(5), 1240-1253.

Fisher, C. and Anushko, A. (2008). Research ethics in social science. In Alasuutari, P., Bickman, L., Brannen, J. (eds). *The Sage handbook of social research methods* (pp. 95-109). London: Sage.

Fligstein, N. (2001). Social Skill and the Theory of Fields, *Sociological Theory* 19 (2): 105- 125.

Forstenlechner, I., and Rutledge, E. (2010). Unemployment in the Gulf: Time to update the "social contract. *Middle East Policy*, 17(2), 38-51.

Forstenlechner, I., and Rutledge, E. J. (2011). The GCC's "Demographic Imbalance": Perceptions, Realities and Policy Options. *Middle East Policy*, 18(4), 25-43.

Freeman, L. C. (2004) *The Development of Social Network Analysis: A Study in the Sociology of Science.* Vancouver, BC: Empirical Press.

Fui-Hoon Nah, F., Lee-Shang Lau, J., and Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. *Business process management journal*, 7(3), 285-296.

Fulk, J., and DeSanctis, G. (1995). Electronic communication and changing organizational forms. *Organization Science*, 6(4), 337-349.

Galliers, R. D., and Whitley, E. A. (2007). Vive les differences? Developing a profile of European information systems research as a basis for international comparisons. *European Journal of Information Systems*, 16(1), 20-35.

Geert Hofstede. (1984). Culture's consequences: International differences in work-related values. sage.

Gibson, J. J. (1986). *The ecological approach to visual perception*. Routledge.

Giddens, A. (1984). *The constitution of society: introduction of the theory of structuration*. Univ of California Press.

Gosain, S. (2004). Enterprise information systems as objects and carriers of institutional forces: the new iron cage?. *Journal of the Association for Information Systems*, 5(4), 6.

Greenwood, R., and Hinings, C. R. (1996). Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of management review*, 21(4), 1022-1054.

Gregor, S. (2006). The nature of theory in information systems. *MIS quarterly*, 611-642.

Grint, K., Woolgar, S. (1997). *The machine at work: Technology, work and organization* (Vol. 416). Cambridge: Polity Press.

Guba, E.G., and Lincoln, Y.S. (1994). Competing paradigms in qualitative research. In N.K. Denzin and Y.S. Lincoln (eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA: Sage

Hansen, M. T., Nohria, N., and Tierney, T. (1999). What's your strategy for managing knowledge? The *Knowledge Management Yearbook* 2000–2001.

Hanseth, O., and Braa, K. (1998, December). Technology as traitor: Emergent SAP infrastructure in a global organization. In *Proceedings of the international conference on Information systems* (pp. 188-196). Association for Information Systems.

Hanseth, O., Aanestad, M., and Berg, M. (2004). Guest editors' introduction: Actor-network theory and information systems. What's so special? *Information Technology and People*, 17(2), 116-123.

Hollstein, B. (2011). Qualitative approaches. In: J. Scott and P. Carrington (eds.). *Sage Handbook of Social Network Analysis* (pp. 404-417). London: SAGE Publications.

Hong, K. K., and Kim, Y. G. (2002). The critical success factors for ERP implementation: an organizational fit perspective. *Information and Management*, 40(1), 25-40.

Howard-Grenville, J. A. (2005). The persistence of flexible organizational routines: The role of agency and organizational context. *Organization Science*, 16(6), 618-636.

Howcroft, D., Mitev, N., and Wilson, M. (2004). What we may learn from the social shaping of technology approach. *Social theory and philosophy for information systems*, 329-371.

Huber, G. P. (1990). A theory of the effects of advanced information technologies on organizational design, intelligence, and decision making. *Academy of management review*, 15(1), 47-71.

Hutchby, I. (2001) Technologies, Texts and Affordances, *Sociology* (35) 2, pp. 441-456.

Jensen, T. B., Kjærgaard, A., and Svejvig, P. (2009). Using institutional theory with sensemaking theory: a case study of information system implementation in healthcare. *Journal of Information Technology*, 24(4), 343-353.

Jones, M. (1999). Information Systems and the Double Mangle, in T. Larsen, L. Levine, and J. DeGross (eds.) *Information Systems: Current Issues and Future Change* (pp. 287-302), OmniPress, New York.

Jones, M. R., and Karsten, H. (2008). Giddens's structuration theory and information systems research. *MIS Quarterly*, 32(1), 127-157.

Jones, M., W. J. Orlikowski, and K. Munir (2004). Structuration theory and information systems: A critical reappraisal. In J. Mingers and L. Willcocks (eds.), *Social theory and philosophy for information systems* (pp. 297-328). Chichester, UK: John Wiley & Sons, Ltd.

Kallinikos, J. (2004a). Deconstructing information packages: Organizational and behavioural implications of ERP systems. *Information Technology & People*, 17 (1), 8-30.

Kallinikos, J (2004b). Farewell to Constructivism: Technology and Context-embedded Action. In C. Avgerou, C. and C. Ciborra (eds.) *The Social Study of IT* (pp. 140-161). Oxford: Oxford University Press.

Kallinikos, J. (2002) Reopening the Black Box of Technology: Artifacts and Human Agency. *Twenty-Third International Conference on Information Systems*, Barcelona, Spain, pp. 287-294.

Kaplan, B. (1991). Models of change and information systems research. In H. Nissen, H. Klein and R. Hirschheim (eds.), *Information systems research: Contemporary approaches and emergent traditions* (pp.593-611). Amsterdam: Elsevier Science Publishers.

King, J. L., Gurbaxani, V., Kraemer, K. L., McFarlan, F. W., Raman, K. S., and Yap, C. S. (1994). Institutional factors in information technology innovation. *Information systems research*, 5(2), 139-169.

Kling, R. (1992). Audiences, narratives, and human values in social studies of technology. *Science, Technology, and Human Values*, 349-365.

Kotorov, R., and Hsu, E. (2002). A road-map for creating efficient corporate internal labor markets. *Career Development International*, 7(1), 37-46.

Kwon, T. H., and Zmud, R. W. (1987). Unifying the fragmented models of information systems implementation. In *Critical issues in information systems research* (pp. 227-251). John Wiley and Sons, Inc.

Lamb, R., and Kling, R. (2003). Reconceptualizing users as social actors in information systems research. *MIS quarterly*, 197-236.

Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management review*, 24(4), 691-710.

Latour, B. (1987). Science in action: How to follow scientists and engineers through society. *Harvard university press*.

Latour, B. (1996). *Aramis, or, The love of technology* (Vol. 1996). Cambridge, MA: Harvard University Press.

Law, J. (1999). After ANT: complexity, naming and topology. *The Sociological Review*, 47(S1), 1-14.

Lee, S., and Lee, H. (2004). The importance of change management after ERP implementation: an information capability perspective. *ICIS 2004 Proceedings*, 76.

Leonardi, P. M. (2011). When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies. *MIS quarterly*, 35(1), 147-167.

Leonardi, P. M. (2013a). Theoretical foundations for the study of sociomateriality. *Information and Organization*, 23(2), 59-76.

Leonardi, P. M. (2013b). When Does Technology Use Enable Network Change in Organizations? A Comparative Study of Feature Use and Shared Affordances. *MIS Quarterly,* 37(3).

Leonardi, P. M., and Barley, S. R. (2008). Materiality and change: Challenges to building better theory about technology and organizing. *Information and Organization*, 18(3), 159-176.

Leonardi, P. M., and Barley, S. R. (2010). What's under construction here? Social action, materiality, and power in constructivist studies of technology and organizing. The *Academy of Management Annals*, 4(1), 1-51.

Leonardi, P. M., Nardi, B. A., and Kallinikos, J. (eds.), (2012). *Materiality and organizing: Social interaction in a technological world*. Oxford University Press.

Lewin K. 1951. *Field Theory in Social Science*. New York: Harper and Row

Liang, H., Saraf, N., Hu, Q., and Xue, Y. (2007). Assimilation of enterprise systems: the effect of institutional pressures and the mediating role of top management. *MIS Quarterly*, 59-87.

Likert, R. (1961). *New patterns of management*.

Lyytinen, K., Newman, M., and Al-Muharfi, A. R. A. (2009). Institutionalizing enterprise resource planning in the Saudi steel industry: a punctuated socio-technical analysis. *Journal of Information Technology*, 24(4), 286-304.

MacKenzie, D. and Wajcman, J. (1999). *The Social Shaping of Technology*. Buckingham: Open University Press.

Madhi, S. T., and Barrientos, A. (2003). Saudisation and employment in Saudi Arabia. *Career Development International*, 8(2), 70-77.

Majchrzak, A., Faraj, S., Kane, G. C., and Azad, B. (2013). The contradictory influence of social media affordances on online communal knowledge sharing. *Journal of Computer-Mediated Communication*, 19(1), 38-55.

Markus, M. L. (1983). Power, politics, and MIS implementation. *Communications of the ACM*, 26(6), 430-444.

Markus, M. L. (2004). Technochange management: using IT to drive organizational change. *Journal of Information Technology*, 19(1), 4-20.

Markus, M. L., and Robey, D. (1988). Information technology and organizational change: causal structure in theory and research. *Management Science*, 34(5), 583-598.

Markus, M. L., and Silver, M. S. (2008). A foundation for the study of IT effects: A new look at DeSanctis and Poole's concepts of structural features and spirit. *Journal of the Association for Information Systems*, 9(10), 609-632.

Mason, J. (2002). *Qualitative researching* (2nd ed.). Sage.

Mellahi, K. (2007). The effect of regulations on HRM: private sector firms in Saudi Arabia. *The International Journal of Human Resource Management*, 18(1), 85-99.

Meyer, J.W. and Rowan, B. (1977), Institutionalized organizations: formal structure as myth and ceremony, *American Journal of Sociology*, Vol. 83 No. 2, pp. 340-63.

Mignerat, M., and Rivard, S. (2009). Positioning the institutional perspective in information systems research. *Journal of Information Technology*, 24(4), 369-391.

Miles, M. B., and Huberman, A. M. (1984). Drawing valid meaning from qualitative data: Toward a shared craft. *Educational researcher*, 20-30.

Mingers, J. (2004). Real-izing information systems: critical realism as an underpinning philosophy for information systems. Information and Organization, 14.2 (2004): 87-103.

Mingers, J., and Willcocks, L. (2014). An integrative semiotic framework for information systems: The social, personal and material worlds. Information and Organization, 24(1), 48-70.

Mingers, J., Mutch, A., and Willcocks, L. (2013). Critical realism in information systems research. *MIS Quarterly*, 37(3), 795-802.

Mische, A. (2011). Relational Sociology, Culture, and Agency. In J. Scott and P. Carrington (eds.), *The Sage Handbook of Social Network Analysis* (pp. 80–97), London: Sage Publications.

Mische, A and White, H. (1998). Between Conversation and Situation: Public Switching Dynamics across Network Domains. *Social Research*. 65,695-724.

Mohr, L. B. (1982). *Explaining organizational behavior*. San Francisco: Jossey-Bass.

Morris, M. (2004) *Network Epidemiology: A Handbook for Survey Design and Data Collection*. Oxford University Press.

Mutch, A. (2002). Actors and networks or agents and structures: Towards a realist view of information systems. *Organization*, 9(3), 477–496.

Mutch, A. (2008). *Managing information and knowledge in organizations: a literacy approach*. Routledge.

Mutch, A. (2010). Technology, organization and structure: A morphogentic approach. *Organization Science*, 21(2), 507–520.

Mutch, A. (2013). Sociomateriality — A wrong turning? *Information and Organization*, 23(1), 28–40.

Mutch, A., Delbridge, R., and Ventresca, M. (2006). Situating organizational action: The relational sociology of organizations. *Organization*, 13(5), 607-625.

Myers, M. D., and Avison, D. (1997). Qualitative research in information systems. *MISQuarterly*, 21, 241-242.

Myers, M. D., and Newman, M. (2007). The qualitative interview in IS research: Examining the craft. *Information and organization*, 17(1), 2-26.

Noir, C. and Walsham, G. (2007). The Great Legitimizer – ICT as myth and ceremony in the Indian healthcare sector, *Information Technology & People* 20(4): 313–333.

Orlikowski, W. J. (1992). The duality of technology: Rethinking the concept of technology in organizations. Organization Science, 3(3), 398-427.

Orlikowski, W. J. (1996). Improvising organizational transformation over time: A situated change perspective. *Information systems research*, 7(1), 63-92.

Orlikowski, W. J. (2000). Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. Organization Science, 11(4), 404-428.

Orlikowski, W. J. (2005). Material works: Exploring the situated entanglement of technological performativity and human agency. *Scandinavian Journal of Information Systems*, 17(1), 183.

Orlikowski, W. J. (2007). Sociomaterial practices: Exploring technology at work. *Organization Studies*, 28(9), 1435–1448.

Orlikowski, W. J. (2010). The sociomateriality of organisational life: considering technology in management research. *Cambridge Journal of Economics*, 34(1), 125-141.

Orlikowski, W. J., and Barley, S. R. (2001). Technology and institutions: what can research on information technology and research on organizations learn from each other?. *MIS quarterly*, 25(2), 145-165.

Orlikowski, W. J., and Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information systems research*, 2(1), 1-28.

Orlikowski, W. J., and Gash, D. C. (1994). Technological frames: making sense of information technology in organizations. *ACM Transactions on Information Systems* (TOIS), 12(2), 174-207.

Orlikowski, W. J. and Hofman J. D. (1997). An Improvisational Model for Change Management: The Case of Groupware Technologies. *Sloan Management Review*, Winter: 11-21.

Orlikowski, W. J., and Scott, S. V. (2008). Sociomateriality: challenging the separation of technology, work and organization. *The academy of management annals*, 2(1), 433-474.

Orlikowski, W.J. and Iacono, C.S. (2001). Desperately Seeking the 'IT' in IT Research: A Call to Theorizing the IT Artifact. *Information Systems Research*, 12(2), 121-134.

Papert, S. (1991). Situating constructionism. In I. Harel and S. Papert (eds.), *Constructionism* (pp. 1–12). Norwood, NJ: Ablex Publishing.

Paré, G., Bourdeau, S., Marsan, J., Nach, H., and Shuraida, S. (2008). Re-examining the causal structure of information technology impact research. *European Journal of Information Systems*, 17(4), 403-416.

Patton, M. Q. (2005). *Qualitative research*. John Wiley and Sons, Ltd.

Pettigrew, A. M. (1997). What is a processual analysis?. *Scandinavian journal of management*, 13(4), 337-348.

Pettigrew, A. M., Woodman, R. W., and Cameron, K. S. (2001). Studying organizational change and development: Challenges for future research. *Academy of management journal*, 44(4), 697-713.

Pickering, A. (1995). *The Mangle of Practice: Time, Agency, and Science*, Chicago: University of Chicago Press

Pinch, T. J., and Bijker, W. E. (1987). The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Knowledge Might Benefit Each Other. In W. Bijker, T. Hughes, and T. Pinch (eds), *The Social Construction of Technological Systems* (pp. 17-50). Cambridge, Massachusetts: MIT Press,

Poole, M. Scott, Andrew H. Van de Ven, Kevin Dooley, and M. E. Holmes (2000). *Organizational change and innovation processes: Theory and methods for research*. New York: Oxford University Press.

Pozzebon, M., and Pinsonneault, A. (2001). Structuration theory in the IS field: an assessment of research strategies. *ECIS 2001 Proceedings*, 86.

Pozzebon, M., and Pinsonneault, A. (2005). Challenges in conducting empirical work using structuration theory: Learning from IT research. *Organization Studies*, 26(9), 1353-1376.

Pozzebon, M., and Van Heck, E. (2006). Local adaptations of generic application systems: the case of Veiling Holambra in Brazil. *Journal of Information Technology*, 21(2), 73-85.

Ramady, M. A. (2012). *The GCC economies: Stepping up to future challenges*. Springer Science & Business Media.

Randeree, K. (2012). Workforce nationalization in the Gulf Cooperation Council states. Center for International and Regional Studies Georgetown University School of Foreign Service in Qatar. *Occasional Paper*, (9).

Razgallah, B. (2008). The macroeconomics of workers' remittances in GCC countries. In *Economic Research Forum*, Working Paper, (410).

Reed, M. I. (1997). In praise of duality and dualism: rethinking agency and structure in organizational analysis. *Organization Studies*, 18(1), 21-42.

Reich, B. H., and Benbasat, I. (2000). Factors that influence the social dimension of alignment between business and information technology objectives. *MIS quarterly*, 81-113.

Robey, D., and Boudreau, M. C. (1999). Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications. *Information systems research*, 10(2), 167-185.

Robey, D., Anderson, C., and Raymond, B. (2013). InformationTechnology, Materiality, and Organizational Change: A Professional Odyssey.*Journal of Association for Information Systems,* 14(7), 379-398.

Robey, D., and Markus, M. L. (1984). Rituals in information system design. *MIS Quarterly*, 5-15.

Rogers, E. M. 1962. *Diffusion of innovations*, New York: Free Press

Romanelli, E., and Tushman, M. L. (1994). Organizational transformation as punctuated equilibrium: An empirical test. *Academy of Management Journal*, 37(5), 1141-1166.

Rose, J., Jones, M. and Truex, D. (2005). Socio-Theoretic Accounts of IS: The Problem of Agency, *Scandinavian Journal of Information Systems,* 17(1), 133-152.

Rose, J., Jones, M. R. (2004). The Double Dance of Agency: a socio-theoretic account of how machines and humans interact. Paper presented at the ALOIS Workshop: *Action in Language, Organizations and Information Systems*, Linkoping, Sweden.

Rose, J., Jones, M., and Truex, D. (2005). The problem of agency re-visited. *Scandinavian Journal of Information Systems*, 17(1), 187.

Sahal, D. (1981). Alternative Conceptions of Technology. *Research Policy*, 10, 2-24.

Sahay, S., and Walsham, G. (1995). Information technology in developing countries: A need for theory building. *Information Technology for Development*, 6(3-4), 111-124.

Saunders, M., Lewis, P. and Thornhill, A. (2009).*Research Methods for Business Students*. Pearson: Harlow

Savas, E. S., and Schubert, A. (1987). *Privatization: The key to better government* (Vol. 35). Chatham, NJ: Chatham House Publishers.

Scott, W. R. 2001. *Institutions and organizations* (2nd ed.). Thousand Oaks, CA: Sage.

Sia, S. K., and Soh, C. (2007). An assessment of package–organisation misalignment: institutional and ontological structures. *European Journal of Information Systems*, 16(5), 568-583.

Silverman, D. (Ed.). (2010). *Qualitative research*. Sage.

Slappendel, C. (1996). Perspectives on innovation in organizations. *Organization Studies*, 17(1), 107-129.

Soh, C., and Sia, S. K. (2004). An institutional perspective on sources of ERP package–organisation misalignments. *The Journal of Strategic Information Systems*, 13(4), 375-397.

Soh, C., Kien, S., Tay-Yap, J., 2000. Cultural fits and misfits: Is ERP a universal solution? *Communication of the ACM*, 43(4), 47–51.

Son, J. Y., and Benbasat, I. (2007). Organizational buyers' adoption and use of B2B electronic marketplaces: efficiency-and legitimacy-oriented perspectives. Journal *of Management Information Systems*, 24(1), 55-99.

Sorensen, A. (1998). Theoretical mechanisms and the empirical study of social processes. In P. Hedstorm and R. Swedberg (eds.), *Social Mechanisms* (pp. 238-266). Cambridge:Cambridge University Press.

Straub, D. W., Loch, K. D., and Hill, C. E. (2003). Transfer of information technology to the Arab world: a test of cultural influence modelling. *Advanced topics in global information management*, 2, 141-172.

Sturm, M., Strasky, J., Adolf, P., and Peschel, D. (2008). The Gulf Cooperation Council Countries-Economic Structures, Recent Developments and Role in the Global Economy. *ECB Occasional Paper*, (92).

Svejvig, P. 2009. Literature Review of Enterprise Systems Research Using Institutional Theory: Towards a Conceptual Model, *Working Paper* 2009-01, Aarhus School of Business, Aarhus University.

Tallon, P. P., Kraemer, K. L., and Gurbaxani, V. (2000). Executives' perceptions of the business value of information technology: a process-oriented approach.*Journal of Management Information Systems* (16:4), pp 145-173.

Tilly C. (2004). *Stories, Identities, and Political Change*. Lanham, Maryland: Rowman & Littlefield

Tilly C (2006). *Identities, Boundaries and Social Ties*. Boulder, CO: Paradigm.

Trist, E. L., and Bamforth, K. W. (1951). Some social and psychological consequences of the Longwall method. *Human relations*, 4(3), 3-38.

Tsoukas, H. (2005). Afterword: why language matters in the analysis of organizational change. *Journal of Organizational Change Management*, 18(1), 96-104.

Tsoukas, H., and Chia, R. (2002). On organizational becoming: Rethinking organizational change. *Organization Science*, 13(5), 567-582.

Tushman, M. L., Virany, B., and Romanelli, E. (1985). Executive succession, strategic reorientations, and organization evolution: The minicomputer industry as a case in point. *Technology in Society*, 7(2), 297-313.

Vaast, E., and Walsham, G. (2005). Representations and Actions: The Transformation of Work Practices with IT Use. *Information and Organization* (15), 65-89.

Van de Ven, A. H., and Poole, M. S. (2005). Alternative approaches for studying organizational change. *Organization Studies*, 26(9), 1377-1404.

Vandyk, A. (1995). Arabian night into day. *Air Transport World*, 32(6), 187-189.

Volkoff, O., and Strong, D. M. (2013). Critical realism and affordances: Theorizing IT-associated organizational change processes. *MIS Quarterly*, 37(3), 819-834.

Volkoff, O., Strong, D. M., and Elmes, M. B. (2007). Technological embeddedness and organizational change. *Organization Science*, 18(5), 832-848.

Walsham, G. (1993). *Interpreting information systems in organizations*. John Wiley and Sons, Inc.

Walsham, G. (1995). Interpretive case studies in IS research: nature and method. *European Journal of information systems*, 4(2), 74-81.

Walsham, G. (1997). Actor-network theory and IS research: current status and future prospects. In A. Lee and J. Liebenau. (eds.), *Information systems and qualitative research* (pp. 466-480). Springer US.

Walsham, G. (2005). Learning about being critical. *Information Systems Journal*, 15(2), 111-117.

Walsham, G. (2006). Doing interpretive research. *European journal of information systems*, 15(3), 320-330.

Walsham, G., and Sahay, S. (1999). GIS for district-level administration in India: problems and opportunities. *MIS Quarterly*, 39-65.

Walsham, G., and Sahay, S. (2006). Research on information systems in developing countries: Current landscape and future prospects. *Information technology for development*, 12(1), 7-24.

Weick, K. E. 1987. Theorizing about organizational communication. In F. M. Jablin, L. L. Putnam, K. H. Roberts, and L. W. Porter (eds.), *Handbook of organizational communication* (pp. 97-122). Newbury Park, Calif.: Sage.

Weick, K. E., and Quinn, R. E. (1999). Organizational change and development. *Annual review of psychology*, 50(1), 361-386.

Westelius, A., and Askenas, L. (2003). Five roles of IT: implications for regional development. In B. Rapp and P. Jackson (eds), *Organisation and Work Beyond 2000* (pp. 25-36). Physica-Verlag HD.

Westrup, C. (2000). What's in information technology? Issues in deploying IS in organizations and developing countries. In C. Avgerou and G. Walsham (Eds.), *Information technology in context: Implementing systems in the developing world* (pp. 96–110). Aldershot, UK: Ashgate.

White, H. (1992). *Identity and Control: A Structural Theory of Social Action*. Princeton: Princeton University Press.

Wilkins, S. (2001). Management development in the Arab Gulf States-the influence of language and culture. *Industrial and Commercial Training*, 33(7), 260-266.

Williams, R., and Edge, D. (1996). The social shaping of technology. *Research policy*, 25(6), 865-899.

World Bank (2010). Economic Integration in the GCC. *The International bank of Reconstruction and Development*. The World Bank.

Xian., H. (2008), Lost in Translation? Language, Culture and the Roles of Translator in Cross-cultural Management Research. *Qualitative Research in Organizations and Management*, 3(3), 231-245.

Xue, Y., Liang, H., Boulton, W. R., and Snyder, C. A. (2005). ERP implementation failures in China: Case studies with implications for ERP vendors. *International journal of production economics*, 97(3), 279-295.

Yin, R. K. (2009). *Case study research: Design and methods*. Sage publications.

Yousef, D. A. (1998). Satisfaction with job security as a predictor of organizational commitment and job performance in a multicultural environment. Inte*rnational Journal of Manpower*, 19(3), 184-194.

Zammuto, R. F., Griffith, T. L., Majchrzak, A., Dougherty, D. J., and Faraj, S. (2007). Information technology and the changing fabric of organization. *Organization Science*, 18(5), 749-762

Zhu, K., and Kraemer, K. L. (2005). Post-adoption variations in usage and value of e-business by organizations: cross-country evidence from the retail industry. *Information Systems Research*, 16(1), 61-84.

Zhu, K., Kraemer, K., and Xu, S. (2003). Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors. *European Journal of Information Systems*, 12(4), 251-268.

Zuboff, S. (1988). *In the age of the smart machine: The future of work and power*. Basic Books.

APPENDIX A: SAMPLE OF THE INTERVIEW GUIDE

Interview Guide	دليل المقابلة
Introduction	**مقدمة**
1. System implemented (Work carried out by the system, system users) 2. Drivers of adoption 3. Role, responsibilities and seniority of the employee participating in the study 4. Participant's role and responsibilities in system implementation and use	١. تعريف بالنظام (الأعمال التي يقوم بها النظام، المستخدمون للنظام) ٢. دوافع تبني النظام ٣. دور ومسؤوليات وأقدمية الموظف المشارك في الدراسة ٤. دور ومسؤوليات الموظف في تطبيق واستخدام النظام
Implementation of the system	**تطبيق النظام**
1. The parties involved and the channels of communication 2. Organizational structure of the project management 3. Strategy and scope of implementation 4. Challenges confronted during implementation/ solutions adopted 5. Extent of alignment between management directions and users requirements 6. Extent and consequences of change in business and workplace. 7. Examples of business processes that have been adopted to align with the new systems 8. Examples of changes on organizational structure in accordance with the new systems. 9. Extent and justifications of system customization 10. Examples of modifications on the system to align with existing business processes. 11. How the balance is achieved between change of existing processes and system customization 12. Implementation schedule, performance and progress measures 13. Training obtained/Knowledge promoting activities 14. System acceptance by different groups/individual users 15. Reasons of acceptance/resistance to change 16. Change management tools and policies	١. الجهات المشاركة وقنوات التواصل ٢. الهيكل التنظيمي لإدارة المشروع ٣. استراتيجية ونطاق التطبيق ٤. التحديات أثناء التطبيق والحلول التي تم اعتمادها ٥. مدى التوافق بين توجهات الإدارة و متطلبات المستخدمين ٦. مدى التغيير في العمل وآثاره ٧. أمثلة على إجراءات العمل التي تم اعتمادها للتوافق مع النظام الجديد ٨. أمثلة على التغير في التنظيم الاداري للتوافق مع النظام الجديد ٩. مدى التعديل في النظام ومبرراته ١٠. أمثلة على التعديلات على النظام للتوافق مع اجراءات العمل المتبعة ١١. كيفية الموازنة بين تغيير الإجراءات و تعديل النظام ١٢. جدول التطبيق/ قياس الأداء والتطور ١٣. التدريب على النظام/ نشاطات تعزيز المعرفة بالنظام ١٤. مدى تقبل النظام من الأفراد أو مجموعات المستخدمين ١٥. أسباب التقبل/المقاومة للتغيير ١٦. وسائل وسياسات إدارة التغيير
Use of the system	**استخدام النظام**
1. Systems and tools used prior to ERP system adoption 2. Comparison with work prior to the system 3. Effects on relationships among individuals/departments 4. System utilisation by different groups/individual users 5. Positive features of the system 6. Inhibitors of optimal use 7. Challenges confronted in use of the system/ solutions adopted/ sources of support 8. Negative features of the system 9. Use of alternative systems 10. Ability to workaround system constraints 11. Influences to change use behaviour (individual, organizational, technical) 12. Role of (management/work group/SMEs) in influencing the attitude towards system use 13. Consequences of non-use/misuse of the system 14. Authority levels among users 15. Type of complaints levelled by different groups/individual users	١. الأنظمة والأدوات المستخدمة قبل اعتماد النظام ٢. المقارنة مع العمل قبل استخدام النظام ٣. أثر استخدام النظام على العلاقات بين الأفراد والأقسام الأخرى ٤. مدى الاستفادة من النظام من قبل الأفراد أو مجموعات المستخدمين ٥. إيجابيات النظام ٦. معوقات الاستخدام الأمثل ٧. التحديات التي واجهها مستخدمو النظام /الحلول المتبعة /مصادر الدعم ٨. سلبيات النظام ٩. استخدام أنظمة بديلة ١٠. إمكانية تجاوز قيود النظام ١١. المؤثرات لتغيير طبيعة الاستخدام (ذاتية/تنظيمية/فنية) ١٢. دور (الإدارة /مجموعة العمل/المستخدمين المشاركين في تطبيق النظام) في التأثير على الموقف من استخدام النظام ١٣. النتائج المترتبة على عدم استخدام النظام أو استخدامه بطريقة غير صحيحة ١٤. مستويات الصلاحية بين المستخدمين ١٥. نوع الشكاوى المقدمة من الأفراد أو مجموعات المستخدمين
Overall Perception	**الانطباع العام**
1. Expectations vs. outcomes 2. Perception and utilization over time 3. Motivations/demotivations to use the system 4. Personal gains/losses	١. التوقعات مقابل النتائج ٢. الانطباع والاستخدام مع مرور الوقت ٣. دوافع ومثبطات استخدام النظام ٤. المكتسبات والخسائر الشخصية

278

APPENDIX B: DETAILS ABOUT INTERVIEWEES

Interviewee	Interview No.	Affiliation	Main IT Project Involvement	Role
Participant No. 1	1	Case Org	Overall Systems Integration	Project Management
Participant No. 2	2	Implementer Co.	Overall Systems Integration	Tech. Support
Participant No. 3	3	Implementer Co.	Overall Systems Integration	Project Management
Participant No. 4	4	Case Org	Overall Systems Integration	Tech. Support
Participant No. 5	5	Case Org	Overall Systems Integration	Power User
Participant No. 6	6	Case Org	Overall Systems Integration	End User
Participant No. 7	7	Case Org	Overall Systems Integration	Project Management
Participant No. 8	8	Case Org	Overall Systems Integration	End User
Participant No. 9	9	Implementer Co.	Overall Systems Integration	Project Management
Participant No. 10	10	Implementer Co.	Overall Systems Integration	Tech. Support
Participant No. 11	11	Case Org	Overall Systems Integration	End User
Participant No. 12	12	Case Org	Overall Systems Integration	Power User
Participant No. 13	13	Case Org	Overall Systems Integration	End User
Participant No. 14	14	Case Org	Overall Systems Integration	Power User
Participant No. 15	15	Case Org	Enterprise Information System	Project Management
Participant No. 16	16	Case Org	Enterprise Information System	Project Management
Participant No. 17	17	Case Org	Enterprise Information System	Tech. Support
Participant No. 18	18	Case Org	Enterprise Information System	Tech. Support
Participant No. 19	19	Case Org	Enterprise Information System	End User
Participant No. 20	20	Case Org	Enterprise Information System	Power User
Participant No. 21	21	Implementer Co.	Enterprise Information System	Project Management
Participant No. 22	22	Implementer Co.	Enterprise Information System	Project Management
Participant No. 23	23	Implementer Co.	Enterprise Information System	Project Management
Participant No. 24	24	Implementer Co.	Enterprise Information System	Project Management
Participant No. 25	25	Case Org	Enterprise Information System	Power User
Participant No. 26	26	Case Org	Enterprise Information System	End User
Participant No. 27	27	Case Org	Enterprise Information System	End User
Participant No. 28	28	Case Org	Enterprise Information System	Project Coordinator
Participant No. 29		Case Org	Enterprise Information System	Project Coordinator
Participant No. 30	29	Case Org	Enterprise Information System	Power User
Participant No. 31		Case Org	Enterprise Information System	End User
Participant No. 32	30	Case Org	Enterprise Information System	End User
Participant No. 33		Case Org	Enterprise Information System	End User
Participant No. 34	31	Case Org	Enterprise Information System	Power User
Participant No. 35	32	Case Org	Enterprise Information System	End User
Participant No. 36	33	Case Org	Enterprise Information System	End User

Interviewee	Interview No.	Affiliation	Main IT Project Involvement	Role
Participant No. 37	34	Case Org	Enterprise Information System	Power User
Participant No. 38	35	Case Org	Enterprise Information System	End User
Participant No. 39		Case Org	Enterprise Information System	End User
Participant No. 40		Case Org	Enterprise Information System	End User
Participant No. 41	36	Case Org	Enterprise Information System	Trainer on the system
Participant No. 42	37	Case Org - BU2	SYSLEARN	Power User/ Training Manager
Participant No. 43	38	Case Org - BU1	SYSLEARN	Power User/ Admin. Asst.
Participant No. 44	39	Case Org - BU1	SYSLEARN	End User/ Admin. Manager
Participant No. 45	40	Case Org - BU1	SYSLEARN	Power User/ Training Manager
Participant No. 46	41	Case Org - BU1	SYSLEARN	End User/ Admin. Asst.
Participant No. 47	42	Case Org - BU1	SYSLEARN	End User/ Instructor
Participant No. 48		Case Org - BU1	SYSLEARN	Power User/ Instructor
Participant No. 49	43	Case Org - BU2	SYSLEARN	End User/ Training Manager
Participant No. 50	44	Case Org - BU2	SYSLEARN	End User/ Admin. Asst.
Participant No. 51	45	Case Org - IT	SYSLEARN	Tech. Support
Participant No. 52	46	Case Org - BU1	SYSLEARN	Power User/ Instructor
Participant No. 53	47	Case Org - BU1	SYSLEARN	End User/ Instructor
Participant No. 54		Case Org - BU1	SYSLEARN	End User/ Instructor
Participant No. 55		Case Org - BU1	SYSLEARN	End User/ Instructor
Participant No. 56	48	Case Org - BU3	SYSLEARN	End User/ Admin. Asst.
Participant No. 57	49	Case Org - BU2	SYSLEARN	End User/ Training Manager
Participant No. 58	50	Case Org - BU3	SYSLEARN	Power User/ Instructor
Participant No. 59	51	Case Org - BU3	SYSLEARN	Power User/ Training Manager
Participant No. 60	52	Case Org - BU2	SYSLEARN	Power User/ Instructor
Participant No. 61		Case Org - BU2	SYSLEARN	End User/ Admin. Asst.
Participant No. 62	53	Case Org - BU2	SYSLEARN	End User/ Instructor
Participant No. 63	54	Case Org - BU3	SYSLEARN	End User/ Instructor
Participant No. 64	55	Case Org - BU3	SYSLEARN	End User/ Admin. Asst.
Participant No. 65	56	Case Org - BU3	SYSLEARN	End User/ Admin. Asst.
Participant No. 66	57	Case Org - BU3	SYSLEARN	End User/ Admin. Asst.
Participant No. 67	58	Case Org - BU3	SYSLEARN	Power User/ Instructor