Investigating User Responses to Mandatory IT-Induced Organisational Changes: Findings from a Multiple-Case Study

A thesis submitted for the degree of Doctor of Philosophy

By

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ABSTRACT

Mandatory IT-induced organisational changes often engender drastic alterations in business processes, employees' skillsets, and the work environment in general. Reaping the benefits of mandatory IT-induced changes depend on how employees respond to, and use, the implemented IT systems for their work processes. Prior Information Systems research provides valuable insights into IT system usage in organisations, including when users accept and resist the introduced IT systems. However, there is still a need for a more nuanced perspective on the phenomenon of user responses to IT in organisations, as past studies have dichotomised IT acceptance and resistance research. This has led to fragmented findings that limit our understanding of the complex phenomenon of user responses to IT in organisations. In addition, existing studies do not provide an in-depth perspective on the changes in user responses over time and the factors that influence these changes in user responses. This study addresses these identified gaps by investigating how employees respond to mandatory IT-induced changes in their work environment, how user responses evolve over time, and the factors that trigger the changes in user responses. The study adopted a qualitative interpretive multiple case study method, with the use of semi-structured interviews as the primary data collection tool. Interviews were conducted with 29 participants in two organisations across two phases. The 'coping theoretic model of user response to mandated IT use' (Bhattacherjee et al., 2017) was adopted as a theoretical lens for the study. Data collected from the interviews were analysed using a thematic analysis approach. During the data analysis process, lower-level codes, sub-themes and themes were developed in order to answer the study's research questions. The findings from the study reveal that users respond to mandatory IT-induced changes in three ways: engaged; compliant; and reluctant. The findings also indicate that the three identified user response types are influenced by individual-related, organisational and process-related, and IT system-related factors. The findings indicate that user responses can transition in a progressive or regressive manner, depending on the influence of three factors: training; social influence; and IT infrastructure. The findings of this study have theoretical and practical implications. From a theoretical perspective, this study extends Bhattacherjee et al.'s (2017) model and responds to multiple calls by Information Systems researchers for the need to integrate IT acceptance and IT resistance research. In addition, this study provides a richer and more accurate description of user behavioural reactions to new technologies in the work environment. From a practical perspective, this study can help organisations and managers involved in IT-induced change projects to design initiatives that lead to progressive transitions and continuous IT system usage by employees in organisations.

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PUBLICATIONS

The following papers have been published (or submitted for publication) as part of the research conducted in this thesis:

1. Nuhu, K.A., Swift, S., Lakoju, M. and Macredie, R.D., 2018. Investigating user responses to mandatory IT-induced organisational changes: a pre-implementation study. European Conference on Information Systems. Portsmouth, United Kingdom.

2. Kashefi, A., Nuhu, K.A, Abbott, P., Ayoung, D. and Alwzinani, F., 2018. Investigating Users' IT Adaptation Behaviours: A Case of a Computerized Work System. International Conference on Information Systems. San Francisco, USA.

ABBREVIATIONS

IT	Information Technology
IS	Information Systems
GIS	Geographical Information System
LAS	Land Administrative System
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Information Technology
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behaviour
IDT	Innovation Diffusion Theory
CMUA	Coping Model of User Adaptation
TTAT	Technology Threat Avoidance Theory
ASU	Adaptive System Use
FTMS	File Tracking Management System
LAN	Local Area Network
WAN	Wide Area Network

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Chapter 1: Introduction

1.1: Introduction

"Notwithstanding the global economic slowdown in recent times, organisations around the world continue to implement information technologies (ITs) to gain operational and strategic benefits" (Bala and Venkatesh, 2016, p. 156); and "…most organisations must change, and change profoundly, if they're to stay alive" (Hirschhorn, 2002, p. 98). Similar comments have been repeated in a number of journal articles published in the fields of Information Systems (IS) and Organisational Change Management. Although research has indicated that IT implementation has a positive impact on organisations and their business processes (see, for example, Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Rai and Tang, 2014), there is a consensus among IS researchers that organisations are still not reaping the maximum benefits from their IT investments (see, for example, Bala and Venkatesh, 2016; Bhattacherjee et al., 2017; Davenport, 1998; Dimitriadis and Stevens, 2008; Klaus and Blanton, 2010; Oborn et al., 2011).

Within the field of IS and Organisational Change Management, studies that have focused on IT-induced organisational change attribute organisations' inability to realise maximum benefits of IT implementation to a number of factors, including technical issues (Finnegan and Willcocks, 2006), lack of fit between technology and business processes (Barki et al., 2007; Goodhue and Thompson, 1995; Strong and Volkoff, 2010; Taylor and Todd, 1995), and underutilisation (Beaudry and Pinsonneault, 2005; Benbasat and Barki, 2007; Jones et al., 2008; Komiak and Benbasat, 2006; Robey et al., 2002; Venkatesh et al., 2010). Recently, IS researchers have argued that the most important issue with regards to lack of benefit realisation from IT implementation is closely related to human agency and how individuals respond to IT implementations in their work environment (Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Boudreau and Robey, 2005; Bruque et al., 2008; Komiak and Benbasat, 2006; Nevo et al., 2016; Sun, 2012).

IT-induced changes in organisations are often accompanied by changes in work processes and skillsets. It has been established that IT users respond in a multitude of expected and unexpected manners to IT implementations in their work environment (Bala and Venkatesh, 2016; Barki et al., 2007; Beaudry and Pinsonneault, 2005; Boudreau and Robey, 2005; Fadel, 2012; Fadel and Brown, 2010; Griffith, 1999; Rizzuto et al., 2014; Venkatesh et al., 2010). Each individual understands and interprets the consequences of an IT implementation differently, which may trigger a complex set of user responses in an organisation (Beaudry, 2009; Beaudry and Pinsonneault, 2005; Elie-Dit-Cosaque and Straub, 2011). Since IS researchers have argued that benefit realisation from IT implementation projects in organisations relies closely on how individuals respond to and use the IT systems, it is of utmost importance to systematically investigate how users respond to IT system implementations in their work environment, and to explore what factors influence these responses over time (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Benbasat and Barki, 2007; Bhattacherjee et al., 2017; Elie-Dit-Cosaque and Straub, 2011; Markus, 2004; Sun, 2012).

Until now, three strands of research in the IS literature have attempted to address the complex phenomenon of user responses to IT in organisations. These strands address IT acceptance, resistance and ambivalence. In order of interest, the vast majority of these studies have been on acceptance, often carried out in a voluntary use context (Davis, 1989; Venkatesh et al., 2003), followed by resistance, often carried out in a mandatory use context (Joshi, 1991a; Kim and Kankanhalli, 2009; Lapointe and Rivard, 2005; Markus, 1983), and then ambivalence (Lapointe and Beaudry, 2014; Stein et al., 2015), which is experiencing a growing interest. These strands have been useful in improving our knowledge of user responses to IT. Though insightful, it has been widely acknowledged in the field of IS that IT acceptance and resistance have been treated as a dichotomy (Bhattacherjee et al., 2017; Bhattacherjee and Hikmet, 2007; Oborn et al., 2011; van Offenbeek et al., 2013), and are consequently not able to fully account for the complex relationship between IT acceptance and resistance.

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To address this issue, numerous IS scholars have called for a broader view of how IT acceptance and resistance should be studied (see, for example, Barki et al., 2007; Bhattacherjee et al., 2017; Bhattacherjee and Hikmet, 2007; Bruque et al., 2008; Cenfetelli, 2004; van Offenbeek et al., 2013; Rizzuto et al., 2014; Turel, 2015). These scholars are of the view that IT acceptance and resistance should be studied jointly, and that acceptance and resistance are conceptually distinct, rather than two opposing constructs. In addition, they argue that more emphasis should be placed on studying how users accept or resist an IT system – that is, the types of user behaviours that are exhibited – rather than concentrating on usage amount (i.e., quantity of use), since this is often less important in mandatory use contexts. This study supports these views that acceptance and resistance are not opposite ends of a bipolar continuum, but rather that they are distinctive behaviours in their own right. Therefore, in order to understand the complex phenomenon of user responses to IT in organisations, these two constructs should be studied jointly. Having presented the research motivation, the next section briefly introduces the theoretical approach adopted for this study.

1.2: Theoretical Approach

To investigate the complex phenomenon of user responses to IT in their work environment, this study made use of the 'coping theoretic model of user response to mandated IT use'(Bhattacherjee et al., 2017). The model draws on an influential theory from the field of psychology known as Coping Theory. Coping Theory describes the process by which individuals appraise and respond to disruptive events in their environment, such as the implementation of a new IT system in an organisation. Over the years, IS scholars have adopted Coping Theory as a theoretical lens to study user responses to IT in organisations (see, for example, Bhattacherjee et al., 2017; Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005, 2010; Benamati and Lederer, 2001; Elie-Dit-Cosaque and Straub, 2011; Fadel and Brown, 2010; Teo and Yang, 2007; Tsai et al., 2007).

IT acceptance research often focuses on enablers such as ease of use and perceived usefulness, while resistance research often focuses on inhibitors such as loss of power and autonomy. Coping Theory considers these two set of factors, providing an avenue to study IT acceptance and resistance jointly. Overall, Coping Theory offers a framework for investigating a full range of individual factors relating to IT-induced changes in organisation. In the following section, the research aims, objectives, and questions for this study are introduced.

1.3: Research Aim, Objectives, and Questions

Building on the arguments presented so far in this chapter, the main aim of this study is to contribute to the growing body of IS research by investigating individual user responses to mandatory IT-induced organisational changes. To achieve this, the study investigates how users respond to IT systems in their work environment, the factors that influence such responses, and ascertain if user responses change over time. The study also aims to empirically test and extend the theoretical model adopted for the study. In order to address the highlighted aims of this study, the following objectives were established:

- to understand the current state of user responses to IT-induced organisational changes research in the IS literature;
- to understand how IT users respond to mandatory IT-induced changes in their work environment;
- to determine if user responses to mandatory IT-induced organisational changes evolve over time;
- to contribute to the growing body of research on user responses to IT in the IS literature;
- to empirically test and extend the model adopted for this study.

The research objectives lead to the following research questions:

1. *How do users respond to IT–induced organisational changes in mandatory use contexts?*
2. *How do user responses to mandatory IT–induced organisational changes evolve over time and what are the factors that influence these changes?*

In the next section, a brief description of the research approach adopted for this study is provided.

1.4: Research Approach

To address the identified research questions, this study adopts an interpretivist philosophical approach, with the use of a qualitative research method. In terms of research strategy, this study adopts a multiple case study strategy (Eisenhardt, 1989; Yin, 2003), with the use of semi-structured interviews as the primary data collection tool. The study was conducted in two phases, with data being collected at two points in time between January 2018 and August 2018. In both phases, data were collected via semi-structured interviews. Interviews were transcribed verbatim and managed using a qualitative analysis tool called 'Nvivo' (version 11) (Nuhu et al., 2018). Thematic analysis (Braun and Clarke, 2006a) was adopted as the approach to analyse the qualitative data. Data were also collected from secondary sources through document analysis and observation.

Having briefly described the research approach, the following section summarises the expected contributions of this study.

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1.5: Expected Contributions

The study is believed to be potentially relevant to academia and practice. Specifically, the study aims to:

- provide a more nuanced perspective on the phenomenon of user responses to mandatory IT-induced changes in organisations;
- highlight the factors that influence user responses and determine if user responses evolve over time;
- extend the theoretical model adopted for the study;
- provide practical insights for managers and other stakeholders involved in IT-induced change initiatives in organisations.

Having briefly presented the expected contributions of this study, the following section presents the summary of the overall thesis chapters.

1.6: Structure of the Thesis

This thesis is organised into seven chapters, of which this is the first chapter. **Chapter 1** has introduced the research effort by presenting the research motivation, the theoretical approach adopted for this study, the research aim, objectives, and research objectives, followed by a presentation of the research approach adopted for this study.

Chapter 2 presents a review and analysis of related studies on user responses to IT in organisations (i.e., IT acceptance, IT resistance, and user adaption and post-adoptive IT user behaviours). The chapter also provides and overview of Coping Theory and its relevance to IS research. The chapter concludes with a presentation of the theoretical model adopted for this study.

Chapter 3 provides a description of the research approach adopted for this study and explains in detail the rationale behind the research methodologies used. Additionally, the chapter explores the data collection techniques used: semi-structured interviews; document analysis; and participant observation. The chapter concludes by discussing thematic analysis as the method adopted for data analysis.

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Chapter 4 presents the organisational context, analysis, and finding of the first case undertaken as part of this study. Organisational context information presented in this chapter includes the case background, the organisation's IT infrastructure, the history of IT system implementation, and participant information. In addition, analysis is presented horizontally by theme, in order to make the findings easier to follow; this is then followed by an analysis presented vertically by users, to show an individual user's perception about all themes. The chapter concludes by showing how an individual user's perception changes critically over a period of time, with the use of worked examples.

Chapter 5 follows the same approach taken in chapter 4, presenting the organisational context, analysis, and findings of the second case undertaken as part of this study.

Chapter 6 builds on, and discusses, the findings from chapters 4 and 5. The chapter begins with a cross case-analysis and discusses the findings from the two case organisations. The chapter moves on to present the theoretical contributions of the study and concludes with a presentation of the implications for practice.

Chapter 7 presents an overall summary of the entire research effort. The chapter presents a summary of the thesis chapters, the major findings of the study, and a summary of the theoretical contributions and contributions to practice. This is followed by a discussion of the research limitations and proposed avenues for future research.

Chapter 2: Literature Review

2.1: Introduction

Chapter 1 presented the research background and identified the research gap that this study aims to address. Chapter 2 will present a review of literature relevant to the subject of this study in order to develop a nuanced understanding of the research gap and set the context for the subsequent analysis and discussion (in Chapters 3, 4, 5, and 6). This chapter will explain the traditional approach in which the Information Systems (IS) field has tended to study user responses to Information Technology (IT). The traditional approach has dichotomised acceptance and resistance research, presenting these two constructs as direct opposites. This conceptualisation is problematic for a number of reasons, which will be discussed in the following sections of this chapter. There is an emerging approach that is strongly growing in the IS field that is of a different view to the traditional approach. This emergent approach is going to be presented, then arguments from this approach that challenge the dichotomisation of user responses to IT will be explained. This will lead to the notion that if this study takes this emergent position, which it does, then a theoretical stand will be needed to underpin empirical work in it.

Recently, Coping Theory has emerged as a theoretical lens that allows us to study both IT acceptance and resistance together in the event of an IT-induced organisational change. Coping Theory will be presented and arguments that support its suitability as a theoretical lens to study user responses to IT will be established. Then, a model based on Coping Theory that can be used to support and structure the study in this thesis will be presented in detail.

This is delivered in the following structure: section 2.2 provides an analysis of literature in the area of user responses to IT, looking particularly at IT acceptance, resistance, and the relationship between the two constructs in the context of IS research. This is followed, in section 2.3, by an analysis of literature related to user behaviours and adaptation to IT in IS research. Section 2.4 discusses Coping Theory

and its inherent components, followed by an analysis of studies that have adopted Coping Theory as a theoretical lens in IS research. Through this analysis, further justification is provided for the use of Coping Theory as a suitable theoretical lens for investigating user responses to IT. Having established this, section 2.5 presents the 'coping theoretic model of user response to mandated IT use' as the basis for the data collection and analysis in this study. Section 2.6 provides a summary of the chapter.

2.2: User responses to IT

In IS literature, there are three strands of research that deal with user responses to IT: IT acceptance, resistance, and ambivalence. In order of interest, the majority of these studies have been on acceptance (e.g., Davis, 1989; Venkatesh et al., 2003), followed by resistance (e.g., Joshi, 1991; Kim and Kankanhalli, 2009; Lapointe and Rivard, 2005; Markus, 1983), and then ambivalence (e.g., Lapointe and Beaudry, 2014; Stein et al., 2015) which is experiencing a growth in interest. IS literature shows that the acceptance and resistance constructs have mostly been studied independently, with some studies indicating that acceptance leads to successful IT use, while resistance leads to negative outcomes. Moving on now to consider the traditionally dichotomised approach of studying acceptance and resistance constructs in the IS literature, the following sub-sections will present a review of studies on each construct and then argue why these approaches are problematic.

2.2.1: IT Acceptance

This section presents a review of studies on IT acceptance, showing how the IT acceptance construct has been defined and conceptualised over the years. This is followed by a discussion highlighting the limitations of previous studies and need for better conceptualisations and approaches for studying IT acceptance in the IS field.

Prior IS research has identified IT acceptance consisting of cognitive components (what users think), affective components (what users feel, emotionally), and behavioural components (user's actual or intended use) (Davis, 1989; Lapointe and Beaudry, 2014; van Offenbeek et al., 2013). In their systematic review of user responses to IT, Lapointe and Beaudry (2014) reported that about half of the acceptance study samples heavily relied on the Technology Acceptance Model (TAM) (Davis, 1989), Unified Theory of Acceptance and Use of Information Technology (UTAUT) (Venkatesh et al., 2003), Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), Theory of Planned Behaviour (TPB) (Ajzen, 1991) or Innovation Diffusion Theory (IDT) (Rogers, 1983) as their theoretical frameworks. These authors also identified that IT acceptance has mainly been measured by items based on TAM or by assessing the frequency or quantity of use (Lapointe and Beaudry, 2014). To date, these are still the most prominent theories and models underlying IT acceptance research.

Prior IS research has established that IT acceptance has been defined and conceptualised in various ways. To date, there is still an ongoing debate among IS researchers about the nature of the IT acceptance construct in empirical studies. For instance, some studies have conceptualised acceptance as an attitude (e.g., Lee et al. 1995; Wixom and Todd 2005), as a process (e.g., Cooper and Zmud 1990), as a psychological state (e.g., Hiltz and Johnson 1990; Nelson and Cheney 1987) and as a multidimensional construct (e.g., Ives and Olson, 1984; Lapointe and Beaudry, 2014; Meyer, 1997; Schwarz and Chin, 2007).

Defining IT acceptance based on the above mentioned conceptualisations, it has been defined as a sequence of individual reactions (White and Massello, 1987), a process involving organizational inducement of individuals' commitment to IT use (Cooper and Zmud, 1990), as "the degree of willingness of an individual or group to utilize information systems" (Nelson and Cheney, 1987, p. 550), as "an individual psychological state with regard to his/her voluntary, intended use of a technology" (Chau and Hu, 2001, p. 701), and as "an individual disposition to adopt and use new IT" (Lucas et al., 2008, p. 206).

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Where IT acceptance has been conceptualized as a behaviour, it has been defined in various ways other than IT use, for example as system usage (Burton-Jones and Straub, 2006), a post-implementation behaviour (Saga and Zmud, 1993), and as purchasing (Wareham et al., 2005). Cooper and Zmud (1990) suggest that acceptance can be both a process and a product, and go further to define acceptance as a usage behaviour itself. As a behavioural intention, IT acceptance has been defined as an individual's intention to use an IT, as an intention to adopt an IT (Karahanna et al., 1999; Komiak and Benbasat, 2006), to reuse an IT (Turel et al., 2008) and to continue using an IT (Limayem et al., 2007). IT acceptance has also been conceptualized as a multidimensional construct, for example as a psychological state and as a behaviour. Schwarz and Chin (2007, pp. 232–233) define IT acceptance as "both a user's behavioural interaction with an IT over time and his/her psychological understanding/willingness or resistance/acceptance that develops within a specific social/environmental/organizational setting". Meyer (1997) also argues that acceptance comprises two dimensions: "an attitude and a behaviour" (1997, p. 276). Lapointe and Beaudry (2014) highlight in their systematic literature review that the earliest definition of acceptance falls within the multidimensional category, which they attribute to Ives and Olson (1984). These authors suggest that system acceptance includes both "system usage behaviour and attitude" (Ives and Olson, 1984, pp. 597–598).

In summary, it has been shown from this review that, over the years, IT acceptance has been conceptualised and defined in various ways, with a vast number of studies relying on 'intention to use' or 'IT use' as a proxy for IT acceptance. Table 2.1 provides a summary of the IT acceptance conceptualisations and definitions reviewed in this sub-section.

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Table 2.1 Conceptualisation and definition of IT acceptance in IS literature

Study	Conceptualisation			Definition
	Process	Psychological state	Behaviour	
Cooper and Zmud 1990	✓	X	X	A sequence of individual reactions, involving organizational inducement of individuals' commitment to IT use.
White and Massello 1987	✓	X	X	
Nelson and Cheney 1987	X	✓	X	The degree of willingness of an individual or group to utilize information systems.
Chau and Hu 2001	X	✓	X	An individual psychological state with regard to his/her voluntary, intended use of a technology.
Lucas et al. 2008	X	✓	X	An individual disposition to adopt and use new IT.
Burton-Jones and Straub 2006	X	X	✓	As system usage.
Saga and Zmud 1993	X	X	✓	A post-implementation behaviour.
Karahanna et al. 1999	X	X	✓	An individual's intention to use an IT, as an intention to adopt an IT.
Komiak and Benbasat 2006	X	X	✓	
Limayem et al. 2007	X	X	✓	An individual's intention to reuse an IT and to continue using an IT.
Turel et al. 2008	X	X	✓	
Schwarz and Chin 2007	X	✓	✓	As a user's behavioural interaction with an IT over time and his/her psychological understanding/willingness or resistance/acceptance that develops within a specific social/environmental/organizational setting.
Ives and Olson 1984	X	✓	✓	As a system usage behaviour and attitude towards an IT.
Meyer 1997	X	✓	✓	

More recently, concerns have been raised about the applicability and validity of the previously-mentioned theories and models across different conditions. As such, researchers have added conditional factors that provide a nuanced understanding of factors that may influence an individual's use of an IT system. They include: organisational factors, including mandate policies (Jeyaraj and Sabherwal, 2008),

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effective change management (Kim and Kankanhalli, 2009), and management commitment (Lewis et al., 2003); individual factors, including self-efficacy (Compeau and Higgins, 1995), intrinsic motivation (Venkatesh, 2000), gender (Venkatesh, 2000; Venkatesh et al., 2003), user experience (Taylor and Todd, 1995; Venkatesh, 2000), and subjective norms (Venkatesh et al., 2003); and IT system factors, including task and technology fit (Goodhue and Thompson, 1995), technical complexity (Subramanian, 1994) and hedonic system characteristics (van der Heijden, 2004).

Although these conditional factors have complimented our understanding of IT acceptance, there is still a need to go beyond what technology acceptance models and their variants offer. This is because these models and their variants have some characteristics that limit their scope in terms of shedding more light on the multifaceted process of user responses to IT-induced organisational changes. As highlighted in IS literature, a major limitation of traditional technology acceptance models is their explanatory power in the context of mandated IT use (Agarwal and Prasad, 1997; Bhattacherjee et al., 2017; Brown et al., 2002; Karahanna et al., 1999; Venkatesh et al., 2003). The vast majority of IT acceptance studies have been conducted in the context of voluntary IT adoption, using either intention to use or usage as a dependent variable. For example, models derived from the Theory of Reasoned Action (TRA) have a fundamental assumption that technology use is voluntary (Karahanna and Straub, 1999), while in reality IT usage in organisations is often mandatory, since IT-induced changes are accompanied by changes in business processes, infrastructure and skillsets. Therefore, users do not often have discretion over their IT usage (Brown et al., 2002; van Offenbeek et al., 2013) and, as such, these models may not be a good explanatory fit in the context of mandated IT usage.

Another concern about prior IT acceptance research is that it implicitly restricts acceptance behaviours to system usage, suggesting that the behavioural component of acceptance is the same thing as usage, since it is often positioned on a unipolar continuum from non-use to high-use (Bhattacherjee et al., 2017; van Offenbeek et al., 2013). With this conceptualisation, acceptance is abstracted at the individual level (Lapointe and Rivard, 2007a) and restricts actors to those that are potential or

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actual, direct or indirect users. Van Offenbeek et al. (2013) highlighted different user categories in their study of user responses to IT, citing an example of an ambivalent category of users – 'supporting non-user' – who were positive about an IT but did not feel the immediate need to accept it. In the traditional IT acceptance literature, this user category would be identified as non-users (Lapointe and Beaudry, 2014; van Offenbeek et al., 2013). This demonstrates that acceptance studies have not set out to shed light on resistance behaviours (Liang and Xue, 2009; Oborn et al., 2011).

IS researchers have also raised the concern of traditional technology acceptance models' inability to properly address the 'intention-behaviour gap'. IS research has shown that intentions are often made before taking an action on whether to accept or not to accept an IT, and a large time gap exists before such a decision is made. Within this time space, many influencing factors come into play and expected and unexpected reactions occur (Bagozzi, 2007; Benbasat and Barki, 2007; Elie-Dit-Cosaque and Straub, 2011). It is therefore very important to consider emerging influential and psychological steps between intention and action initiation (Bagozzi, 2007). This is also in line with Benbasat and Barki (2007), who argue that "Researchers should revisit the core theory of TPB and redirect their focus towards examining different antecedents (e.g., IT artefact and design) and different consequences (e.g., adaptation and learning behaviours) in order to reach a more comprehensive understanding of what influences adoption and acceptance in different IT use contexts" (Benbasat and Barki, 2007, p. 216).

Finally, traditional technology acceptance models may not apply well in the context of technologies like Enterprise Resource Planning (ERP) systems that bring about radical changes in organisations – for example, changes in work routines, skills-sets, business processes, and infrastructure. As such, each user in an organisation may respond and adapt differently to these changes, in comparison to changes brought about by less complicated technologies (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Fadel, 2012).

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Although traditional technology acceptance models and their variants provide useful insights of IT acceptance, they do not explain the underlying process that most users have to go through when faced with an IT-induced organisational change. Likewise, these models do not show how situational factors influence user responses to IT-induced changes over time. In summary, prior IT acceptance literature shows that studies on IT acceptance have mainly focused on initial stages of adoption and early use behaviours. By not shedding more light on the dynamic processes of user responses, existing IT acceptance models may fail to unveil users' experiences and responses to complex IT-induced changes in organisations. This study supports the view of other IS scholars (e.g., Bala and Venkatesh, 2016; Benbasat and Barki, 2007; Bhattacherjee et al., 2017; Burton-Jones and Straub, 2006; Jasperson et al., 2005) who argue for further studies on user responses and adoption behaviours in IS research.

2.2.2: IT Resistance

This section presents a review of studies on IT resistance, showing how the IT resistance construct has been defined and conceptualised across the organisational change, psychology, and IS literature. This is followed by a discussion highlighting the similarities among IT resistance studies and why IT resistance has a wider scope than IT acceptance studies. The section concludes with discussions about an emergent conceptualisation of IT resistance that makes it suitable to be studied alongside IT acceptance.

IS literature indicates that there are numerous definitions and conceptualisations of IT resistance, reinforced by Lapointe and Beaudry (2014) who highlighted that "there is no clear agreement in the literature on how resistance to IT ought to be defined and studied" (2014, p. 4621). These authors go further, explaining that many researchers who have conducted studies on IT resistance have not offered a clear definition of how they see or define IT resistance in their research (Lapointe and Beaudry, 2014).

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In organisational change literature, resistance has been defined as any act that serves to maintain the status quo in the face of pressure to alter the status quo (Zaltman et al., 1977). Psychology literature conceptualises resistance along a continuum from active to passive resistance (Bovey and Hede, 2001). In IS literature, resistance to IT has been mostly conceptualised as a behaviour, being defined as behavioural reactions expressing reservation in the face of pressure exerted by change supporters seeking to alter the status quo (Lapointe and Rivard, 2005; Meissonier and Houzé, 2010; Waddell and Sohal, 1998). Researchers who have conceptualised resistance as a behaviour include: Markus (1983), who defines resistance to IT as "behaviours intended to prevent the implementation or use of a system or to prevent system designers from achieving their objectives" (1983, p. 433); and Kane and Labianca (2011), who define resistance as avoidance, which "implies that the individual has the opportunity and even the need, but consciously circumvents using the system" (2011, p. 505). Resistance has also been defined as "an adverse reaction to a proposed change which may manifest itself in a visible, overt fashion (such as through sabotage or direct opposition) or may be less obvious and covert (such as relying on inertia to stall and ultimately kill a project)" (Hirschheim and Newman, 1988, p. 398).

IT resistance has also been conceptualised differently by other IS researchers, with some IS researchers arguing that resistance is not a behaviour, but rather a cognition. For instance, Selander and Henfridsson (2012) report resistance as a "negative affect towards the IT implementation and manifests a perception of seeing through the espoused goals of the implementers" (2012, p. 293). Resistance has also been defined as "a cognitive force for precluding potential behaviour" (Bhattacherjee and Hikmet, 2007, pp. 727–728). Resistance has also been defined as a process – Ferneley and Sobreperez (2006) suggest that resistance is a process comprising of two-phases: an initial cognitive or emotional phase; and a second phase, where a decision is made to resist. In contrast, Lapointe and Rivard (2005) conceptualise IT resistance as a multidimensional construct, arguing that resistance behaviours occur when there is a perceived threat associated with the interaction between an object and initial conditions (Lapointe and Rivard, 2005; Rivard and Lapointe, 2012). The authors further state that initial conditions can be modified by

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triggers, and that this alteration may initialize different resistance behaviours among individuals. Table 2.2 provides a summary of the IT resistance definitions from different domains reviewed in this sub-section.

Table 2.2 IT resistance definitions from different domains

Study	Organisational change	IS domain	Definition
	Domain		
Zaltman et al. 1977	✓	*X*	As any act that serves to maintain the status quo in the face of pressure to alter the status quo.
Lapointe and Rivard 2007	*X*	✓	As behavioural reactions expressing reservation in the face of pressure exerted by change supporters seeking to alter the status quo.
Meissonier and Houzé 2010	*X*	✓	
Waddell and Sohal 1998	*X*	✓	
Markus 1983	*X*	✓	As behaviours intended to prevent the implementation or use of a system or to prevent system designers from achieving their objectives.
Kane and Labianca 2011	*X*	✓	As avoidance implies that the individual has the opportunity and even the need, but consciously circumvents using the system.
Hirschheim and Newman 1988	*X*	✓	An adverse reaction to a proposed change which may manifest itself in a visible, overt fashion (such as through sabotage or direct opposition) or may be less obvious and covert (such as relying on inertia to stall and ultimately kill a project).
Selander and Henfridsson 2012	*X*	✓	As a negative affect towards the IT implementation and manifests a perception of seeing through the espoused goals of the implementers.
Bhattacherjee and Hikmet 2007	*X*	✓	As a cognitive for precluding potential behaviour.
Lapointe and Rivard 2005	*X*	✓	Resistance is a reaction to a perceived threat associated with the interaction between an object and initial conditions.

In IS research, resistance has mostly been reported as a negative behaviour that may hinder or prevent IT implementers from achieving their objectives, or affect the overall success of the IT implementation project (Ferneley and Sobreperez, 2006).

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Problems relating to IT resistance have been studied in the IS domain for quite some time (Lapointe and Rivard, 2007b) and has resulted in the development of various models to help organisation overcome this phenomena. For instance, approaching resistance from a psychological perspective, Kim and Kankanhalli (2009) suggest that users evaluate changes related to IT implementation projects based on a 'status quo' bias perspective, then decide on whether or not to resist an IT. Their study revealed that most users prefer to maintain their status quo, and that the higher the perceived switching cost, the higher the chance of a user increasing resistance. Markus (1983) seminal paper distinguished three resistance theories: system-determined; people-determined; and interactive. This study demonstrated that system-determined and people-determined resistance theories had limited explanatory power, while interactive theory offered a better explanation of resistance in organisational settings. Markus (1983) study also highlighted that contextual issues, such as redistribution of power among stakeholders, may affect an IT user's IT adoption. In this vein, Joshi (1991) suggests that perceived inequality at individual, peer group or organisational level may lead to users resisting an IT system. Joshi (1991) and Markus (1983), then, argue that resistance results from perceived threats rather than from the IT system itself, and their models posit that resistance is more of a social system and less of a psychological phenomenon.

Other studies suggest that workers may manipulate an IT system to satisfy their self-defined interests (e.g., Rosenthal, 2004). In their multilevel model of resistance to IS, Lapointe and Rivard (2005) suggest that resistance can manifest as passive resistance, apathy, active resistance and aggressive resistance, while identifying five interacting resistance components: initial conditions (pre-implementation context); subject of resistance (user or actor); object of resistance (IT/IS); perceived threat (possible negative consequences); and resistance behaviours. Contrary to Joshi (1991) and Markus (1983), Lapointe and Rivard (2005) argue and stress that resistance behaviours can vary over time. Meissonier and Houze's (2010) 'IT conflict-resistance theory' illustrates that resistance and conflict are embedded within IT choices and IS design, arguing that resistance and support behaviours are

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inherent to any IT project that interferes with traditional organisational norms and settings.

IT resistance literature has shown that resistance can be attributed to many factors and the antecedents of resistance may expand over time as individuals come in contact with IT systems on a regular basis (Bala and Venkatesh, 2016; Karahanna et al., 1999). Identified factors include perceived lack of involvement and participation in IT system implementation (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Fadel and Brown, 2010; Klaus and Blanton, 2010), inadequate training (Bhattacherjee et al., 2017; Klaus and Blanton, 2010; Venkatesh et al., 2010), self-efficacy (Beaudry and Pinsonneault, 2005; Liang and Xue, 2009), job uncertainty (Gill, 1996), and loss of power and status (Adams et al., 2004).

Van Offenbeek et al. (2013) highlight some important characteristics shared among the vast majority of IT resistance studies. First, resistance research has a wider scope, aiming to shed light on resistance behaviours of all stakeholders involved, rather than only concentrating on the direct IT system users. Second, resistance research often begins with a stakeholder analysis and reveals how the introduction of an IT system may disrupt activities and redistribute resources such as control and finance, power, and how various individuals may react differently to these changes, either in a positive or negative manner. Finally, antecedents of resistance to IT-induced changes are often related to wider contextual issues than the new IT's functional and technical features (van Offenbeek et al., 2013). Recently, IT resistance research has seen a shift in paradigm, whereby resistance is not necessarily seen as a good or bad reaction, but rather can involve either dysfunctional or functional conflict (Bagayogo et al., 2014; van Offenbeek et al., 2013). IS scholars are now calling for a broader view on how resistance should be studied (e.g., Bagayogo et al. 2014; Lapointe and Beaudry 2014; van Offenbeek et al. 2013), as prior research has lacked an actual measure and conceptualisation of resistance.

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2.2.3: Relationship between IT Acceptance and Resistance

Having reviewed prior studies and explained the way that the IS field has traditionally dichotomised IT acceptance and resistance research in the previous sections, this section argues for the need to study acceptance and resistance jointly, as independent constructs. This is done by presenting the relationship between the two constructs and concludes with how this approach may provide a nuanced understanding about how users respond to IT-induced changes in their work environment. It has been widely acknowledged by IS scholars that IT acceptance and resistance are important factors in IT implementation projects. As already noted, IS literature shows that these two phenomena have been treated as a dichotomy (Bhattacherjee et al., 2017; Bhattacherjee and Hikmet, 2007; Klaus and Blanton, 2010; Oborn et al., 2011; van Offenbeek et al., 2013). Having been studied independently, these studies have been useful in improving our understanding of user responses to IT, but these studies do not fully account for the complex relationship between IT acceptance and resistance.

IS literature has revealed that more often acceptance has been associated with use, while resistance has been associated with non-use (Bagayogo et al., 2014). In addition, acceptance and resistance constructs are simply assumed to be opposite ends of a single dimension by some researchers (e.g., Lapointe and Beaudry 2014; Marakas and Hornik 1996), laying at opposite ends of the same continuum. Lapointe and Beaudry (2014) conducted a review of IT acceptance, resistance and ambivalence behaviours, proposing a typology of IT user behaviours comprising five archetypes: engaged; resigned; deviant; dissident; and ambivalent.

Responding to numerous calls by IS scholars for a broader view on acceptance and resistance research, Van Offenbeek et al. (2013) proposed a two-factor view of user responses with acceptance (non-use to high-use) and resistance (from enthusiastic support to aggressive resistance) along orthogonal dimensions. The authors combined the two dimensions to propose four categories of user reactions, namely: supporting users; resisting users; supporting non-users; and resisting non-users. In a similar vein, Rizzuto et al. (2014) argue that acceptance and resistance are "two

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conceptually distinct (and not necessarily opposing) constructs" (2014, p. 480). The study in this thesis supports the view that acceptance and resistance are not opposite ends of a bipolar continuum, but rather that they are distinctive behaviours in their own right (Bhattacherjee et al., 2017; Cenfetelli, 2004; Turel, 2015).

The above-mentioned view is supported by three fundamental arguments from the IT acceptance and resistance literature. First, if IT acceptance is the polar opposite of resistance, then IT system users cannot accept and resist an IT system at the same time. For instance, a user may acknowledge an IT system to be beneficial, but still have reservation about the same IT system due to implementation characteristics and practices. Van Offenbeek et al. (2013) exemplify this using an example where sales personnel using mobile phones for their work routines may also show resentment towards the same phones, since the phones were perceived as keeping them tethered to work for 24 hours a day.

Second, prior IT acceptance research has studied user behaviours and responses to IT in a voluntary context, where users have discretion over their use or non-use of the system (Bhattacherjee et al., 2017; Venkatesh et al., 2003), while IT resistance research has studied user behaviour and responses to IT in a mandatory context, where users do not have discretion over IT use, as these systems are fully mandated by the organizations (Bhattacherjee et al., 2017; Klaus and Blanton, 2010; Venkatesh et al., 2003).

Third, if acceptance and resistance are polar opposites, it would be expected that IT acceptance and resistance studies would apply similar theories, attributes and methods (Bhattacherjee et al., 2017; van Offenbeek et al., 2013). Although both research streams are directed towards explaining user behaviour and responses to IT, they draw on distinctly different conceptualisations and assumptions. IT acceptance is often predicted by factors such as perceived ease of use, usefulness and self-efficacy (Venkatesh et al., 2003), while IT resistance is often predicted by lack of requisite knowledge, loss of power, inequitable conditions and so on (Bhattacherjee and Hikmet, 2007; Joshi, 1991b; Markus, 1983).

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Overall, a key theme in the emergent research stream is that IT acceptance and resistance coexist within the same organisation, and should be studied jointly. It is also important to highlight that this emergent research stream emphasises studying how users accept or resist an IT – that is, the types of user behaviours that are exhibited – rather than concentrating on usage amount (i.e., quantity of use), since this is often less important in mandatory use contexts (Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Elie-Dit-Cosaque and Straub, 2011; Stein et al., 2015).

2.3: User Behaviour and Adaptation to IT

In IS research, three distinct yet related streams of research have provided insights on user responses to IT in their work environment. These streams are summarised by Bala and Venkatesh (2016) in their study of users' adaptation to IT in organisations. The first stream, post-adoptive IT use, investigates how and why users use an IT following their adoption decisions (e.g., Jasperson et al., 2005; Sun, 2012; Sykes et al., 2014). This stream offers conceptualisations of IT use at various levels, studies predictors of IT use, investigates cognitive processes that users employ during IT use and offers insights on dynamic IT use patterns. The second stream is an extension of the post-adoptive IT use stream, often referred to as user adaptation to IT. This stream focusses on the processes and strategies that users employ to cope with IT-induced organisational changes (e.g., Beaudry and Pinsonneault, 2005; Liang and Xue, 2009; Stein et al., 2015). This stream extends post-adoptive research by providing insights on the processes and phenomena such as workarounds, improvisation, unintended use of IT and so forth. The third stream is closely related to user adaptation to IT, as it investigates recursive interactions between IT features, organisational properties, and human agency during IT implementations (e.g., Nan, 2011; Sharma and Yetton, 2003, 2007). This stream offers insights into the processes that users employ to appropriate IT features and adapt IT systems to accomplish their tasks and also processes that include changes in organisational contexts, such as work routines, processes and reward structures.

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In summary, these three streams posit that users employ different adaptation strategies and engage in various post-adoptive behaviours in response to an IT system implementation. Additionally, these streams also provide insights on adaptation processes and consequences in relation to how users use and make adjustments to an IT system and their work practices. The next sub-section discusses post-adoptive user behaviours in IS research in order to provide a basis for analysis and discussion in the coming chapters.

2.3.1: Post-adoptive IT User Behaviour

This section aims to review the various studies relating to post-adoptive IT user behaviours from prior IS research. As highlighted earlier, the vast majority of prior IS research has mainly focused on the initial stage of IT adoption rather than the post-adoption stage (Benbasat and Barki, 2007; Eder and Igbaria, 2001; Zhu et al., 2006). However, there is a growing interest in studying post-adoptive IT usage behaviours, as research shows it is the longest stage in the IT adoption life cycle (Cooper and Zmud, 1990; Jasperson et al., 2005; Kashefi et al., 2015; Limayem et al., 2007). Understanding post-adoptive IT usage behaviour is important because even within a mandatory use context, users' post-adoptive usage behaviours largely depend on the extent to which a user puts in effort to learn, interact with and use the IT system (Ahuja and Thatcher, 2005; Jasperson et al., 2005; Klaus and Blanton, 2010). As such, IS researchers have emphasised the need for more research on post-adoptive IT usage behaviours in organisations (e.g., Fadel, 2012; Fadel and Brown, 2010; Kashefi et al., 2015).

More recently, IT adoption literature has revealed that there is no agreed definition of post-adoptive IT use, with studies presenting different types of post-adoptive use behaviours from various perspectives and at different levels of analysis. For instance, Bhattacherjee (2001) argues that the initial acceptance of an IT system in an IT implementation project is an important step towards achieving IT implementation success, but the long term viability of an IT system and its full success depends on its continued use (Bhattacherjee, 2001). The author conducts a study on 'IS continuance', by examining the affective and cognitive beliefs that

influences one's intention to continue using an IT system. He validates the model in his study by surveying online banking users, and findings from the study suggest that perceived usefulness and user satisfaction with the IT system determined their intention to continue using the IT system. The study also draws attention to the difference between acceptance and continuance behaviours in the post-adoptive IT usage stage.

Ahuja and Thatcher (2005) introduce the concept of 'trying to innovate with IT'. They define this concept as an individual's goal of finding novel uses of information technologies. These authors argue that work environment impediments render intentions inadequate for examining post-adoptive IT use (Ahuja and Thatcher, 2005). The authors test and validate this construct by examining the influence of the work environment and gender on trying to innovate with IT. Similarly, Jasperson et al. (2005) conceptualise the construct 'post-adoptive behaviour' to synthesise the factors that influence post-adoptive behaviour from prior IS literature. These authors propose a two-level model, with the first level evaluating an individual's cognitions and behaviours regarding feature adoption, use and extension, while the second level evaluates the individual's work environment. From their study, the authors identify three aspects of post-adoptive behaviour which they argue have not been fully addressed in IS research: prior use; habit; and feature-centric view of technology (Jasperson et al., 2005).

Burton-Jones and Straub (2006) reconceptualise the 'system usage' construct by using a systematic approach comprising two stages: definition and selection. These authors argue that their approach allows researchers to develop a clear and valid measurement for system usage (Burton-Jones and Straub, 2006). These authors further explain that the definition stage entails researchers defining system usage and explicating its fundamental assumption, while in the selection stage, system usage should be conceptualised in terms of its functions and structure. They validate their reconceptualization by empirically investigating the relationship between system use and short-run task performance in cognitively engaging tasks. Burton-Jones and Grange (2012) extend research on the performance outcome of system use and put forth the concept of 'effective use'. They define effective use as "using a system in a way that increases achievement of the goals for using the system"

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(2012, p. 2). These authors draw on Representation Theory to derive a high-level framework of how effective use and performance evolve over time. In addition, the authors derive specific models of effective use and the drivers of each model.

Cho (2016) studies post-adoption behaviours by exploring the concept of 'continued use' in a health mobile app use context. The author surveys 343 Korean users of a health app and the results from his conceptual model revealed that emotional and perceptual factors – perceived ease of use, usefulness, satisfaction and confirmation – were significantly associated with continued intention to use the health app (Cho, 2016).

Together, all these studies present different conceptualisation of post-adoptive IT usage behaviours (e.g., effective use, deep usage and so forth) across various contexts, thus improving our understanding of post-adoptive IT usage behaviour. Table 2.3 provides a summary of the above reviewed studies of post-adoptive IT usage from IS literature.

Table 2.3 Post-adoptive IT usage behaviours from IS literature

Conceptualisation	Definition	Source
IS continuance	An individual's continued use of an IT to complete daily job routines.	(Bhattacherjee 2001)
Trying to innovate	An individual's goal of finding novel uses of information technologies.	(Ahuja and Thatcher 2005)
Post-adoptive behaviour	The myriad feature adoption decisions, feature use behaviours, and feature extension behaviours made by an individual user after an IT application has been installed, made accessible to the user, and applied by the user in accomplishing his/her work activities.	(Jasperson et al. 2005)
Deep structure usage	Deep structure use indicates the extent to which system features have actually been used by a user.	(Burton-Jones and Straub 2006)
Effective use	Using a system in a way that increases achievement of the goals for using the system.	(Burton-Jones and Grange 2012)
Continued use	An individual's intention to continue using an IT.	(Cho 2016)

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2.3.2: User Adaptation to IT

This section aims to present a review of prior studies relating to user adaptation to IT during the event of an IT-induced organisational change. IT users engage in adaptation during the post-adoption stage. User adaptation studies in IS literature reveal that user adaptation at the individual level of analysis has been studied using different, yet conceptually linked, terms such as appropriation, adjustment, and even adaptation (Bruque et al., 2008; Kashefi et al., 2015). Understanding user adaptation to IT is of utmost importance, as IT implementation projects alter work processes, skillset needs and policies in organisations (Boudreau and Robey, 2005; Damanpour and Schneider, 2006, 2009). User adaptation studies provide insights into how individuals change or adjust their behaviours in order to adapt to changes brought about by IT implementation in their work environments.

Over the past few years, IS researchers have studied different aspects of user adaptation; for example, Tyre and Orlikowski (1994) define 'technological adaptation' as "the adjustment and changes following the installation of a new technology in a given setting" (1994, p. 99). These authors argue that the process of technological adaptation is not continuous and gradual, as is often presented in the IT innovation literature. They conducted a study to examine the implementation and adaptation of technologies that support production operations in manufacturing organisations. Findings from their study reveal the episodic pattern of technology adaptation by users at the initial stage of adaptation and highlight the importance of the initial stage of adaptation and stress that there is a limited window of opportunity for users to adapt to the new technology and change their adaptation behaviors. They also suggest that further adaptation will be highly unlikely unless some unusual event triggers subsequent episodes of adaptation activity (Tyre and Orlikowski, 1994).

Orlikowski (1996) outlines a perspective on organisational transformation in which she proposes change as an endemic to the practice of organising, and that change is brought about by situated practices where organisational actors improvise, innovate and adjust their work routines over time. She defines 'appropriation' as the "the continuous, progressive, mutual adjustment, accommodation and improvisations

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between technology and its users" (1996, p. 69). Orlikowski's (1996) study empirically examined the use of a new IT within an organisation over a period of two years. Findings from the study suggested that organisational practices and structure of the company changed considerably after the IT implementation, although the changes were not brought about by the IT itself, but rather the changes occurred through the ongoing, gradual, and reciprocal adjustments, accommodations and improvisations of the IT users (Orlikowski, 1996).

Boudreau and Robey (2005) define 'reinvention' as "the process where users deviate from prescribed work process and tweak a system to make it respond to their needs" (2005, p. 13). These authors conducted an interpretive case study of an ERP implementation in the context of a large government agency. Results from their study indicated that despite the system being taunted as a transformation agenda in the agency, the system users initially chose to avoid using the system as much as possible and, as time went on, they started to work around the system constraints in an unintended manner, in turn reinventing their system usage. Majchrzak et al. (2000) conducted a study to investigate the use of inter-organisational virtual teams for the development of a highly innovative product. These authors described technology adaptation process as "cycles of misalignments, followed by alignments, followed by more but smaller misalignments, gradually evolving to a state which the technology, the delivery system and the performance criteria are aligned" (2000, p. 571). Their findings indicated that the team initially experienced significant misalignments among the pre-existing organisational environment, group, and technology structures. The team went through series of adaptation processes such as modifying the group structures, the technology and the organisational environment, before successfully achieving the goal of the project.

Barki et al. (2007) proposed and tested the information system use-related activity (ISURA) construct with the aim of improving approaches to conceptualising and measuring IS use. ISURA is based on the premise that a broader focus is necessary when conceptualising IS use in order to better predict fundamental outcome variables such as organisational and individual benefits (Barki et al., 2007). Their study identified technology interaction behaviours (e.g., coordinating activities and

problem solving), task-technology adaptation behaviours (e.g., improvement and customisation of interfaces, software and hardware), and individual adaptation behaviours (e.g., reading manuals and gaining training) to define the use of technology with the consideration of other activities that are not directly system use.

Bruque et al. (2008) define adaptation as "the process by which individuals learn, negotiate, enact and maintain behaviors appropriate to a given organizational environment" (2008, p. 178) in their study of the influence of social networks (supportive and informational networks) on employees' adaptation to new technology in organisations. The study was conducted in a large financial company, surveying 371 employees. Their results indicated that several aspects of the social networks relate to quality of employees' adaptation processes and that the strength, size and density of information network significantly predicts an employee's adaptation to the new IT.

Sun (2012) argues that post-adoptive system use is often characterised by cycles of adaptation, in which users actively revise their IT usage. He conceptualises the Adaptive System Use (ASU) construct in order to study how and why individual users revise and alter their system use at the feature level (Sun, 2012). He develops an ASU model based on Louis and Sutton's (1991) study of how people switch to active thinking from automatic thinking. His model identifies three antecedents of ASU (discrepancies, novel situations and deliberate initiatives) and two moderators (facilitating conditions and personal innovativeness in IT). Findings from the study suggested that the three identified antecedents significantly influence ASU and confirms the moderating effects of personal innovativeness in IT usage. The findings also indicated that individual users engage in different ASU behaviours under different triggering conditions (i.e., discrepancies, novel situations and deliberate initiatives).

Table 2.4 provides a summary of the user adaptation studies reviewed in this section.

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Table 2.4 User adaptation studies from IS literature

Conceptualisation	Definition	Source
Adaptation	The adjustment and changes following the installation of a new technology in a given setting.	(Tyre and Orlikowski 1994)
Appropriation	The continuous, progressive, mutual adjustment, accommodation and improvisations between technology and its users.	(Orlikowski 1996)
Reinvention	The process where users deviate from prescribed work process and tweak a system to make it respond to their needs.	(Boudreau and Robey 2005)
Adaptation	The cycles of misalignments, followed by alignments, followed by more but smaller misalignments, gradually evolving to a state which the technology, the delivery system and the performance criteria are aligned.	(Majchrzak et al. 2000)
Information System Use-related Activity (ISURA)	The process of users' technology interaction behaviors, task-technology behaviors and individual adaptation behaviors when using an IT to accomplish a task.	(Barki et al. 2007)
Adaptation	The process by which individuals learn, negotiate, enact and maintain behaviors appropriate to a given organizational environment.	(Bruque et al. 2008)
Adaptive System Use (ASU)	User's revisions regarding what and how features are used.	(Sun 2012)

Together, these studies indicate that when an organisation implements a new IT system, users may respond in different ways and their adaptation behaviours may evolve over time. These studies also show that adaptation behaviours are influenced by contextual structures in a users' work environment such as work tasks and systems-related factors (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; DeSanctis and Poole, 1994). For example, users may engage in behaviours and activities aimed at facilitating their adaptation, such as attending training or seeking additional help from their colleagues. Additionally, users may also customise the IT system to fit their current work processes, while in other cases users may modify their work processes to fit the IT system. If users perceive that an IT system will offer benefits such as improved efficiency, effectiveness and so forth, users are likely to respond to the IT system positively, whereas if users perceive that an IT system will have negatives consequences over them, they are

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likely to respond in a negative manner (Bhattacherjee et al., 2017; Davis, 1989; Taylor and Todd, 1995; Venkatesh et al., 2003).

In summary, it has been seen from this review that adaptation of the IT system, the user and the work context are key factors that influence the successful deployment and continued use of a new IT system in an organisation. However, despite various findings that can be related to the concept of user adaptation, these findings do not fully provide an integrated theoretical perspective for understanding the multifaceted process of user adaptation and how adaptation behaviours change over time. Additionally, little attention has been paid to what factors triggers users' transition in behaviour and responses to IT system implementations in organisations, with the exception of a few studies (e.g., Bala and Venkatesh, 2016; Barki et al., 2007; Beaudry and Pinsonneault, 2005; Saga and Zmud, 1993; Stein et al., 2015). As such, no systematic studies of triggers and contextual constraints of user responses in IT use have been conducted.

Recently, Coping Theory has emerged as a theoretical lens for studying user responses to IT in organisations (Beaudry and Pinsonneault, 2005; Fadel and Brown, 2010; Kashefi et al., 2015). Coping Theory provides a framework for understanding how individuals respond to changes in their environment from a general context (Lazarus and Folkman, 1984). IS researchers have adopted Coping Theory in an IT context, in order to understand user responses to IT in organisations. In the following section, an overview of Coping Theory and its use in IS research is presented.

2.4: Coping Theory and Its Components

This section provides a detailed explanation of Coping Theory and its inherent components. The section begins with a brief presentation of the three main models that have been used to study coping in the field of psychology. This is done in order to establish the strengths of Coping Theory within the field of psychology. An overview of the coping process is presented, followed by arguments as to why Coping Theory is suitable for studying user responses to IT in IS research. The section concludes with a review of studies from IS research that draw on coping

theory as a theoretical lens for understanding user responses to IT-induced changes in their environment.

In the field of psychology, three main models have been used to study coping (Folkman, 1992). The personality perspective considers coping as a personality trait that reflects an ability to effectively face environmental challenges (Grasha and Kirschenbaum, 1986; Lazarus and Folkman, 1984). In the ego-psychology perspective, coping is an unconscious adaptive defence mechanism that manages instinct and affect, reduces tension, and restores an individual's psychological equilibrium (White, 1974). These two models are useful for understanding certain individual behaviours, but nonetheless have their limitations and have received mixed support from empirical studies (Folkman, 1992; Lazarus and Folkman, 1984).

The contextual model of coping, which is of interest to this study, and further discussed in this section of the thesis, has received the most attention, and is widely used and accepted in the field of psychology (Beaudry and Pinsonneault, 2005; Lazarus and Folkman, 1984). This perspective defines coping as "constantly changing cognitive and behavioural efforts to manage (reduce, tolerate, or minimize) specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person" (Lazarus and Folkman, 1984, p. 141). Internal demands are personal requirements or desires that the environment must meet, such as an individual's desire to get challenging work versus the challenges that a specific job effectively carries (French et al., 1974; Lazarus and Folkman, 1984). External demands stem from the environment and must be met by individuals. They are related to the roles that an individual has to undertake in a given environment (e.g., organizations, institutions), for example a call centre employee position requiring a certain number of calls to be treated in a day.

Two main functions are achieved by coping: managing the issue that is causing the disruption/discomfort and maintaining an emotional and psychological equilibrium (Folkman, 1992; Lazarus and Folkman, 1984). In terms of the contextual model of coping, coping is viewed and studied in relation to certain events or situations, which are interpreted as being positive or negative, taking place in an individual's

environment. By doing so, a wide range of patterns emerge, where individuals can interpret a similar situation differently and also as an individual's coping acts can change in a different context and over a period of time (Beaudry, 2009; Beaudry and Pinsonneault, 2005; Folkman, 1992). Therefore, in the contextual model, coping responses are not unconscious defence mechanisms or stable features of personality, but rather are a person's perceptions and what he/she does in response to a change in a given situation or environment (Folkman, 1992).

2.4.1: An Overview of the Coping Process

An individual undergoes two key sub processes that continuously influence each other while going through the process of coping (Lazarus, 1966; Lazarus and Folkman, 1984). The first sub-process is the 'appraisal', which is the cognitive evaluation of a particular event or situation; and the second sub-process is the 'coping acts/efforts', which are cognitive and behavioural efforts exerted to manage the event or situation. These sub-processes are discussed in detail in the following paragraphs.

Appraisal starts by an individual appraising (cognitively evaluating) a situation or event. The appraisal sub-process has two steps, the 'primary' and 'secondary' appraisal. In the primary appraisal process, an individual assesses the nature of an event or situation and its personal importance (Folkman, 1992; Lazarus and Folkman, 1984). This prompts an individual to ask questions such as "what might I gain or lose in this situation?" in response to a change or disruptive situation. In that moment, an individual tries to understand the consequences and significance of the disruption to him/her personally (Folkman, 1992). Coping Theory suggests three categorisations for disruptive events: challenge; threat; or loss (Folkman, 1992; McCrae, 1984). Empirical studies in the field of psychology have shed more light on the concept of threat and loss, showing that the two concepts tend to be confused by people (McCrae, 1984). Threat/loss are related to events expected to have negative consequences, while challenge is often associated with events that can have positive consequences (Lazarus and Folkman, 1984; McCrae, 1984). Coping Theory also states that situations or events are multifaceted and are usually

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appraised as having both positive and negative dimensions (i.e., threat and challenge), but that their perceived importance differs across individuals and events.

During the secondary appraisal process, an individual evaluates the coping options available to him/her. The individual determines the level of control that they have over the situation and what they feel they can do about it with the coping resources available to them (Lazarus and Folkman, 1984). The term "resources" is interpreted in a general sense and includes physical, material, financial, social and psychic resources as well as specific attitudes, knowledge and skills an individual can use to respond to a disruption in their environment (Lazarus and Folkman, 1984). In this situation, an individual will ask questions – like "what are my options for coping"? "What can I do"? And "how much control do I have over the situation"? – all in an effort to deal with the stressful/disruptive situation. An individual is more likely to appraise a situation positively (i.e., challenge) with perceived control, whereas a situation where an individual has no or very limited control will be appraised negatively (i.e., threat).

As an individual may appraise a situation as positive or negative, the same individual can change his/her perception about that particular situation with time, as a result of new information in the environment. This change or modification of appraisal is termed 'reappraisal' (Lazarus, 1966; Lazarus and Folkman, 1984). Cognitive appraisals depend on an individual's subjective interpretation on an event in his/her environment, therefore, any change in information will lead to reappraisal in the coping process (Lazarus and Folkman, 1984).

Coping Acts/Efforts, the second process, has two main sub-processes according to Coping Theory, which are 'problem-focused' and 'emotion-focused' coping acts. These two acts strongly depend on the combination of cognitive and behavioural acts. When an individual engages in problem-focused coping acts, the individual aims at managing the disruptive situation or event itself. The individual will work towards taking advantage of the situation or work towards solving the problem. Problem-focused acts are stirred towards changing the environment, by altering environmental barriers, resources, procedures and pressures. These acts may also

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be stirred inwards towards an individual, by shifting levels of aspiration, learning new skills or procedures and developing new standards of behaviour (Lazarus and Folkman, 1984).

Emotion-focused coping acts are focused on one's self and are aimed at regulating personal tensions and emotions, reducing emotional distress and restoring a sense of stability. These acts change an individual's perception about the situation, but do not change the situation itself (Lazarus and Folkman, 1984). An individual engages in emotion-focused acts by engaging in positive comparison (i.e., comparing one's situation to others who are worse off), minimizing the threats (i.e., maintaining hope and refusing to acknowledge the negative sides of the event), seeking psychological support, avoidance and self-deception (i.e., denying the facts and their implications) (Lazarus and Folkman, 1984). Both problem- and emotion-focused coping acts are used together in most situations, but the effort invested in each type of act depends on an individual's appraisal of the situation (i.e., primary and secondary appraisal) (Folkman, 1992; Lazarus and Folkman, 1984).

The outcomes of the coping processes vary from one individual to another – emotion-focused acts if successful, may lead to stress and strain reduction, restoration of emotional and psychological stability and positive reappraisal, while problem-focused coping acts may lead to increase in skills and knowledge of an individual, and reduce negativity and uncertainty. Coping acts and their outcomes may also lead to a process of reappraisal, triggering another wave of coping acts (Lazarus and Folkman, 1984). Coping Theory also highlights that in extreme cases when a situation or an event is perceived as a threat with no or a low level of control, individuals might withdraw from the situation. For example, an individual may quit their job or seek a transfer. Psychologists have highlighted three periods in which the entire coping process can occur: the 'anticipation period' (i.e., before the event actually occurs); the 'impact period' (as the event happens); and the 'post-impact period' (i.e., after the event has taken place) (Folkman, 1992).

Figure 2.1 provides a diagrammatic illustration of the coping process.

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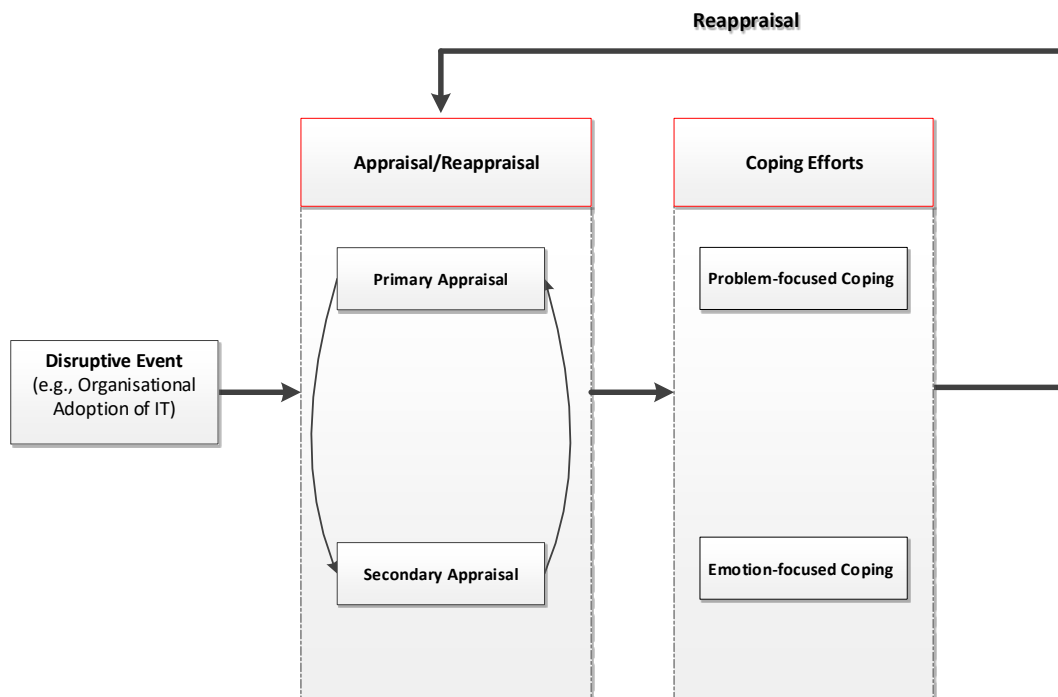
Figure 2.1 The coping process (Lazarus and Folkman, 1984)

2.4.2: Why Coping Theory Suits User Responses Research

This section aims to establish why Coping Theory is considered to be a reasonable and relevant theoretical lens for studying user responses to IT. Coping Theory is a process-oriented theory that can help to shed light on the processes of user responses to IT-induced organisational changes. Coping Theory shares three essential characteristics with existing user responses to IT research (Beaudry, 2009; Beaudry and Pinsonneault, 2005). First, both research streams deal with how an individual responds to key disruptions or changes in his/her environment (Beaudry and Pinsonneault, 2005; Leonard-Barton, 1988; Majchrzak et al., 2000; Tyre and Orlikowski, 1994). Behavioural and adaptation studies in IS research often focus on a user's response to IT-induced organisational changes, since these changes have a significant impact on an IT user. This is similar to stressors in Coping Theory, because IT-induced changes can be perceived as negative or positive depending on how an individual interprets the situation, as these changes can generate strain and stress (Cartwright and Cooper, 1996).

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Coping Theory and user response research both focus on similar components in the relationship between an individual and his/her environment. These components include acts related to the environment (e.g., modifying one's working procedures, convincing or confronting other, customizing applications) and acts related to one's self (e.g., psychological distancing, learning new skills) (DeSanctis and Poole, 1994; Tyre and Orlikowski, 1994). Additionally, both adaptation and coping acts can be focused towards restoring emotional stability such as avoidance and wishful thinking (Beaudry and Pinsonneault, 2005) or can be focused towards managing the situation by adapting a new technology to make it fit with one's work routine (Goodhue and Thompson, 1995).

Another important similarity between Coping Theory and user response studies is that both are interested in the vast array of potential outcomes of the coping/adaptation process, including increase in job effectiveness and efficiency, improved job satisfaction, solving problems brought about by disruptions and restoring emotional stability (Bala and Venkatesh, 2016; Beaudry, 2009; Beaudry and Pinsonneault, 2005). As a process-oriented theory, Coping Theory can also improve our understanding of user responses to IT, as prior research has mainly focused on the antecedents of IT adoption and usage. Variance models do not shed full light on the adaptation process, but rather give more emphasis to acceptance and rejection of technology (Barki et al., 2007; Benbasat and Barki, 2007). Therefore, Coping Theory provides a well-established and empirically validated theory to further investigate and improve our understanding of the user responses to IT-induced organisational changes.

2.4.3: Coping Theory in IS research

This section aims to review prior IS studies that draw on Coping Theory as a theoretical lens. Organisational changes are normally accompanied by major adjustments and alterations to work processes, job roles, skillsets, and so forth, which often come with a huge burden and stress. Various reactions to organisational change – such as merger and acquisitions, restructuring, downsizing and layoffs – have been studied through the theoretical lens of Coping Theory (Ashford, 1988;

Judge et al., 1999). In most cases, organisational change decisions are strategic in nature, and are usually imposed from the top management to the lower level employees, with most employees having little or no influence over the implementation decision and overall process (Ashford, 1988; Bala and Venkatesh, 2016). Prior IS research (e.g., DeSanctis and Poole 1994; Leonard-Barton 1988; Tyre and Orlikowski 1994) has presented significant evidence that major changes to existing IT and new IT implementation bring about significant changes to organisational members. However, our understanding of user responses to IT-induced organisational changes is still limited, particularly in mandatory use contexts (Ashford, 1988; Barki et al., 2007; Bhattacherjee et al., 2017; Tyre and Orlikowski, 1994).

Coping Theory offers directions to examine user responses in relation to IT-induced organisational changes, as the theory has been tested numerous times in different settings in IS research, providing relevant insights to the antecedents and outcomes of IT users (Beaudry, 2009). Coping Theory has been used in IS research to study how managers cope with rapid IT-induced changes (Benamati and Lederer, 2001), users' reactions to new IT implementations in their organisations and their effects on users' job outcomes (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005), the role of emotions in IT-related user adaptation (Beaudry and Pinsonneault, 2010), strategies related to stress and constant updating of technical skills by IT professionals (Tsai et al., 2007) and users' reactions towards software restrictions (Teo and Yang, 2007). These studies are discussed further in the following paragraphs.

Benamati and Lederer (2001) conducted a study on coping mechanisms that IT managers use to reduce problems associated with rapid IT changes in organisations. Sixteen IT managers were interviewed, uncovering 36 coping mechanisms. A survey was then administered to 246 IT managers, in which the results indicated that IT managers successfully employed all 36 initially-uncovered coping mechanisms to deal with rapid IT changes. Results from the study also indicated that IT managers relied more on problem-focused coping efforts than emotion-focused coping efforts. Drawing on Coping Theory, Beaudry and Pinsonneault (2005) proposed the Coping Model of User Adaptation (CMUA) to investigate how

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and why IT users adapt to the implementation of a new IT in their work environment. Six account managers were interviewed in this study, yielding four adaptation strategies (benefits satisficing, benefits maximizing, disturbance handling and self-preservation), and resulting into three individual level outcomes (improving user effectiveness and efficiency, minimizing the perceived threats of the technology, and restoring emotional stability).

Tsai et al. (2007) investigated how IT professionals perceive and cope with stress associated with the need for them to constantly update their technical skills. Fourteen IT professionals were interviewed and their results suggested that IT professionals rely on both problem-focused and emotion-focused coping strategies to reduce distress associated with the threat of skills obsolescence. Yang and Teo (2007) conduct a longitudinal study to investigate coping behaviours triggered by free software trial restrictions, and the impact of the behaviours on the users' willingness to purchase the full software version. These authors argue that coping acts are influential, and act as crucial intermediaries connecting the negative disconfirmation that restrictions impose on time, functionality and subsequent decisions to make a purchase. Yang and Teo's results suggest that negative disconfirmation on time limit expectation is positively related to controlling negative emotions toward trial restrictions, while negative disconfirmation on functionality restrictions is related to action coping (i.e., problem-focused coping acts) which is, in turn, related to users' willingness to pay for the full software package.

Liang and Xue (2009) studied users' cognitive process to avoid IT threats by developing the Technology Threat Avoidance Theory (TTAT). Results from their study indicated that users can both engage in problem-focused and emotion-focused coping to minimize IT threats, citing examples where users avoid an IT that they perceive to be a threat in order to minimize the negative consequences of that IT. Their results also indicated that emotion-focused coping helps users restore emotional stability, as users do not focus on controlling the perceived threat brought about by the IT implementation.

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Beaudry and Pinsonneault (2010) draw on the CMUA (Beaudry and Pinsonneault, 2005) and the appraisal theory of emotions (Lazarus and Folkman, 1984) to extend the work of Beaudry and Pinsonneault (2005). They developed a model that classifies emotions into four distinct types (challenge, achievement, loss, and deterrence). They tested the model by surveying 249 bank account managers to investigate the direct and indirect relationships between emotions and IT use, which they suggested subsequently influence adaptation behaviours. Similarly, Fadel and Brown (2010) extended the CMUA by integrating the model with the Unified Theory of Acceptance and Use of Technology (UTAUT) to examine how adoption related IS perceptions influence user level post-adoptive appraisal. Their work derived a model that gives more emphasis in the appraisal stage of the coping process. They also added a set of IS perceptions and outcomes to understand various user reactions to the use of an IS.

Bala and Venkatesh (2016) investigated the influence of adaptation behaviours on employee job outcomes during and after the implementation of new disruptive IT systems in organisations. As a result, the authors developed a nomological network model of technology adaptation behaviours, building on Coping Theory and CMUA. They validated their model in two field studies, using a survey as a means for collecting data. Their study identified four different adaptation behaviours (exploration-to-innovate, exploitation, exploration-to-revert, and avoidance). Additionally, this study reports that adaptation behaviours have an influence on two key job outcomes (job performance and job satisfaction).

Liang et al. (2019) investigate how individuals cope with IT security threats. The authors argue that in order to reduce IT security risks, it is of utmost importance to first understand how individuals volitionally cope with IT security threats, since IT users often behave emotionally beyond reasoning when faced with IT security threats. Drawing on Coping theory (which considers both cognition and emotions) to understand users' security behaviours, the authors propose a model and test the model using two studies, an experiment with 140 individuals, followed by a survey of 934 respondents. Results from the two studies indicate that both inward emotion-focused coping (EFC) and outward emotion-focused coping (EFC) are stimulated by perceived threat, but that only inward EFC is reduced by perceived avoidability.

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Also, inward EFC and outward EFC are found to have opposite effects on problem-focused coping (PFC). While inward EFC impedes PFC, outward EFC facilitates PFC. The study provides a more complete understanding of individual user behaviour under IT security threats and further examines the relationship between EFC and PFC during the coping process.

Chen et al. (2019) highlight that despite the increasing popularity of mobile applications in commerce, there is an emerging trend where users are abandoning these applications due to constant push notifications. Hence, the authors conduct a study to understand users' discontinuance behaviour towards the use of mobile shopping applications with push notifications and the coping strategies users exploit to protect themselves from technostress. Coping Theory is applied in a $2 \times 2 \times 2$ factorial design experiment with manipulations on perceived information overload, perceived intrusiveness, and perceived reward in their study. Their findings reveal that users are affected by perceived information overload and perceived intrusiveness from push notifications in shopping applications and they deal with these stresses by using disturbance handling strategies and self-preservation strategies. However, the use of these two coping strategies vary from one user to another. Also, the findings are of benefit to both mobile shopping application users and the retailers that use the technologies to provide products and services more efficiently to their customers.

Table 2.5 provides a summary of the above reviewed studies that employ the use of coping theory in IS research.

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Table 2.5 Selected user responses studies that apply Coping Theory in IS literature

Research Focus	Source
Explores coping mechanisms IT managers use to reduce problems associated with rapid IT changes.	(Benamati and Lederer, 2001)
Investigates how and why IT users adapt to the implementation of a new IT in their work environment using the Coping Model of User Adaptation (CMUA).	(Beaudry and Pinsonneault, 2005)
Investigates how IT professionals perceive and cope with stress associated with the need for them to constantly update their technical skills.	(Tsai et al., 2007)
Studies coping behaviours triggered by free software trial restrictions, and the impact of the behaviours on the users' willingness to purchase the full software version.	(Teo and Yang, 2007)
Studies users' cognitive process to avoid IT threats by developing the Technology Threat Avoidance Theory (TTAT).	(Liang and Xue, 2009)
Investigates the direct and indirect relationship between emotions and IT use, which subsequently influences adaptation behaviours by drawing on the CMUA and the appraisal theory of emotions.	(Beaudry and Pinsonneault, 2010)
Examines how adoption related IS perceptions influence user level post-adoptive appraisal by extending the CMUA and integrating the model with the Unified Theory of Acceptance and Use of Technology (UTAUT).	(Fadel and Brown, 2010)
Investigates the influence of adaptation behaviours on employee job outcomes during the implementation of a new disruptive IT system, by developing a nomological network model of technology adaptation behaviours based on the coping theory and the CMUA.	(Bala and Venkatesh, 2016)
Investigates how individuals cope with IT security threats by drawing on Coping Theory (which considers both cognition and emotions) to understand users' security behaviours.	(Liang et al., 2019)
Studies users' discontinuance behaviour towards the use of mobile shopping applications with push notifications and the coping strategies users exploit to protect themselves from technostress, by applying Coping Theory in a $2 \times 2 \times 2$ factorial design experiment.	(Chen et al., 2019)

Overall, Coping Theory offers a preliminary framework for investigating a full range of individual factors relating to IT-induced changes in organisation; however, it does not offer the conceptual tools for understanding the relationship between individual factors and contextual factors, and how these factors evolve over time. Additionally, since primary appraisal takes place in an organisational context, factors such as management support, subjective norm, power and organisational culture may have an influence on one's primary appraisal (Bala and Venkatesh, 2016; Davis, 1989).

Although Coping Theory and its extensions offer rich insights into individuals' IT use, adaptation processes and strategies, there has been a limited understanding of specific user responses in the event of an IT-induced organisational change, and the antecedents of these responses. More recently, Bala and Venkatesh (2016) have tried to address this gap by looking at the influence of user participation and involvement, training effectiveness, and management support, but their study does not look at the influence of social factors such as subjective norm and colleague interactions. Additionally, as with the vast majority of prior research on user responses to IT, their study was conducted in a voluntary use context. In addition, prior research has paid little attention to the factors that trigger transitions in user responses to IT over time, as changes in job roles and other organisational conditions may shape and reshape user responses (Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Elie-Dit-Cosaque and Straub, 2011; Sun, 2012). To address the highlighted limitations of the above reviewed studies, this study adopts the use of the coping theoretic model of user response to mandated IT use in order to provide richer insights into how users respond to mandated-IT induced changes in organisations, and how those responses evolve over time. The model is discussed in detail in the following section.

2.5: The Coping Theoretic Model of User Responses to Mandated IT Use

Having argued that there is a need to better understand user responses and transition in user responses in relation to mandatory IT-induced organisational changes, the coping theoretic model of user response to mandated IT use (Bhattacherjee et al., 2017) was chosen as the theoretical model to underpin this research. This model draws on Coping Theory and builds on its extensions in IS research. Having mentioned the strengths of Coping Theory and why it fits IS research in sub-section 2.4.2, and having reviewed the limitations of prior IS studies that have used Coping Theory in sub-section 2.4.3, the model seems the most suitable candidate for studying this research's area of interest. Next, it is important to discuss the underlying assumptions and components of the model. Therefore, the remainder of

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this section presents more details on the coping theoretic model of user response to mandated IT use.

2.5.1: The Taxonomy of User Responses to IT

The fundamental argument that this model is built upon is that acceptance and resistance behaviours can coexist in a mandatory IT use setting. Therefore, acceptance and resistance are distinct behaviours, and a common taxonomy of these two behaviours can improve our understanding of the different types of IT use behaviours that co-emerge in mandatory IT use contexts in organisations. Doty and Glick (1994) define taxonomies as "classification systems that categorize phenomena into mutually exclusive and exhaustive sets with a set of discrete decision rules" (1994, p. 232). Bhattacherjee et al. (2017) build on the work of Lapointe and Beaudry (2014) by modifying their typology of IT use (engaged, resigned, dissident, and deviant). Despite highlighting some limitations with the typology, Bhattacherjee et al. (2017) argue that the typology provides a useful starting point in efforts to understand different forms of user responses; additionally, it provides a better approach than building conceptual archetypes of responses from the beginning. The typology is modified into a taxonomy of four user responses, which include both emotional and behavioural responses to mandatory IT use at a given point in time. Table 2.6 provides a summary of the four user responses, which are discussed further in the following paragraphs.

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Table 2.6 The taxonomy of user responses to IT

Response Category	Emotional Response	Behavioural Response	Similar Categories from prior research
Engaged	-Passionate and/or enthusiastic about IT use. -Wanting to discover new features about IT. -A sense of ownership of the IT.	-Uses IT beyond required use (e.g., remote login from home). -Experiments with IT. -Modifies work procedures to optimize the use of IT and/or modifies IT to optimize work.	-Emergent use (Saga and Zmud 1993) -Trying to innovate (Ahuja and Thatcher 2005)
Compliant	-Generally positive about IT, but views IT use as less rewarding. -IT seen as a necessity and nothing more.	-IT use is purposeful but mechanistic. -Little or no innovation. -No customization of IT.	-Standardized use (Saga and Zmud 1993), -Routine use (Li et al. 2013)
Reluctant	-Fear of or reservations about IT. -IT seen as a distraction from work -Low expectations of IT.	-Uses IT only to 'meet quotas' or comply with mandates. -Occasional disengagement from IT use and training. -Tendency to fall back to old ways of work.	-Passive resistance (Lapointe and Beaudry 2014) -Resigned use (Lapointe and Beaudry 2014)
Deviant	-IT believed to be an affront/challenge to work and autonomy. -Desire to disown IT.	-IT non-use or use of 'proxies'. -Use of workarounds. -Voices opposition to IT. -Dissuades IT use among peers. -Employs delaying tactics. -Undermines or sabotages IT implementation.	-Active/aggressive resistance (Lapointe and Beaudry 2014)

Engaged response is characterised by innovative use and enthusiastic support of an IT system. Engaged use is evident through IT system use that is matched with positive emotions that show a user's passion and enthusiasm about using an IT system, resulting from a strong sense of comfort, ownership and control over his/her IT system usage. Engaged use has also been referred to as enhanced use (Bagayogo

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et al., 2014) and innovative use (Saga and Zmud, 1993) in IS research. Engaged use was originally derived from organisational commitment literature (Kahn, 1990). In IS research, engagement has been identified as a very important element in IT use and implementation (Lapointe and Beaudry, 2014). Engagement encourages personal development and reflects an individual's enjoyment in task performance, positive intentions and zeal to achieve mastery (Kahn, 1990). Engaged users are very satisfied with their IT system use and exploit more ways to use an IT system beyond its required use, in order to achieve the most benefits the IT may offer. These extensions may include personalisation of an IT system or modification of work-related processes for optimum performances.

Compliant response is characterised by sub-optimal use of an IT system. User with this type of response are supportive of an IT system, but are limited in their use of the technology. This may be due to lack of confidence or enthusiasm about the IT system. Users within this category use the IT system in a standard, mechanistic, structured, and repetitive way. Unlike engaged users, compliant users see IT use as a necessity, therefore they try less or do not attempt to extend the use of IT system beyond its minimum required use. Users within this category exhibit emotions that typically avoid risks and lower performance gains in comparison to engaged use. Compliant users are generally satisfied with their use, but may occasionally experience frustration with their inability to complete task with the IT system.

Reluctant response is characterised by IT use to comply with organisational mandates and rules by individuals who are resistant towards the IT system. This response category is similar to 'resigned compliance' in Lapointe and Beaudry's (2014) typology. Users with a reluctant response may use the IT system frequently, but only to abide by organisational rules and mandates. Reluctant users generally disengage themselves from the IT system and exhibit fear and frustration with their inability to use IT system, as a result lowering their morale. Bhattacherjee et al (2017) highlight that this type of behaviour may give "false hope of security for managers responsible for motivating IT use among employees" (2017, p. 5). The benefits realised from reluctant response is low, since users are emotionally disengaged from the IT system and see its use as nothing more than an organisational policy.

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Deviant response is characterised by disruptive IT system use by individuals who view the technology as a threat to their status, work and autonomy. Employee deviance is defined as "voluntary behaviour that violates significant organisational norms and in so doing threatens the well-being of an organisation, its members or both" (Robinson and Bennett, 1995, p. 556). Employee deviance is seen as a behaviour that violates organisational procedures and threatens organisational change initiatives. Deviant behaviour can take many forms, for example sabotage, pretending to use the IT system without actually using it, employee workarounds, influencing co-workers negatively, and spreading rumours. Users who respond in a deviant manner appraise the IT system as a threat and try to use their resistance to impose change and disown the IT system. Deviant responses often lead to little or no benefit from IT system use, and spread negative feelings within the organisation (e.g., creating tense relationships with supervisors and peers, low levels of motivation and in some cases resignation from the job).

2.5.2: Explaining the Taxonomy of User Responses to IT through Coping Theory

Bhattacherjee et al. (2017) draw on Coping Theory (discussed in section 2.4) to explore the underlying factors and processes driving their taxonomy of user responses to IT. The authors build on the works of Beaudry and Pinsonneault (2005), Elie Dit Cosaque and Straub (2011), and Stein et al. (2015) to empirically extend research into user responses to IT systems in real-world settings, particularly in mandatory use contexts, to postulate a unifying causal view of IT acceptance and resistance.

As discussed in sub-section 2.4.3, Beaudry and Pinsonneault (2005) proposed the Coping Model of User Adaptation (CMUA) to investigate how and why IT users adapt to the implementation of a new IT system in their work environment. Their study yields four adaptation strategies (benefits satisficing, benefits maximizing, disturbance handling and self-preservation), suggesting that when users appraise an IT system as an opportunity and believe that they have high control over an IT system and its use, users will adapt the IT system (e.g., by customizing and

adjusting the IT) and/or their work procedures (e.g., by modifying their sequence of activities) to obtain the most benefits of the IT ('benefits maximizing'). When users appraise an IT system as an opportunity, but believe that they have low control over the IT system, users will have minimal adaptation efforts ('benefits satisficing'). In such cases, users do not fully exploit the IT system. When users appraise an IT system as a threat and believe that they have high control (of mitigating the threat), users incline towards problem-focused coping to negate the IT threat ('disturbance handling'). When users appraise an IT system as a threat and believe that they have low control, users incline towards emotion-focused coping, such as distancing themselves from the IT system, making comparisons to worse circumstances, and wishful thinking to feel better about the situation ('self-preservation').

As shown in Figure 2.2, and in line with prior IT use research, Bhattacherjee et al. (2017) suggest that if users anticipate benefits (opportunity appraisal) from using an IT system (e.g., performance improvement), they are most likely to use that IT system. Therefore, if users appraise an IT system as an opportunity and believe they have high control over the IT system, they will respond in an engaged manner. Whereas, if users appraise an IT system as an opportunity, but believe they have low control over the IT system, they will respond in a compliant manner. However, if users appraise an IT system as a threat and believe they have low control over their IT system use or non-use, then they will respond in a reluctant manner. Similarly, if users appraise an IT system as a threat, but believe they have high control over their IT system use or non-use, then they will respond in a deviant manner.

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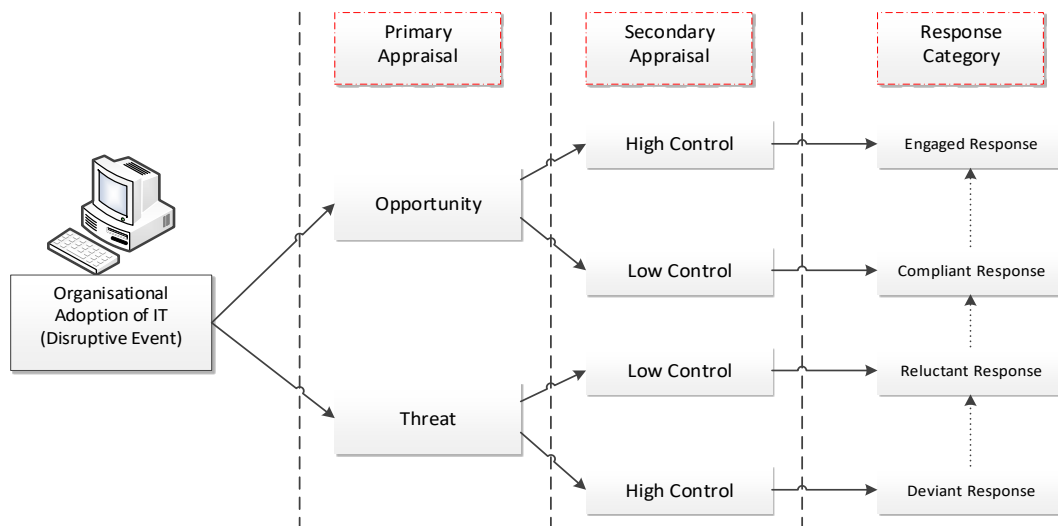
Figure 2.2 The Coping Theoretic Model of User Response to Mandated IT Use (adapted from Bhattacherjee et al. (2017))

2.5.3: Transition in Coping Response

Appraisal and coping are temporal processes that constantly reinforce each other. When users witness the outcomes of their adopted coping responses, they may re-evaluate and adjust their prior primary and/or secondary appraisals, in so doing triggering a new set of coping responses (Beaudry and Pinsonneault, 2005). For example, a user who appraises a new IT system positively (opportunity), but differs in perception of control (secondary appraisal), may employ an engaged or compliant response. If a user who employs a compliant response then feels his/her level of control has improved over time (e.g., through training or support), then the user might gradually move towards employing a more engaged response. As such, Bhattarcharjee et al. (2017) suggest that users who appraise an IT system as an opportunity and their secondary appraisal of control over IT system use changes over time from low to high, then their response may correspondingly change from a compliant to an engaged response.

On the other hand, users with low control over their IT system use may employ a compliant or reluctant response, depending on their appraisal of the IT system as positive (opportunity) or negative (threat). A change in their primary appraisal from threat to opportunity (e.g., through user education programs or training) may trigger a move from an overall reluctant response towards a compliant response. Further

migration is also possible if perceived control can be improved (e.g., through user training or involvement in the IT implementation process), in which case users may eventually transition to an engaged response. Therefore, Bhattarcharjee et al. (2017) suggest that where users see themselves as having low control over their IT system use and their primary appraisal of the IT system changes over time from threat to opportunity, then their response may correspondingly change from reluctant to compliant responses.

Finally, users who appraise an IT system as a threat may employ reluctant or deviant responses, depending on their perceived level of control. Interventions designed to reduce the perception of control over an IT system among users who employ a deviant response, for instance transferring them to organisational positions where they have less control over the IT implementation or isolating them from other employees to prevent them from voicing their negative perceptions about the IT system, may help change their coping responses from deviant to reluctant responses. As such, Bhattarcharjee et al. (2017) suggest that when users appraise an IT system as a threat and their secondary appraisal of control over the IT system changes over time from high to low, then their response may correspondingly change from deviant to reluctant responses.

2.6: Summary

The chapter has reviewed and presented literature on IT adoption in general, with special emphasis on user responses to IT-induced changes in organisations. The chapter reviewed and discussed findings of existing scholarly work related to IT acceptance, resistance, user behaviours and adaptation to IT. The chapter has also discussed Coping Theory, and explained why it suits IS research, and has analysed studies within IS literature that have adopted Coping Theory as a theoretical lens through which to study user responses to IT. Finally, and most importantly, this chapter has provided a rationale behind the choice of the coping theoretic model of user response to mandated IT use as the theoretical model underpinning this research. The next chapter describes the research design followed to conduct the empirical studies undertaken as part of this research.

Chapter 3: Research Methodology

3.1: Overview

This chapter provides an account of the research approach adopted for this study. Detailed descriptions and justifications are provided for the research assumptions, research design, data collection techniques, data analysis and ethical considerations that underpinned this study. Figure 3.1 depicts the steps taken, and the methods and techniques used, in the study.
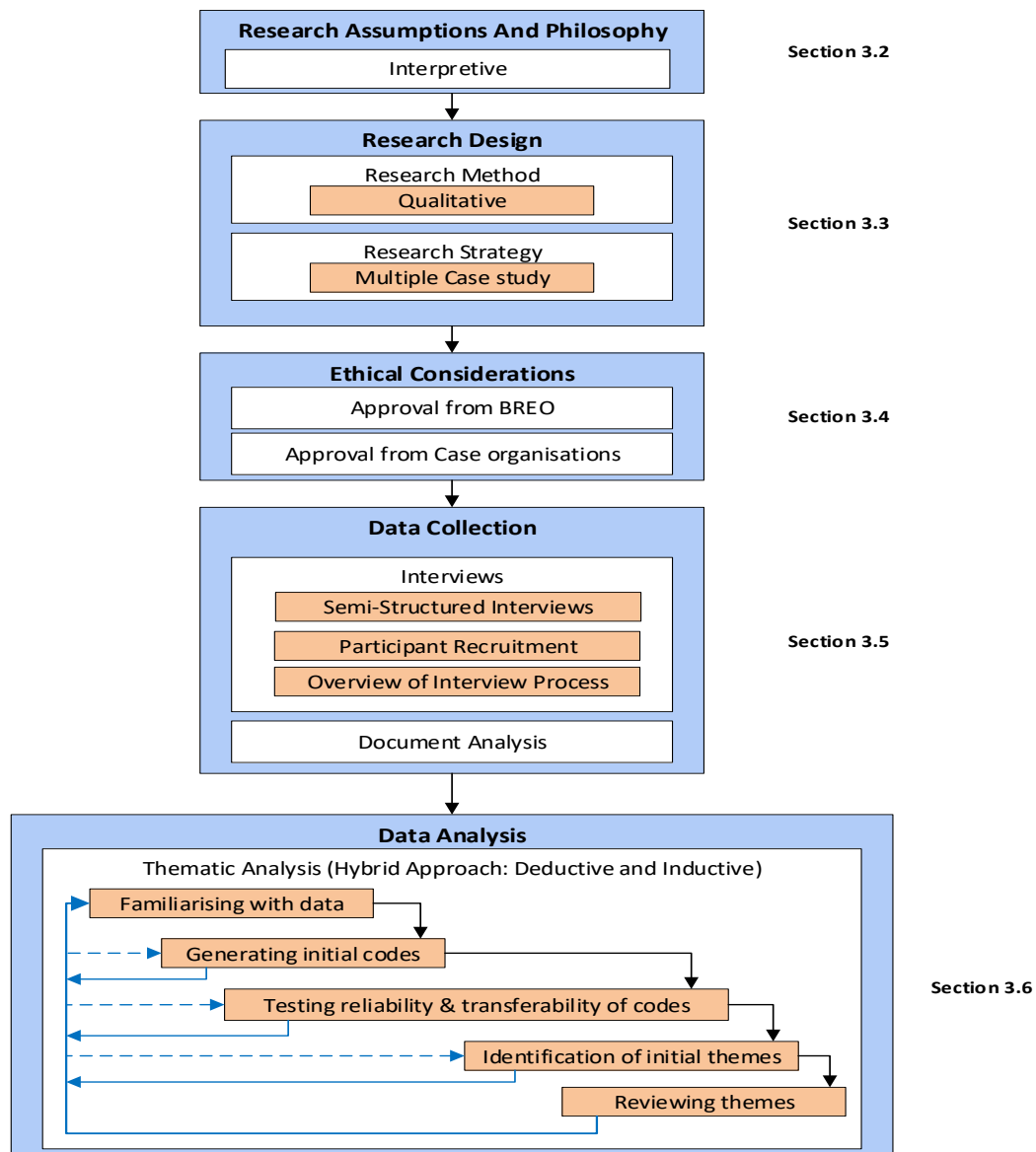
Figure 3.1 *The steps taken, and the methods and techniques used in this study*

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3.2: Research Assumptions and Philosophies

Every research undertaking is based on a philosophical assumption that provides the basis from which a researcher conceptualises a problem and works towards designing strategies to address the identified problem. The term 'research philosophy' refers to "a system of beliefs and assumptions about the development of knowledge" (Saunders et al., 2015, p.124). As a researcher, at every stage in a research project, an individual will make various assumptions to guide the project. These assumptions are classified into three categories: *epistemology* (assumptions about human knowledge); *ontology* (assumptions about the realities a researcher encounters in a research project); and *axiology* (assumptions about the influence of a researcher's values on the research process). Together, these assumptions (summarised in Table 3.1) are used to distinguish between various research philosophies (Guba and Lincoln, 1994; Saunders et al., 2015).

Table 3.1 Summary of the three research assumptions

Assumption	Description
Epistemology	Assumptions about knowledge (what constitutes valid, acceptable and legitimate knowledge) and how knowledge can be communicated to others.
Ontology	Assumptions about the nature of reality, which shape the way in which a researcher sees and studies a research object (e.g., individuals, organisations, artifacts, etc.).
Axiology	The role of values and ethics within a research process (i.e., how a researcher deals with both his/her own values and the values of research participants.

Within different fields of research, various research philosophies have been used to guide research activities; for instance, Saunders et al. (2015) highlight five research philosophies in business research: positivist; interpretivist; critical realism; postmodernism; and pragmatism. In IS research, three dominant research philosophies have been identified in the literature: interpretivist; positivist; and critical realism/research (Chen and Hirschheim, 2004; Liu and Myers, 2011; Orlikowski and Baroudi, 1991). Overviews of each of these three philosophies are provided in the following sub-sections and they are summarised in Table 3.2.

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3.2.1: The Positivist Philosophical Approach

The ontological assumption in the positivist research philosophy is that "an objective physical and social world exists independent of humans, and whose nature can be relatively unproblematically apprehended, characterised and measured" (Orlikowski and Baroudi, 1991, p.9). Orlikowski and Baroudi (1991) further explain the positivist philosophy by citing an example in an organisational context, where organisations are believed to have a structure and reality beyond the actions of organisational members. Therefore, a researcher guided by this philosophy will try to 'unveil' the objective physical and social reality by coming up with precise measures and constructs that will identify and gauge the dimensions of reality that are of interest to the researcher. The relationship between the researcher and object of inquiry is independent, as the researcher does not intervene in the object of inquiry, but rather plays a neutral and passive role in the investigation (Chen and Hirschheim, 2004; Creswell, 2012; Orlikowski and Baroudi, 1991).

Most positivist researchers dismiss the element of human agency and assume that humans behave rationally and intentionally, or at the least in a bounded rational way. The concept of bounded rationality implies that when individuals make decisions, their rationality is limited by the influence of the decision problem, their cognitive mindsets and the time they have available to make a decision (Chen and Hirschheim, 2004; Creswell, 2012; Orlikowski and Baroudi, 1991; Saunders et al., 2015). The epistemological belief of the positivist approach is concerned with the "empirical testability of theories, whether this requires theories to be verified or falsified" (Orlikowski and Baroudi, 1991, p.10).

3.2.2: The Interpretivist Philosophical Approach

The ontological and epistemological assumption in the interpretivist research philosophy is that "reality and knowledge are social products and are hence incapable of being understood independently of the social actors (including the researcher) that construct and make sense of that reality" (Orlikowski and Baroudi, 1991, p.13). Unlike the positivist research approach where the world is viewed as a

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fixed constitution of objects, the interpretive research approach views the world as "an emergent social process, that is an extension of human consciousness and subjective experience" (Burrell and Morgan, 1979, p.253).

The primary aim of interpretive research is to understand how members of a social group, through their engagement in a social process, enact their realities and give them meaning through sense-making, and to show how these interpretations, beliefs, and intentions help to constitute their social action (Creswell, 2012; Goldkuhl, 2012; Orlikowski and Baroudi, 1991; Saunders et al., 2015). In summary, the interpretive approach attempts to understand the intersubjective meanings of how social actors interpret life, and to explain why people act the way they do. In terms of epistemology, the interpretivist research approach believes that a social process is not captured in numbers or hypothetical deductions, but, rather, through understanding the social process by one involving him/herself inside the world of those generating it (Goldkuhl, 2012; Saunders et al., 2015; Walsham, 1993).

3.2.3: The Critical Realism Approach

The ontological assumption in the critical realism research philosophy is that "social reality is historically constituted, hence human beings, organisations, and societies are not confined to existing in a particular state" (Chua, 1986, p.619). This research philosophy assumes that everything possesses an unfulfilled potential, and that when people recognize these possibilities and potentials, they often change their material and social circumstances (Mingers et al., 2013; Orlikowski and Baroudi, 1991; Saunders et al., 2015).

Unlike the positivist and interpretivist approaches that seek to predict or explain the status quo, the critical research philosophy is more concerned with critiquing existing social systems and unveiling any conflicts and contradictions that may exist within their structures. The epistemological belief of the critical approach is that knowledge is grounded in historical and social practices (Chua, 1986). This approach is not yet well-established in the field of IS, unlike the other two approaches (Chen and Hirschheim, 2004; Mingers et al., 2013; Orlikowski and

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Baroudi, 1991; Smith, 2006), but continues to draw increasing interest among researchers in the field.

Table 3.2 Summary of the three dominant philosophies in IS research

Assumptions	Philosophies		
	Interpretivist	**Positivist**	**Critical**
Epistemology	Meanings are subjective and socially-constructed. Focuses on the details of a situation, the reality behind it, and the motivating actions.	Meaning is obtained only through an observable phenomenon which provides credible data and facts. Focuses on causality and law-like generalisations, summarising a phenomenon to its simplest elements.	Meaning is obtained through an observable phenomenon which provides credible data and facts. Insufficient data reflects inaccuracies in sensations (direct realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism). Focuses on explaining phenomena within single or multiple contexts.
Ontology	Reality is socially-constructed and subjective. Reality may change multiple times.	Reality is objective and independent of social actors.	Reality is objective and independent of human thoughts and beliefs or knowledge of their existence (realist) but is interpreted through social conditioning (critical realist).
Axiology	Research is bounded by values, as the researcher and the phenomena being researched cannot be separated.	Research is conducted in a value-free way, as the researcher is independent of the phenomena and maintains an objective stance.	Research is value-laden, as the researcher is biased by worldviews and cultural experiences that have an impact on the research.

3.2.4: The Philosophical Stance of this Study

As highlighted in section 3.2, a researcher's philosophical choice is influenced by their epistemological, ontological and axiological belief, the research questions and the nature of the phenomenon of interest (Bryman and Bell, 2007; Guba and Lincoln, 1994; Orlikowski and Baroudi, 1991). Therefore, the success of a research

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project depends on a researcher identifying his/her research identity. In this study, the researcher adopts an interpretivist philosophical approach, with the assumption that reality is subjective and is likely to differ with context and time. The researcher's perspective is that reality is gained only through social constructions such as individual interactions, consciousness, language and other artifacts (Klein and Myers, 1999, 2001).

The perspective taken is that the researcher has an important role to play in investigating the phenomenon of interest, by understanding and interpreting research findings during the research process. The research interest is viewed as an emergent reality that is in a continuous state of construction and reconstruction, and not an external reality that acts on and constrains individuals (Bryman and Bell, 2007). How users' respond to mandatory IT-induced changes in organisations involve complex interactions between people and environmental factors that shape their reality about the disruption in their environment. Therefore, the view is taken that that adopting an interpretivist philosophical approach will yield multiple valid realities.

Furthermore, user response to mandatory IT-induced changes is a multifaceted socially constructed behaviour. Through the use of an interpretivist approach, deeper insights into this complex phenomenon can be 'unravelled' (Klein and Myers, 2001; Orlikowski and Baroudi, 1991; Walsham, 1993). It is also important to reiterate that the aim of this research is not to develop a static or objective description of factor variables that lead to the acceptance or rejection of IT, but, rather, to understand the multifaceted realities of individuals through their interactions and experiences with IT and the drastic changes that it brings about in their work environment. Having explained the assumed research philosophy, section 3.3 provides a detailed explanation of, and justification for, the overall research design of this study.

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3.3: Research Design

A research design can be defined as a general plan of how a researcher goes about answering a highlighted research question or questions (Saunders et al., 2015). This section provides a description and justification for the methodological choices, strategies, and techniques used to conduct this research – all of which constitute the study's research design.

3.3.1: Research Method

A researcher may choose to adopt a qualitative, quantitative or mixed method research design. From a philosophical standpoint, qualitative research is commonly associated with the interpretivist philosophical approach, while quantitative research is more often associated with the positivist philosophical approach, especially when combined with highly-structured and predefined data collection techniques (Denzin and Lincoln 2011; Saunders et al., 2015). In terms of approach to theory development (which will be further discussed in section 3.6, which addresses data analysis), quantitative research is usually associated with a deductive approach (where a researcher focuses on using data to test a theory) rather than an inductive approach (where a researcher uses data to develop a theory). With qualitative research, theory development in some cases starts with a deductive approach to test an existing theory, while adopting the use of qualitative data collection techniques. In other cases, qualitative research may start with an inductive approach to develop a theory that does not exist in literature or to shed more light on an existing theory.

Quantitative research may use a single or multiple data collection techniques to collect data in a standardised manner, to examine and analyse the association between numerical variables (Creswell, 2009; Doyle et al., 2016; Saunders et al., 2015). Research strategies associated with quantitative research include experiments and surveys (Creswell, 2009; Saunders et al., 2015). Qualitative research may also use a single or multiple data collection techniques to collect data, with the use of guidelines in a less strict manner in order to allow for the emergence

of data naturalistically (Saunders et al., 2015). Research strategies associated with qualitative research include case study, ethnography and grounded theory (Eisenhardt and Graebner, 2007; Glaser and Strauss, 1967; Walsham, 2006; Yin, 2013). Mixed method research incorporates the use of both qualitative and quantitative data collection techniques and methods of analysis (Doyle et al., 2016; Johnson and Onwuegbuzie, 2004; Onwuegbuzie and Leech, 2006). These methods and techniques may be combined in a concurrent or sequential (exploratory, explanatory or multi-phase) form (Johnson and Onwuegbuzie, 2004).

This study adopted a qualitative research method, as its features fit the aim of investigating the complex nature of user responses to mandated IT-induced changes in organisations. Furthermore, a qualitative research method was seen as being most suitable in reflecting the research participants' meanings, and the relationships between the meanings, rather than measuring IT usage in some quantitative terms.

3.3.2: Research Strategy

Saunders et al. (2015, p.177) define a research strategy as "a plan of which a researcher will go about answering his/her research question". A research strategy is important as it serves as the methodological 'link' between a researcher's philosophy and subsequent choice of methods for data collection and analysis (Denzin and Lincoln, 2011).

The case study research strategy was adopted for this study. The case study strategy has been defined differently by numerous researchers, but one of the most accepted definitions is by Yin (2003, p.13) who defines a case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". A 'case' may refer to an organisation, a person, an event, or an artifact, as well as any other type of research subject. The case study is one of the most common research strategies used in IS research to study complex IT-related organisational phenomena (Liu and Myers, 2011). The use of case studies is significant in IS research as this strategy gives a researcher the opportunity to become a 'passionate

participant' by interacting with the actors involved in the study (Guba and Lincoln, 1994; Walsham, 2006).

The case study was selected as a research strategy for this study for several reasons. As reflected in its definition, a case study provides a researcher with an opportunity to study a phenomenon in its real-life context, therefore supporting the understanding of significant characteristics and also providing opportunities for deeper insights as events 'unravel' (Creswell, 1998; Eisenhardt, 1989). In line with the nature of this study's research questions, that is 'how' and 'why' questions, the case study strategy is considered as being very useful in real-life contexts, owing to the researcher's limited control over complex social phenomenon (Venugopal and Rao, 2011; Yin, 2003). Finally, case studies allow the flexibility to adopt multiple data collection techniques, which aids researchers in generating both exploratory and explanatory knowledge (Benbasat et al., 1987; Yin, 2013).

Three main steps have been identified for setting up a case study strategy: case study design; case study selection; and case study analysis (Eisenhardt, 1989; Yin, 2003). Case studies can be designed using a single-case or multiple-case design, and it is worth noting that both designs may lead to successful case studies. This study employed the use of a multiple-case design. Yin (2003) stresses that when a researcher has the choice and resources, multiple-case designs may be preferred over a single-case design, as even a 'two-case' case study may provide a researcher with a better case study than using a single-case design. The multiple-case design was appropriate for this study as the researcher had access to resources that ensured his ability to carry out multiple-case research with limited problems. Additionally, the multiple-case design provides rigorous avenues for quality research through corroboration of evidence from multiple case sites (Eisenhardt, 1989). Therefore, the researcher had a strong belief that with the availability of resources and time, the multiple-case study would provide better avenues for investigating the phenomenon of interest.

Cases for this study were not selected randomly, as the purpose of this study was not to test a large-scale hypothesis, but rather to understand the dynamic and complex process of user responses to mandatory IT-induced changes. Therefore, a

theoretical sampling method was employed based on the context and objectives of this study. Eisenhardt and Graebner (2007, p.27) explain that: "Theoretical sampling simply means that cases are selected because they are particularly suitable for illuminating and extending relationships and logic among constructs".

It is important to acknowledge the limitations raised by some researchers about the use of the case study research strategy. Galliers (1990) presents three arguments against the use of case studies in IS research. First, since social reality is interpreted by the researcher, studies conducted using case studies might be biased. Second, with the use of case studies, variables are hardly defined, making it almost impossible to control them. Finally, case study findings are very difficult, if not impossible, to generalise using statistical techniques (Galliers, 1990). Some researchers have responded to these criticisms and have provided justifications for the use of case studies in IS research. Yin (2004), for example, argues that case studies can be applied to draw theoretical propositions from empirical observations and that the validity of a case study to draw generalised inferences from a specific context or area of study has been validated by various scholars and studies (Lee and Baskerville, 2003; Walsham, 1995; Yin, 2003).

Walsham (1993) also responds to criticisms of the case study research strategy by arguing that the validity of a case study does not depend on generalisation and statistical figures, rather "on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them" (1993, p.15). Walsham (1995) emphasises that generalisations from a case study can encapsulate theories, concepts, implications and rich insights about a phenomenon of interest (Walsham, 1995, 2006).

3.3.3: The Role of the Researcher

Having chosen the research strategy, it is important for a researcher to determine the type of role and relationship he/she wants to sustain with their research participants (Walsham, 1995). Walsham (1995) states that a researcher can choose to be an 'outside observer/researcher' or an 'involved researcher'. As an outside observer, a researcher chooses a neutral stance and is not immersed in the social

situation. In contrast, as an involved researcher, the researcher becomes part of the phenomenon through action research, maintaining close ties with the participants whilst trying to exert some form of influence on the research participants (Walsham, 2006).

For this study, the researcher took the stance of an outside researcher, as the researcher was not aligned with any individual or group within the case study or aligned with any view or perception. The researcher did not try to influence the participants' opinions, and the interview questions were designed to be open. In that sense, the questions were not leading, therefore allowing the participants' to air their views about the phenomenon of interest. This reassured participants and other stakeholders that there was no bias or pressure on the part of the researcher, providing a more relaxed and conducive environment for the research process. Having outlined the key choice with respect to the study's research design, section 3.4 will present how ethical considerations related to the research were addressed.

3.4: Ethical Considerations

The importance of research ethics cannot be overemphasised in any research project. It is mandatory to adhere to standards that govern research activities at both the University and the case study organisations (Miller et al., 2012; Walsham, 2006). Before any form of contact was made or data was collected at participating organisations, the University's online research ethics course was completed, as mandated by the University. The participating organisations were then contacted by letter to describe the research outline and gain permission to conduct research in the organisations. Upon receiving the acceptance letters from the organisations (Miller et al., 2012), the researcher applied for ethics approval from the University's Ethics Committee through the Brunel Research Ethics Online (BREO) system (Nuhu et al., 2018). The researcher applied for ethical approval twice, receiving the first approval on the 15 August, 2017 and the second approval on the 3 July, 2018. Ethical approval documents and sample interview guides related to this study are provided in Appendix B and Appendix A.

Ethical safeguards are important as they ensure the integrity of the research, protect research participants and maintain safe and ethical conduct throughout the research process (Miller et al., 2012). The following section explains the selected data collection techniques and how the techniques were incorporated into the study.

3.5: Introducing and Selecting Research Techniques

As highlighted in sections 3.2 and 3.3, the choice of an appropriate data collection technique depends on the research philosophy, topic, method, and availability of data (Myers, 2009; Saunders et al., 2015). Data can be classified as either secondary data or primary data. Saunders et al. (2015) describe secondary data as data that were initially collected for other purposes, while primary data is data that has been specifically collected for a researcher's study. Yin (2003) suggests that evidence from case studies may be acquired from various sources – such as observations, interviews, archival records, documents, and physical artefacts – with each associated technique for collecting data from these sources having its merits and weaknesses, and the researcher being responsible for choosing the most appropriate based on the research approach and method to be used while conducting a study.

This study employed the use of both primary and secondary data to support the process of data triangulation. Triangulation is defined as the use of multiple research methods or data sources to identify different facets of an empirical situation (Patton, 1999). Table 3.3 provides a summary of each of the four types of triangulation which can be used for verifying and validating qualitative findings.

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Table 3.3 Triangulation types for qualitative inquiry (Patton, 1990)

Triangulation Type	Description
Methods Triangulation	Quantitative and qualitative methods are used in a complementary manner by validating quantitatively derived findings through qualitative methods or vice-versa.
Data Triangulation	Data is collected from multiple sources to cross-check and validate findings. For example, interview data can be validated by checking other sources such as documents and training manuals.
Theory Triangulation	Multiple theoretical perspectives are used in the interpretation of the phenomenon.
Investigator Triangulation	Multiple researchers analyse data from the same sources, applying the same research methods in an attempt to reduce potential bias while assessing the reliability and validity of findings.

By using a triangulation of multiple sources of data, the issue of reliability and validity can be addressed (Yin, 2003, 2013). In a similar vein, Lennie (2006) suggests that employing different modes of inquiry, for the purpose of triangulation, provides richer data and access to the views of a broad and diverse set of individuals involved in a phenomenon of interest. Consequently, it was deemed appropriate to adopt data triangulation and investigator triangulation for this study in order to gain a better understanding of the phenomenon of interest, while reinforcing the validity and reliability of the findings. Theory triangulation was not employed, as the theoretical lens adopted for this study was deemed robust enough to help achieve the highlighted aims of the study (see section 2.4). Owing to the nature of this study and its adopted philosophical choice (see section 3.2.4), method triangulation was not considered to be favourable methodological approach. The primary data source for this study was semi-structured interviews, while secondary data sources included direct document analysis and review.

3.6: Interviews

Having mentioned the use of both primary and secondary data for this study in the preceding section, this sub-section aims to provide details about activities associated with the data collection exercise. This includes justification for the choice of interview type, approach to developing interview guides, methods used to recruit interview participants, and an overview of the interview process.

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The qualitative interview is the most frequently used, and one of the most important, data collection tools in qualitative research (Myers and Newman, 2007; Schultze and Avital, 2011). An interview can be described as a 'social interaction' between two people (Myers and Newman, 2007), which involves a learning process (Edwards and Holland, 2013) and the interchange of views about a subject of interest (Taylor et al., 2015). Three basic approaches have been identified for conducting qualitative interviews: structured; semi-structured; and unstructured (Myers, 2009; Saunders et al., 2015). Structured interviews are based on standardised, prearranged and identical questions which are asked of each interviewee. Semi-structured interviews are fairly open and are based on a set of questions that serve as guidelines, allowing a focused two-way communication of the subject of interest. Unstructured interviews involve asking open-ended questions without any strict protocol or guide in order to discover participants' perceptions about a subject of interest (Oates, 2006).

Concerns have been raised about structured interviews as their strict protocol may hinder or limit participants from expressing their views further; and unstructured interviews may present the risk of not capturing any relevant data (Oates, 2006). Owing to the above-mentioned concerns, semi-structured interviews were chosen as the primary data collection technique for this study. Additionally, there are many advantages associated with the use of semi-structured interviews. One is that semi-structured interviews allow a researcher to untangle research issues and gain richer insights about a phenomenon of interest. In this way a researcher can explore the beliefs and perceptions of a participant with regards to the subject being investigated because semi-structured interviews do not prevent participants from further expressing themselves during the interview sessions (Edwards and Holland, 2013).

Semi-structured interviews are usually used with a predetermined list of open-ended questions referred to as a 'guide' (Schultze and Avital, 2011). This process allows for the emergence of potentially new insights related to the subject of interest, as the researcher can ask further probing questions to get better clarification about issues raised during the interview session (Gray, 2013). Therefore, semi-structured interviews seemed appropriate to allow the researcher to investigate and

get rich information about how users' respond to mandatory IT-induced organisational changes in their work environment. Having provided details and justifications for the use of interviews as a primary data source, the next sub-section focuses on how the interview instrument was developed for this study.

3.6.1: Development of Research Guide

This sub-section is designed to offer details about the development of the interview guide. Additionally, it aims to reflect how the interview guide relates to the chosen theory and relevant literature for this study. Given that the researcher settled for the use of semi-structured interviews to collect primary data, the researcher designed and developed the interview guide beforehand. While designing the guide, the researcher included key questions that would guide the flow of the conversation (Myers and Newman, 2007). In addition, this would ensure reliability and consistency in all the interviews, as research participants' would be asked similar questions during their interview sessions. Questions were carefully crafted to ensure free-flow of interaction, while also ensuring that questions were not leading in nature, and sought only to elicit responses from participants' (Stringer and Genat, 2004).

The interview guide was developed using the theoretical model adopted for this study (see section 2.5, and represented the elements embedded in the study's research questions (see section 1.2) and relevant literature. The interview questions were exploratory in nature, designed using words such as 'what', 'why' and 'how' to probe participants and elicit more information. As can be seen from table 3.4, the interview guide comprised questions related to the adopted theory, research questions and relevant literature for this study. The next paragraph presents a brief description of the questions in relation to each theme in the interview guide.

In the 'Participant Background'-themed questions, participants were asked to provide information about the number of years that they had been working in the organisation, a brief description of their job roles and responsibilities, and an appraisal of their level of IT literacy. Questions within this theme were asked in order to understand a participant's work environment, how they conducted their

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daily tasks before the change, and how they currently conduct their task after the IT implementation. For example, one question asked within this theme was 'how would you rate your level of IT/computer literacy?'

The 'Primary Appraisal'-themed questions attempted to understand participants' perceptions about the change brought about by the IT in their work environment. Therefore, the questions within this theme sought to capture participants' views on whether the change was actually needed, whether the change had been positive, negative or mixed, and the effects of the change on their work and well-being. For instance, one question that was asked was 'what are your views on the current IT system implementation?'

The 'Secondary Appraisal'-themed questions attempted to understand the participants' level of control with regards to their tasks, their selves, and the IT system. These questions were asked to elicit information such as a participant's ability (or otherwise) to customise the IT system, adjust tasks to fit the changes in the work environment, and so on. An example of a question that was asked was 'is the new IT system customisable?'

In the 'Implementation Characteristic'-themed questions, participants were asked to describe their experience with activities relating to the IT implementation, such as management support, user participation, training, and so on. These questions provided further insights into how the participants believed these activities shaped their responses to the change. A question that exemplifies this theme is 'did you participate in any stage of the system implementation project?'

In the 'User Response'-themed questions, participants were asked to describe their IT usage behaviours, the emotions that accompanied those behaviours, and how they coped with the IT-induced change in the work environment. For instance, a question in this theme was 'have you used the IT system to accomplish other tasks beyond what it was intended for?'

In the 'Conclusions'-themed questions, participants were asked if they had any furthers questions or concluding remarks regarding the study. Participants were also asked if they would agree to participant in follow-up interviews after a period of six

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months to see if they had experienced any changes in their responses towards the IT system implementations in their work environment.

Table 3.4 A summary of the research guide

S/N	Question Theme	Question Area	Justification	Source
1	Introduction	**Aims to set the interview in motion and introduce the participant to the study:** Exchange of pleasantries, Ethics, research background.	Literature	(Edwards and Holland, 2013; Schultze and Avital, 2011)
2	Participant Background	**Aims to identify the background of participants**: Years at the organisation, Computer Literacy, Job role, and responsibilities.	Literature, Theory	(Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005, 2010; Bhattacherjee et al., 2017; Elie-Dit-Cosaque and Straub, 2011; Lazarus and Folkman, 1984; Venkatesh et al., 2010)
3	Primary Appraisal	**Aims to identify the perceptions of participants about new/changed IT system:** Positive perceptions, Negative perceptions. Experience with prior IT system, organisational context.	Literature, Research questions, Theory	
4	Secondary Appraisal	**Aims to identify participants' level of control over the change:** Control over work, Control of Technology, Control over self.	Literature, Research questions, Theory	
5	Implementation Characteristics	**Aims to identify participants' perception of the characteristics of the change brought about by new/change IT:** Management support, User involvement, User Participation, Training, Communication.	Literature, Research questions, Theory	
6	User responses	**Aims to Identify participants' reaction to the change brought about by the new/changed IT:** IT usage behaviours, Coping Strategies, Emotions.	Literature, Research questions, Theory	
7	Conclusion	**Aims to conclude the interview session:** Closing remarks, Permission for follow-up interviews.	Literature	(Edwards and Holland, 2013; Schultze and Avital, 2011)

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Three different interview guides were designed: one for IT users; one for management; and a final one for IT support and training staff. The interview guides were used to obtain credible data relating to the stakeholders, the IT system and the factors that influenced certain responses from the participants. The main reason for interviewing different groups of participants was to elicit rich information relating to the perspectives of the organisation, its management, IT users, and staff. This also allowed the researcher to corroborate information gained from participants, thus improving data reliability (Creswell, 2012). In the following sub-sections, procedures relating to data collection, such as participant recruitment, the interview process, and ethical considerations will be discussed.

3.6.2: Participant Recruitment

Participant selection is a key element of research design, as this process has a profound effect on the quality of the overall research exercise (Creswell, 1998, 2012). For this study, the recruitment of participants was guided by theoretical sampling (Glaser and Strauss, 1967). Participants were not selected randomly, but rather on the basis of the likelihood that they could offer insight with respect to the phenomenon of interest. It was ensured that participants had a stake in the IT implementation projects that formed the focus of the individual case study and used the relevant IT system to conduct their work activities. The researcher worked with key contacts in the case organisations to identify suitable participants, as recommended by Benjamin and Levinson, (1993). The snowballing technique – which involves the use of participants to contact other respondents, which is particularly applicable when discussing sensitive issues (Streeton et al., 2004) – was also used to identify potential participants. The researcher did not pre-define or limit the number of participants for the study, but rather relied on theoretical saturation to trigger the end of the interview exercise. In this case, theoretical saturation is the point at which incremental learning is minimal owing to the researcher observing the same (set of) phenomena in interviews (Glaser and Strauss, 1967). The interview exercise was concluded once it was realised that no new concepts were emerging from the sessions.

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Table 3.5 Number of participants by organisation and by participant category

Participant Category	Case Organisations	
	Case A	Case B
Management	3	2
IT User	9	9
IT support & Training	4	2
Total	**16**	**13**

Table 3.5 presents the number of participants within each organisation and by participant category, based on their involvement in the IT implementation projects and how they used the IT system in their respective organisations. The following sub-section provides an overview of the interview process.

3.6.3: Overview of the Interview Process

Interviews were scheduled to take place over two phases. Phase one interviews were conducted in order to understand the participants initial response to the mandatory IT system implementation in their work environment, while phase two interviews were conducted to determine if the participants' response to the IT system implementation had changed over a period of time. The interview process was similar for each of the case organisations involved in the study. As noted earlier in section 3.6, the interviews were semi-structured in nature, with the researcher probing each participant to elicit insightful information during their interview session. Before the interview sessions began in each case organisation, the researcher gave a short briefing to the majority of the research participants (not all were able to attend each briefing as, in some cases, the presentation coincided with a busy time in their calendar). During the briefing sessions, the researcher described the background of the research, explained why the individuals had been identified as possible participants and addressed ethical and confidentiality issues associated with the study. Once the briefing had been completed in an organisation, the interview sessions were initiated.

The scheduling of individual interviews was based on the availability of the participants. There were days when multiple interviews were scheduled, while others took place on separate dates in order to accommodate participants' schedules. Table 3.6 presents a summary of the interview schedule for the two case

organisations. Interview sessions were mostly held in meeting rooms to minimise interruption during the session. In a few, exceptional cases, interviews were held in a participant's office. During the sessions, the researcher tried to build the participant's trust and create a stress-free environment by beginning with general conversation focused on telling the participant about his experiences in relation to IT implementation projects (for instance, talking about similar challenges he had encountered with IT implementation projects within developed and developing countries). This discussion made some participants feel more open to sharing their experiences in relation to how the use of the new/changed IT system had brought about changes in their work environment.

Table 3.6 Interview schedule

Case Organisation	Interview Timeline			
	Phase 1		Phase 2	
	Start	Finish	Start	Finish
Case A	4th January, 2018	11th January, 2018	17th August, 2018	23rd August, 2018
Case B	15th January, 2018	22nd January, 2018	27th August, 2018	31st August, 2018

After the brief discussion, the researcher then presented the participant information sheet and consent form (see Appendix C) to each participant, making sure that they fully understood the purpose of the interview and reminding them that the interview data would be fully anonymised. The researcher also stressed the importance of the participant understanding that he/she did not have to answer any specific question, for example, if he/she did not feel comfortable with the subject, and that he/she could end the interview session at any time without providing further justification.

All of the interviews were conducted in English. After gaining consent from the participants, the interviews were recorded. The researcher also took notes during the interview sessions to supplement the interview transcripts. Interview questions were asked to elicit information about a participant's background in the organisation, level of IT literacy, perceptions about the new/changed IT system, how they conducted their task before the IT implementation and how their work routine had changed after the implementation. Participants were allowed to ask questions during the sessions. The researcher encouraged participants to elaborate fully on their responses, and when the researcher realised a situation where a

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participant was drifting away from the topic, he/she was guided back in a polite manner by asking a question related to the topic. The researcher tried, as much as possible, to exercise prudence and not to lead participants towards responses. However, in situations where a participant was finding it difficult to identify an incident or to understand a question, a prompting statement was used by the researcher to help elicit a response. (For instance, "can you recall how your work was before the IT implementation" or "can you remember any particular issue that has influenced your current perception of the new IT system").

After the interview sessions, the researcher listened to all of the interview recordings and reflected on the associated notes taken during the relevant interview sessions. This was done to help the researcher to familiarise himself with the data, which it was felt would help in unveiling interesting concepts and themes from the interviews (see, section 3.9). This also aided the researcher in identifying points that were missed during the interview sessions, or concepts that would benefit from elaboration by the participants. In such cases, the researcher was able to contact the participants, who had made their contact details available during the interview sessions, to seek further information.

3.7: Document Analysis

As suggested by Saunders et al. (2015), secondary data may be used in research to support primary data. Sources of secondary data that were used in this study included organisational documents such as project implementation documents, training materials, organisational policy documents, meeting logs and background documents. Materials from organisational websites were also used as supplementary sources. The researcher collected, organised and analysed all secondary data, which was used with the primary data for the overall analysis.

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Table 3.7 A summary of secondary data sources

Case organisation	Data Source								
	Website	Training Documents	Minutes of Meeting	User Manuals	IT & Organisational policy documents	Press & News publications	Project Proposals	Organisational background documents	Project implementation plans
Case A	✓	✓	✓	X	✓	✓	✓	✓	✓
Case B	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 3.7 provides a summary of secondary data sources used for each case. The researcher used information from the organisations' websites, policy documents, and organisational background documents to explain actions, history, and past managerial decisions (Bryman and Bell, 2007). Through these documents, the researcher was able to understand the culture within the organisations, their modes of operation, and the need for change in work processes through IT implementation. Documents such as project proposals, implementation plans, and minutes of meetings gave the researcher a better understanding of the decisions and activities that took place before, during, and after the IT implementation projects. This enabled the researcher to corroborate and crosscheck information obtained from the interview sessions (Yin, 2013). The following section provides a detailed explanation of how the data collected for this study was analysed by the researcher.

3.8: Introducing the Data Analysis Process

Having detailed the activities and processes related to data collection in the previous section, this section aims to report how data collected for this study were analysed. Qualitative research has several techniques for conducting, recording and evaluating data analysis processes (Braun et al., 2014; Nowell et al., 2017), but it is the sole responsibility of the researcher to ensure the rigour and trustworthiness of the overall analysis process. To reflect the rigour and trustworthiness of the data analysis process of this study, the following sub-sections explain how the data analysis was conducted in a systematic and detailed manner.

Rich qualitative data was collected from the case organisations in this study. Due to the qualitative nature of the data, a large volume was collected (Grbich, 2012), which had to be analysed using systematic and rigorous data analysis techniques. Consequently, the researcher employed the use of thematic analysis. Thematic analysis is defined as "a method for identifying, analysing and reporting patterns (themes) within data" (Braun and Clarke, 2006, p.6). Thematic analysis may be used following a deductive, inductive or hybrid approach. The researcher adopted a hybrid approach while analysing the data (Fereday and Muir-Cochrane, 2006). A hybrid approach involves using both deductive and inductive approaches for data analysis. In an inductive approach, data analysis is not driven by a researcher's theoretical interest in the topic; rather, it is a data-driven analytical process. This means that the researcher will not try to code the data to fit in a pre-existing coding frame or analytical preconception (Boyatzis, 1998; Braun and Clarke, 2006b; Saunders et al., 2015). On the other hand, in a deductive approach, data analysis is driven by the researcher's analytical or theoretical interest in the topic. This means the deductive approach is more explicitly analyst-driven (Saunders et al., 2015).

The hybrid approach offered many advantages offered to this research effort. The hybrid approach complemented the research questions by allowing the tenets of user responses to be integrated deductively while allowing themes to emerge directly from the data. Put simply, this means that the coding of data was accomplished by initially using theoretical perspectives and also allowing the emergence of themes from the data (Fereday and Muir-Cochrane, 2006). Braun and Clark (2006, p.84) emphasize that the hybrid approach "gives a researcher the ability to examine the underlying ideas, assumptions, conceptualisations and ideologies" thereby, creating an environment for the interpretation of the influence of sociocultural and contextual factors of personal accounts put forward by research participants. Having discussed the suitability of thematic analysis for this study, the following sub-section provides a brief explanation of thematic analysis and highlights the steps that the researcher followed while analysing the data.

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3.9: Thematic Analysis

As highlighted in the previous section, thematic analysis was adopted as the analytical technique for this study. Thematic analysis is very powerful in the sense that it helps to identify and report patterns within data; these patterns are commonly labelled as themes (Braun and Clarke, 2006b). A theme represents something important about the research data in relation to the research interest and presents a meaning within the research data. Table 3.8 summarises the guidelines presented by Braun and Clarke, (2006) for conducting thematic analysis. Although the guidelines depict a linear process, it is worth highlighting that analysis for this study was an iterative and reflexive process (Braun and Clarke, 2006a; Nowell et al., 2017). The researcher moved back and forth through the data collection and the analysis process, submerging himself deeply into the collected data to identify concepts, themes, and relationships in relation to the phenomenon of interest.

Table 3.8 Phases of the thematic analysis (Braun and Clarke, 2006)

	Phase	Description
1	**Familiarising yourself with your data**	Start by transcribing the data if necessary, reading and re-reading the data, and noting down initial ideas.
2	**Generating initial codes**	Coding interesting features of the data in a systematic manner across the data set, collating data relevant to each code.
3	**Searching for themes**	Collating codes into potential themes, gathering all data relevant to each potential theme.
4	**Reviewing themes**	Checking if themes work in relation to the coded extracts (level 1) and the entire data set (level 2), generating a theme map of the analysis.
5	**Defining and naming themes**	Continue analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6	**Producing the report**	Select vivid, compelling extract examples, the final analysis of selected extracts, relating back of the analysis to the research questions and literature, producing a scholarly report of the analysis.

To complement the use of thematic analysis, the researcher adopted Lincoln and Guba's (1985) criteria for trustworthiness. Trustworthiness is very important in research, as it is among the ways in which researchers can persuade themselves and readers that their findings are worthy of attention (Lincoln and Guba, 1985; Nowell et al., 2017). Lincoln and Guba (1985) refined the concept of trustworthiness by

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presenting the criteria of credibility, dependability, transferability, and conformity to parallel the quantitative assessment criteria of validity and reliability (Nowell et al., 2017). Credibility concerns the 'fit' between the respondents' views and the presentation of those views by the researcher (Tobin and Begley, 2004). Lincoln and Guba (1985) claim that the credibility of a study is achieved when readers or other researchers are confronted with a recognisable experience from a study.

Nowell et al. (2017) describe transferability as the generalisability of an inquiry. In qualitative research, this concerns only to case-to-case transfer (Tobin and Begley, 2004). Dependability is concerned with ensuring that the research process is logical, traceable and well documented (Tobin and Begley, 2004). Lincoln and Guba (1985) argue that only when researchers are able to examine the research process will they be able to determine a research's dependability. These researchers also argue that confirmability is established when credibility, dependability, and transferability are achieved. Confirmability is concerned with ensuring the researcher's findings and interpretations are derived from the data, through the demonstration of how conclusions have been reached (Tobin and Begley, 2004). Figure 3.2 provides a diagrammatic illustration of the data analysis process employed in this study. The following sub-sections explain the incorporation of the above-described criteria with the use of thematic analysis to conduct the data analysis process in this research.
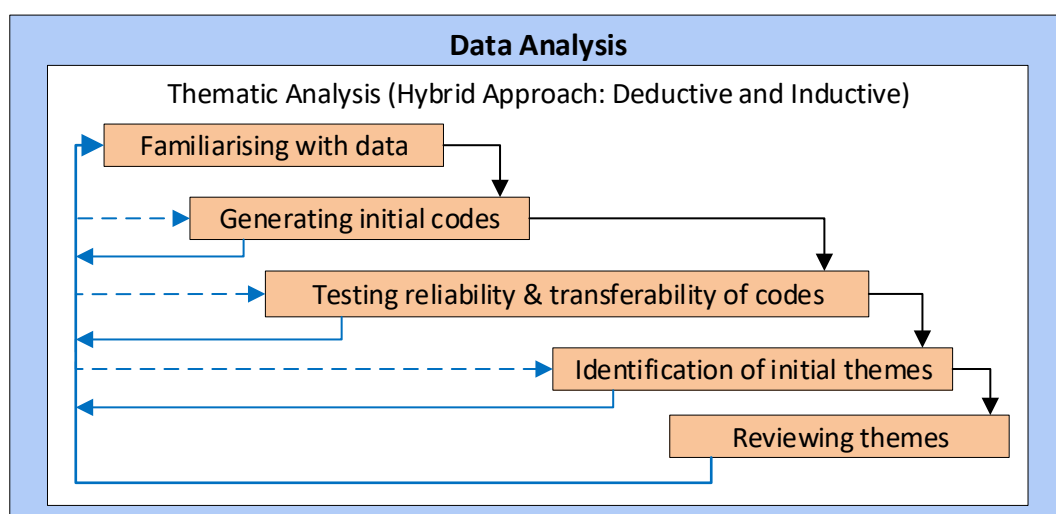
Figure 3.2 The data analyses process adopted for the study

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3.9.1: Familiarisation with the Data

As highlighted previously, the primary data source used in this study were digitally recorded semi-structured interviews. The researcher listened to each interview file at least once before commencing the transcription exercise. Transcription is a process of converting audio or video data into text files (Braun and Clarke, 2006b; Miles and Huberman, 1994). Data collection and transcription were conducted concurrently, this was done to allow the researcher to identify areas within the interviews that needed further probing or clarification (Creswell, 2012; Fereday and Muir-Cochrane, 2006). The transcription process took significant time as an hour-long interview took approximately five to seven hours to transcribe. The researcher transcribed every participants' words and expressions, such as "sigh". For instance, the use of "sigh" was mostly used to express negative emotions or activities related to stressful events during and after the IT implementation.

The transcription exercise was completed after the data collection process due to time limitations. This long process of transcription allowed the researcher to immerse himself into the data, through continuous listening, reading and writing up of the interviews into a Microsoft Word document. As suggested by Braun and Clark (2006), immersion allows the researcher to search for meaning, patterns, and concepts embedded within the collected data. Even though at this stage the researcher did not fully initiate the coding process, he took notes and started marking out ideas that would assist the coding process. Having become familiar with the data, the next step was to start generating initial codes, the process of which is described in the following sub-section.

3.9.2: Generation of Initial Codes

All recorded interview files were fully transcribed and transferred to a computer-aided qualitative data analysis software (CASQDAS) package, NVivo (version 11) (Bazeley and Jackson, 2013). The researcher chose NVivo as the CASQDAS for several reasons. First, the license was readily available to the researcher. Second, NVivo is considered an appropriate software package for conducting analysis of

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textual interview transcripts and other sources of qualitative data, as several researchers in both the field of IS and business have used NVivo to conduct data analysis (Bazeley and Jackson, 2013; Myers, 2009). Qualitative data analysis is, as noted earlier, a gradual, thoughtful, interactive and iterative process (Braun et al., 2014; Fereday and Muir-Cochrane, 2006). Therefore, it is important to emphasize that NVivo did not automatically analyse the data, but was used to manage and organise the data, helping to generate codes and facilitate the display of analysed data.

A code refers to "the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" (Boyatzis, 1998, p.63). The coding process involves identifying a feature of the data that appears interesting to a researcher and categorising data with similar meanings. The researcher engaged in coding to make each piece of meaningful data accessible for further analysis. The coding process began to develop both data-driven and theory-driven initial codes, themes and sub-themes to answer the research questions. Writing is an integral part of the analysis and should begin at the early phases of analysis (Braun and Clarke, 2006b). As such, the researcher developed a coding manual to serve as a data management tool for organising segments of related text to assist in the interpretation of theory-driven codes. The use of a coding manual helps in providing a clear trail of evidence to support a study's credibility (Fereday and Muir-Cochrane, 2006). The coding manual used for this study was based on the research question and The Coping Theoretic Model of User Response to Mandated IT Use (Bhattacherjee et al., 2017).

A coding manual can be developed a priori or based on preliminary scanning of text from collected data (Fereday and Muir-Cochrane, 2006). For this study, the researcher designed the coding manual by scanning the text from the transcribed interviews; this was to ensure that theory-driven codes would match the theory adopted for the study. This process involved reading and re-reading the interview transcripts to become familiar with concepts embedded within the data. This consequently allowed the researcher to identify interesting concepts that would form both the theory-driven and data-driven codes from the data. The researcher

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entered the codes developed for the coding manual into NVivo as nodes and started coding the text by matching each code with segments of the interview data selected as representative of the code. Initial codes were first grouped into level-one and level-two codes, which were codes categorised by their low level of abstraction. Level-two codes were still codes that the researcher found could not represent a sub-theme or theme on their own.

For ease of identification of the codes, the researcher adopted recommendations by Boyatzis (1998) for code documentation. These recommendations include giving a code a name or label, code definition, and code description. Table 3.9 exemplifies how theory-driven codes were developed and documented using the coding manual. Based on continuous scanning of text from the collected data and matching to the theory adopted for the study, the researcher identified sub-themes/categories including threat, opportunity, high levels of control, low levels of control, positive emotions, negative emotions, and IT usage behaviours. Identified codes for these sub-themes/categories included, but were not limited to, improved file tracking, safer data storage, improved transparency, increased workload, perceived loss of power, proxy use and extended use.

Table 3.9 Development and documentation of the theory-driven codes using the coding manual

Sub-theme: Opportunity	
Code Name	Safer data storage
Definition and description	An instance where data is perceived to be stored safer compared to prior practices. Code associated with positive perceptions due to the implementation and use of new/changed IT.
Quotes from interview transcripts	"Now our records are kept safer, unlike before where paper files can get missing or dilapidated, now everything is safe in the database". "The data is safe, unlike with papers that damage over a period of time".

At no stage of the analysis was the coding process confined by the use of the coding manual; as highlighted earlier, the manual was just used as a guide. This allowed for the emergence of data-driven codes from the interview transcripts. The researcher assigned emergent codes to segments of data from the interview that described a new theme or expanded on the theory-driven codes. Table 3.10 exemplifies how data-driven codes were developed and documented during the

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analysis processes. During the coding process, the initial stage of coding generated 114 codes across all of the case studies. Coding reliability and validity were ensured by the use of researcher triangulation (Patton, 1999). The researcher contacted an independent researcher, knowledgeable in the phenomenon of interest, who agreed to go through the interview transcripts and codes in order to assess whether the codes were representative of the data from the interview transcripts.

Table 3.10 Development and description of data-driven codes

Sub-theme: Opportunity	
Code Name	Reduced team work and interaction.
Definition and description	An instance where a participant feels that the level of team work and face-to-face interactions with colleagues had reduced owing to the use of the IT system.
Quotes from interview transcripts	"Before the system, we usually worked in teams, the spirit was high because we also had interactive activities. That has changed now because mostly everyone does his work on a computer, and if not a problem arises, all we do is send each other documents. The human element is gone, and that's not good".

The following sub-section describes how sub-themes are combined at a higher level of abstraction to form themes.

3.9.3: Identification of Initial Themes

Initial themes were identified after the collation of all coded data. This stage of the analysis process involved going beyond the lower level of codes to a higher level of abstraction (Braun et al., 2014; Braun and Clarke, 2006b). The researcher started by sorting out the long list of codes into similar and different groups to form either sub-themes or themes (Nowell et al., 2017). Themes were both developed from data-driven or theory-driven codes. The theory-driven themes were based on the theory adopted for the study and comprised codes that reflected elements of the adopted theory. Data-driven themes were developed from a combination of both theory-driven and data-driven codes. As highlighted earlier, some data-driven codes provided further explanation or details about some of the theory-driven codes, and, in some instances, were not captured in the adopted theory, but shed more light upon the phenomenon of interest. The researcher used visual representation, through the use of tables, to help sort codes into sub-themes and themes (Braun et

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al., 2014; Braun and Clarke, 2006a; Creswell, 2012). Visual representation of the codes aided the researcher in identifying the relationship between codes and different levels of theme (e.g., themes and sub-themes).

The researcher grouped some level one codes to form sub-themes, whereas some level one codes needed further clustering to form level two codes. The grouping of more than one level two also led to the generation of sub-themes. Finally, the grouping of sub-themes led to the generation of themes. As an example, table 3.11 shows how the researcher grouped lower-level codes (levels one and two) to form sub-themes and themes for the 'user responses' theme. The initial codes section in the table provides examples of level one codes, which are presented in italics. The level one codes are further grouped to form level two codes, which are presented in bold italics. The researcher then grouped the codes to form sub-themes, and finally grouped the sub-themes to form the themes.

Table 3.11 Construction of Sub-themes and themes

Lower-level codes and sub-themes		Sub-themes	themes
Primary Appraisal: ***Opportunity***	Secondary Appraisal: ***High Control***	**Engaged Response**	**User Responses**
Improved information tracking, improved personal and professional development, improved work transparency, safer data storage, speeding up of work processes.	*High self-efficacy, perceived encouragement, adequate training, effective management communication, perceived involvement and participation, easy and user-friendly IT system, adequate access to IT infrastructure.*		
Primary Appraisal**: *Threat***	Secondary Appraisal: ***Low Control***	**Reluctant Response**	
Perceived job uncertainty, loss of power and autonomy, slowing down of work processes, reduced teamwork and interaction.	*Low self-efficacy, perceived discouragement, inadequate training, ineffective management communication, perceived lack of involvement and participation, difficult and complex IT system, adequate access to IT infrastructure.*		

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The researcher also came across codes that did not seem to fit anywhere. Consequently, the researcher created a theme called 'miscellaneous' to temporarily house such codes, as recommended by (Braun and Clarke, 2006b). The researcher did not abandon the codes entirely at the early stage, as it was uncertain whether codes and themes may hold, or be refined, separated, or discarded at the later stages of the analysis process. Having identified the initial themes, the subsequent sub-section details how initial themes were reviewed and named.

3.9.4: Reviewing Initial Themes and Defining Theme Names

The process of reviewing themes and defining or confirming theme names is the final stage of the thematic analysis before producing a report (Braun et al., 2014; Fereday and Muir-Cochrane, 2006). Reviewing themes is a very important process as it helps a researcher to eliminate the problem of fabricating data. Data fabrication "constitutes the unintentional, unconscious seeing of data that researchers expect to find" (Fereday and Muir-Cochrane, 2006, p.90). The researcher closely scrutinised the initial themes to ensure that the themes were representative of the data analysis and the codes attached to them. This process involved several iterations before the researcher proceeded to the report writing stage.

The researcher conducted the first review by rereading the interview extracts, codes, and themes. This was done in order to identify any errors that may have been missed during the code review exercise. As mentioned previously, codes were reviewed using researcher triangulation, as suggested by Patton (1999). This exercise helped to ensure the validity and reliability of the codes. Once the researcher was satisfied with the codes and themes, the second exercise involved confirming the theme names through the use of researcher triangulation. The researcher and another independent researcher went through each theme to ensure that the data captured within the theme matched its given name. Where themes seemed a bit misleading or confusing, the researcher discussed them with the independent reviewer and determined better names to represent the themes. Themes were thoroughly reviewed until an agreement was reached between the researcher and the

independent reviewer. Having explained the data analysis process, reports from the analysed data will be presented in the next chapter.

3.10: Summary

This chapter has discussed the overall research paradigm and research methodology adopted for this study, explaining the choice of a qualitative interpretive approach to address the study's highlighted objectives before presenting a description of the overall research process.

In addition, activities including the research design, data collection and data analysis process have been addressed. The chapter has provided justification for choosing a case study as a research method, and the use of semi-structured interviews as data collection instruments. Further, activities relating to data collection such as the development of the interview guide, participant recruitment and the overview of the interview process have been presented. The chapter has also given a justification for using thematic analysis as a data analysis method and provided a detailed explanation of how the method was used to analyse the data collected from interview participants. In the next chapter, data collected from the interviews will be analysed and presented.

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Chapter 4: Organisational context, Analysis, and Findings: CASE A

4.1: Introduction

This chapter presents the organisational context, analysis, and findings of the first case for this study. Each case is presented separately to reveal the organisational context and the findings from each case organisation. Organisational context information presented in this chapter includes the case background, the organisation's IT infrastructure, the history of IT system implementation, and participant information. Organisational context information was important as it helped the researcher understand the agency's processes, people, and resources made available to support the implementation and use of the IT system.

Following the presentation of the organisational context in section 4.2, section 4.3 provides an outline of how themes that emerged from the data analysis process are introduced. Analysis are presented by themes across users horizontally in sections 4.4 and 4.5 in order to make the findings easier to follow. In section 4.6, analysis are presented across users by themes vertically to show an individual user's perception about all themes. Section 4.7 shows how an individual user's perception changes critically over a period of time, with the use of worked out examples. The chapter ends with an overall summary in Section 4.8.

4.2: CASE A

CASE A is a government-owned agency in Kano state, situated in the north-west region of Nigeria. The state is the second largest industrial area in the country, with an estimated population of over 13 million people as of 2017 (National Bureau of Statistics, 2017). The agency is charged with the responsibility of handling all land administrative activities within the state. These activities include capturing of land cadastral data, land valuation, ground rent management, issuance of land certificates, and urban and regional planning. The agency has several units involved

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in different land administrative activities, these units include the registry and information unit; the geometry unit; the administrative unit; the IT unit; and the production unit.

4.2.1: Background of CASE A

Before the IT implementation project, the agency formerly operated as a state ministry. A traditional approach to land administration was used to govern the ministry's activities. All activities were carried out using a manual paper-based approach. Data was captured manually, drawn on papers and stored alphabetically in archive rooms. The state has been growing and expanding rapidly beyond projections due to increases in population and business activities. As such, the traditional approach to land administration has become time-consuming, inefficient and prone to abuse.

Several interviews and analysis of documents provided the researcher with an orientation about the agency's long history in a bid to reform and modernise its services and activities. There have been several unsuccessful attempts by the government to deal with its land administrative issues. Several computerisation projects had been introduced in the past but failed due to issues such as improper project management and lack of government commitment. Past computerisation projects were abandoned and reinitiated on multiple occasions. A participant gave a brief insight into the agency's past computerisation history:

> *We have a long history, the issue of automation and computerisation has gone as far back as 1997. That was when we started the actual issue of computerisation and automation. It's been a very, very long journey. That time people were always afraid of a computer, wherever you see a computer, it will be kept safe and caged like an animal in a zoo, in order to prevent people from stealing it or spoiling it. (A01)*

The most recent computerisation project, which is the focus of this research, led to the restructuring of the ministry into the current CASE A agency. The project was initiated in the second quarter of 2013 as a Public Private Partnership (PPP) between the government and a private consultancy firm and was agreed to last for a period

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of six years. At the end of the six years, the plan was for the government to assume full control and management of the agency. The mandate of the project was to revolutionise land administration in the state through the use of Geographic Information Systems (GIS) technology. It was expected that this project would move the agency from traditional methods of land administration to a state-of-the-art computer-based approach in both field and administrative activities.

Unfortunately, a year into the project, there had been no progress and the government ended the agreement and took full control of the project. The government cited the use of outdated equipment and lack of commitment from the consultants as their reasons for terminating the agreement. The government set up a team within the agency to complete the project in-house. This setback affected the project in such a way that the in-house team could not continue with project activities until late 2014. At the time of the interviews for this research, the agency had just merged with another state agency involved in land administrative activities. This merger had significant consequences for the IT project, causing further delays and unexpected reactions from project stakeholders. In the subsequent section, an overview of the agency's IT system and IT infrastructure is provided in order to reveal the context of the IT implementation project and the resources made available to the participants to support their IT system usage. Section 4.2.2 presents an overview of the agency's current IT infrastructure and IT system.

4.2.2: The Agency's IT System and Infrastructure

The agency implemented its first GIS package, ArcGIS, in late 2015. ArcGIS is mapping and analytics software provided by a company called Esri. The software has features such as spatial analytics, imagery, and remote sensing, mapping and visualisation, and data management tools. The agency also acquired digital imagery licenses from a company called DigitalGlobe, which provides digital satellite imagery that can be integrated with the GIS software package of a customer's choice. A land administrative system (LAS) was integrated with ArcGIS to help the agency capture biographical data such as land owner details, property type and land

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usage charges, which are matched to the cadastral data and stored in the agency's database.

In terms of hardware equipment, the agency used desktops, laptops, servers, office printers, and GIS printers. Internet and network connectivity was mostly below the speed of 2Mbps, which was considered inadequate for the type of activities that were being carried out in the agency. The power supply was often sporadic, with the agency having to rely on backup power generators. Even at the time of the interviews, the in-house project implementation team had continued to face problems such as inadequate hardware supply, inadequate training, and delays in project decision making. It is also worth highlighting that at the time of the interviews, the agency had just finished upgrading its GIS system, based on issues raised by users within the agency. In summary, the agency had continued facing complex and difficult implementation issues, which will be discussed further in sections 4.3 to 4.5, which presents an analysis of the case data.

4.2.3: Participant Information

Five units participated in this research: the registry and information unit; the geometry unit; the administrative unit; the IT unit; and the production unit. Each unit's use of the IT system was based on its job roles and responsibilities. The registration and information unit was charged with the responsibility of merging new and old files for the process of recertification, commissioning of new files, checking the status of applications, and dealing with general enquiries. The geometry unit had one of the most important responsibilities in the agency, being involved in multiple activities, including data capturing, paper-based data transformation, ground truthing (a process of observing and verifying information captured during field activities), data quality checks, and geographical-database management. The administrative unit was involved in the day-to-day running of the agency, providing services such as training, equipment acquisition, and other human resource-related activities. The IT unit maintained all of the IT infrastructures in the agency and provided support to the IT system users. Lastly, the production unit was in charge of the last stage of the certification process; once

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all application requirements are fulfilled, a new certificate is generated using customised and secured templates with the use IT system.

Data were collected from sixteen participants that included two IT support staff, two training staff, three management-level staff, and nine IT system users across the different units. Table 4.1 provides a summary of participant information for this case organisation.

Table 4.1 Participant information for CASE A

Participant	Unit	Participant category	Number of interviews	Years at the Agency
A01	Admin	Non-user	2	23
A02	Admin	Non-user	1	14
A03	Admin	Non-user	1	7
A04	IT	Non-user	2	4
A05	IT	Non-user	1	2
A06	Geometry unit	User	2	3
A07	Production unit	User	2	4
A08	Geometry unit	User	1	3
A09	Geometry unit	User	2	6
A10	Registry and information unit	User	2	5
A11	Geometry unit	User	2	5
A12	Registry and information unit	User	2	6
A13	Geometry unit/ Production unit	User	2	8
A14	Registry and information unit	User	2	16
A15	Training	Non-user	2	3
A16	Training	Non-user	1	2

4.3: Analysis and Findings at CASE A

This section introduces the themes that emerged from the data collection and analysis process at CASE A. Themes were built up from a combination of lower level codes and sub-themes to form a higher level of abstraction (see section 3.6.1). As discussed in section 3.2, a qualitative approach was adopted for this research, with semi-structured interviews used as the primary tool for data collection. The interview guide was designed based on the theoretical model adopted for this research (see section 3.5.1). A rich set of qualitative data was acquired from the interview sessions.

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When the model was introduced in section 2.5 it was explained that the important features were: primary appraisal (a process whereby an individual evaluates if the consequences of implementing an IT system in his/her work environment is positive or negative); secondary appraisal (a process whereby an individual evaluates his/her level of control over the IT system implementation, in light of the resources available at an individual's disposal), referred to from this point as 'influencing factors'; and usage behaviours (how an individual actually uses the IT system to accomplish his/her tasks). Moving to the analysis, in order to present the findings in a comprehensive manner that is easy to follow, as indicated previously in section 4.1, the findings will be structured around the themes that emerged from the data. After the presentation of themes across users horizontally in sections 4.4 and 4.5, analysis are presented across users by themes vertically in section 4.6 to show an individual user's perception about all the themes. The next section will present the analysis related to the model's theme of 'influencing factors', then followed by the 'primary appraisals' theme.

4.4: Influencing Factors

This section presents the findings associated with sub-themes that make up the theme 'influencing factors'. Sub-themes were created and incorporated in order to provide a better conceptualisation among the factors based on their similar characteristics and how they influenced a user's perception of control in respect to the IT system implementation at the agency. Each of the sub-themes within the 'influencing factors' theme will be presented, then matching with other sub-themes will be considered in the coming sections (see section 4.6) in order to frame individual user responses to the implemented IT system in the agency. Three sub-themes – individual-related, organisational and process-related, and IT system-related factors – were identified from the data. Table 4.2 provides a summary of the sub-themes and their associated lower level codes.

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Table 4.2 'Influencing factors' theme with associated sub-themes and lower level codes

Lower-level codes	Sub-themes	Themes
Self-efficacy, Social influence.	Individual-related factors.	
Training, Management communication, User involvement and participation.	Organisational & Process-related factors.	Influencing Factors
IT instrumentality, IT infrastructure.	IT System-related Factors	

A participant's perception of having the ability and resources to deal with the changes brought about by the IT system implementation determines his/her level of controllability. As highlighted in the adopted theoretical model, a user's evaluation of control is critical because each user will have a different degree of control following the IT implementation. Therefore, 'influencing factors', also referred to as implementation characteristics in the IT implementation literature (Bala and Venkatesh, 2016; Venkatesh et al., 2010), have a key role in a user's response to an IT implementation in a mandatory context. The three sub-themes that make up the 'influencing factors' are discussed in the following sub-sections.

4.4.1: Individual-related Factors

The Individual-related factors sub-theme was made up of two lower-level codes: **self-efficacy** (*high self-efficacy or low self-efficacy*), which reflected the participant's psychological perceptions about their IT skills, and **social influence** (*perceived encouragement or perceived discouragement*), the degree to which a participant perceived that people who they find important believe that they should use the new IT system.

Self-efficacy had a significant influence on how users appraised their level of control and interaction with the IT system, consequently influencing their response towards the IT system. Participants with high self-efficacy expressed a high level of control over their IT system usage. Such users believed that they had the necessary skillsets and abilities to use the IT system without facing any problems. These participants also believed that owing to their high self-efficacy, they were able to use the system more effectively, and even use the system beyond initial expectations. A participant who was fully confident of his IT abilities stated:

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Basically, computers have been my life ...I have been using computers for over 15 years. That knowledge has been an advantage to me throughout this change. Because of it, I use the system easily without having any problems. I have been confident of my IT abilities from day one (A08)

Some participants within the agency had knowledge of GIS software from their prior work experience and were comfortable using such technologies. Others also mentioned using the software during their university days. This prior knowledge helped them in using the current IT system in the agency. As far as they were concerned, using the IT system represented 'business as usual', and they felt that they could make the most out of the system because it was not something that was new to them. As one participant who expressed having a high level of control over the IT system due to his prior experience explained:

I worked in a private health organisation that heavily relied on GIS software for their activities, we used it for mapping and tracking our projects. So I can say I'm pretty good at using it. I also studied various GIS courses at University, so the technology is not new to me. In fact, I was very happy when I found out that the GIS project was reinitiated here at the agency (A06)

In a similar vein, another participant explained having high self-efficacy:

I have had experience working with computers since university. I have a B.Sc. and M.Sc. in geography and geographical information systems. We used such software extensively in different modules. So for me, it's just putting what I have learnt into practice, to be honest. Not for a minute was I ever in doubt about being able to use the system or not (A07)

In contrast to these two participants, some of their colleagues within the agency felt that they lacked high levels of control over their IT system usage as a result of their low self-efficacy. These participants believed that a lack of basic computer knowledge and familiarity with GIS technologies contributed to their struggles while using the IT system to accomplish their tasks. Further, they often voiced the concern that the IT system had caused a major change in their work environment. This was a technology they were unfamiliar with as they hardly used computers for their day-to-day activities. As one participant explained:

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I'm not an expert in the use of computers, all of this is new to me. My work relied on my filed expertise, and now I have to use computers more than I can imagine. I will be honest with you, it's a huge struggle, and it's something I'm not used to (A13)

A GIS officer explained how some of his colleagues with little or no experience using computers had struggled using the new IT system:

It's not a matter of agreeing or not, they struggle to comprehend the new system because it's something they have never used, so it's hard for them to understand it. For instance, if you have someone that has never used a computer or basic packages like MS Office, it will be very difficult for him to use a comprehensive system of cadastral data management (A08)

Another participant explained not being able to complete mapping and plotting activities as fast as he had been able to manually, with pen and paper. He felt that using the system was difficult and that as a result, he could not accomplish tasks as easily as he had previously been able to. He heavily relied on help from his colleagues, as such, he felt that he had limited control over his IT system usage. He explained:

Using paper and my drawing kit, I completed many maps in a day. I can't say so now, because the system is extremely difficult. I have not used anything like it before, so it takes a long time. Most of the time I have to keep asking other staff how to do this or that, it's very annoying (A14)

Social Influence was found to be relevant in influencing participants' responses to the new IT system. Participants shaped their perception of control in terms of how they felt people important to them in the agency discouraged or encouraged them to use the new IT system. People such as colleagues, managers, and consultants had a significant influence on participants' confidence levels and perceptions of control over their IT system usage. This is because participants aimed to seek guidance from these individuals during and after the IT implementation project.

Encouragement of IT use through verbal persuasion and active usage of the IT system by peers and managers in the agency gave participants the impression of having a high level of self-control and belief to use the IT system themselves.

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Encouragement also boosted user confidence and made it easier for users to see the benefits of the IT system clearly. For instance, one participant explained:

Our manager has always tried to motivate everybody. He encourages us a lot, and personally, I can tell you that it has worked on me. The way he convinces me that I'm good enough to make the most out of the new system is amazing. He has made me see the light, [laughs], now I feel super confident while using the system (A06)

A management-level staff member who was closely involved in the change management process mentioned using a number of interventions to encourage the staff to use the new IT system. He mentioned the agency organising inter-agency trips to other organisations that had implemented a similar technology, sending staff members for training and courses, and giving volunteers incentives to work as on-the-job trainers, as the quote below further explains:

Engaging and encouraging people is very important during a change process…one way to encourage staff is by sending them out for training… we have taken your friend to Sweden, we have taken your friend to England, so you will definitely be happy hoping you are next, these are some methods we have been using to get more acceptance from the staff. When they go to a new environment they get more experience, they take pictures and come back happy and motivated. These are the sort of things we have been doing to win their hearts. (A01)

Another participant who also felt the encouragement and support he received from his colleagues boosted his confidence and gave him a high sense of control over his IT system usage explained:

Most of the people here are very supportive because sometimes members of the top management even use their own time to put others through…We help each other out when we have challenges, we have a friendly working environment. I'm sure you have noticed that we are always making jokes in the office when you have problems with the system, nobody will judge you, we just try to motivate and help each other out. (A09)

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It also appeared from the analysis that some participants were affected in a contrasting manner in relation to social influence. This was because people such as team leads and managers who they looked up to and considered important within the agency discouraged using the IT system. These individuals provided guidance on behavioural expectations, and those who had a more negative attitude towards the new IT system reflected a sense of discouragement to some participants within the agency. As one participant explained:

> *Most of the managers in our department and unit don't really like the system too. We hear them saying bad things about the change, so for them to complain about it, what would you expect people like us that work under them? Definitely, most of us won't like it too… if they are showing concern about it, definitely something must be wrong. To be honest, I don't really feel confident using it too (A12)*

In a similar vein, another participant explained how more experienced staff around him had been complaining about the IT system. He believed that the senior staff should be his point of reference and that he should be able to learn how to use the IT system from them. However, their constant complaints about the IT system left him feeling discouraged and low in confidence himself. He stated:

> *In my unit, even the more experienced staff are complaining, let alone people like me, so it's not like I can go to them to teach me, because I might even be better than them. Honestly, it's not a good feeling, because then you are put in an awkward position, and you won't feel confident using the system yourself (A13)*

Overall, the findings reveal that individual-related factors such as self-efficacy and social influence had an influence on the participants' perceived controllability in relation to their IT system usage. Figure 4.1 presents a diagrammatic summary of the individual-related factors sub-theme at CASE A. In the following sub-section, the Organisational and Process-related factors sub-theme will be presented.

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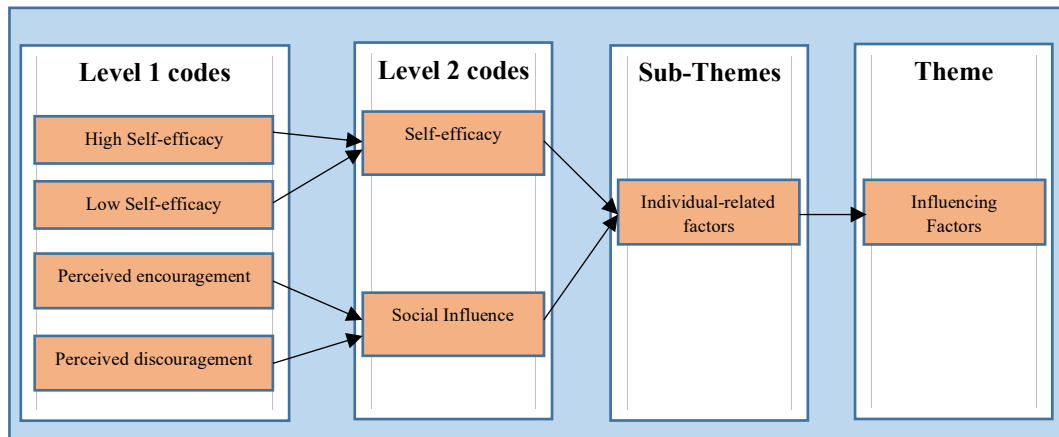
Figure 4.1 Construction of individual-related factors sub-theme

4.4.2: Organisational and process-related Factors

The Organisational and Process-related factors sub-theme consisted of the lower-level codes: **training** (*adequate training or inadequate training*), **management communication** (*effective management communication or ineffective management communication*), and **user involvement and participation** (*perceived involvement and participation or perceived lack of involvement and participation*). These lower-level codes were categorised under the Organisational and Process-related factors sub-theme since they were related to organisational aspects necessary to meet the needs of users in relation to their response to the IT system. These factors had an effect on the participants' perceptions of control because they were directly linked to the IT-implementation project within the agency.

Training had a significant influence on participants' perceptions of control in relation to their IT system usage. Each participant framed their perception of training based on how the training was organised and delivered, and on the fit between the training type and the actual task that they had to accomplish while using the IT system. The agency organised both internal and external training. Some training sessions were generic in nature while other sessions were more task specific, depending on the unit and the task undertaken by its members. Selected employees also attended external training in the form of workshops and professional courses. The agency also encouraged internal training through 'train the trainer' courses and peer learning among colleagues.

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Participants highlighted that adequate and effective training helped them to develop a sense of mastery over the IT system. Adequate training gave the participants better knowledge of the system features and a better understanding of how the IT system fitted with their work practices. Participants who believed that the training that they received was adequate mentioned having access to IT support and training staff, task-specific training, and training manuals. A participant with these perceptions explained:

> *To be honest the training was very good because I have relied on it to help people so far. Most of the things I know or I am using for the job was as a result of the training I received from the training team (A04)*

Another participant who enjoyed attending external training commented:

> *We went for a workshop/seminars with an NGO called 'E-health'. The workshop was really good because it involved the use of GIS technologies and techniques that helped us improve the way we work with our current IT system. There is also an agency called 'Digital group' that came some weeks ago and trained us on how to use satellite images (A08)*

Participants who showed promise and commitment were sent to other countries for training. A participant among this group expressed the experience and benefits that he enjoyed as a result of such training:

> *I have been to Sweden, Mongolia... all to get more knowledge on land administration and I have gone up to 6 countries for the International federation of surveyors' conference, where many land administration developmental issues and use of modern day technologies are discussed and promoted. There are some of my staff that have gone to Ghana for imagery training, they have gone to Sweden also. We have gained a lot from these trainings, the programs have really improved our use and understanding of the system (A01)*

Training was also problematic according to other participants. These participants complained that training was often too generic and a waste of time. Some complained that the timing of the training was inappropriate and that, in some cases, sessions were rushed by the instructors. As such, these participants did not believe that the training that they had received had given them adequate knowledge to

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master their IT system usage. Owing to the nature of the training, they found it difficult to accomplish some tasks related to their roles, and some even complained that certain organisational units received more specialised training than others. As one participant explained:

> *I have never seen any user manual about the system, specialised training for us was mentioned, but it's yet to happen. We all have different training needs, so it doesn't make sense to have a one shoe fits all training. The general training we had doesn't directly relate to what we do in my unit. So it's as good as not being trained at all (A14)*

This participant also lamented not having access to IT support and training staff owing to their busy schedules. IT support and training staff were also assigned to data conversion duties to accelerate the conversion of paper-based files to digital copies at the agency. As this participant elaborated:

> *Even the IT support staff now use the system to do entries like Bio data of parcels in order to help speed up the job, so if they are really busy, sometimes they don't have the chance to come and assist you. In some cases, you have to wait for them to finish what they are doing. So it's like they are working two positions (A14)*

Another participant explained how the lack of access to specialist training and staff had affected her training experience:

> *We haven't really received adequate training, we depend on the other staff, who sometimes are also busy, when you reach a point you don't know how to move forward, it gets so annoying, well that's how we have been managing so far. If only we had better training, we would work more effectively and efficiently while using the new system (A12)*

Management Communication was found to be relevant in influencing participants' perceptions of control over their IT system use. Communication is an important organisational factor because employees expect that management will keep them informed about the reasons for any changes, and the benefits that accompany the changes, which, in this case, was the introduction and use of the new IT system. Communicating project information was a key part of the agency's IT implementation project. Members within the implementation team believed that

effective communication would indicate the management's commitment towards the successful implementation of the IT project. Before and during the IT implementation project, the agency faced mixed results in terms of communicating the rationale behind certain activities, and their subsequent implications. Some stakeholders were kept fully informed, while others felt that they had limited knowledge about activities relating to the project. In some cases, certain stakeholders even complained of being informed after activities had been completed or final decisions had been made.

Participants who felt that they received appropriate communications and frequent updates from the management about the IT project developed a sense of psychological safety and structural assurance that their jobs were safe in the agency. These participants revealed that management communication motivated them and provided a clearer picture of the benefits that the IT system would bring to their work environment. As one participant stated:

> *Yes, I believe the management has explained the need for the new system, and I'll be honest with you, its straight forward. We have started seeing the benefits already. The management has been honest in communicating its expectations for this project and the role of all stakeholders involved (A06)*

In a similar vein, another participant pointed out that communication from the management was effective, going on to further explain that the benefits of adopting the new system were clearly stated and demonstrated to the extent that he was part of a team that visited a similar organisation using a similar system. This was arranged by the management in order to show the employees first-hand the benefits that would accrue from using the system. This participant believed that the information helped him to manage his expectations and set targets in relation to how the use of the new IT system would affect his job. He also mentioned that owing to the information that he received from the management about the IT implementation, he was able to research and be more knowledgeable about the system's imminent implementation. He stated:

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The management was honest and open about the IT implementation project. As far as I am concerned, we were fully carried along, we were informed of the system's benefits and we even went to Lagos to see how they implemented and use their own GIS solution. The management tried as much as possible to clear the rumours that people would lose their jobs due to the new IT system because many people had that thought initially (A07)

On the other hand, some participants felt that management communication was ineffective because reasons for, and updates about, the imminent change were not properly communicated to all stakeholders. This belief brought about a high sense of uncertainty and confusion for some participants. They found it difficult to reason about the decision to adopt a new way of doing things in their work environment. This group of participants had a 'why fix it if it's not broken' perception because, as far as they were concerned, they had been doing their work without the use of computers and had been functioning well. This perceived lack of information led to the rise of rumours within employee groups. Some participants were unsettled, feeling that they might even lose their jobs after the IT implementation project. This, later on, translated into feelings of lack of control and tension. A participant expressed his associated concerns in the following way:

At first, we started hearing chit-chats that's we are going to use a new computer system… There was a lot of confusion because when you ask other staff, they will just tell you that they are not sure if it was really going to happen. Some others were even saying that most old staff would be sacked and younger computer literate people will be recruited (A13)

Furthermore, another participant lamented that ineffective communication from management left them feeling ignored and side-lined. He described the situation as being chaotic, with news and information changing frequently:

Communication has not been excellent. We still find it confusing, because today you hear this, tomorrow that. A lot of rumours all over the agency. As we speak, we have not been really involved in most of the decisions, I don't even know what my new job role might be. Whoever you met, you heard different stories. A lot of us were really unsettled (A10)

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User involvement and participation had a significant influence on participants' perceptions of control during and after the IT implementation process. Participants appraised their participation in terms of activities, behaviours, and processes that they or their representatives performed during the IT implementation. Involvement was reflected in the form of a subjective psychological state that represented a participant's relevance and importance to the IT implementation project. These factors were often mentioned together during the interview sessions, even though in some cases participants elaborated more on one of the factors than the other.

The agency used different methods to involve participants and to allow them to participate in the IT implementation project. Involvement and participation often depended on a participant's organisational unit and level of expertise. Participants with more technical expertise were often involved in the decision making and requirements gathering for the system customisation. Project teams were set up to align system customisation with work processes in the agency. Members from different units were also selected to be part of the usability acceptance testing. Participants who perceived that the IT system was of personal relevance to them, and/or perceived that they were given an opportunity to participate in the implementation process, formed perceptions of high control over their IT system usage. This was because these participants learned more about the IT system features and the system's potential benefits. As an example, the following participant explains how he was involved in decision-making and also participated in the system customisation process:

> *After the contract with the consultants was terminated, we had to redesign the system and related processes all over again by the in-house implementation team. So we were part of both the decision making process and the customisation of the system. It gave us a better chance to make things work the way we wanted (A06)*

In another instance, a participant who believed that the new system had personal relevance to him, and was highly involved in the implementation process, discussed the whole project being a symbol of pride to him and, owing to his involvement, suggested that a successful implementation would make the new system an

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important resource for the agency. Consequently, he felt highly motivated to make sure that he did all in his capacity to ensure the project's success. As he explained:

> *I have had a lot of responsibilities during the implementation… I always believed we couldn't let this project fail, because history won't be kind to us. I always contribute when I am needed (A09)*

On the other hand, participants who were not involved or did not participate in the IT implementation project expressed perceptions of low control over their IT system usage. These users often felt that the system was forced upon them, and they were not given an opportunity to be involved in the decision-making or to participate in any implementation activities. These users did not feel the IT system had any personal relevance to them, and some often saw the IT system as a symbol used to change their work processes and, ultimately, force them out of the organisations. As one user explained:

> *I wasn't really familiar with the system before it went live. I was not involved in the implementation process or decision-making. I felt like the organisation was using the system to tell us that our time was up here, and we weren't needed that much (A14)*

Likewise, another participant expressed that the IT system had been forced upon him without him having a say or choice:

> *I was not part of any implementation team, so I didn't have much of a say… we use the system as it is. It's like they just handed us the system, "it's ready and you must use it whether you like it or not" so, to be honest, I don't think they really cared to involve us (A13)*

Figure 4.2 shows a diagrammatic summary of the Organisational and Process-related factors that have been discussed in this section. In the following sub-section, IT system-related factors will be presented.

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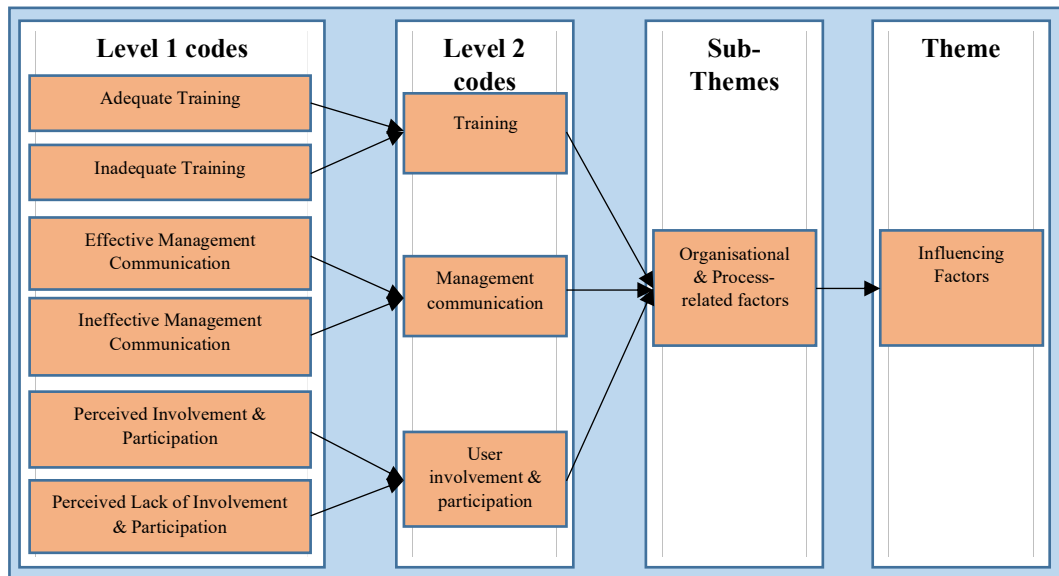
Figure 4.2 Construction of organisational and process-related factors sub-theme

4.4.3: IT System-related Factors

The IT System-related factors sub-theme consists of the lower level codes: **IT instrumentality** (*easy and user friendly IT system or difficult and complex IT system*) and **IT infrastructure** (*adequate access to IT infrastructure or inadequate access to IT infrastructure*)**.** These lower level codes were categorised under the IT system-related factors sub-theme because they were primarily related to the new IT system itself.

IT instrumentality refers to the usable design and functionality of the IT system. Participants formed their perception of controllability in terms of IT instrumentality by appraising how the IT system helped or hindered their activities in the work environment. Users often expressed this by comparing the IT system with the previous ways of doing things, passing judgements on whether the former or the latter was more favourable to them. The implementation of the IT system changed many work processes, such as how data was captured, processed, and stored. Many field activities that were carried out physically using tools were changed to a more digital approach, with the use of GIS features provided by the IT system. Participants at the agency responded differently to this change in their work environment.

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One participant often complained about how the IT system was making his work more difficult because most features were not customisable. Owing to these non-customisable features, he believed that he found the IT system complicated. He often struggled while using the IT system to accomplish his tasks. He strongly believed that given the opportunity to customise the system features, he would perform better. He recalled:

> *Most of the features on the GIS module are not really customisable compared to the administrative module and the database. There are somethings we would want to adjust on the GIS module, but unfortunately, at the moment it's not possible and it has made my work more difficult. Trust me, if we could adjust things here and there, things would have been easier (A11)*

Another participant expressed his lack of control over the IT system owing to his belief that the system design was too complex, and its complexity always made him struggle while using the new system to accomplish his task. He explained:

> *The things I could do before with my pens and drawing set, I struggle to do them now on the system… It looks too busy and complicated, it takes a long time to get going. Even now, I make mistakes from time to time. It takes time also, because I have never used this type of software till now, so I don't work or process files as fast as I used to do with the forms and paper-based system (A13)*

Unlike these participants, others perceived that the system was designed in a way that made their work easier, and they found using the new IT system straightforward and easy. These users found the IT system to be very user friendly. Some also mentioned that they had a high level of control over the IT system because they were able to customise certain features within the system to fit more closely what they wanted to do at work. A participant with such perceptions said:

> *The system is very user friendly, I find navigating it very easy. We have been able to customise certain parts of the system, especially the format in which it generates and displays data for use. It makes our work more visible and professional, so we do not really need to explain maps and reports as we do before (A07)*

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Another participant stated:

> *From a technical point of view, I can say we have had the ability to customise the*
> *system to our own work processes because by default it has a general setup, but*
> *then we customized it to suit our precise needs. So to illustrate using this pen, it*
> *is sold by a vendor, once you buy it, he cannot control what you write with it, so*
> *in that sense, we customise it to fit our needs, since we have paid for the full license*
> *(A09)*

IT infrastructure had a significant influence on participants' perceptions of
control during and after the IT implementation process. Participants viewed
hardware, software, network connectivity, and power supply as critical components
that would ensure the success of the IT implementation project. Within some units,
participants did not feel that they had adequate access to these infrastructure
elements, while others believed that they had what was needed to support them in
their job. Based on these beliefs, participants formed their perceptions of control
within the agency. In terms of power supply, the agency installed a backup power
generator in case any power interruption was experienced. The backup generator
was connected to the main building in the agency, so some buildings within the
agency were not serviced by the backup generator. This meant that in the event of
a power outage, the unconnected buildings had to suspend their activities until the
central power supply had been brought back online. This issue affected how
participants stationed in offices outside the main building used the IT system to
accomplish their tasks. A participant expressed his concern:

> *Lack of constant power supply is a major infrastructural issue. So, as far as there*
> *is no power, the system will definitely not work. The power in this building is*
> *epileptic, it is very difficult to have stable power that would last for 5 hours*
> *straight. The generator has not been connected to this building yet, and only God*
> *knows when that will happen. It's really affecting our work since now we can't do*
> *things manually (A11)*

Some units within the agency also had issues like slow internet connectivity and a
shortage of computers and servers. Some of the computers available to them were
very slow and affected the pace at which tasks could be completed using the IT
system. Some participants complained about the fact that they had to use

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workarounds, such as converting computers into servers temporarily. Participants affected by these issues exhibited low levels of control in terms of their IT system usage because they felt that they did not have access to adequate IT infrastructure. As one participant who felt there was inadequate access to IT infrastructure explained:

> *Some of the computers are just manageable because they are old and slow. And we are presently experiencing shortages of servers, we have to sacrifice some desktops and convert them to servers, and even with that issue, we don't even have enough computers at the moment to support our activities. We have complained to the management, but it doesn't seem anything is changing anytime soon (A04)*

In a similar vein, another participant complained about the poor power supply and slow internet connectivity:

> *Sometimes we have issues with the network, it is slow or goes off totally. We have complained about it, well we are still waiting for a stable network and constant power supply (A10)*

Units involved in more technical-related activities in the agency often received more computers and were provided with better internet connectivity and access to the latest software. This was because most of these implementation team members were selected from such units, therefore they enjoyed a certain level of autonomy. Participants who enjoyed these privileges had a high perception of control over their IT system usage because they were satisfied with the IT infrastructure that was available to them. They believed that the management provided adequate infrastructures such as hardware and software, and they did not face problems in relation to the power supply and network connectivity in their units. As one participant mentioned:

> *I don't think I have ever been happy about anything more than I have been about the decision to acquire and use our new GIS and admin system. It is a total game changer, many things have improved, we now have new computers and we are connected to high speed internet. If you add all these to the new system we have, it just shows you how our work processes have now been perfected (A09)*

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Another participant also expressed a perceived high level of control owing to his access to adequate IT infrastructure, especially having access to good computers and a fast internet connection, noting that:

> *Our situation has improved, we have very fast internet now, so our work is moving smoothly. At the beginning of the year, our unit was provided with new computers. I was lucky enough to get a laptop because it saves time using it even when we are in the field. So far so good, we have what we need to ensure we use the system 100% (A06)*

Figure 4.3 shows a diagrammatic summary of the IT system-related factors sub-theme that have been discussed in this section. Having presented the sub-themes that form the theme 'influencing factors' in this section, section 4.5 will now move on to present the 'primary appraisals' theme.
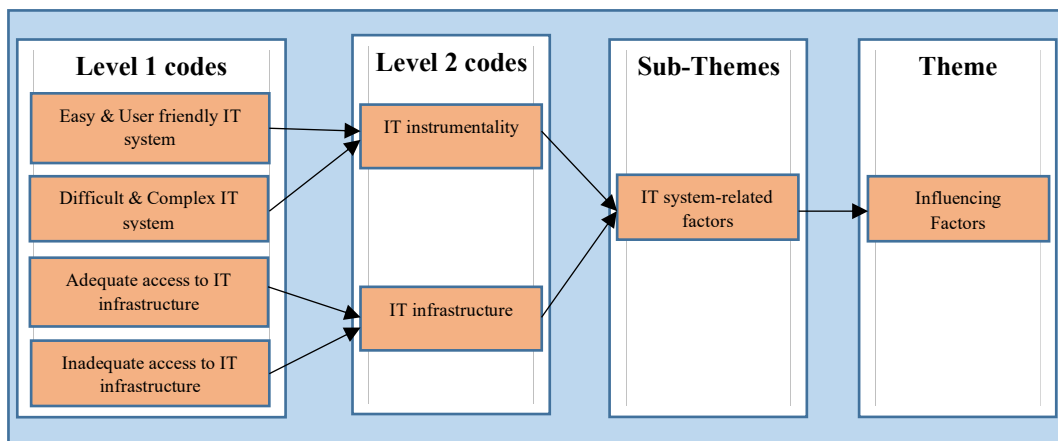
Figure 4.3 Construction of IT system-related factors sub-theme

4.5: Primary Appraisals

This section presents the findings associated with sub-themes that make up the theme 'primary appraisals'. As highlighted in section 4.3, a primary appraisal is a process by which an individual determines the consequences of the IT system implementation in their work environment, and how this change will likely affect them professionally and personally. Following the approach taken in section 4.4, each of the sub-themes within the 'primary appraisals' theme will be presented, then matched with other sub-themes in section 4.6 using empirical chains of

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evidence to frame individual user responses. Two sub-themes – opportunity and threat – were identified from the data. Table 4.3 provides a summary of the sub-themes and their associated lower level codes. These sub-themes are comprehensively presented in the following sub-sections.

Table 4.3 'Primary appraisals' theme with associated sub-themes and lower-level codes

Lower level codes	Sub-themes	Themes
Improved information tracking, improved personal and professional development, improved work transparency, safer data storage, and speeding up of work processes.	Opportunity	Primary Appraisals
Perceived job uncertainty, loss of power and autonomy, slowing down of work processes and reduced teamwork and interaction.	Threat	

4.5.1: Opportunity

Participants who appraised the IT system implementation as an opportunity had the belief that the IT system would bring positivity to them both personally and professionally. These participants welcomed the use of the new IT system and were confident it was going to improve their work environment. The Opportunity sub-theme was made up of the lower level codes: **improved information tracking**; **improved personal and professional development**; **improved work transparency**; **safer data storage**; and **speeding up of work processes**. These codes will be explained further in this sub-section with the use of illustrative quotes from participants, acquired during the interview sessions.

Improved information tracking reveals how participants felt the IT system gave them the ability to access and track information more effectively and efficiently. Before the implementation of the IT system, information was stored using manual and paper-based methods such as the use of files and folders. Files and folders were then stored in archive rooms organised in alphabetical manner. Using this method made tracking and accessing information difficult, or in some cases almost impossible, since mistakes were often made during shelving of folders in the archive room. The manual method of storing and accessing information changed with the implementation of the IT system. The IT system had an electronic database

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that allowed users to search for information using different search criteria, which provided easier management and access to information. A participant who felt the electronic database and file management feature of the IT system gave him better access to information explained:

> *The new IT system has made keeping and tracking records easier and safer. Since files don't have to move physically from one office to another, the processes are faster, all you need to do is log in to your computer, and if you have access rights, you just go to a file and do what you need to do, that's all. Previously, you would have to look for it in the archive room, which was a very difficult task (A11)*

Another participant who believed that the IT system had provided a better method of managing and safe keeping records explained:

> *We are more organised now, files are stored in the databases and applications can be tracked easily. For example, it's easier now to help customers or clients confirm their land and property status when they have a dispute with someone, in the old system, that would take months and even give room for corrupt staff to request for money, but now all that is history, you will hardly hear that issue, so to be honest, this system is a blessing to the agency and the state as a whole (A09)*

The IT system generated new file numbers based on the date and category of applications created by a user. Previously, the agency relied on a manual file-naming procedure that often resulted in errors, such as allocating a file number to multiple applications or mixing up application categories while trying to assign file numbers. All of these issues were solved with the implementation of the IT system, as it generated and allocated file numbers based on the selected criteria entered by a user. As a participant who was very happy about how this feature improved the management of, and access to, information explained:

> *Previously, we had to open a file, issue file numbers and send copies of application forms to different units, all done manually, but with the new system, we do it on a computer, with things like file numbers generated automatically and other departments viewing information they need from the database. It has improved our work, it's fast and easier to track information (A10)*

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Improved personal and professional development was seen as a consequence of the IT system implementation at the agency. Participants expressed how they enjoyed the benefits of being sent for external and internal training in order to support their IT system usage. In a bid to motivate and encourage employees at the agency to use the IT system continuously, training programs were delivered within the agency and, in some cases, employees were sent for training and workshops externally. Some participants believed that even the general computer training that they received was in order to help them use the IT system better; some even mentioned that if not for the implementation of the IT system, they were sure that the agency would not have trained them in the area of general computing skills. As one participant stated:

> *The new system has opened numerous doors, we have enjoyed trainings and workshops. All these activities look good on your CV and improve your skills as a person. We had been asking for computer training for a long time, but it never happened till we started using the new system… Most job adverts today, even if you are applying for a low level job, the requirements include computer proficiency, so you can see, even with the use of this system, I am improving my computer skills and knowledge, and that is very good for my CV (A06)*

In a similar vein, another participant believed that he received personal development training as a consequence of the IT system implementation. He mentioned never imagining going to another state for training if not for the use of the IT system, noting that:

> *I was part of the team that went to Lagos for the digital imagery training, If not for the system, that wouldn't have happened. I have been here for a while, and I have never been sent for external training until now. I learned a lot at the training, we were even issued certificates, which is good because now I can add that to my CV (A07)*

Some participants also highlighted that the introduction of the IT system gave them the opportunity to put their skills into practice. Some participants had a background in GIS and computing and felt that the use of manual methods to conduct land administrative activities did not give them the avenue to practice the skills that they gained during their training and higher education. They often lamented that, before

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the IT system was implemented, their GIS skills were becoming dormant, and they were getting out of touch with those skills and even feared that they might forget the basics. As one participant explained:

The system has brought the best out of most of us because I'm actually practicing what I have studied. I spent years learning GIS, and before the system was implemented, it felt like wasted knowledge. Now I can use that knowledge at work. Practice makes perfect, and that means the agency itself will improve. It's nice for you to put into practice what you have studied, you gain experience and improve on the job (A09)

Similarly, another participant stated:

There is a difference between being employed and having a job. Before the system, we had a job, but now we are employed, because we use the system and showcase the skills we were employed for right from the beginning. GIS knowledge was part of the requirement, but we were doing things manually. With the system now, I'm even learning newer things than what I learned in University, so my skills are improving. I'm really happy that now I'm able to practice what I have learned at the University (A08)

Improved work transparency reveals how participants believed that the IT system implementation tackled problems such as fraud and also improved the image of the agency. The agency has had a long history of issues relating to fraud and safety of client information. After the IT system went live, clients often expressed their satisfaction with the IT system and how it was being used to improve service delivery. Clients were convinced that the IT system showcased the agency's commitment to serve them better and make services more accessible. A participant reflected this in his experience with clients, saying:

We faced so many challenges in the past, our clients' didn't really trust us, and people were scared and not optimistic to come here for anything. With the new system in place, by just looking at how we now setup, clients and other stakeholders are now happy with the change, we have received a lot of positive feedback with regards to the use of the system. They often highlight how easy it is to get certificates now, and how it's almost impossible for someone to create a counterfeit of your land certificate (A07)

Another participant explained this further:

The system has given the agency a positive portrayal, because people now feel safer and assured when coming in to re-certify their documents, their plots of land and all. It has really improved our image and increased our clients' confidence in us, and we are currently experiencing a decrease in the level of fraudulent activities in the agency (A06)

The agency faced other issues relating to fraud, such as staff hiding client files and requesting money before applications could be processed, the collection of bribes to accelerate application processes and, in some cases, files being misplaced or misfiled intentionally. All of these issues were addressed with the implementation of the IT system, as applications were then handled electronically, without having to move files from one place to another, as were payments. As a result, most of the mentioned fraudulent acts were 'flushed out' of any application process at the agency. A participant who was particularly happy with this development noted:

I think the biggest advantage offered by the system is the reduction in the level of fraud, because before people could hide a client's file and request money from the client, claiming they can speed up the processing for them, even though they are the ones that have slowed down the process. But now since everything is computerised, people cannot hide applications anymore. Another fraudulent activity is double allocation of land, but now once coordinates are added to the database and matched with a client's bio data, that certificate cannot be allocated to someone again, only if legal requirements are met for land transfer (A11)

Another participant also explained how the IT system had reduced the level of fraudulent activities that had hampered the progress of the agency and its activities:

The system has brought about positive change, because issues like corruption, land scamming, and fraud are actually dying off very fast. There is more transparency. After a certificate has been produced now, there is no way it can be allocated to a different individual again, unlike before which happened rampantly... The system has stopped a lot of shady activities that have held land administration back over the years, now you can't hide files and request for money, or engage in double land allocation to cheat people (A09)

Safer data storage reveals how participants experienced using the IT system to manage records in a safer and effective manner, compared to the previously-used manual, paper-based method. Before the IT implementation project, the agency faced problems such as files being destroyed by rodents, papers becoming old and dilapidated and, in some cases, files being destroyed as a result of poor storage room conditions. Upon implementation of the IT system, this was no more the case, as files were all stored electronically in the system's database. This system feature meant that records could be kept safely for longer periods of time without being subjected to the above mentioned issues. A participant explained how positively their work had been influenced by the IT system in terms of record management:

Our records are now saved electronically, and we have multiple backup copies, so we don't have to bother about records being destroyed by rodents, paper files getting teared or dilapidated. All we do now is make sure that all new records are properly backed up (A04)

Another participant who felt that the IT system provided a better way of safe keeping records stated that:

In terms of record management, the system has been amazing. Poor record management is a well-known problem in the agency before. You could go to the achieve room to get a file, just to pick it up and see it has crumbled, or get a file and just see half of the page is missing. Using the new system, that does happen anymore, you can keep your records for a longer time and still meet them as you saved them (A07)

Unauthorised access and unauthorised modification of records were also problems faced by the agency before the IT system implementation. Unauthorised staff could easily access records by acquiring the keys to the archive room. The agency did not have any system in place to track who accessed or modified record information. As a result, issues such as the production of counterfeit certificates, intentional hiding of files and destruction of records were faced at the agency. After the IT system implementation, these problems significantly reduced, since access levels were assigned to each user, and a record log was kept to track who viewed a record or made changes to a record on the system. This was seen by many participants as a

positive move to improve the safety and integrity of the agency's record. As one participant stated:

> *Our records are now safely stored electronically, unlike before when paper files could get misplaced or incur physical damage. Everyone has a certain level of access to the system, some can only view, some can edit and delete, so basically it depends on your job role. The system also keeps a log, so whatever is done on the system can be easily traced back to the user (A10)*

Similarly, another participant explained how the IT system had provided better record management and security:

> *The era of staff hiding files and asking for bribes from the clients is now in the past, likewise copying and modifying certificates to forge counterfeits. Our information has now been sanitised and it's safer, in the sense that even if some tries to tamper with a file, the system will show an individual's log in credentials, and everyone has a different access level, so only authorised staff have access to certain parts of the system (A09)*

Speeding up of work processes reveals how participants expressed being able to complete tasks and processes faster as a result of using the IT system. Before the implementation of the IT system, the average time taken to process and produce a single certificate of occupancy was between eight months and one year. The previous process was long and tedious, as paper files had to move physically from one unit to another for various administrative checks. During this process, files could get misplaced, stay untreated for long periods of time and become very difficult to track. Once the IT system was live, the application and processing life cycle dramatically improved. Applications were made electronically and went through all administrative checks via the IT system. The IT system automatically generated data such as application numbers, which reduced the initial time taken to file an application. Many participants highlighted their happiness with how the IT system accelerated their work processes. As one participant stated:

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The system has provided many advantages, but the most important among them is the speed at which it helps us process and produce certificates of occupancy. Before it took almost forever, but now once I have my data fully attributed, no amount would be an issue in production. We can now generate thousands within few hours, compared to before when it could take you a month or even a year to get that same number produced, but now at a click, you get them all (A09)

Another participant explained how they integrated the IT system with a signature machine to accelerate the process of certificate production:

As we speak, you will be surprised at how swiftly we produce C of Os (certificate of occupancy) now, and the number we produce in a short time. The system is really remarkable, we couldn't have asked for a better change. For example, we integrated a signature machine with the system, so now certificates are signed automatically. Imagine how an individual would have to sign 1000 certificates, you would feel sorry for him. But most of these issues and processes have been computerised and they are easy now (A06)

Minor errors were encountered during the manual process of producing certificates. Rectifying these errors often increased the time that it took to produce a certificate. The majority of these errors were associated with the generation of file and application numbers, and assigning proper measurements to plot drawings. Upon implementation of the IT system, this significantly changed as all of the above information was generated automatically while processing an application. As a result, the number of errors encountered reduced, consequently improving the pace at which certificates could be processed and produced. As one participant explained:

The new system is easy to use, it has reduced a lot of errors and has made our work faster. For instance, we normally had errors on certificates due to the manual process of generating application numbers and certificate ID, we hardly face these issues now, since these numbers are generated automatically by the system. Mistakes like allocating the same file number twice don't occur anymore, so we are able to work faster and produce more certificates (A10)

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4.5.2: Threat

Participants who appraised the IT system implementation as a threat believed that the IT system had more negative consequences towards them both personally and professionally. These participants were not happy with the changes that came as a result of the use of the IT system. In most situations, if they could have had their way, they would have happily gone back to the manual, paper-based processes used by the agency in the past. The Threat sub-theme was made up of the lower level codes: **perceived job uncertainty**; **loss of power and autonomy**; **slowing down of work processes**; and **reduced teamwork and interaction**. These codes will be explained further in this sub-section with the use of illustrative quotes gathered from participants during the interview sessions.

Perceived job uncertainty reflects how some participants felt that the IT system implementation had brought about a high level of job uncertainty within the agency. Participants with this perception believed that the IT system was established to replace them, mostly because they did not have adequate computer and IT skills. Some participants also saw the IT system as a means of replacing older staff with younger 'tech-savvy' staff. As a result, there were numerous rumours within the agency that certain employees' 'days were numbered', and that they would imminently lose their jobs. As one participant with such a perception explained:

> *There was too much confusion, today you hear staff saying the system will be implemented, tomorrow you hear a different thing. The worst part of it is now that the system has been implemented, there is a high level of uncertainty. Many people fear for their jobs, especially those that are not really good with computers. It's either you lose your job, or maybe you get redeployed to somewhere you don't like (A13)*

In a similar manner, another participant who felt that the IT system was implemented in order to replace staff who were not IT literate stated:

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Many people didn't really like it because we all knew our job will change, we might even lose our jobs. So it caused panic and stress for a lot of us, the uncertainty was a very bad feeling, we just had it in mind that something bad was going to emerge from the whole process…It makes me feel that eventually, we will not be useful anymore, especially how long it takes us to finish work now (A14)

Apart from the fear of losing their jobs, some participants believed that the implementation of the IT system brought about uncertainty in relation to their job roles and what they had to do specifically using the IT system. The IT system implementation was accompanied by changes in business processes and job roles. There was a belief by some participants that the management did not properly handle the designation and communication of new job roles after the IT implementation project had been completed. As such, some participants were left confused and in a state of uncertainty. As one participant explained:

We weren't really told much about the change, we were assigned to units based on the new structure, but I can't pinpoint my exact job role, today I'm doing this, next week that. All I know is for now I have been told to use the system to digitize old files that are going to be recertified. I could be doing something else next week, the uncertainty is too much, and a lot of us are worried about it (A10)

Another participant who felt that she did not really know her job role after the IT system implementation stated:

There are times we struggle to use the system, because we don't have specific job roles at the moment, I have done multiple tasks with the system, from registration to conversion of files. The earlier we know what we have to do the better for us. It seems like the management is still trying to redeploy people, and I'm scared I might be sent to another unit (A12)

Loss of power and autonomy reflects how certain participants believed that the IT system led to them losing some level of power and autonomy in the agency. Some long-term staff that were used to the manual, paper-based processes of land administration and hardly, or never, used computers for their work processes felt that they did not have the necessary skills to use the IT system effectively. As such, they saw the IT system as a threat to their status because, before the IT system implementation, they were looked up to for guidance and coaching. This changed

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owing to the requirement to have IT and computing skills in order to use the new system. So, instead of teaching the younger staff how to carry out daily activities, they found themselves relying on the younger staff to help them to use the computers and the IT system. For them, this was a major shift in status which they found hard to accept. As one participant said:

> *Many things have changed, for example, the staff we use to mentor before, some of them are the ones teaching us how to use the system, I can remember the first day a staff was showing me how to use the new system, he said "click here sir" I just laughed and said you are the bosses now, [laughs]. It's an entirely different process, I love teaching people what I do, but that part of my job is slowly fading away due to the system (A14)*

As part of the changes in work processes brought about by the use of the IT system, some tasks that were carried out by data entry staff were now transferred to higher-level staff, such as GIS officers. As such, staff affected by this change felt that they were forced to do tasks that were below their status in the agency. For example, one participant stated:

> *I understand records are kept better on computers, but it's not my job to be adding all these things to the system, that's what the junior staff are here for. I can't believe I'm doing this now, data entry is what you do when you join at the very beginning, and I have been here for more than 10 years (A14)*

Other participants also voiced the opinion that the older staff were not in support of learning how to use the IT system from new and junior staff in the agency. As one participant stated:

> *Some staff feel that they cannot go to a young staff to learn something new since they have been here for a long time. They have big egos, but unfortunately, the Ego doesn't know how to use GIS software, [laughs]. To be honest, they feel like they are not senior staff anymore, the system has predefined steps, so now they can't do whatever they want, so they are not happy (A10)*

The situation reached a point where there was division between the staff at times, with the more experienced staff feeling like they were losing their relevance at the agency. As one participant explained:

The old staff in the lands department feel they have lost power, there has never been a time in the history of the agency where the new and younger staff knew more than the old experienced staff, so this is something that has scared them a lot, and they feel really threatened by it. They don't want to work with the younger staff and learn, so in fact, they are rejecting not just the technology, but also the transition the system has brought that reduced their power and influence in the agency (A14)

Slowing down of work processes reflects how some participants felt that the use of the IT system had reduced the speed at which they were able to complete tasks compared to when they were using the manual, paper-based method. As already highlighted, the use of the IT system required computer and IT skills – skills that the majority of the staff were lacking when the IT system went live. As a result, participants who lacked such skills struggled to use the system. They often complained about getting stuck while trying to complete tasks like mapping and data entry. This set of users relied heavily on their colleagues for help in order to complete tasks using the IT system, resulting in them completing fewer applications than expected. As one participant said:

I don't work or process files as fast as I used to do with the forms and paper-based system. I could process more applications before, the manager complains that we are slowing down the process intentionally, but I guess he won't understand the difficulty since he doesn't use the system to do his work… most of the time I have to keep on asking other staff for help on how to do certain things using the new system (A13)

Another participant also explained that, apart from not having the technical know-how to use the IT system without facing any struggles, poor network connectivity and the lack of a constant power supply also affected the speed at which they could process applications, noting that:

I am struggling to understand it fully, sometimes you want to work, and there is poor network connectivity, so all these issues slow down my work. Before we would complete forms or give clients forms to complete with pen and paper, the forms are filled and we start processing quickly. Now because I'm not that fast with the computer, so it takes longer (A12)

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Similarly, another participant believed that the time and resources used in implementing the IT system had slowed down both his work and the progress of the agency. He often complained that the previous way of doing things was fine, but that they now had to waste time learning how to use the IT system before accomplishing tasks with it, noting that:

> *I don't think it is necessary. It is making my work difficult now; number one I don't know how to use the computer, so I have to keep asking people how to do my work. I can process more than 4 files in a day before, now I am struggling to process 1 or 2 highest in a day... They expect since we have computers now, everything should be faster, but the reality is the computers have slowed down my work (A14)*

Reduced team work and interaction refers to how participants felt that the level of team work and face-to-face interactions with colleagues had reduced owing to the use of the IT system. Before the IT system went live, staff normally worked together in meeting rooms to accomplish tasks such as mapping and plotting. After the IT system went live, most of these tasks were digitised and participants carried out these task using computers. Files that needed to be shared were simply made available via email or shared task folders. As such, staff did not have to meet frequently to accomplish project-related tasks compared to their prior working arrangements. Some participants felt that the reduction in the level of interaction was not good for personal development as it reduced the chances of sharing knowledge and ideas. As one participant explained:

> *Before the system, we usually worked in teams, the spirit was high because we also had interactive activities. That has changed now because mostly everyone does his work on a computer, and if not a problem arises, all we do is send each other documents. The human element is gone, and that's not good (A13)*

Another participant expressed the same opinion, stating:

> *We had more face-to-face interactions before, we would sit and brainstorm. It was basically a team effort. We learnt a lot from each other. But now we work individually, and that means we hardly exchange knowledge and ideas between ourselves. This is not good for development, especially for the new and young staff (A14)*

4.6: Diversity of User Responses at CASE A

Sections 4.4 and 4.5 presented analysis of the 'influencing factors' and 'primary appraisals' themes, drawing on the positive and negative perceptions of the participants in the case, and their perceived levels of controllability over the IT system implementation. While the statements from the participants in relation to the two themes are insightful, what these statements do not show is an individual's perspective about the changes brought about by the IT system over a period of time.

To address this, section 4.6 presents analysis for each user by theme in order to show an individual user's perception about all of the themes and, importantly, to show how individual users' perceptions changed over the period of time covered by the case. Looking at where each individual user is categorised across the user response categories at phase one allows the first research question (How do users respond to IT–induced organisational changes in mandatory use contexts? – see section 1.3) to be answered. This analysis will be the focus of the remainder of this section.

Gaining insights into the changes in individual users' perception over time will also be important as it will provide answers to the second research question (How do user responses to mandatory IT–induced organisational changes evolve over time and what are the factors that influence these changes? – see section 1.3). This analysis will be presented in section 4.7.

All of the analysis in section 4.6 is drawn from Table 4.4, which shows a high-level analysis of individual user responses. Table 4.4 presents the responses from all of the participants in the IT-system user category at phase one. For the purpose of simplicity, each participant has been placed in a user response category based on the number of utterances categorised as threat or opportunity appraisals and perceived level of control over influencing factors. It should, however, be noted that a participant may simultaneously hold a threat- or opportunity-oriented view of the IT system (Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017). For instance, a user may view the IT system as offering an opportunity because it improves work transparency and a threat because it reduces his/her work autonomy.

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To resolve such differences, it was decide that if a participant uttered more positive appraisal statements than negative appraisal statement, that participant would be classified within the positive response category (a situation where a user sees the IT system implementation as an opportunity for personal or professional growth). If a participant uttered more negative appraisal statements than positive appraisal statement, that participant would be classified within the negative response category (a situation where a user sees the IT system implementation as a threat to position, autonomy, or power). If a participant uttered an equal number of positive and negative statements, that participant would be classified within the ambivalent response category (a situation where a user sees the IT system implementation equally as a threat and as an opportunity) (Stein et al., 2015). However, it is worth nothing that no participant emerged within the ambivalent response category from the case study.

Each box in Table 4.4 represents a participant's perception of a theme. Light green indicates positive perceptions, while orange indicates negative perceptions. The number in each box indicates the number of utterances that a participant made about a factor within that theme. Boxes without colour and marked as 'X' indicate that a participant did not mention that particular factor within the theme. The tick sign '✔' within the user response category section of the table indicates the response category a participant fits into.

Worked examples will be presented in separate sub-sections to show into which category each individual user fits and to explain why. Within each response sub-section, at least one individual user example will be presented to demonstrate the process of categorisation, through the use of diagrammatic illustrations of statements from participants, followed by a detailed analysis. Three response categories were uncovered in the first phase of the interviews with participants: engaged; compliant; and reluctant.

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Table 4.4 High-level analysis of the individual user responses in phase one

| Participant | Primary Appraisal | | | | | | | | | Influencing Factors | | | | | | | | | | | | | | User Response | | |
| | Opportunity | | | | | Threat | | | | Individual-related factors | | | | Organisational & process-related factors | | | | | | IT system-related factors | | | | | | |
	Improved information tracking	Improved personal & professional development	Improved work transparency	Safer data storage	Speeding up of work processes	Perceived job uncertainty	Loss of power and autonomy	Slowing down of work processes	Reduced teamwork & interaction	High self-efficacy	Low self-efficacy	Perceived encouragement	Perceived discouragement	Adequate training	Inadequate training	Effective management communication	Ineffective management communication	Perceived involvement & participation	Perceived lack of involvement & participation	Easy & user-friendly IT system	Difficult & complex IT system	Adequate access to IT infrastructure	Inadequate access to IT infrastructure	Engaged	Compliant	Reluctant
A07	3	2	3	2	3	X	X	X	X	3	X	5	1	3	1	3	X	4	1	3	X	2	1	✔		
A09	2	3	4	3	4	X	X	1	X	4	X	3	1	3	X	1	2	4	X	4	X	1	2	✔		
A06	4	2	5	3	5	X	X	2	X	3	X	4	1	3	1	3	X	2	X	2	X	1	2	✔		
A08	X	3	1	1	2	X	X	X	X	3	X	3	X	2	X	2	1	4	2	1	X	1	2	✔		
A10	3	X	1	2	3	X	X	1	X	1	X	3	2	X	4	X	4	1	6	1	1	X	4		✔	
A11	X	X	3	2	2	X	X	2	1	3	X	X	2	X	3	X	4	X	4	1	2	X	6		✔	
A12	1	X	X	X	X	2	1	3	X	1	2	1	2	X	3	1	3	X	2	X	3	X	2			✔
A13	X	X	X	1	X	2	3	2	3	1	2	X	1	X	2	X	3	X	4	X	4	X	2			✔
A14	X	X	X	X	X	3	3	3	2	X	2	1	X	X	3	X	2	X	3	X	3	X	1			✔

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Figure 4.4 is an abstraction of Table 4.4 which provides an overall summary of participant responses across all four of the response categories for the first phase of the interviews. The deviant response category is added in Figure 4.4 in order to show completeness of the model, even though no participant emerged from the deviant response category. The textboxes with dotted border lines indicate the phase of the study and the number of participants within a particular response category. Considering the first response category, 'P1' denotes phase one, while the number '4' indicates that four participants responded in what was deemed to be an engaged manner in that phase. In the following sub-sections, a detailed analysis will be presented for each of the response categories.
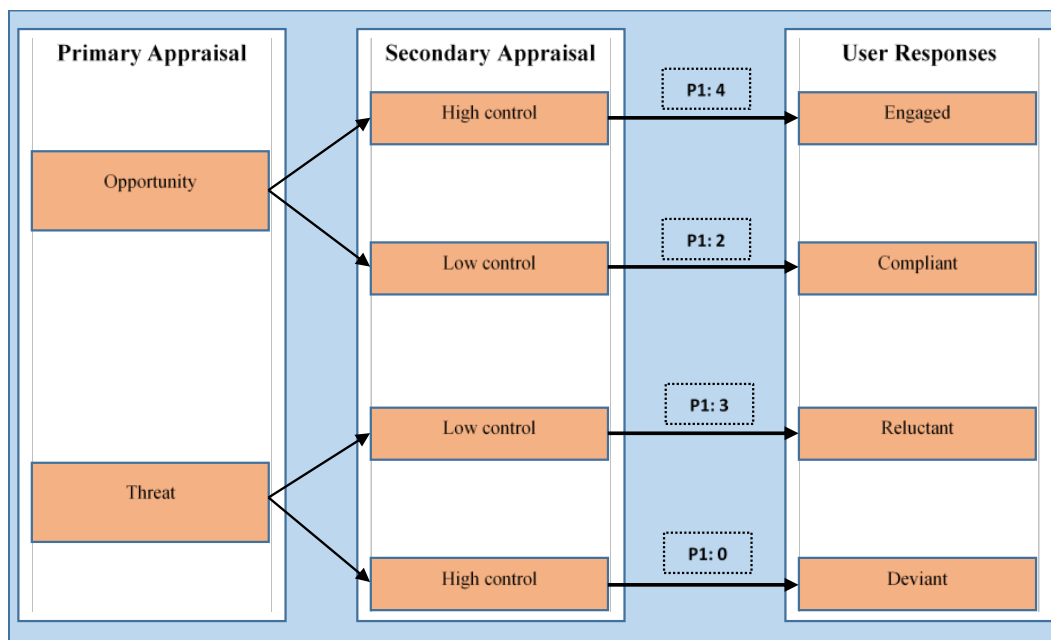
Figure 4.4 Summary of individual user responses in phase one

4.6.1: Engaged Responses

Engaged responses emerged in instances where participants appraised the IT system as an opportunity and felt that they had a high level of control over the IT system implementation and its use in their work environment. Participants who responded in an engaged manner were oriented towards taking full advantage of the opportunities offered by the IT system. The IT system usage behaviours exhibited by participants who responded in an engaged manner showed a willingness to

extend the usage of the IT system beyond its required and anticipated use, by experimenting and discovering novel uses of the IT system.

During the first phase of the interviews, four out of nine participants in the IT-system user category were found to have responded in an engaged manner. High levels of control over influencing factors were expressed as *perceived involvement and participation*, *adequate training*, *perceived encouragement*, *high self-efficacy*, and so forth (see section 4.4). Opportunity perceptions were expressed as: *improved information tracking*, *improved personal and professional development*, *improved work transparency*, and so forth (see section 4.5.1). Evidence of engaged IT system usage behaviours was assessed not in terms of how much participants used the IT system, but the way in which they used it – for example, participants trying to customise some IT system features, using the IT system to create certificate templates, embedding codes in the IT system to recognise design errors, and creating ground rent calculation formulas on the IT system.

As an illustration of the chain of evidence for engaged user responses, Figure 4.5 provides a worked example of the response for the participant 'A07'. A detailed analysis of quotes from the participant follows.
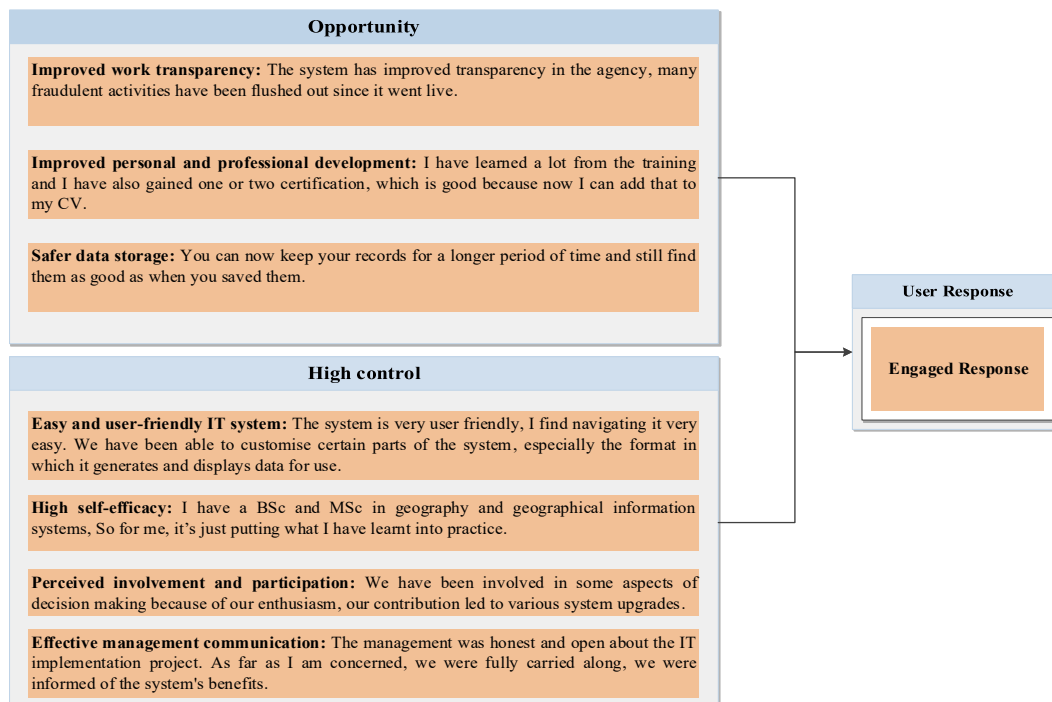
Figure 4.5 Engaged response: evidence chain for A07

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A07, a member of the production unit, described many benefits of the IT system during the interview. Having highlighted issues of fraud and corruption in the agency, he was happy to see that the use of the IT system had drastically reduced such issues. IT system features such as online payment, restricted access to information, improved communication channels and improved transparency at the agency. Other mentioned benefits included safer data storage, as all agency files were now stored electronically in a database. As such, problems like file damage and misplacement were eliminated from the work process. A07 expressed high levels of control over the IT system implementation and its usage particularly with regard to his ability to learn and use the IT system easily. In the interview, he stressed that since he had prior knowledge of GIS and computer skills, he knew he would not struggle using the IT system. He also mentioned, among other things, being heavily involved in the decision making process and also participating in multiple deployment activities.

As a consequence of A07's appraisal of the IT system implementation, his IT system usage behaviour demonstrated an engaged response. As a production officer, his tasks were centred on the final stages of producing various certificates issued by the agency. Having used the IT system for some time, he explored various features within the IT system and uncovered an innovative way of designing new certificate templates. This was an important innovation for the unit, as it was initially not realised that this was a feature/possible use. As a result, the unit experienced increased efficiency and an increase in the quality of its certificates. A07 describes in the following quote how he discovered how to create new templates with the IT system:

> *We issue various certificates, for instance, an occupancy permit. This is the first certificate the government gives out before they issue you a piece of land, so it's just like an invoice. This was issued manually before, we later agreed that this has to change, so I tried designing it with the new system, and I successfully achieved it. Now, all we do is add all the information and click send, and the system automatically generates and prints the certificate.*

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Having presented a high level of analysis of individual user responses in Table 4.4, and presented a worked example, it can be seen how the 'engaged response' judgement was made for the participant A07, Summaries, with similar chains of evidence, for other participants within this user response category are provided in Appendix D.

4.6.2: Compliant Responses

Compliant responses emerged in instances where participants appraised the IT system as an opportunity but felt that they had a low level of control over the IT system implementation and its use in their work environment. Participants who responded in a compliant manner were satisfied using the IT system to accomplish their tasks and satisfy organisational mandates without attempts to explore further IT system features. Participants in the compliant response category, however, did not enjoy as many benefits as their colleagues in the engaged category owing to their perceived low levels of control over the IT system implementation. The IT system usage behaviours exhibited by participants who responded in a compliant manner revealed a standardised and repetitive usage pattern, with no indication of further IT system exploration.

During the first phase of the interviews, two of the nine participants in the IT system user category responded in a compliant manner. Low levels of control over influencing factors were expressed as *inadequate access to IT infrastructure*, *difficult and complex IT system*, *in adequate training*, *perceived lack of involvement and participation*, and so forth (see section 4.4). Opportunity perceptions were expressed as: *improved work transparency*, *safer data storage*, *speeding up of work processes*, and so forth (see section 4.5.1). Evidence of compliant IT system usage behaviours were reflected in how the participants used the IT system in a routine and repetitive manner, with no attempt to discover novel uses. These participants were satisfied using the IT system to accomplish their allocated tasks in the prescribed way. Figure 4.6 presents A10's appraisal of the IT system implementation, as an example of a compliant user's responses.

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Opportunity

Improved work transparency: Previously, all our processes were done manually, now these processes are automated. The system has improved our work, it's fast, and easier to process and track information.

Speeding up of work processes: The new has reduced a lot of errors and has made our work faster. For instance, we normally had errors on certificates due to the manual process of generating application numbers and certificate ID, now it's generated automatically and very fast.

Safer data storage: The system also keeps a log, so whatever is done on the system can be easily traced back to the user, now our records are kept safer.

Low control

Ineffective management communication: I can't say there is good communication. There is a huge communication gap, we still find it confusing, because today you hear this, tomorrow that. A lot of rumours all over the agency.

Low self-efficacy: I hardly use computers until now, but I'm not that good with it, because this is the first time I am using it to work, it's a new concept to me, because most of the processing we do before is totally paper-based.

Inadequate access to IT infrastructure: Management has not fully supported us, to be honest. Not yet. Most of the computers we use are old, because they have been here for a while.

Inadequate training: we haven't received any official training yet, most of the time it's our colleagues that put us through, and it's not very detailed.

User Response

Compliant Response

Figure 4.6 Compliant response: evidence chain for A10

A10 appraised the IT system positively. During the first phase interview, he highlighted many benefits that he had enjoyed from using the IT system to accomplish his tasks. As a member of the registry and information unit, the success of his tasks relied on how quickly he could accomplish them within a certain time frame. Processing information and giving clients feedback were two of the most important activities at the agency. Having faced problems like slow file retrieval and files being unaccounted for, he stated that all those problems had been resolved with the use of the new IT system. Among many mentioned benefits, he emphasised how the IT system had speeded-up work processes. Files could now be accessed within a click of a button and there was now no need to move files physically from one office to another, an activity that was detrimental to the overall processing of a client's application.

Although A10 realised many benefits from using the IT system, he expressed low levels of control over the IT system implementation and its usage owing to factors such as his low self-efficacy and having received inadequate training. In as much as he used computers for some activities, those activities were mostly for entertainment and not office-related activities. He also mentioned being unfamiliar

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with GIS software prior to its implementation at the agency. As such, he mostly struggled to accomplish his tasks while using the IT system. While training had been conducted at the agency, A10 believed that the informal training that he had received was not enough for him to master the use of the IT system. He lamented not having dedicated training sessions, which he believed would have gone a long way in helping him to improve his IT system usage. In terms of IT infrastructure, A10 felt that the Internet connectivity in their unit could have been improved, as the service was not always stable enough to support their activities.

Consequently, A10's IT system usage behaviour demonstrated a compliant response. Owing to his struggles while using the IT system, A10 was satisfied using the IT system in a standardised, routine manner, following the steps that he had learned from his colleagues. He had no intention of exploring other IT system features that were not directly related to his tasks. His tasks were mainly administrative and were not as complex as other tasks, such as mapping and plotting of cadastral data. A10 explained how he was satisfied concentrating on using just the primary IT system features related to his tasks, saying:

> At the moment I am using the features I have been trained to use. I'm not a heavy user of the system, I do the administrative parts mostly, the people using the GIS and cadastral features use more sophisticated features than me, so I leave that to them. I am not really interested in that aspect.

Summaries, with chains of evidence, for other participants within the compliant user response category are provided in Appendix D.

4.6.3: Reluctant Responses

Reluctant responses emerged in instances where participants appraised the IT system as a threat and felt that they had a low level of control over the IT system implementation and its use in their work environment. Participants who responded in a reluctant manner were typically against the implementation and use of the IT system at the agency. This set of participants would have gladly gone back to the manual paper-based method of land administration if given the option. These participants only used the IT system with the intention of complying with the

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organisational mandate regarding the IT system. They did not enjoy the full benefits of using the IT system as their usage behaviour was reluctant and, as such, they only used the IT system when it was absolutely necessary.

Three reluctant responses were observed from interviews with nine participants in the IT system user category during the first phase of the interviews. Low levels of control over influencing factors were expressed as: *low self-efficacy*, *perceived discouragement*, *inadequate training*, and so forth (see section 4.4). Threat perceptions were expressed as: *perceived job uncertainty*, *loss of power and autonomy*, and so forth (see section 4.5.2). Evidence of reluctant IT system usage behaviours were reflected in how these participants used the IT system reluctantly and how often they complained about having to complete tasks using the IT system. For instance, these participants often lamented why they had to use the system or would complain of having to wait for a colleague to come and lead them through tasks. They showed no interest in mastering the IT system or exploring other novel uses of the system to improve their work. Figure 4.7 presents A12's appraisal of the IT system implementation, as evidence of a reluctant user's responses.

Threat

Perceived job uncertainty: A lot has happened since the system went live, I'll be honest with you, and a lot of us still feel we may lose our jobs.

Slowing down of work processes: As for me, the new system has slowed down my work, because I am struggling to understand it fully, I'm not that fast with the computer, it takes longer.

Loss of power and autonomy: Before I could go with my work home, I would carry certain files to treat after office hours. I can't do that now, because everything is online. I don't have a computer and good Internet connection at home, so it's impossible at the moment.

Low control

Perceived discouragement: Most of the managers in our unit don't really like the system too. We hear them saying bad things about the change, so for them to complain about it, what would you expect people like us that work under them?

Ineffective management communication: People were scared and confused. The transition was a tense situation, we didn't really know much because the management was mostly mute about it.

Difficult and complex IT system: I'm still learning how to use the system, I won't really say it's easy because I haven't used anything like this before and at the moment I am struggling a lot.

Inadequate training: We haven't really received adequate training, and I have never heard anything about a user manual.

Perceived lack of involvement and participation: We were just told its official now, we couldn't say we want to use the system or not. It was mandatory.

User Response

Reluctant Response

Figure 4.7 Reluctant responses: evidence chain for A12

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A12, a member of the registry and information unit exemplifies a participant with a reluctant response towards the IT system implementation at the agency. Her first phase interview unveiled how she appraised the IT system implementation as a threat. She mentioned the IT system implementation as creating a cloud of uncertainty at the agency. She lamented people being scared of losing their jobs due to a lack of computer skills or reassignment of staff to other units within the agency. She described the situation as being tense and reported that many people were anticipating a bad consequence after the 'go live' period. She repeatedly explained how the IT system slowed down the pace at which she could complete her tasks in comparison to the prior manual, paper-based method. This was owing to her lack of computer skills and low level of familiarity with GIS software. A12 also felt that since the IT system was designed based on strict work processes and security protocols, she lost some aspects of her work autonomy. The system could only be accessed on the agency's network, which meant that she could no longer take work home with her as she had previously done, before the IT system went live.

A12 also bemoaned having low levels of control over the IT system implementation. She expressed frustration about not having participated in, or being involved in, any decision making during the IT implementation project. As far as she was concerned, the IT system was forced upon them without any consultation about their views of the whole process. She also felt that ineffective communication from the management team created uncertainty in the agency, with many people not knowing what would happen next, unavoidably causing the spread of rumours among employees. Being the first time that she had had to use GIS software for her work, she found the system too complex and cumbersome, inevitably causing her to struggle while using the IT system to accomplish her tasks.

As a result of A12's appraisal, her IT system usage behaviour demonstrated a reluctant response. She only used the IT system when it was absolutely necessary, avoided using features that were not directly related to her tasks and used the IT system only to comply with the agency's compulsory usage policy. As she explained:

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I'm still trying to learn the basics, at least learn what I have to do to accomplish my own tasks. I will not bite more than I can chew. At the moment that's my only concern… I'm still struggling to use the system without facing any difficulties…I don't understand why we have to go through all this stress in the name of implementing technology.

Summaries, with chains of evidence, for other participants within this user response type are provided in Appendix D. Analysis of the second phase of the interviews are presented in the following section.

4.7: Changes in User Responses at CASE A

As noted earlier, this section presents findings from the second phase of this study which provides answers to the second research question: how do user responses to mandatory IT–induced organisational changes evolve over time and what are the factors that influence these changes? Participants were re-interviewed after approximately six months to examine whether they had experienced any changes to their initial responses towards the IT system implementation. Unlike phase one where the judgement criteria for categorising participants into different user response categories were based on content analysis and number of utterances made by a participant about particular codes, phase two takes a different approach, in that it comprised follow-up interviews that built upon user responses from phase one. Simply put, phase two interviews were an incremental judgment of participants' view over time and lasted shorter than interviews in phase one. The researcher started phase two interviews by re-grounding the participants as to their previous views and asking if the participants had experienced any changes in those views. As such, a more impressionistic judgement was made about whether participants mentioned a greater number positive or negative things in relation to each of the areas discussed in phase one (where a frequency-based categorisation analysis was used). This allowed changes in user responses over time to be identified.

Interestingly, the second phase interviews provided evidence of transition in participant responses from one response category to another. Eight out of the nine initial participants in the IT system user category were re-interviewed, as one

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participant had left the agency by the time of the second phase interviews. Transition in user responses was experienced as a result of changes in influencing factors and primary appraisals. Perhaps surprisingly, both progressive and regressive transitions were witnessed at the agency, although progressive transitions were much more common. Figure 4.8 presents a diagrammatic illustration of participant responses during the second phase interviews. The transitions in user responses are explained in the following sub-sections.
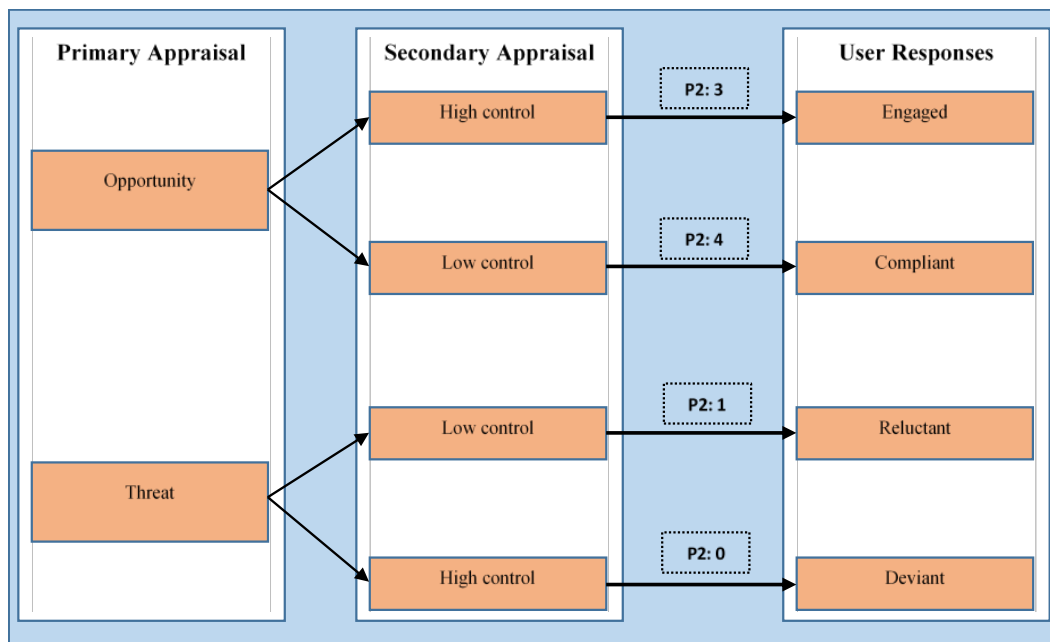
Figure 4.8 Summary of individual user responses in phase two

4.7.1: Compliant to Engaged Responses

Compliant to engaged response transitions showed changes in the level of control from 'low' to 'high' over influencing factors with no substantive change in view of the IT system as an opportunity (primary appraisal). Perceptions of an increased level of control over the use of the IT system was as a result of increased interaction with the IT system by users and improved post-implementation activities by the agency. A10's transition offered interesting insights of such a transition. During the second phase interview, A10 reaffirmed his appraisal of the IT system as an opportunity (see Table 4.4 for a summary of A10's appraisal at phase one), but

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provided insights about his perceived increase in the level of control over his IT system use.

Upon receiving multiple complaints and feedback from the IT system users, the agency had decided to provide more training and provide better IT infrastructure in some units. The agency had adopted a new strategy to improve training by organising individual training sessions and on-the-job training, and had encouraged peer-to-peer learning among employees. This new training strategy recorded a certain level of success, as some participants mentioned benefiting from it immensely. A10 was one of these employees, noting how the new training strategy increased his levels of control over his IT system usage:

> *Many things have changed since we started using the system. Training has improved because we have had some individual sessions…I think what has helped me the most is working closely with A07, I have learned many things, for example, I can now customise acknowledgment slips based on the type of application a client has gone through…I do not struggle to use the system anymore, in fact, I find it very interesting nowadays. The peer-to-peer learning processes have made a real difference.*

The registry and information unit was among the units that received new computers after the agency decided to increase the number of computers to support its operations. The agency launched an initiative to capture more clients and increase the number of registered plots in its database. As a result, laptops were acquired in order to allow registration officers to go to locations within the state to register potential clients rather than wait for them to visit the agency. A10 was among the employees that benefited from this initiative, as he received a new laptop to support his work activities. As A10 explained:

> *I enjoy working with my new laptop because it's faster than the old desktop I used before. We can now go out to register clients, we do this once every week…I can work faster now because I have a better machine. The laptop battery can last for a while, so even if there is a power outage, we just continue our work, unlike when we used desktops without any UPS. The old desktop computers were part of our major stumbling blocks before.*

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Hence, A10's response transitioned from compliant to engaged. Benefiting from improved training increased his knowledge of the IT system; as such he used the IT system without struggling anymore. Having access to a new laptop also improved his IT system usage, since it performed far better than his previous desktop computer. A10 also started using the IT system in an engaged manner, as he was now able to create customised acknowledgement slips using the IT system.

4.7.2: Reluctant to Compliant Responses

Reluctant to compliant response transitions showed changes in primary appraisals from threat to opportunity, with no substantive change in perceived level of control over the use of the IT system. Participants who experienced this type of transition still believed that they had low levels of control over how they used the IT system to accomplish their tasks. Some still struggled while using the IT system, often highlighting the need for more training and better access to infrastructure, such as computers and faster Internet connectivity.

A12 is an example of a participant who transitioned from a reluctant to a compliant response. A12 initially appraised the IT system as a threat, believing it slowed down the pace at which she worked and feeling that she might lose her job as a result. After using the IT system for some time and benefitting from the new training strategy put in place by the agency, her threat perceptions towards the IT system started changing. She attributed the change to the individual training she had received and to working closely with a colleague. As a result, she was able to improve her knowledge of the IT system and to see its benefits first hand. A12 explained the positive impact of her new training experience:

> *The new method of training has made a real difference. I have received a lot of one-to-one training, especially from A07, he was assigned to our unit to train us. We call the process peer-to-peer training…I must admit, I am now seeing the benefits of the system clearly. At first, it looked like it would replace us, but now I can see it's just an enabler to help us improve our work… At this moment I'm still improving, so I still need help using it, but I definitely use it better and faster than before, so I'm confident I'll master it in no time.*

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While A12's appraisal changed from threat to opportunity, she still experienced limited control over how she was able to use the IT system. There were still features within the IT system that could not be customised, even though some employees had requested for changes to be made to the IT system. Consequently, some employees continue to face difficulties while navigating through the IT system. This is exemplified by A12, who said:

> *I wish the system could show me information in separate windows, it only shows the information in different tabs, so that makes it difficult to view two different sections within the system at the same time.*

In terms of IT system usage behaviour, A12 did not try to extend her IT system usage and find innovative ways to use the IT system but rather used the IT system in a routine manner to accomplish her daily tasks. She was generally happy with her improvement and was satisfied with being able to use the IT system to accomplish her tasks, saying of her current IT system usage:

> *I'm still not an expert, but my colleagues are helping me get there. I still use the system as it is, but I understand it still has many functions that can improve our work.*

4.7.3: Engaged to Compliant Responses

Engaged to compliant response transitions showed changes in the level of control from 'high' to 'low' over the IT system and its use, with no substantive change in opportunity appraisals. Changes in perception of control from 'high' to 'low' were mainly attributed to a lack of infrastructure, poor decision making and a lack of continuous training.

A08's transition offered interesting insights into such a transition. He initially reflected opportunity appraisals matching a high level of control over his IT system use, but after using the IT system for some time, his appraisals of control shifted from 'high' to 'low'. He attributed this change to not having had access to adequate IT infrastructure, which consequently affected the pace at which he could complete his tasks. The geometry unit, in which he worked, heavily relied on the IT system

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for its daily tasks, therefore users in this area required powerful computers and a fast broadband connection owing to the nature of their tasks. When the agency decided to provide more computers, its emphasis was more on units that did not have enough computers, rather than those that needed repairs and upgrades. As a result, the geometry unit had to use their old computers and often relied on a slow Internet connection. This affected the output of some employees within the unit, with A08 noting that:

> *Our computers are getting old, and you know what that means, eventually they will be slower, so we need more and we also need a stable internet connection… Sometimes when you request for certain hardware, it takes a long time for them to get it or in some cases, they will tell us the agency doesn't have the money to buy it at the moment. For example, processes that need servers, since they have not bought any, we sacrifice a workstation computer and convert it into a server, and we cater to our needs. So you see, we do a lot of improvisation, that's one out of many examples. We just try to use what we have.*

Owing to these issues, A08 felt that he had to struggle and manage with the use of slow computers and a slow Internet connection since the agency was not able to satisfy his needs to accomplish his tasks. He also highlighted that most of the decisions made with regards to acquiring and distributing new computers were made by the top management, without in-depth consultation with the main users of the computers.

4.7.4: Summary of Individual User Responses and Transitions

Overall, the analysis in this section has provided important insights into how participants transition from one response category to another. Figure 4.9 provides a summary of individual user response categories and transitions between them from phase one to phase two of the interviews with participants. The text boxes with the dotted borderlines indicate the number of participants that fall within each response category in each of the study's two phases. The dotted arrows show the direction of the transition of a participant's response. The numbers next to the arrows show the

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number of participants transitioning from one response category to another. Using the reluctant response category and its transitions to the compliant response category as an example, P1:3 indicates that at phase one of the interview exercise, three participants responded in a reluctant manner. At phase two of the interview exercise, two out of the initial three respondents had transitioned to a compliant response, which is indicated by the dotted arrow facing up with the number '2' by its side. P2:1 shows the one participant who maintained a reluctant response at phase 2 and, since there was no response from compliant to reluctant response, the dotted arrow facing down has the number '0' by its side.
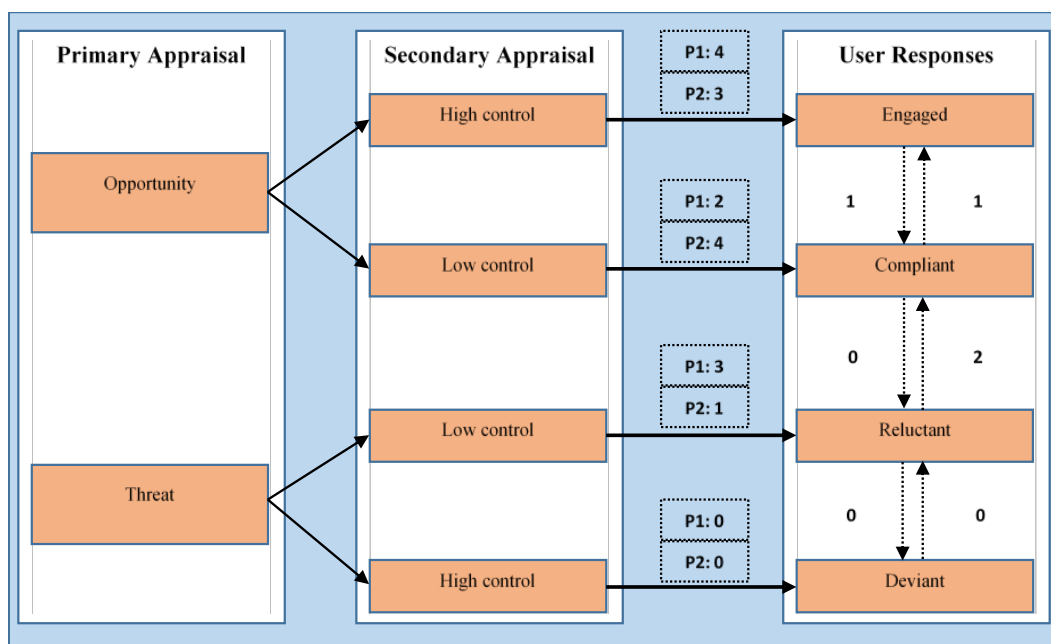
Figure 4.9 Summary of individual user responses and transitions in response categories from phase one to two

4.8: Summary

This chapter has presented the organisational context, analysis, and findings of the first case undertaken as part of this research. The organisational context addressed in this chapter included the case background, the organisation's IT infrastructure, the history of the IT system implementation, and participant information.

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In addition, themes that emerged from the data analysis process were presented. The data analysis process revealed how lower level codes were combined to form sub-themes and themes at a higher level of abstraction. Having presented the analysis across themes, the chapter then presented the analysis across participants by vertically matching the sub-themes 'influencing factors' and 'primary appraisals' in order to reflect individual user responses and to examine whether user responses changed over a period of time (from phase one to phase two). Three user response categories– engaged, compliant, and reluctant– were uncovered in the first phase of this first case. The chapter concluded by showing how individual user responses changed at the second phase of the participant interviews, a period of six months after the first interviews. Three transitions in response categories for individual users were unveiled – one participant transitioned from compliant to engaged, two from reluctant to compliant, and one from engaged to compliant. The organisational context, analysis of gathered data, and findings of the second case are presented in the next chapter.

Chapter 5: Organisational Context, Analysis, and Findings: CASE B

5.1: Introduction

Following the same approach taken in chapter four, this chapter begins by presenting the organisational context, analysis, and findings of the second case for this study. Organisational context information is presented in section 5.2 and includes the case background, a description of the organisation's IT infrastructure, the history of the IT system implementation, and relevant participant information. This is followed, in section 5.3, by a brief outline of how the themes were determined. Sections 5.4 and 5.5 provide an analysis of each theme (drawing on the data from the interviews with all of the participants), while section 5.6 provides an analysis of individual users responses across the themes. This informs section 5.7 which shows how an individual user's perception changes critically over a period of time, with the use of worked out examples. The chapter concludes with section 5.8 which provides a summary of the chapter.

5.2: CASE B

CASE B is a government-owned agency in Kaduna state, situated in the north-west region of Nigeria. The state is considered to be the educational centre of Nigeria, bearing the motto "centre of learning". The state had an estimated population of over 7 million people as of 2017 (National Bureau of Statistics, 2017). The CASE B project was initiated in November 2015 to revolutionise the state's land administrative activities and services. The CASE B project replaced the former Ministry of Lands in the state, streamlining all land, survey and town planning institutional structures into one single body. The main aim of the project is to move away from paper-based processes in land administrative activities in the state, and towards computerised processes that would improve both the efficiency and effectiveness of the agency in carrying out its duties.

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The state government reached a conclusion that the only way to accelerate the process of land titling, decrease fraud, and improve revenue management was through computerisation of the agency's activities. It is expected that activities such as allotment of land, registration of power of attorney, creation of deeds of assignments, processing of applications and other related activities will be conducted electronically upon completion of the computerisation project. The agency has several units involved in different land administrative activities, including: the customer service and information unit; the tracking and vetting unit; the geometry and town planning unit; the production unit; the ICT unit; and the training unit.

5.2.1: Background of CASE B

Before the restructuring of the Ministry of Lands that led to the CASE B project, the ministry used manual paper-based processes for their land administrative activities and services. Staff would go out into the field and capture data manually, returning to the office to create maps and plots using architectural tools. Payments and billings were performed manually using paper invoices and receipts. All captured information was kept in storage rooms and arranged based on a naming and numbering convention designed by the ministry. These manual processes were becoming tedious and almost impossible to manage owing to the increase in data generated by the ministry. Having identified the need for improvement in land administrative activities and services, the government took the bold decision to implement the computerisation project at the agency. Interviews with management-level staff provided an initial orientation in relation to the rationale for initiating the computerisation project at the agency. For instance, a member of top management explained:

> *"The world is changing from paper-based to digital processes, so we felt it was time for the change to happen in this agency as well. Another reason was for ease of doing business, a lot of investors need the information we have in this agency. In order to improve service delivery, a new way of doing things was needed. With the new system, things are moving faster, transparency has increased, as the decline in level of fraud is already visible in the agency."(B01)*

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The agency entered a Public-private Partnership (PPP) with the selected consultancy firm, *GIS/Transport Limited*. The consultancy team consisted of 26 experts who were given the responsibility of setting up the technical infrastructure of the agency, undertaking the software development and customisation, organising and delivering staff training, and overseeing wholescale implementation of the institutional reform. The project involved the implementation of a fully-fledged Enterprise GIS that would cater for both land administrative activities and GIS cadastral data processing. The contracted consultancy firm was believed to have extensive knowledge of GIS computerisation projects as the firm was involved in the computerisation projects of three other similar agencies in the country. At the time of the interviews, the agency and the consultancy firm were still in the PPP agreement and all project deliverables were running according to schedule. It is expected that at the end of the PPP agreement, the government will take full control of the agency, fully-equipped and staffed by a fully-trained workforce. In section 5.2.2, an overview of the agency's IT system and IT infrastructure is provided in order to explain the context of the IT implementation project and the resources that were made available to the participants to support their IT system use.

5.2.2: The Agency's IT System and Infrastructure

As part of the PPP agreement, the consultancy firm provided the GIS package for the computerisation project. The Enterprise GIS implemented at the agency has two major modules, integrated to provide full support for the agency's activities. The first module is called *Merlin*, a propriety land information system customised by the consultants to fit the processes of the agency. Merlin has a file tracking management system (FTMS) that links with the system's PostgreSQL database for easy file tracking and storage. Merlin constitutes the land attributes, such as allocation records (e.g., plot sizes, uses & locations, plot numbers, and name of allottees), records of land transactions (e.g., deeds of assignments, mortgage subleases, power of attorney, and devolutions), and also serves as a 'front desk' for customer relations and services.

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The second module is called *Quantum GIS*, a free open source software system used for capturing and processing cadastral data, such as state master plans, detailed site development plans, land usage plans and other digitally-captured survey information. Together, these two modules serve as the Enterprise GIS of the agency. Other IT infrastructure in the agency includes servers, Local Area Networks (LANs) , a Wide Area Network (WAN) connecting the two agency buildings via a microwave link, and 80 computer workstations (which was expected to increase to about 250 by March 2018). The agency has an in-house training facility comprising three training rooms. Training was categorised into two types: basic ICT training (general computing and use) and enterprise GIS training (in the use of Merlin, Quantum GIS and the customer services module). Training needs assessment is carried out by the training unit to determine the type and level of training that a staff member may require. In summary, the agency enjoyed a smooth and balanced IT implementation process, which will be discussed further in sections 5.3-5.5 as part of the analysis of the case data.

5.2.3: Participant Information

Six units participated in this research: the customer service and information unit; the tracking and vetting unit; the geometry and town planning unit; the production unit; the ICT unit; and the training unit. Participants within each unit use the IT system based on their job roles and responsibilities.

The customer service and information unit is the first point of contact for a customer when they visit the agency for any form of land administrative activity. This unit has three sub-units: the help-desk/reception; a call centre; and a complaints sub-unit. All sub-units within the customer service and information unit use Merlin to register new applications or access existing customer details while serving the customer. The unit is charged with the responsibility of processing new applications, checking the status of applications, and dealing with general customer enquiries. The help-desk deals with new applications and makes sure all application documents meet the requirements for the type of application. Once this process has been completed, the customer will make a payment and the application will be

submitted for further processing. The call centre deals with general inquiries and also contacts a customer if a need arises. The call centre also provides detailed information to prospective customers who are in need of further details about any application process. The complaints sub-unit deals with issues relating to applications and any disputes that may arise during or after an application process.

The tracking and vetting unit has responsibility for transforming paper-based files into digital formats. These files include biographic and cadastral files. The unit traces all files stored in the record room and uses the IT system to transform them into digital copies. The unit also verifies all documents provided by customers who apply for property recertification. The documents are matched with the newly-digitised copies to certify that they are genuine copies of the certificates issued by the agency during the use of the paper-based process.

The geometry and town planning unit is the busiest unit in the agency. It deals with multiple activities such as data capturing, ground truthing, ground rent calculation, quality assurance, and geo-database management. The production unit is in charge of the last stage of the certification processes. Upon completion of all required activities and processes, a new certificate is produced using a secured template from the IT system.

The ICT unit deploys and maintains all IT infrastructure in the agency. The unit also provides day-to-day support for all IT system users. Lastly, the training unit is charged with the responsibility of assessing training needs and delivering appropriate training to all agency staff. The training unit also works closely with the ICT unit in order to deliver effective and efficient ICT training to staff within the agency.

Data were collected from thirteen participants, comprising one member of ICT staff, two management-level staff, one training officer, and nine IT system users across different units. Table 5.1 provides a summary of participant information for this case organisation.

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Table 5.1 Participant information for CASE B

Participant	Unit	Type of Participant	Number of interviews	Years at the Agency
B01	Admin	Non-user	1	12
B02	Admin	Non-user	1	4
B03	Training unit	Non-user	2	3
B04	ICT unit	Non-user	2	3
B05	Customer service and information unit	User	2	4
B06	Tracking and vetting unit	User	2	4
B07	Geometry and town planning unit	User	2	5
B08	Geometry and town planning unit	User	2	8
B09	Tracking and vetting unit	User	2	11
B10	Geometry and town planning unit	User	2	6
B11	Production unit	User	2	6
B12	Geometry and town planning unit	User	2	5
B13	Production unit	User	2	7

5.3: Analysis and Findings at CASE B

The approach used to conduct and present the analysis is similar to that for the first case, reported in section 4.3.To prevent repetition, the researcher will present the analysis for CASE B directly. In section 5.4, the analysis related to the model's theme of 'influencing factors' will be presented, followed in section 5.5 by analysis related to the 'primary appraisals' theme.

5.4: Influencing Factors

This section presents the findings associated with sub-themes that make up the theme 'influencing factors'. Three sub-themes – individual-related, organisational and process-related, and IT system-related factors – were identified from the data. Table 5.2 provides a summary of the sub-themes and their associated lower level codes. Each sub-theme will be presented in an individual sub-section in order to provide a nuanced perspective on its influence on individual user responses to the IT system implementation.

Table 5.2 'Influencing factors' theme with associated sub-themes and lower-level codes

Lower-level codes	Sub-themes	Themes
Self-efficacy, Social influence.	Individual-related factors.	
Training, Management communication, User involvement and participation.	Organisational & Process-related factors.	Influencing Factors
IT instrumentality, IT infrastructure.	IT System-related Factors.	

5.4.1: Individual-related Factors

The Individual-related factors sub-theme was made up of two lower-level codes: **self-efficacy** (*high self-efficacy or low self-efficacy*), which reflected the participant's psychological perceptions about their IT skills; and **social influence** (*perceived encouragement or perceived discouragement*), the degree to which a participant perceived that people who they find important believe that they should use the new IT system.

Self-efficacy significantly influenced participants' perceptions of control over the IT system and how they used it to accomplish tasks. Participants who believed that they had the necessary skillsets and knowledge to use the IT system without facing any significant problems expressed high levels of self-efficacy. Owing to their high self-efficacy, these participants believed that they had high levels of control over their IT system usage, consequently using the IT system in an efficient and effective manner. Some participants had already been using GIS software like AutoCAD voluntarily to accomplish tasks such as mapping and town planning exercises. Even though it was not mandatory, the agency allowed their employees to use such software, as long as the output from the software was in line with the requirements and standards of the agency. As such, these participants viewed the IT system as being a familiar tool with which they were already, to some extent, familiar. For example, one participant said:

> *I have been using computers at the office for over four years, and most of the things we did involve the use of computers even before the new GIS system, although then it wasn't mandatory…We already have the experience, so most of our unit members hardly struggle using the new system (B08)*

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Another participant who was familiar with the use of cadastral software before the implementation of the IT system explained:

> *I'm conversant with the use of computers, as a town planner, we use to design our layouts using computer software like AutoCAD. So if you have interest, you can just use the AUTOCAD and design the layout, even though before it was not compulsory. So I don't have any issue using computers (B06)*

Even though not all participants were familiar with land administrative IT systems, some participants felt that their knowledge of general computing and IT skills gave them a high level of control over their IT system usage. As one participant noted:

> *I am knowledgeable with computers. I have been using computers and various software since my university days. So pretty much this is not entirely new to me. I have worked as a call centre agent before, so the system we used there has similar features to what we are using for our work here (B05)*

On the other hand, some participants within the agency felt that they had low levels of control over their IT system usage owing to their low self-efficacy. These participants felt their lack of familiarity with GIS software and low levels of computing and IT skills had significantly contributed to their current struggles while using the IT system to accomplish their tasks. Up until that point, some of these participants had hardly, or had never, used a computer to accomplish tasks at work, consequently marking a major change in their work environment. For instance, one participant explained:

> *We didn't use computers to conduct our work before, and personally I have hardly used a computer for any activity. We go out, measure plots and carve out layouts. I don't really know much about computers, I find it hard using them, and now I even find the new system harder and complex, it's not easy (B09)*

In a similar vein, another participant alluded to the notion of having low self-efficacy, stating:

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I hardly use computers, because I prefer going out practically. It's easier and faster drawing maps and sketches with the hands, and when you really know what you are doing, it's no different from what is generated using the software. I'm not really good with computers, so I don't really fancy this system, it takes too much time and effort to use (B10)

Social Influence had a significant impact on how participants responded to the IT system. Participants formed their perception of control in terms of how they perceived people important to them in the agency as encouraging or discouraging the use of the IT system. Continuous encouragement and usage of the IT system by peers and managers in the agency created a supportive environment for some participants. As a result, some participants experienced the impression of high levels of self-control and increased confidence, and were encouraged to use the IT system themselves. B05, for example, explains how encouragement from unit heads had boosted employees' confidence towards using the IT system:

B03 has been very helpful and friendly, she has been encouraging a lot of people to accept and use the new system to its fullest. It's always nice to have an arm over your shoulder, you feel you have the support you need, and B03 has certainly provided that. So even for her, I would endorse this system, let alone its benefits. She has created a very conducive environment in her training room, and the other managers have been helpful as well (B05)

Another participant who also felt that the encouragement and support he received from his colleagues boosted his confidence, reduced his concerns about uncertainty and gave him a high sense of control over his IT system usage explained that:

Our head of unit has been very helpful, he has encouraged us a lot. He even convinced some of the people that were scared they would lose their jobs, and that the system is not here to replace them, rather it's here to improve their productivity and give clients a better impression about the agency in general… B03 has been very supportive, she makes everybody feel at home, she makes you feel so confident, even when you know you have little computer knowledge, so it's safe to say they have created a good and calm environment to support the new system usage (B08)

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A training officer mentioned that user encouragement and motivation played a vital role in influencing participants' responses towards the IT system. She mentioned the training unit setting up and running the training rooms to be as comfortable and user-friendly as possible. She highlighted that making the training room feel like a 'safe haven' was one of the major reasons why many participants responded to the IT system in a positive manner, noting that:

> *When staff come for training I try to talk to them and motivate them, make them feel at home and see the benefits, so this helped the training program enormously. In fact the staff would have told you, the ones you have already interviewed, how they prefer using computers now, over the old file and paper processing they used before. You can attribute this to our intensive training methods (B03)*

The analysis also revealed that some participants were dissuaded from using the IT system because of negative comments and discouragement from their colleagues at the agency. Some employees openly criticised the implementation of the IT system, often mentioning that there was no need for it in the first place. Speaking about this issue, one participant said:

> *My unit head doesn't really like the new system, and he doesn't really bother much about it. Others in supervisory roles are also the same. If the head aches, the body must surely follow! If our boss is complaining about it, what do you expect from his subordinates? He's more experienced so he has a better judgement. That's why I also have my own reservations about this new system (B10)*

In summary, interviews with participants revealed that individual-related factors such as self-efficacy and social influence had an influence on the participants' perceived controllability in relation to their IT system usage. Figure 5.1 presents a diagrammatic summary of the individual-related factors sub-theme at CASE B. The next sub-section moves on to describe the Organisational and Process-related factors sub-theme.

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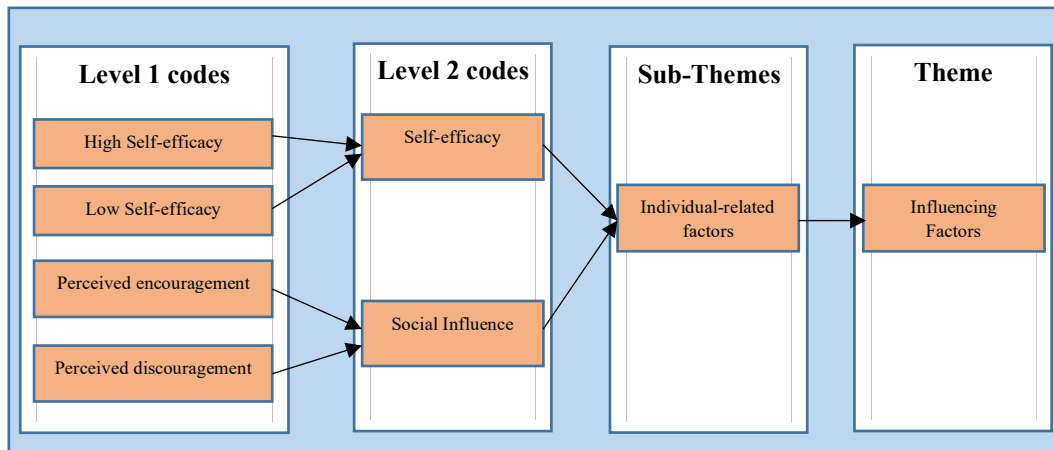
Figure 5.1 Construction of individual-related factors sub-theme

5.4.2: Organisational and Process-related Factors

The Organisational and Process-related factors sub-theme consisted of the lower-level codes: **training** (*adequate training or inadequate training*), **management communication** (*effective management communication or ineffective management communication*), and **user involvement and participation** (*perceived involvement and participation or perceived lack of involvement and participation*).

Training had a significant influence on participants' perceptions of control in relation to their IT system usage. Participants formed their perceptions of training based on factors such as training organisation and delivery, and the fit between the type of training received and the tasks that the participants had to accomplish while using the IT system. The agency organised various types of training, at different levels and in different categories. This was done in order to cater for the varying training needs of employees at the agency. Most of the training was organised in-house, as the agency had set up a training room with IT infrastructure in order to provide adequate training for its employees. Commenting on how training was delivered at the agency, a training officer explained:

> *We don't just train people randomly, we start by conducting a training assessment exercise for each individual in order to categorise them into different levels and batches. First is basic training computer operations. Once they have perfected, we go on to train them on how to use the system itself. That's how we were able to transform all of those staff...(B03)*

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Some participants stated that the level of training that they received aided them in acquiring the knowledge needed to master the IT system in order to accomplish their tasks. As one participant with such a perception said:

> *The training was so good that we started the actual work on the same day, we caught up so fast. I was actually surprised by the depth and quality of the training. In addition to that, we also had on the job training. It was really helpful, the training has made using the system very easy. We even had one-on-one training, and also general training (B05)*

Another participant explained how the quality of training helped him to master the use of the IT system, noting that:

> *Training wasn't only about using the new system, people were grouped into different levels of computer literacy. Training started from the basics like computer operations, office packages and then to the system. I was really impressed by the training, because even people with little computer knowledge were catching up very fast. I guess that's what you get when you have a good team working hand in hand. The training has really helped me master the new system (B08)*

Even though training was organised and delivered at different assessment levels, some participants felt that the number of training sessions that they were offered was not enough for them to master the IT system so that they could accomplish their tasks. As one participant put it:

> *People like me who are still struggling with the system need more training, maybe more sessions, at least once in a month for like five straight months, but I'm not sure if that is possible because of scares finances. I just know they the training I have received is not enough (B07)*

Another participant acknowledged the quality of the training, but felt that the number of sessions was too low, especially for people like him who he termed as being 'slow learners'. He also mentioned on-the-job training being made available, but he preferred formal training. As he explained:

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The trainers have tried, they are kind and approachable, I just feel for slow learners like myself, we should have more formal training. The one the job training is good, but I always forget some processes not long after I have been shown how to do them. So maybe more formal training will be better for us. I don't think training can ever be too much, so apart from system training, we should have other training that will support the entire process (B09)

Management Communication played a significant role in influencing participants' perceptions of control over their IT system use. Communication was seen as an important enabler of change by the agency. The agency believed that by providing timely and useful information to project stakeholders, the organisational restructuring and IT system implementation would go efficiently. The agency adopted multiple methods of communicating project information. External communication was done through publications in national daily newspapers, television adverts and billboards in the state, while internal communication was done through emails, memos, and meetings. In most cases, employees were fully aware of the change and its rationale, even though some complained about not having detailed information about how the change would affect their job roles and activities.

Participants who believed that they had received appropriate and timely information about the IT implementation project developed a sense of calmness and structural assurance about the safety of their jobs. These participants believed that the information that they received from the management with regards to the IT system implementation project clearly showed them the benefits of the project and served as a motivational force. As one participant explained:

A lot of meetings and briefing sessions took place, we were assured we wouldn't lose our jobs… It was cited that the main reason of this project was to improve revenue generation, rebrand the image of the agency and make sure it would provide world class services to the citizens. Hearing all this positive news really motivated us and got us excited. So I can pretty much say we were well informed before the change was initiated (B08)

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In the past, there had been multiple attempts to computerise activities at the agency, but unfortunately a computerised system had never materialised. As such, there we many doubts about the possibility of initiating the current IT system implementation project. After using numerous approaches to communicate the rationale and benefits of the IT system implementation project, employees were then convinced that the management were committed to ensuring the success of the project. This boosted the morale of some participants. As one participant noted:

> *At first most of us were sceptical about the whole process. Then we started seeing adverts on TV and newspapers, we had some meetings with the senior management and they explained consultants were coming in to do system implementation. From there on, internal communication intensified, with the benefits of the system becoming clearer. I must admit the management handle the communication perfectly, because it cleared most doubts we had initially (B05)*

Conversely, one participant felt that management communication was not as effective as he had expected. He complained that even though the management made them aware of the change, they did not communicate detailed information about changes to job roles and work processes. As a result, he was in a "constant state of uncertainty" and feared for his position at the agency. This led to a perception of low levels of control over the IT system implementation. Talking about this issue, the participant said:

> *I was aware of the imminent change, but didn't know my job role would change like it has now. At least a prior notification or discussion would have given me a better picture. At first we thought it was a rumour, but the most troubling thing is changing and restructuring people's work without laying out a plan and consulting those individuals right from the beginning (B10)*

User involvement and participation played an important role in influencing participants' perceptions of control during and after the IT system implementation process. The agency used multiple approaches to involve participants in decision-making and also allow them to participate in IT system implementation activities. Levels of involvement and participation were based on a participant's unit, expertise, and position in the agency. The top management and consultants worked closely with employees from more technical units. Most customisations were made

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based on the recommendations from the Tracking and Vetting unit and the Geometry and Town Planning unit. Teams were also constituted, consisting of members from units across the agency. These teams handled tasks like system requirements gathering, training needs assessment, and usability testing.

Participants who believed that they were involved and/or participated in the IT system implementation process formed perceptions of high control over their IT system use. This was by virtue of learning more about the IT system's features and its potential impact on their work processes. One participant who felt that he had played a vital role in the IT system implementation explained:

> *I played a vital role in the project, the consultants relied on us to understand the existing work processes. They worked with us to understand how to customise the system in a way that we won't feel it's too difficult, or entirely different from what we know. Some implemented features were actually our own ideas. For example, we told them it's better to setup the workstations with multiple screens and they did so. So in a way, we felt really involved (B08)*

Another participant alluded to the notion of playing a key role in the IT system customisation process. Owing to his involvement, he felt a high level of control over the IT system implementation process, as he was able to influence some functionalities and features of the IT system. As he explained:

> *We brainstormed and passed our opinions to the consultants. Most of our suggestions were implemented. Our experience was used in further customising the system to match our activities at the agency…I am proud I was able to contribute to the design, experience is the best teacher, and we used our experience to ensure the system would work in a way we operate (B13)*

In contrast, B07, a member of the customer service and information unit, complained that she was not involved in the IT system implementation project. Her unit was seen as a non-technical unit, because their tasks and work processes were different from those in technical units such as the Geometry and Town Planning unit. She felt that since their activities were different, members from her unit should have been involved in how their own module was customised, stating:

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In terms of system customisation, I can't really say I was involved, because I wasn't part of any team, and I didn't really know much about the GIS system, so I couldn't contribute much. My observation is those from the technical units were engaged in the process. I was told that our own part of the system is not really complicated, so it doesn't really need many changes (B07)

Another participant, who acknowledged that some project team members participated in the IT system implementation, complained that he was not involved in any way because he was not 'technically sound'. He felt that he was side-lined because he did not have computer and IT skills, and he was not really involved in most of the technical tasks at the agency. As he explained:

I was not involved at any point. We were given our marching orders and we abided. I'm not a technical computer user… Most of the people that were consulted were the ones that have technical and computer knowledge. They felt maybe we couldn't contribute much. So in the end, it was just slapped in our face, here is the new system, go and use it (B09)

Figure 5.2 shows a diagrammatic summary of the Organisational and Process-related factors that have been discussed in this section. In the following sub-section, IT system-related factors will be presented.
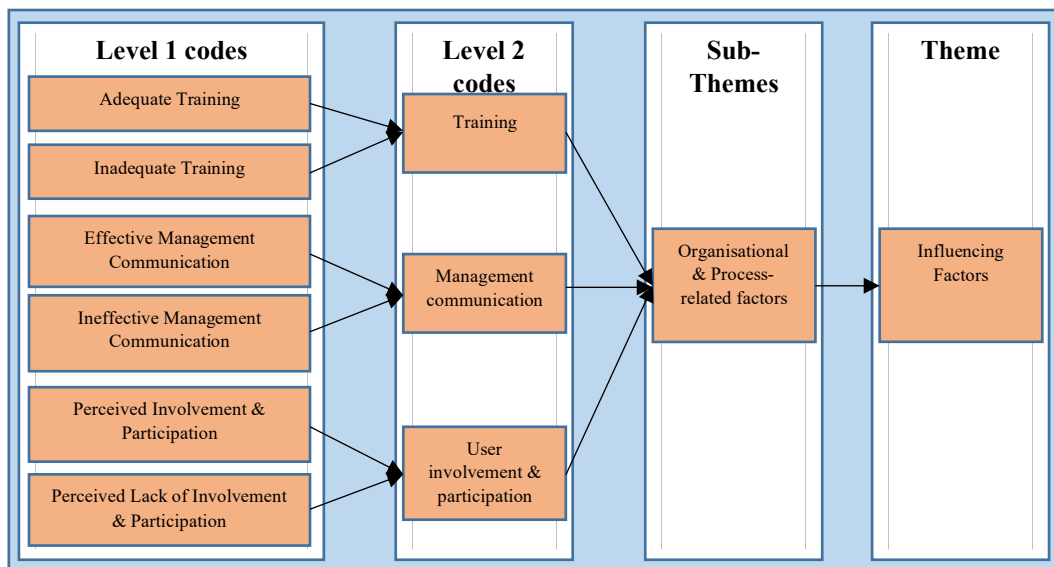
Figure 5.2 Construction of organisational and process-related factors sub-theme

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5.4.3: IT System-related Factors

The IT System-related factors sub-theme consists of the lower level codes: **IT instrumentality** (*easy and user friendly IT system or difficult and complex IT system*) and **IT infrastructure** (*adequate access to IT infrastructure or inadequate access to IT infrastructure*)**.** These lower level codes were categorised under the IT system-related factors sub-theme because they were primarily related to the new IT system itself.

IT instrumentality played a significant role in influencing participants' perceptions of control in terms of their IT system usage. Participants appraised the usability and functionality of the IT system in terms of how the IT system helped or hindered their work activities. The implementation of the IT system changed work processes such a data collection, information processing, and communication with clients. As a result, participants often compared previous work processes to what was currently practiced with the use of the IT system. Some participants found the IT system straightforward and easy to use, while others felt that it was complex and difficult to use to accomplish tasks.

Some participants found the IT system easy to use, and these participants also explained that there were able to customise certain features within the IT system to make their work easier. Their ability to customise certain features within the IT system gave them a sense of high control over their IT system use. Commenting on this perception, one of the participants said:

> *You can change things like view and layout on the system. I prefer working with two screens, so I change a few things here and there. It helps me set multiple windows to do multiple activities at the same time, and that's a feature I use a lot for my work. It gives me flexibility and makes my work easier I guess. The system is easy to navigate and master after you have used it once or twice (B08)*

In another example, a participant who also found the IT system easy to use and customisable explained how the IT system could be easily customised to accommodate certain information captured in customary titles. Customary titles are temporary certificates issued by traditional district heads in townships. The initial

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IT system design did not recognise these titles, but some participants found an easy way to change this on the IT system. For example, as one participant explained:

One advantage of the system is that it has open source features. Initially, the system could not process customary titles, like the ones issued by traditional rulers. So we had to update and customize some parts of the software. To our surprise, we just used some open source codes from the internet, it was very easy, just like using the other parts of the system (B13)

Some participants did not particularly find the IT system easy to use. These participants often complained that the IT system was complex and, in a way, difficult to use. They also felt that some features within the system should have been customisable in order to give them flexibility while accomplishing their tasks. As a result of the lack of customisation and the struggles that they faced while using the IT system, they felt that they had low levels of control over their IT system use. Commenting on these issues, one participant explained:

I find it difficult using the system to be honest, and I keep making mistakes. The first time I used the system, it took me almost two days to recreate a plot from a paper file to an electronic one. For me it's really difficult, because even before you start the drawing and mapping, you have to work on other sections, and most of them can't be changed (B10)

Another participant expressed his lack of control over IT system usage when commenting that he often struggled while trying to accomplish tasks using the IT system. He complained of finding the IT system's interface too complex and very confusing, even though he had attended some training sessions. He mentioned asking if it was possible to customise certain features that he had to use on the IT system, but reported that he had been told that it would require a substantial upgrade to the system, to which the agency was not ready to commit at that point in time. He described his experience in the following way:

It can be hectic a times, I think I sit there looking at the computer for over 10 minutes before I start, because it's so overwhelming. I asked if the tools section can be customised, unfortunately that's something that won't happen anytime soon at least (B09)

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Similarly, another participant stated:

I'm still struggling to understand most parts and functions of the system, it's not as easy as the previous ones I have used. For the things I find difficult, I ask my colleagues or the consultants. Slowly but surely I will get there (B06)

IT infrastructure had a significant influence on some participants' perceived levels of control during and after the IT implementation process. Even though most of the IT infrastructure was new at the agency, some locations within the agency experienced poor Internet connectivity. Participants affected by this felt that it made their work more difficult, as high speed Internet connectivity was seen as a vital resource to ensure successful task completion. Some participants attributed the slow Internet connectivity to the location of their offices, while others believed that it was due to bandwidth allocation. The agency was connected to the Internet via high-speed Microwave antennas with Internet access then available within the agency via the use of cables and wireless modems. Some employees were also allocated Internet dongles, in the event that they needed Internet access while working in the field. One participant, describing how slow Internet connectivity had affected his work, noted:

One of the challenges here is the network fails very often and the connectivity becomes poor. We have complained about it, and the people in charge say it's because of where our office is located. So with this issue, sometimes our work is delayed, because the system runs on the network, everything is connected (B06)

Another participant also commented on how slow Internet connectivity affected his work activities, stating:

Since we started, the main issue we have faced is the slow network. It affects our work because most of the things are online now. Sometimes you might be trying to start an application, but the network is not responding, so clients that are waiting start complaining. Sometimes you might try to save details enter in an application and you will receive an error message (B09)

Some participants who had to rely on the use of Internet dongles described how often the connectivity was poor. Dongles were acquired from telecommunications service providers as an alternative means of providing Internet access to employees

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in the office and those involved in field activities. Even though the main reason for acquiring the dongles was to provide Internet access in the field, some participants had to rely on dongles even within their office owing to poor connection to the organisation's broadband in the office environment. A participant who was often frustrated with the network connectivity explained:

> *I am in shock that we have to rely on these dongles even in the office, the connectivity is very bad. We were told to manage them before the whole Internet issue is resolved, but it is taking too long. It is reducing our productivity and output, it really needs to be taken care of as soon as possible (B10)*

Figure 5.3 shows a diagrammatic summary of the IT system-related factors sub-theme that have been discussed in this section. Having presented the sub-themes that form the theme 'influencing factors' in this section, section 5.5 will now move on to present the 'primary appraisals' theme.
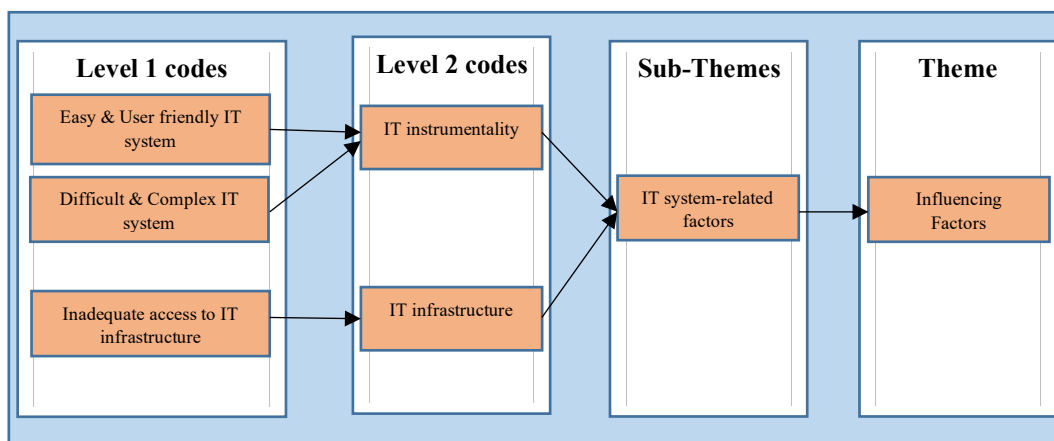
Figure 5.3 Construction of IT system-related factors sub-theme

5.5: Primary Appraisals

This section presents the findings associated with sub-themes that make up the theme 'primary appraisal'. Having described the themes related to primary appraisals (in relation to the first case study) in section 4.3, this section will present the findings only in order to avoid repetition. Two sub-themes – opportunity and threat – were identified from the data. Table 5.3 provides a summary of the sub-

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themes and their associated lower level codes. Analysis in relation to these sub-themes is presented in the following sub-sections.

Table 5.3 'Primary appraisals' theme with associated sub-themes and lower-level codes

Lower level codes	Sub-themes	Themes
Improved information tracking, improved personal and professional development, improved work transparency, safer data storage, speeding up of work processes, and reduced work stress.	Opportunity	Primary Appraisals
Perceived job uncertainty, loss of power and autonomy, and slows down work processes.	Threat	

5.5.1: Opportunity

Participants who saw the IT system implementation as an opportunity had the belief that the IT system would bring positive benefits to them, both personally and professionally. These participants welcomed the use of the new IT system and were confident that it was going to improve their work environment. The opportunity sub-theme was made up of the lower level codes: **improved information tracking**; **improved personal and professional development**; **improved work transparency**; **safer data storage**; **reduced work stress**; **and speeding up of work processes**. These codes will be explained further in the following paragraphs with the use of quotes from participants acquired during the interview sessions.

Improved information tracking revealed how participants believed that the IT system provided better means of accessing and managing information. Prior to the implementation of the IT system, information was stored manually in folders in filing cabinets. Files and folders were stored based on a naming convention comprising file number, plot location, and plot type. Since files and folders were stored in storage rooms, an increase in file numbers meant an increase in the effort and time needed to locate a file when it was needed. This method had become no longer sustainable owing to the increase in the number of files, errors during shelving, and the dilapidation of files and folders. These issues were addressed after the IT system went live, as the IT system had an electronic database that saved all of the information captured or generated by the agency. As a result, employees could access information at the click of a button and also generate multiple reports

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with ease. One participant who was particularly impressed with the change explained:

> *Before the system, to locate files was a chaotic process. It could take anytime from days to weeks to locate a single file. In some instances, the files can't be traced because of improper filing, sabotage or files being destroyed one way or another. At least now things have change, from your device, you can pull up information easily without breaking a sweat. All our records are now safe and fully intact (B07)*

In another example, a participant explained how tracking information previously caused major delays in the processing of applications. Since applications were moved from one office to another in paper format, sometimes documents could be misplaced or could stay too long in a particular office before being moved on to the next stage of processing. With the use of the IT system, this changed, since processing and approvals were all done online via the IT system. As one participant explained:

> *Our work is faster now, since we do almost everything from our desks. I don't have to move from one office to another tracking and pushing applications to the next stage. That was one of the major causes of delays in application approvals. Everything is online now, you get a notification when you need to approve or work on anything, so it's more efficient and effective now (B05)*

Apart from having easy access to information, one participant mentioned that the IT system provided better information security in terms of who could access or modify a file on the database, noting that:

> *Everything now is in the database, if you have the right levels of access, you can view or edit a document. So it can easily detect who has accessed or changed a file. This is very important because it has helped address some fraudulent issues we have faced in the past (B06)*

Improved personal and professional development revealed how participants believed that the IT system provided them with an opportunity to improve their current IT skills and also to acquire new skills while using the IT system. Participants were trained in different areas and levels of computing and IT skills in

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order to support their IT system use. Some participants believed that the implementation of the IT system led to their acquisition of such skills, as no computing and IT skills training was ever officially delivered before the IT system went live. Participants were trained internally, attended workshops, and in some cases visited sister agencies in other states to practically witness their use of GIS and land administrative systems. As a result, participants saw this an opportunity to improve their CVs, as one participant noted:

> *Using the system has exposed me to some of the latest technologies in my field. It has improved my knowledge of my job, even though I have used AutoCAD before, with the new system, I'm learning new features on a daily basis. I was surprised by the range of activities I could accomplish with the system…I have also attained GIS certification, so it's a major bonus to my CV (B08)*

Another participant revealed how the IT system provided her with a platform to practice the GIS skills and knowledge that she had attained from her higher education. Even though she had some knowledge of GIS, she had never previously used it practically because the agency did not officially work with any GIS or land administrative software before the current IT system implementation. As she explained:

> *I have a BSc in geography and MSc in GIS, I studied a lot of modules during these courses, so I'm really happy and excited that finally the system has given me the chance to make use of them. So basically now I know it in theory and in practice (B05)*

Training was not just limited to land administrative and GIS processes, as participants were also trained in the area of general computer operations, Microsoft office packages and use of the Internet. Some participants attributed this training to the IT system implementation owing to the fact that there had previously been no training programmes for such skills. This was a morale boost for some participants since they were able to acquire new skills owing to the IT system implementation. As one participant put it:

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Computer training? That was never mentioned before. It only became a reality because we needed the skills to work with the new system. At first I was worried a bit, but honestly, this has improved our work tremendously. I use the training I have learnt for many things now, for both official and non-official activities. It has improved me beyond doubt (B07)

Improved work transparency describes the extent to which participants believed that the IT system had improved the agency's internal operations by reducing fraudulent activities, and had improved the agency's image among its clients. Certificate forgery, bribery, and unauthorised access to client information were among the major issues faced by the agency. Upon implementation of the IT system, these issues reduced drastically since the IT system offered embedded security features such as access control and the use of user profiles. Having seen the improvements brought about by the IT system, clients' perceptions of the agency's operations also improved, with clients often passing on positive remarks. As one participant explained:

The system has improved the image of the agency, because our clients are receiving better services, they trust us more and feel more confident while engaging with the agency. There was a day a customer came in surprised his certificate was ready, he was expecting it to take at least a year or have to pay a bribe. These are the positive things we have been experiencing with the new system now (B06)

In another instance, a participant explained how clients were happy and impressed with the services provided by the IT system, noting that:

Even the clients are happier now, because all you need to do is search on the system and tell the individual the status of their application. Everyone loves it, because it is transparent, fast and easier. And the clients get to be treated face-to-face. Nothing like go and come back later, as it was done before the new IT system. We even have a customer hotline for enquiries, no need to come and follow up or pay someone in the agency to do that for you (B05)

The IT system addressed various issues relating to fraud, especially during payments for services and limiting an employee's ability to request for bribes or to 'hike' service costs. Since all payments were made through the IT system, receipts

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and invoices were generated automatically, so an employee was not be able to adjust the cost of services. All applications were also treated online, so employees were not be able to request bribes to accelerate application processes. The IT system easily provided an application status report, unlike before when tracking a single application could take at least a day or two. As one participant who was happy about this development explained:

> *The biggest problem we face in land administration, which is fraud, has almost been completely eliminated. The new system has improved transparency, we have fewer cases of fraud and our clients trust the agency more compared to before. Processes are easy and open, there are no more any grey areas that open the door for corruption (B08)*

Another participant also reflected on the positive changes, reporting that:

> *The problem of fraud has declined noticeably, almost all the shady activities have been put to a stop. There is more accountable because all activities on the system can be traced to a user's profile, so shady deals can hardly happen now (B07)*

Safer data storage revealed how the use of the IT system provided safer and more effective ways of managing records at the agency. Having mentioned how the agency previously stored records in record rooms, problems associated with such methods included documents becoming dilapidated owing to poor storage conditions, documents being misfiled, and documents being accessed by unauthorised employees. The IT system provided an electronic database where records could be stored and accessed only by employees with approved access profiles. As a result, most of the previously-faced issues were addressed. A participant who acknowledged the improvement with record management noted:

> *We used to store all our records on papers, almost anything could happen to it, for instance files could get old and tear, the storage rooms were always too dusty and other problems. Now every single thing is stored electronically on computers, so all those problems are history...one good security feature is you can only access information your profile is assigned to view, that means no more shady activities (B06)*

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Unauthorised access to records aided fraudulent activities such as the production of counterfeit certificates and double allocation of a single certificate to multiple clients. A security feature in the IT system prevented these activities since employees could only access information relating to their tasks. Most employees could no longer access full records unless they were in the production unit, therefore making it difficult to produce counterfeit certificates or engage in double allocation. Commenting on this issue, one participant said:

> *Problems like applications being misplaced from moving physically from one office to another, staff delaying applications and requesting for money or documents being forged have been tackled with the use of the system. Now everything is computerised, so that's not possible anymore, because all data is saved and accessed electronically (B08)*

Speeding up of work processes shows how participants described being able to complete tasks faster with the use of the IT system compared to the previously-used manual process. One of the major reasons for delays in processing and producing certificates was the physical movement of applications from one unit to another. Files could stay in a particular unit longer than expected, or in some cases get lost or mixed up with other documents. After moving to the electronic method of processing applications, the pace at which applications were completed improved drastically. Application forms were submitted electronically and each unit would receive a notification once an application needed their response. Therefore, employees did not have to move applications from one office to another, in turn speeding up the application process. A participant who was impressed by this new process explained:

> *I can say most of the people are excited because it has reduced the burden of carrying files around, now you can just work on your computer and with the click of a button you can access any file you need or other information. Things are more organised and you don't have to spend the day chasing people to sign one document to another (B08)*

Another issue that caused delays in processing applications were the long queues that clients had to form in order to submit an application. These queues were often unorganised and also uncomfortable since clients had to stand in a line and wait for

their turn to be served. The IT system has a queue and ticketing module that helped to organise and manage how clients were attended to. For instance, tickets were allocated based on the activity for which a client was visiting the agency, as a result reducing the waiting time and improving service delivery. One participant who praised this module explained that:

> *The queueing feature has made our work easier, all you need to do is click next, and the next customer number is displayed on the screen and called. We attend to them and send them to where they need to be next, no fuss no trouble. Before, people would just barge in an even interrupt you when dealing with other customers, and that really delayed our work. Thank God this doesn't happen anymore (B05)*

In another example, a participant explained how the IT system had reduced the waiting time for the production of a certificate of occupancy:

> *The new system is faster in the sense that processing of applications and production of certificates have been fast-tracked. Before it could take you five years to get a C of O. I'm passionate about my profession, so people normally complain about how long it takes, but with the new system, you can get it within 3-4 months and this give me joy, in fact any stakeholder involved with the agency (B06)*

5.5.2: Threat

Threat appraisals reflected how participants believed that the IT system implementation had negative consequences towards them, both personally and professionally. Participants' threat appraisals were mostly happy with the previous ways of doing things, and therefore felt that the IT system was limiting their ability to accomplish their tasks. The threat sub-theme was made up of the lower level codes: **Perceived job uncertainty**; **loss of power and autonomy**; **slowing down of work processes**; **and increased workload**. Quotes from participants during the interview sessions will be used in the subsequent paragraphs to shed more light on the identified codes.

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Perceived job uncertainty described how some participants attributed their feelings of job uncertainty to the IT system implementation. There was a belief by these participants that the IT system would replace them since it had automated some tasks, or would provide the basis for replacing them with younger 'tech-savvy' staff. This led to a tense situation, with rumours going round the agency of imminent staff dismissal or task restructuring. As one participant who felt that the IT system was mainly implemented to lay-off old staff and those without IT skills, rather than improve the services of the agency explained:

> *I'll be honest, I know corruption is a huge problem in land administration, but most of us feel like this system was brought in to kick us out. I'm told the main reason for it is to fight corrupt practices. Let me tell you, if someone is shady, a computer cannot correct him. It's a matter of mind-sets, not technology. To me it's all politics, because corruption can be tackled in a different manner (B09)*

Another participant who felt that the IT system was implemented in order to replace staff who were not IT literate stated:

> *We are not convinced what the final picture would look like. At the moment, advertisements have been made for recruitment, with emphasis on computing skills. So we could be out of here before you know it. We have been given assurance that we will get the training we need, but I'm still not sure what's going to happen (B10)*

The IT system implementation was accompanied by changes in organisational structure and work processes. Mandates and policies were updated, new units were formed and others were merged. Some participants were troubled by these changes owing to redeployment and changes to task requirements. Even after the IT system went live, the agency was still undergoing restructuring. This caused a sense of uncertainty for some participants because they were not sure of where they would be posted or what tasks they had to accomplish daily. Reflecting this concern, one participant said:

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People have been moved from one unit to another, for example, my colleague that usually goes to the field now works 100% in the office, we don't go out together anymore because his work now is more of vetting than data capture. The movements haven't finished, as we speak no one can assure you they know where they will be in two months, at least majority of the staff (B12)

Another participant was also concerned about the sustainability of the whole project when the consultants handed over to the agency's management. He highlighted that, even though things currently seemed to be in place, he feared that it could fall apart once all contractual agreements had been met by the consultants, noting that:

At some point the consultants are going to leave us. So there is a bit of concern who will take up their role. Everyone knows our biggest problem in this country is maintenance. I do not think it's worth doing what we can't manage physically and financially, for some of us it's just smoke, many already fear the project is dead on arrival (B11)

Slowing down of work processes reveals how some participants believed that the use of the IT system reduced the speed at which they were able to accomplish their work and also increased their workload. The new skill requirements meant that all employees who had to use the IT system to accomplish their tasks needed IT skills which the majority of the employees were lacking. Since participants were mostly not familiar with the IT system, it took them longer to accomplish tasks compared to how they worked (manually) before. Some participants struggled while using the IT system and in some cases came to a standstill while trying to accomplish a task. These issues caused delays in their work and often had an impact on their targets and deadlines. One participant explained how his struggles with the IT system slowed down his tasks, saying:

I treat fewer files now because I struggle when using the system… It still takes me a long time to complete mapping a single plot, something I could do maybe 5 at a time straight away, I end up doing just one or two the whole day now. They keep on telling me that once I become an expert with the system, my work will get faster, but at the moment it has slowed me down (B09)

Similarly, another participant explained how he felt that the IT system slowed down the rate at which he completed his tasks, explaining:

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I am actually not in support of the new system because it has made my work slower. Firstly, I can't treat as much files as I do before, it's just too complicated for my liking. Secondly, it delays me in the sense that most of the time I have to rely on help from my colleagues. If they are busy, I just have to wait and there is nothing I can do (B10)

In terms of workload, the changes in work processes that accompanied the IT system implementation meant that some participants had to do more tasks than was the case under their previous work practices. As a result, some participants felt that there was an increase in workload and a subsequent increase in stress. Participants who struggled to use the IT system attributed stress to the increase in workload and felt that it affected the pace at which they could accomplish their tasks. As one participant who felt that the increase in workload affected the pace at which he accomplished his tasks explained:

There is no doubt about it, this new role has increased my workload. I have to do administrative tasks combined with fieldwork, so you can imagine how stressful it can be. It takes longer to get things done. Before I mainly concentrated of field activities, other people within the unit would take care of the admin part. That's not the case anymore (B12)

Another participant stated how he got stressed while using the IT system to the extent that it affected the rate at which he completed tasks:

The system is not easy to use. I'm not use to sitting in front of a computer for a long time, it stresses my eyes…like I said I'm more of a field worker, so I don't really enjoy sitting down for a long time on a chair and table in the office… My eyes and back are over stressed these days, that's why I take breaks very often, the computer screen is just not good for me (B11)

Loss of power and autonomy reveals how some participants felt that the introduction of the IT system reduced their level of autonomy and influence in the agency. As mentioned earlier, the majority of the experienced staff hardly, or never, used computers for their work. When the IT system went live, it created a need for changes in employee's skillsets, from manual to computerised methods of capturing and processing information. Previously, experienced staff were seen as knowledge banks in the sense that they guided new or less experienced staff on the methods

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and processes needed to accomplish tasks at the agency. Now, owing to their lack of IT skills, the tables turned, and this set of staff found themselves relying more on the young and less experienced staff to guide them on how to use the IT system. As a result, they felt that their levels of power and influenced had declined. As one participant who has unhappy over his reliance on his colleagues to guide him on how to use the IT system explained:

I feel like I am slowly becoming a liability because I keep interrupting people while doing their work. It's different now because I am not the one doing the teaching, the younger staff have taken over. Their generation grew up with computers, I can't say the same for mine… It's not easy and straightforward to go down to their level, but that is what we have to do now (B09)

Before the IT system went live, employees could take their work home and complete it at their convenience, since most designs and drawings were done on paper. That was not possible once the IT system had been deployed since employees had to draw and design plots on their office PCs. Some participants saw this as a loss of autonomy and argued that it hindered their ability to work at home after office hours. As one participant who saw this as a threat to his work explained:

I could go with my work home and get it done easily before, but that's not possible now because everything is on the office desktop. All I can do now is see what I can complete between now to 5pm, then wait for the next day. Honestly, this is not good because it has taken away the flexibility we have enjoyed from day one (B12)

Changes in work processes also meant changes in job roles. Some participants were redeployed to different units after the IT system went live. These participants were not particularly happy because they had to change their work processes and considered these changes as downgrades of their status and job roles. B10, who usually worked as a field officer, now had to divide his tasks between fieldwork and office-related tasks. He was not impressed with this, as he felt that he was doing a job below his status at the agency, noting that:

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The day I was assigned this new job role was the day I knew most likely my days are numbered here. When it comes to fieldwork, anyone can testify I am one of the hardest working staff, but now I just feel like I'm a secretary using a computer, not contributing much… I feel like I have been retired to the office, like I'm no more relevant in the field, and other colleagues share the same concern with me, the ones affected at least (B10)

This participant also explained how he felt that he had lost the mentoring aspect of his previous job role since his field engagements had reduced, noting that:

I love what I did before, the fieldwork made me feel like I was creating something valuable, we would go with some internship students to the field and teach them land administration and survey practically. But now I cannot do that anymore, and I don't even have enough computer knowledge to put myself through, let alone teach the interns how to use the new system (B10)

5.6: Diversity of User Responses at CASE B

Sections 5.4 and 5.5 presented analysis of the 'influencing factors' and 'primary appraisals' themes, drawing on the positive and negative perceptions of the participants in the case, and their perceived levels of controllability over the IT system implementation. As explained earlier in section 4.6, these two themes presented in this way do not show an individual's perspective about the changes brought about by the IT system over a period of time. To address this, section 5.6 will present analysis for each user by theme in order to show an individual user's perception about all of the themes and, importantly, to show how individual users' perceptions changed over the period of time covered by the case.

Following the same approach taken for the first case (see section 4.6), looking at where each individual user is categorised across the user response categories at phase one allows the first research question (How do users respond to IT–induced organisational changes in mandatory use contexts? – see section 1.3) to be answered. This analysis will be the focus of the remainder of this section. Gaining insights into the changes in individual users' perception over time will also be important as it will provide answers to the second research question (How do user

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responses to mandatory IT–induced organisational changes evolve over time and what are the factors that influence these changes? – see section 1.3). This analysis will be presented in section 5.7.

Table 5.4 shows a high-level analysis of individual user responses from each of the participants in the IT-system user category at phase one. All of the analysis in section 5.6 is drawn from the data presented in Table 5.4. Analysis in this section is based on the same analytical approach adopted in section 4.6, with each participant being placed in a user response category based on the number of utterances categorised as threat or opportunity appraisals and perceived level of control over influencing factors. Each box in Table 5.4 on the participant rows represents a participant's perception of a theme. Light green indicates positive perceptions, while orange indicates negative perceptions. Where there is a digit in a box, it indicates the number of utterances that a participant made about a factor within the relevant theme. Boxes without colour and marked as 'X' indicate that a participant did not mention that particular factor within the theme. The tick sign ('✔') within the user response category section of the table indicates the response category into which a participant fits based on the analysis of their utterances.

Worked examples will be presented in separate sub-sections to show into which category each individual user fits and to explain why. Within each response sub-section, at least one individual user example will be presented to demonstrate the process of categorisation, through the use of diagrammatic illustrations of statements from participants, followed by a detailed analysis. Three response categories were uncovered in the first phase of the interviews with participants: engaged; compliant; and reluctant.

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Table 5.4 High-level analysis of individual user responses in phase one

Participant	Primary Appraisal									Influencing Factors														User Response		
	Opportunity					Threat				Individual-related factors				Organisational & process-related factors						IT system-related factors						
	Improved information tracking	Improved personal & professional development	Improved work transparency	Safer data storage	Speeding up of work processes	Perceived job uncertainty	Loss of power and autonomy	Slowing down of work processes	Reduced teamwork & interaction	High self-efficacy	Low self-efficacy	Perceived encouragement	Perceived discouragement	Adequate training	Inadequate training	Effective management communication	Ineffective management communication	Perceived involvement & participation	Perceived lack of involvement & participation	Easy & user-friendly IT system	Difficult & complex IT system	Adequate access to IT infrastructure	Inadequate access to IT infrastructure	Engaged	Compliant	Reluctant
B08	3	2	4	1	4	X	X	1	X	4	X	3	X	3	X	5	X	2	X	2	1	4	2	✔		
B05	5	1	2	2	3	X	1	2	X	3	1	3	X	5	X	3	X	3	1	3	1	2	2	✔		
B13	3	X	4	4	3	X	X	2	X	4	X	2	X	3	X	3	1	4	X	2	X	2	3	✔		
B06	2	X	5	1	3	1	X	1	X	1	3	1	3	1	4	2	1	X	3	X	3	1	2		✔	
B07	4	X	3	2	3	X	X	1	1	X	5	2	1	1	2	X	2	X	2	X	4	2	1		✔	
B11	2	2	4	1	2	X	2	1	1	X	3	3	X	X	2	1	X	1	2	X	3	1	3		✔	
B10	X	X	2	1	X	2	3	4	3	X	2	X	X	X	4	X	2	1	3	X	2	1	2			✔
B09	1	X	1	X	X	1	4	4	2	X	4	2	X	1	2	1	3	X	5	X	3	X	1			✔
B12	X	X	2	2	X	2	2	6	3	1	2	1	3	1	3	X	X	X	4	X	4	2	3			✔

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Figure 5.4 presents an abstraction of Table 5.4, providing an overall summary of participant responses across all four of the response categories for the first phase of the interviews. The 'deviant' response category has been added in Figure 5.4 in order to show completeness of the model, even though no participant was identified in the 'deviant' response category. The textboxes with dotted border lines indicate the phase of the study and the number of participants within a particular response category. In the following sub-sections, a detailed analysis will be presented for each of the response categories.
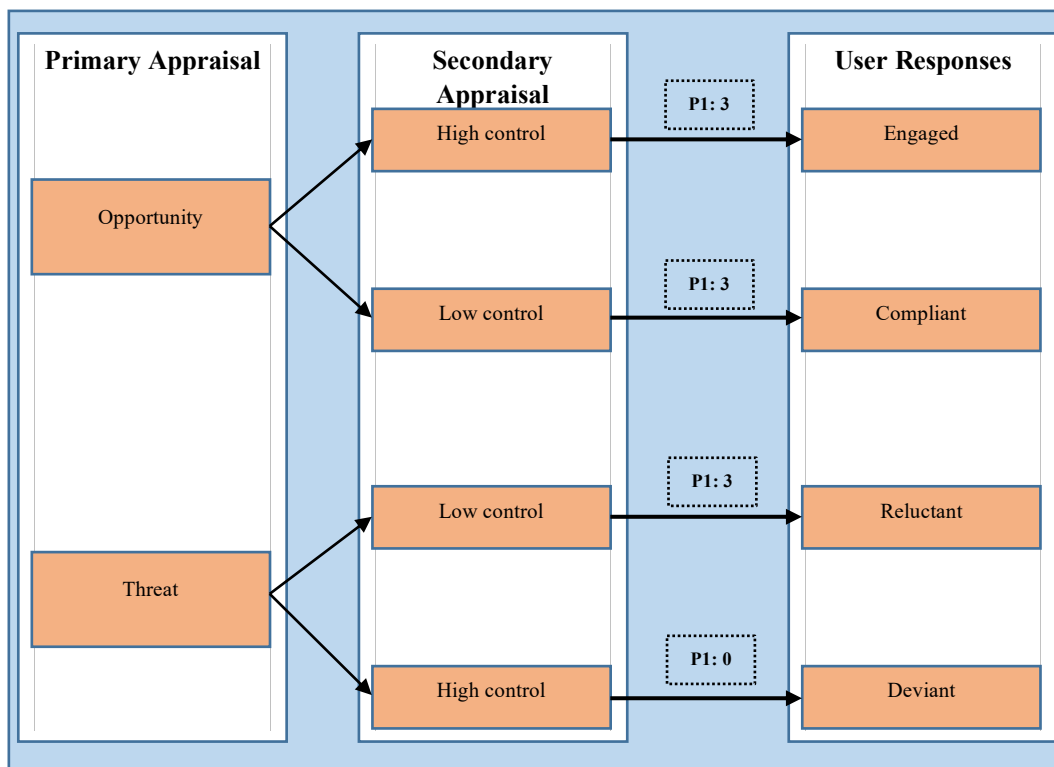
Figure 5.4 Summary of individual user responses in phase one

5.6.1: Engaged Responses

Engaged responses emerged in instances where participants appraised the IT system as an opportunity and felt that they had a high level of control over the IT system implementation and its use in their work environment. Participants who responded in an engaged manner were oriented towards taking full advantage of the opportunities offered by the IT system. The IT system usage behaviours exhibited by participants who responded in an engaged manner were characterised by a

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willingness to extend the usage of the IT system beyond its required and anticipated use, by experimenting and discovering novel uses of the IT system. During the first phase of the interviews, three out of nine participants in the IT-system user category were found to have responded in an engaged manner.

High levels of control over influencing factors were expressed as *perceived involvement and participation*, *adequate training*, *perceived encouragement*, *high self-efficacy*, and so forth (see section 5.4). Opportunity perceptions were expressed as *improved information tracking*, *improved personal and professional development*, *improved work transparency*, and so forth (see section 5.5.1). Evidence of engaged IT system usage behaviours was assessed not in terms of how much participants used the IT system, but in the way in which they used it – for example, participants using reports from the IT system to create infographic documents and creating planning reports that could be used by sister agencies and stakeholders. As an illustration of the chain of evidence for engaged user responses, Figure 5.5 provides a worked example of the response for the participant 'B05'. A detailed analysis of quotes from the participant follows.

Opportunity

Improved information tracking: Our work is faster now, since we do almost everything from our desks. I don't have to move from one office to another tracking and pushing applications to the next stage.

Improved personal and professional development: I have a BSc in geography and MSc in GIS, I studied a lot of modules during these courses, so I'm really happy and excited that finally the system has given me the chance to make use of them.

Speeding up of work processes: The queueing feature has made our work easier and faster… We attend to them (clients) and send them to where they need to be next, no fuss no trouble.

Improved work transparency: We even have a customer hotline for enquiries, no need to come and follow up or pay someone in the agency to do that for you.

High control

High self-efficacy: I am knowledgeable with computers. I have been using computers and various software since my university days.

Perceived encouragement: It's always nice to have an arm over your shoulder, you feel you have the support you need, and the training manager and my colleagues have certainly provided that.

Adequate training: The training was so good that we started the actual work on the same day, we caught up so fast.

Effective management communication: I must admit the management handle the communication perfectly, because it cleared most doubts we had initially.

User Response

Engaged Response

Figure 5.5 Engaged response: evidence chain for B05

B05, who worked in the customer services and information unit, described many benefits of the IT system during the interview. Having highlighted issues such as delays in processing applications owing to poor queue management during application submission, and the slow physical movement of applications from one office to another, she was pleased to see that the IT system had addressed these issues. The queue and ticketing module of the IT system helped in organising and managing how customers were attended to by automatically allocating ticket numbers based on a client's inquiry. This meant that clients no longer had to stand in queues; rather, they would take a seat and wait for their ticket number to be called. This significantly improved service delivery and reduced waiting time for clients. Other identified benefits included faster application processing, as all applications were now submitted electronically. As such, applications did not have to move physically from one office to another, which previously led to application forms being misplaced. B05 expressed high levels of control over the IT system implementation and its usage, particularly with regard to her high self-efficacy. In the interview, she mentioned being familiar with GIS software from her higher education studies and was confident of her computer and IT skills. As such, she knew that she would find the IT system easy to use. She also mentioned, among other things, receiving considerable support from the training manager and from her colleagues with regards to using the IT system to accomplish her tasks.

As a consequence of B05's appraisal of the IT system implementation, her IT system usage behaviour demonstrated an engaged response. B05 used the IT system innovatively to create infographic documents that displayed the different categories of complaint that were received and resolved in the customer services and information unit. This aided the unit in understanding the rate of recurrence of complaint types and the number of complaints that the unit had been able to resolve. The unit did not initially realise that this was a possible feature, but it has now become a feature that is frequently used by the unit. As B05 explained:

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I use reports from the system, by exporting them to excel to generate diagrammatical illustrations of the kind of issues and complains we resolve for our clients, with this we can see which ones occur more frequently... When I first showed diagrams and charts at one of our meetings, our manager was impressed, because she didn't know this could be done. And since then we have been doing that for reports of our quarterly meetings.

Having presented a high level of analysis of individual user responses in Table 5.4, and presented a worked example, it can be seen how the 'engaged response' judgement was made for the participant B05. Summaries, with similar chains of evidence, for other participants within this user response category are provided in Appendix D.

5.6.2: Compliant Responses

Compliant responses emerged in instances where participants appraised the IT system as an opportunity but felt that they had a low level of control over the IT system implementation and its use in their work environment. Participants who responded in a compliant manner were satisfied using the IT system to accomplish their tasks and satisfy organisational mandates without attempts to explore further IT system features. Participants in the compliant response category, however, did not enjoy as many benefits as their colleagues in the engaged category owing to their perceived low levels of control over the IT system implementation. The IT system usage behaviours exhibited by participants who responded in a compliant manner revealed a standardised and repetitive usage pattern, with no indication of further IT system exploration. During the first phase of the interviews, three of the nine participants in the IT-system user category responded in a compliant manner.

Low levels of control over influencing factors were expressed as *inadequate access to IT infrastructure*, *difficult and complex IT system*, *in adequate training*, *perceived lack of involvement and participation*, and so forth (see section 5.4). Opportunity perceptions were expressed as: *improved work transparency*, *safer data storage*, *speeds up work processes* and so forth (see section 5.5.1). Evidence of compliant IT system usage behaviours were reflected in how the participants

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used the IT system in a routine and repetitive manner, with no attempt to discover novel uses. These participants were satisfied using the IT system to accomplish their allocated tasks in the prescribed way. Figure 5.6 presents B07's appraisal of the IT system implementation, as an example of a compliant user's responses.

Opportunity

Speeding up of work processes: The system makes our work more organised and faster because everything is done mostly by just clicking your mouse, unlike before when you had to pick up paper files from archive rooms.

Improved information tracking: Before the system, to locate files was a chaotic process… At least now things have change, from your device, you can pull up information easily without breaking a sweat.

Improved personal and professional development : I use the training I have learnt for many things now, for both official and non-official activities. It has improved me beyond doubt.

Improved work transparency: There is more accountable because all activities on the system can be traced to a user's profile, so shady deals can hardly happen now.

Low control

Difficult and complex IT system: The system is very difficult to use, especially when it's your first time using it .

Perceived lack of participation and involvement: I can't really say I was involved, because I wasn't part of any team, and I didn't really know much about the GIS system, so I couldn't contribute much.

Inadequate training: I just know the training I have received is not enough… need more training, maybe more sessions.

User Response

Compliant Response

Figure 5.6 Compliant response: evidence chain for B07

B07 was pleased with most of the changes brought about by the IT system implementation. During the interview, she described how the IT system had improved work processes at the agency. For example, she highlighted how the IT system now prevented fraudulent practices, such as service price hiking and employees demanding bribes to offer certain services within the agency. Payments were now digital, with invoices and receipts being generated automatically by the IT system, meaning that employees would not be able to adjust the costs manually. Other mentioned benefits included improved personal and professional development, as she believed some training would have never been offered if the agency had still been using the manual, paper-based processes of land administration.

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Despite the fact that B07 was pleased with many features of the IT system, she expressed low levels of control over the IT system implementation and its usage owing, among other thing, to factors such as having received inadequate training and her finding the IT system difficult and complicated. Although training was organised and delivered based on training need assessments, B07 felt that the number of sessions offered were still insufficient for her to master the IT system features that she needed to learn to comfortably accomplish her tasks. She believed that certain sessions should have been available at least two or three times annually, rather than being offered as one-off sessions, as delivered by the agency. With regards to the IT system features, B07 felt that some should have been easily customisable to accommodate the nature of her tasks. She criticised the fact that some features were not easily customisable, noting that the consultants had highlighted certain features that would have had to go through a major system upgrade to become customisable, a process in which the agency was not ready to engage.

As a result of B07's positive appraisal, matched with perceptions of low levels of control over the IT system implementation and its use, her IT system usage behaviour demonstrated a compliant response. B07 was content to use the IT system in a standardised manner, relying on the steps that she had learned from training sessions and from her colleagues. She had no interest in exploring other IT system features that were not critically related to her tasks. The comment below captures how B07 described her IT system use in phase one:

> *I just try to use the system to do what is required of me, once I can meet my target and finish all work assigned to me, I am satisfied. Other aspects that need skills like programming, honestly that is not my part and I have never studied programming before, so I won't venture into that part… I know it can do more than what I use it for, but for now I'll settle for the basics.*

Summaries, with chains of evidence, for other participants within the compliant user response category are provided in Appendix D.

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5.6.3: Reluctant Responses

Reluctant responses emerged in instances where participants appraised the IT system as a threat and felt that they had a low level of control over the IT system implementation and its use in their work environment. Participants who responded in a reluctant manner were typically against the implementation and use of the IT system at the agency. These participants only used the IT system with the intention of complying with the organisational mandate regarding its use. This set of participants would have gladly gone back to the manual, paper-based method of land administration if given the option. Three reluctant responses were observed from interviews with nine participants in the IT system user category during the first phase of the interviews.

Low levels of control over influencing factors were expressed as: *low self-efficacy*, *perceived discouragement*, *inadequate training*, and so forth (see section 5.4). Threat perceptions were expressed as: *perceived job uncertainty*, *loss of power and autonomy*, and so forth (see section 5.5.2). Evidence of reluctant IT system usage behaviours were reflected in how these participants used the IT system reluctantly and how often they complained about having to complete tasks using the IT system. For instance, these participants often questioned why they had to use the IT system to accomplish their tasks. Figure 5.7 presents B09's appraisal of the IT system implementation, as an example of a reluctant user's responses.

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Threat

Perceived job uncertainty: I'll be honest, I know corruption is a huge problem in land administration, but most of us feel like this system was brought in to kick us out.

Slowing down of work processes: I treat fewer files now because I struggle when using the system… It still takes me a long time to complete mapping a single plot, something I could do maybe 5 at a time straight away.

Loss of power and autonomy: It's different now because I am not the one doing the teaching, the younger staff have taken over. Their generation grew up with computers, I can't say the same for mine.

Low control

Inadequate training: I just feel for slow learners like myself, we should have more formal training. So maybe more formal training will be better for us.

Perceived lack of involvement and participation: I was not involved at any point. We were given our marching orders and we abided… They felt maybe we couldn't contribute much. So in the end, it was just slapped in our face, here is the new system, go use it.

Inadequate access to IT infrastructure: Most of the managers in our unit don't really like the system too. We hear them saying bad things about the change, so for them to complain about it, what would you expect people like us that work under them?

Low self-efficacy: We didn't use computers to conduct our work before, and personally I have hardly used a computer for any activity...I don't really know much about computers, I find it hard using them, and now I even find the new system harder and complex, it's not easy.

User Response

Reluctant Response

Figure 5.7 Reluctant response: evidence chain for B09

B09 exemplifies a participant with a reluctant response towards the IT system implementation at the agency. B09 described how he appraised the IT system implementation as a threat to him personally and professionally during his first phase interview. He explained having doubts over the management's reason for implementing the IT system. He acknowledged that the agency had been suffering from fraudulent activities, but did not believe that the IT system was implemented to tackle those issues, arguing instead that it was a political symbol implemented by the agency to make it look good and also as a way of laying-off old staff. Among other threat perceptions, he also mentioned how the IT system reduced the number of files and applications that he could complete within a day. He attributed his decrease in effectiveness and efficiency to his struggles while using the IT system to accomplish his tasks.

B09 also bemoaned having low levels of control over the IT system implementation. He mentioned not being involved in the IT system implementation, even though some of his colleagues were, because he was not technically sound. He saw his omission from the implementation activities as a deliberate way of side-lining him from the whole process. Among other issues, he also explained that

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people with insufficient IT skills should have received more training. Even though on the job training continued, he was of the opinion that 'slow learners' like him should have been offered more formal training. Consequently, his IT system usage behaviour demonstrated a reluctant response. He did not use features that were not directly related to his tasks, nor did he try to explore novel uses for the IT system. He only used the IT system as a last resort in order to comply with the agency's compulsory usage policy, saying:

> *I'm barely using it because it is mandatory, not because I want to. We have been told to use it for our job, I'm still a learner, and if I use it, no one can complain about me. I have a lot of responsibility at home and at office, so I don't really have that sort of free time to look at other parts of the system. So I use it to do my assigned work, that's all!*

Summaries, with chains of evidence, for other participants within this user response type are provided in Appendix D. Analysis of the second phase of the interviews are presented in the following section.

5.7: Changes in User Responses at CASE B

As noted earlier, this section presents findings from the second phase of this study which provides answers to the second research question: how do user responses to mandatory IT–induced organisational changes evolve over time and what are the factors that influence these changes? Participants were re-interviewed approximately six months after their phase one interviews to examine whether there were any changes in their initial responses towards the IT system implementation.

The second phase interviews provided evidence of transition in participant responses from one response category to another, as was observed during analysis of the first case organisation of this study (see section 4.7). All nine participants in the IT system user category were re-interviewed during the second phase. Transition in user responses was experienced as a result of changes in influencing factors and primary appraisals. Interestingly, in contrast to the first case study (see Chapter 4), only progressive transitions (i.e., where participants became more positive over time) were witnessed in this case organisation. Figure 5.8 presents a

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diagrammatic illustration of participant responses during the second phase interviews. The transitions in user responses that this reflects will be explained in the following sub-sections.

Primary Appraisal	Secondary Appraisal		User Responses
	High control	P2: 5	Engaged
Opportunity	Low control	P2: 2	Compliant
Threat	Low control	P2: 2	Reluctant
	High control	P2: 0	Deviant
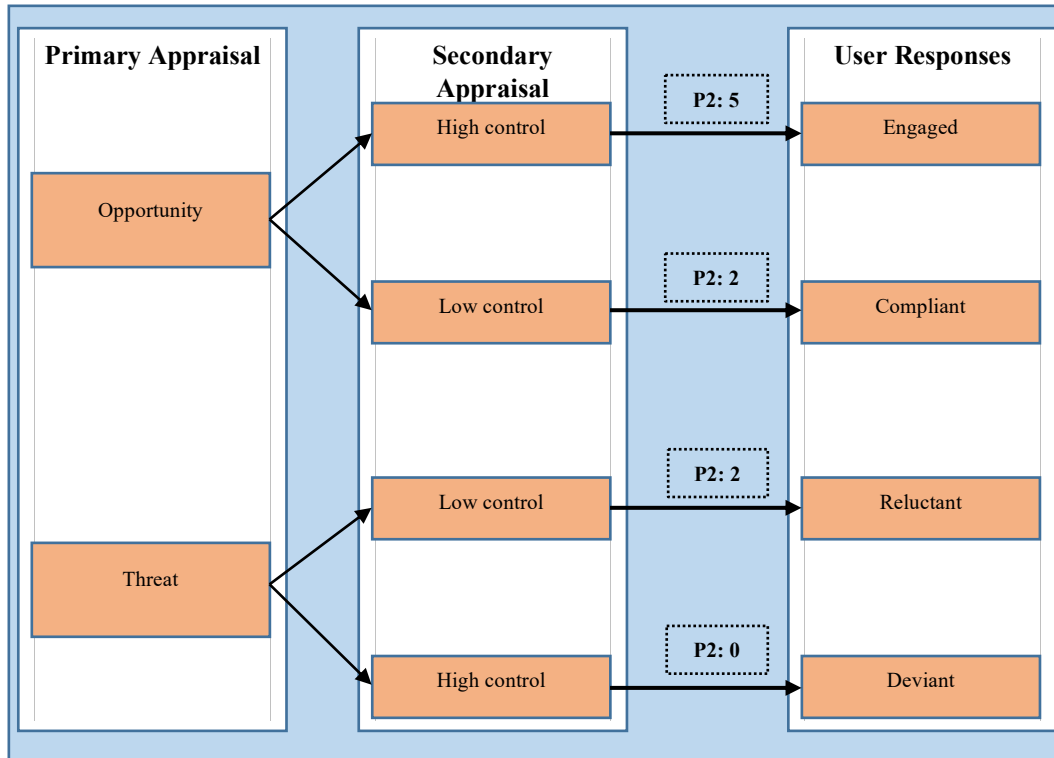
Figure 5.8 Summary of individual user responses in phase two

5.7.1: Compliant to Engaged Responses

Compliant to engaged response transitions showed changes in the level of control from 'low' to 'high' over influencing factors with no substantive change in view of the IT system as an opportunity (primary appraisal). Perceptions of an increased level of control over the use of the IT system was as a result of increased interaction with the IT system by users and improved post-implementation activities by the agency. B07's transition offered interesting insights of such a transition. During the second phase interview, B07 reaffirmed her appraisal of the IT system as an opportunity (see Table 5.4 for a summary of B07 appraisal at phase one), but provided insights about her perceived increase in the level of control over her IT system use.

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B07 previously complained about the training she received being inadequate and often struggled while using the IT system to accomplish her tasks. As part of the training strategy adopted by the agency, having received suggestions for improved staff development, the agency offered refresher training courses, peer-to-peer learning and increased task-specific training. This training strategy was useful in terms of providing employees with more knowledge on how to use the IT system, with the hope of users potentially exploring more IT system features. B07 explained how peer-to-peer learning and task-specific training helped her overcome her difficulties while using the IT system:

> *I have come a long way in a short period of time. Before, I just used the system step-by-step doing what I learnt in training. I did not want to explore the system because I wasn't confident. Now I have learned new things from other people, working closely with my colleagues helped me and the individualised training helped also.*

B07 increased engagement with the IT system and working closely with her colleagues provided her an opportunity to learn new IT system features and extend her usage behaviour. B07 discovered how to match and compare a plot with an area's master plan, a feature she previously didn't use. Before discovering this feature, she had to verify plot information using measurements captured from the field, but she could now easily compare a plot design with an area master plan to confirm its validity using satellite imagery. As she explained:

> *Initially, I never knew it was possible to use satellite imagery for vetting and tracking exercises, after working with B08, he showed me a lot of things the system can do. I'm really impressed and happy, because now we can finish our activities faster and easier. Funny enough even our manager wasn't aware of this till we brought it to his attention.*

B07's transition from compliant to engaged response showed how she gained higher levels of control through training and working closely with her colleagues. Her IT system usage behaviour also changed from using the system in a repetitive manner to exploring more IT system features to improve her effectiveness and efficiency while accomplishing her tasks.

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5.7.2: Reluctant to Compliant Responses

Reluctant to compliant response transitions showed changes in primary appraisals from 'threat' to 'opportunity', with no substantive change in perceived level of control over the use of the IT system. Participants who experienced this type of transition still believed that they had low levels of control over how they used the IT system to accomplish their tasks. Some still struggled while using the IT system, often highlighting the need for more training and better access to infrastructure, such as computers and faster Internet connectivity.

B09 is an example of a participant who transitioned from a reluctant to a compliant response. As can be seen from Table 5.4, which provides a summary of B09 appraisal at phase one, B09 at first appraised the IT system as a threat and felt that he had low levels of control over its implementation and usage. He often argued that the IT system instilled a sense of job uncertainty, slowed down his work and had made him lose some level of autonomy over his job. After using the IT system for some time and seeing the benefits first hand, his views on the system started to change. As mentioned earlier, employees were free to request intensive training, which included individualised sessions and peer-working with colleagues to learn the IT system better. Through the training, B09 gained knowledge that helped him clearly see its advantages, saying:

> *Things have changed since we started the one-to-one training, now I can see the benefits of the system. I won't say I have perfected it, because I still struggle but I now appreciate what it can do…It took me some time, but now I have an open mind towards the system, I must admit I was a bit harsh about it at the beginning.*

Working closely with his colleagues also encouraged B09 to engage more with the IT system and improve his understanding of its features. B09 explained how his colleagues had influence his perceptions about the IT system:

> *I used the system just to abide by the rules of the agency, I never cared to use it beyond that. The support I have received from my friends has changed that view. It has encouraged me immensely, I even created my own step-by-step guide for the features I use with the help of some team members. With an open mind, you can see many benefits of the system.*

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In terms of his perceived low levels of control over his IT system usage, when interviewed in phase two B09 still struggled to use the IT system, even though he had improved considerably. He still maintained that slow Internet connectivity affected the speed of his work, noting that:

> *I'm still no expert, I face some difficulties here and there, but I have improved. The personal guide I designed has been very useful…Yes, we still face connectivity issues, the management are aware of it, and hopefully all of us with problems get our dongles soon.*

B09's transitions showed a change from threat to opportunity appraisals as a result of improved training and interaction with his colleagues. Even though he still maintained low levels of control over his IT system usage, his usage behaviour had changed considerably. Initially, he only used the IT system to meet the agency's mandate, but after some time he started making the effort to improve his IT system usage to the extent he created a personal step-by-step guide.

5.7.3: Summary of Individual User Responses and Transitions

Overall, the analysis in this section has provided insights into how participants transitioned from one response category to another. Figure 5.9 provides a summary of individual user response categories, and transitions between them, from phase one to phase two of the interviews with participants. As explained previously in section 4.7.4, the text boxes with the dotted borderlines indicate the number of participants that fall within each response category in each of the study's two phases. The dotted arrows show the direction of the transition of a participant's response. The numbers next to the arrows show the number of participants transitioning from one response category to another.

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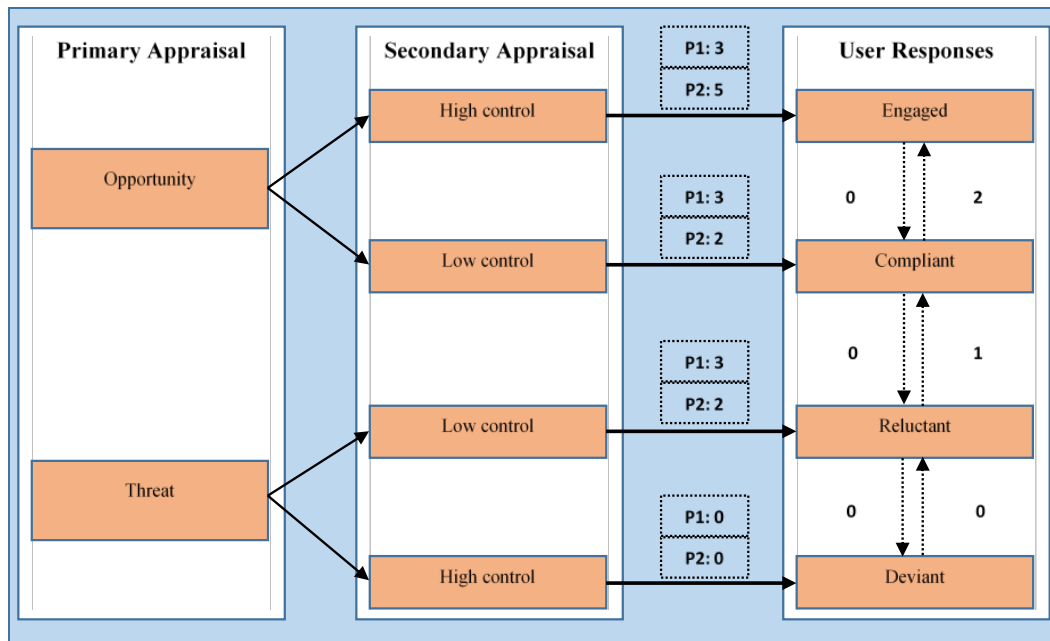
Figure 5.9 Summary of individual user responses and transitions in response category from phase one to two

5.8: Summary

This chapter has presented the organisational context, analysis, and findings associated with the second case undertaken as part of this research. The organisational context addressed in this chapter included the case background, the organisation's IT infrastructure, the history of the IT system implementation, and participant information.

In addition, themes that emerged from the data analysis process were presented. The data analysis process revealed how lower level codes were combined to form sub-themes and themes at a higher level of abstraction. Having presented the analysis across the themes, the chapter then presented the analysis across participants by matching the sub-themes 'influencing factors' and 'primary appraisals' across the two interview phases in order to reflect individual user responses and to examine whether user responses had changed over a period of time (from phase one to phase two). Three user response categories – engaged, compliant, and reluctant – were identified in the first phase of this second case. The chapter concluded by showing how individual user responses had changed at the

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second phase of the participant interviews, a period of six months after the first interviews. Two transitions in response categories for individual users were found – two participants transitioned from compliant to engaged, and one from reluctant to compliant.

Chapter 6 will present a discussion of the findings from the two case organisations reported in Chapters 4 and 5.

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Chapter 6: Discussion

6.1: Introduction

Chapters 4 and 5 presented the organisational context, analysis, and findings from the two case organisations for this study. Chapter 6 aims to discuss these findings through the following structure. Section 6.2 presents a cross-case analysis and discussion of the findings from the two case organisations. Section 6.3 presents the theoretical contributions of the research, while section 6.4 presents implications for practice. Finally, section 6.5 provides a summary of the chapter and its position in the thesis.

6.2: Cross-case Analysis and Discussion

This section presents a cross-case analysis and attaches meaning to the findings reported in chapters 4 and 5, relating the findings to those presented in published studies that were reviewed in chapter 2. Overall, analysis of the results from the two cases reveal many similarities and a small number of differences, owing to the IT implementation characteristics from the two case organisations. For ease of discussion, this section contains five sub-sections: section 6.2.1 provides a brief contextual background of the two case organisations; section 6.2.2 discusses the findings related to the primary appraisals theme; section 6.2.3 discusses the findings related to the influencing factors theme; section 6.2.4 discusses the findings related to the individual user responses theme; and section 6.2.5 discusses the findings related to the transition in user responses in the two case organisations.

6.2.1: Contextual Background of the Two Case Organisations

The two case organisations that participated in this study are both government-owned agencies involved in land administrative activities. The two agencies have similar mandates and are involved in similar activities across their areas of coverage. These agencies formerly operated as state ministries, adopting traditional paper-based approaches to land administrative activities (see sections 4.2 and 5.2). In a bid to modernise and improve their activities and service delivery, both agencies decided to adopt the use of GIS and land administrative systems (LAS).

With regards to their IT implementation strategy, both agencies went into PPP agreements with consultants in order to ensure the successful deployment and use of the IT systems in the agencies. However, the agencies experienced different outcomes, owing to the difference in the nature of project management and change management approaches adopted at each of the two case organisations. CASE B, to a large extent, achieved the majority of its PPP objectives as the agency engaged an experienced consultancy firm that had been previously been involved in three similar projects, while CASE A had to abandon its PPP agreement shortly after it had been launched owing to the lack of experience and commitment from the agency's chosen consultant. As a result, the agency decided to manage the project in-house. In spite of the change in strategy, CASE A's IT implementation project faced numerous challenges. IT implementation strategy played a key role in both agencies as it strongly influenced participants' primary appraisals and perceptions of control over influencing factors in their agencies.

These findings are consistent with prior IS literature that suggests that the nature and the pace of organisational change can play a vital role in outcomes and how individuals respond and adapt to IT implementations in their work environment (Bala and Venkatesh, 2016; Burton-Jones and Gallivan, 2007; Gallivan et al., 1994; Rogers, 1983). This will be discussed further in the following sections.

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CASE A implemented a proprietary GIS package and integrated it with a LAS, while CASE B implemented a free, open source GIS package that was later integrated with their consultant's LAS. Both GIS packages had similar features, with the only difference being that CASE A had access to unlimited customer support, while CASE B had to rely on information and support from online discussion forums.

In order to provide the basis for a cross-case analysis, similar categories of participants were interviewed across the two case organisations. Data were collected from management-level staff, training/IT support staff, and IT system users in both case organisations. The data collected from the diverse set of participants across the two cases revealed the similarities and differences among the two IT implementation projects. The next section continues the discussion of the results, moving on to consider the primary appraisals theme.

6.2.2: Primary Appraisals

As explained in section 2.5, the theme 'primary appraisal' – a process whereby an individual evaluates whether the consequences of implementing an IT system in his/her work environment are positive or negative – is an important feature in the model adopted for this study. In both case organisations, primary appraisals had a significant effect on how the participants responded to the mandatory IT-induced changes in their work environment. In fact, the findings from this study in relation to primary appraisals in an IT use context are consistent with prior IT use and behavioural studies which suggest that IT users are more likely to develop a general assessment of opportunity if they believe that an IT system offers a chance for professional and personal improvement (see, for example, Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Davis, 1989; Fadel, 2012; Fadel and Brown, 2010; van Offenbeek et al., 2013; Venkatesh et al., 2003). On the other hand, if IT users perceive an IT system as causing harm to their professional and personal well-being, they are likely to develop a general assessment of threat about the IT system (see, for example, Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005, 2010; Benamati and Lederer, 2001;

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Bhattacherjee et al., 2017; Fadel and Brown, 2010; Lapointe and Rivard, 2005; Liang and Xue, 2009; Meissonier and Houzé, 2010; van Offenbeek et al., 2013; Selander and Henfridsson, 2012; Teo and Yang, 2007; Tsai et al., 2007).

Across the two case organisations, five lower level codes emerged that made up the **opportunity appraisal** sub-theme: improved information tracking; improved personal and professional development; improved work transparency; safer data storage; and speeding up of work processes. All five lower level codes emerged in both cases. It is worth noting that similar and different examples in relation to the five codes were uttered by the participants across the two cases (see the interview excerpts presented in sections 4.5.1 and 5.5.1). Examples of how the IT systems improved information tracking and sorting, and speeding up of work processes, emerged from both cases. The examples were related to how easier access to information accelerated processes such as enquires and issuance of certificates. These findings are similar to those presented in prior IT use and behavioural studies (for example: Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Bhattacherjee and Premkumar, 2004; Davis, 1989; Oborn et al., 2011; van Offenbeek et al., 2013; Venkatesh et al., 2003) which indicated that IT users appraise an IT system positively when it provides improved access to information and accelerates work processes.

Improved work transparency and safer data storage were often mentioned by participants in each of the case studies. Among the major issues faced by the two agencies were fraud and data storage. Information tampering often caused delays in processing applications and completion of work processes due to quality checks having to be carried out whenever the integrity of records were in question. This meant that more time had to be spent while verifying records, in turn increasing the processing time. Records stored physically in archive rooms were difficult to track and in some cases were found to be damaged, which caused major delays in completing work processes. In each of the case studies, the IT systems had electronic databases that ensured that files were kept safely without fear of any physical damage. Likewise, the IT systems offered user authentication features that ensured that information could only be accessed or modified by authorised personnel. This improved the safety and integrity of agency records, while also

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reducing the time needed to verify records. This engendered positive perceptions about the IT system among participants. This finding is in line with prior IT use studies that suggests the use of IT systems can improve work efficiency and effectiveness (see, for example, Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Davis, 1989; Venkatesh et al., 2003).

Findings for improved personal and professional development were evident across the two cases. For example, some participants attributed the ICT and personal development training that they received to the IT system implementation. Both sets of participants believed that the training had improved them professionally by boosting their skills and exposing them to new fields of knowledge. Participants received different certifications and engaged in various hands-on activities, which they perceived as an upgrade to their CVs. These participants were confident and pleased to have moved from paper-based methods of land administration to computerised IT systems. They also believed that their newly acquired skills would help them beyond the work in which they were engaged in their current work environment. These findings are in line with those in prior IT use studies that indicate that users find an opportunity to improve their skills and have their competence seen through the use of IT systems, as a result of which they may expect to gain more skills and professional reputation in and outside their work environment (see, for example, Kashefi et al., 2015; Nelson et al., 2005; Vaast and Walsham, 2005; Wasko and Faraj, 2005).

Four lower level codes emerged that made up the **threat appraisal** sub-theme: perceived job uncertainty; loss of power and autonomy; slowing down of work processes; and reduced teamwork and interaction. All four lower level codes were evident in each of the cases. Perceived job uncertainty reflected how participants in each case study feared losing their jobs or being transferred to new job roles. This was closely related to how participants interpreted the rationale behind the IT system implementation. Some of the participants had perceptions of uncertainty and ambiguity because they felt that the management teams in their agencies did not properly communicate information about the IT projects, leading to participants forming negative perceptions towards the IT system implementations. This result corroborates the view that IT system implementation in organisations can render a

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situation threatening for employees, as has been found to be the case in prior organisational and IT use and behavioural studies, particularly in IT resistance research (such as, Chattopadhyay et al., 2001; Crozier and Friedberg, 1977; George et al., 2006; Jackson and Dutton, 1988; Joshi, 1991; Klaus and Blanton, 2010; Lapointe and Rivard, 2005; Meissonier and Houzé, 2010).

Loss of power and autonomy was mentioned by some participants across the two cases. The IT system implementations brought about drastic changes in work processes in both agencies. One issue highlighted by some participants was their perceived loss of influence owing to their lack of IT skills and knowledge. These participants were looked up to for guidance and coaching before the IT system went live, but later found themselves relying on the younger staff to help them to use the computers and the IT systems. For them, this was a major shift in status which they found hard to accept. In another instance, participants from CASE B complained about not being able to work from home following the implementation of the IT system. This result supports prior findings in IT resistance literature that suggest that IT users may appraise an IT system to be threatening owing to its effects on their autonomy, status symbols and prestige (e.g., Joshi, 1991; Lapointe and Rivard, 2005; Markus, 1983).

The findings relating to the code 'slowing down of work processes' in each case study indicated that some participants attributed the delay in completing their tasks to the IT system implementation. This was because of two reasons: low self-efficacy and inadequate access to IT infrastructure. Participants with this perception felt that they did not have the required skills and knowledge to use the IT systems without facing many difficulties, resulting in them spending more time to accomplish their task than they expected. This is consistent with prior studies that suggest that users may feel that they have insufficient competencies to adapt to, or master, features of an IT system, in turn linking the system to negative impacts on their work performances (see, for example, Beaudry and Pinsonneault, 2005; Lapointe and Rivard, 2005; Martinko et al., 1996; Venkatesh et al., 2003). With respect to inadequate IT infrastructure, at CASE A participants believed that they were not provided with enough computers or servers, or fast Internet connectivity. In the case of CASE B, the main issue with infrastructure was the slow and

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intermittent Internet connectivity at the agency. Both IT systems relied heavily on the processing speed of computers and on the bandwidth speed, which was notably slow at both case organisations. This often caused delays in processing applications and completing other tasks. This finding supports those of Sykes et al. (2014) who suggest that task and technology components have a significant impact on IT user responses and behaviours while using IT to accomplish their tasks.

The code 'reduced teamwork and interaction' emerged across the two cases. This code represented some participants' beliefs that the IT systems in their agencies had reduced the level of teamwork and interaction among colleagues. Changes in work processes meant that fewer people had to be involved in plotting maps and designs, since this was now done using the IT system instead of using the paper-based approach used previously. This finding must be interpreted with caution, as no prior study in the IT use literature was identified that has suggested that the use of IT may result in reduced teamwork and interaction.

Having discussed the study's results related to the primary appraisal theme, the next section will discuss the results related to the influencing factors theme.

6.2.3: Influencing Factors

The theme 'influencing factors/secondary appraisal' (a process whereby an individual evaluates his/her level of control over the IT system implementation, in light of the resources available at an individual's disposal) is also an important feature of the model introduced in section 2.5. Influencing factors played a significant role in shaping participants' responses to the IT system implementations in their agencies. The three sub-themes that made up the influencing factors theme emerged across the two cases, including: **individual-related factors**; **organisational and process-related factors**; and **IT system-related factors**.

Individual-related factors (self-efficacy and social influence) were found in the study to significantly influence participants' responses to the mandatory IT system use in their work environments. Discussion in relation to each factor within this context will now be presented.

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The findings of this study indicate that self-efficacy is a significant factor that influences an individuals' response to using an IT system in his/her work environment. This is consistent with Venkatesh (2003), Compeau and Higgins (1995), Thomas et al. (1990), Beaudry and Pinsonneault (2005), Davies (1989), and Klaus and Blanton (2010), who reported that self-efficacy plays an important role in shaping an individual's response to, and use of, an IT system. This study reaffirms findings from the above mentioned studies that suggest that individuals with high self-efficacy are more likely to respond positively to IT system implementations and may derive more positive benefits from using the IT system; conversely, individuals with low self-efficacy are likely to respond negatively, realising fewer benefits from IT system implementations.

Moving on to the next individual factor – social influence – the results show that individuals' responses to the use of IT systems for their work was evidently influenced by their social circles and those that they felt were important to them in their work environment. This finding supports those obtained by many researchers (see, for example, Ajzen, 1991; Davis, 1989; Fishbein and Ajzen, 1975; Karahanna et al., 1999; Mitchell et al., 2012; Sykes et al., 2014; Taylor and Todd, 1995; Venkatesh, 2000; Venkatesh and Davis, 2000) indicating that IT users are more likely to respond positively or negatively to an IT system depending on the perceptions of the people that they find important to them and how those people use the IT system to accomplish their own tasks. The finding also reflects those of Venkatesh et al. (2003) who indicated that social influence constructs are not significant in voluntary IT use contexts, but that they are very significant in mandatory IT use contexts. Further, Mitchell et al. (2012) cite an instance where participants reported that they were motivated by their department members and supervisors to use the IT system in their hospital, and that motivation played a significant role in influencing their response towards the implemented IT system.

However, the identified significance of social influence contradicts other studies in the IS literature, such as those of Chau and Hu (2002), Han et al. (2004), and Schaper and Pervan (2007) who reported social influence as having no significant influence on an individual's response to IT. One possible reason for the mixed findings may be the difference in organisational types and contexts of the studies in

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question, as participants from the studies that found a non-significant effect of social influence were all physicians and health workers who enjoyed a high level of autonomy in their organisations.

Organisational and process-related factors (Training, Management communication, and User involvement and participation) played a very important role in influencing participants' responses towards the IT system implementations, with all three factors evident across both case studies. Training had a significant influence on participants' perceptions of control in relation to their IT system usage. The nature of influence was based on their perception of how the training was organised and delivered, the fit between the training type and the actual task that they had to accomplish while using the IT system. This finding reinforces prior studies (see, for example, Barki and Hartwick, 1994; Klaus and Blanton, 2010; Sabherwal et al., 2006; Sharma and Yetton, 2007) that suggest that training has a significant influence on an individuals' response and use of an IT system. For instance, Bala and Venkatesh (2016) suggested that IT users are more likely to form positive perceptions of opportunity towards an IT system if they perceive that the training they have received is efficient and effective. They also suggest that effective training will help individuals develop mastery over IT system features, improving their knowledge of the benefits that an IT system can offer. Klaus and Blanton (2010) also suggest that if individuals perceive training to be a waste of time, the timing of the training is inappropriate, that trainers are incompetent, or if there is lack of training, this may be problematic as it leads to individuals forming negative perceptions towards an IT system.

Management communication significantly influenced participants' perceptions of control over their IT system usage in both cases. Management communication has been shown to be critical in shaping individuals' responses to IT systems in many IT use and behavioural studies (such as Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Jeyaraj and Sabherwal, 2008; Klaus and Blanton, 2010; Lapointe and Beaudry, 2014; Sabherwal et al., 2006) that have emphasised that management communication in relation to IT system implementation projects has a significant impact on individuals' responses and usage of IT systems. This is because individuals expect management to keep them informed of the 'benefits'

and the 'whys' of the change. The finding of this study is consistent with Klaus and Blanton (2010), who found that management communication affects an individual's psychological contract during IT-induced organisational change and that, if management communication is effective, it will lead to positive responses towards an IT system. On the other hand, if a lack of management communication is perceived during an IT system implementation, an individual will interpret it as a breach of psychological contract, in turn leading to a negative response towards the IT system.

Evidence from both cases indicated that user involvement and participation had a significant influence on participants' responses to the IT system implementations in their respective agencies. These findings are in line with past studies (such as those of Bala and Venkatesh, 2016; Barki and Hartwick, 1994; Ives and Olson, 1984; Klaus and Blanton, 2010; Wagner and Newell, 2007) that suggest that individuals who participate and/or are involved in an IT system implementation project are more likely to develop positive perceptions about the IT system and perceptions of control over their IT system use. Bala and Venkatesh (2016) found that user participation, in fact, had the strongest effect on user perceptions of opportunity during IT-induced organisational changes. In this study, user participation and involvement was found to be significant in both the pre- and post-implementation stage of the IT systems at CASE A and CASE B. This finding reinforces the views of Wagner and Newell (2007) who call for a "reorientation with regard to the role and timing of user participation" (2007, p. 521) in IT projects. They argue that user participation should continue in the post-implementation stage and that "projects do not, and should not, wind down at go-live" (2007, p. 521).

IT system-related factors (IT instrumentality and IT infrastructure) played a significant role in influencing participants' responses towards the IT system implementations, with both factors evident in each case study. IT instrumentality impacted participants' responses towards the IT system both positively and negatively. This was based on how the participants appraised the IT systems as being complex or easy to use. Participants who felt that the IT system was easy and user friendly mostly responded positively to the IT systems, matched with perceptions of high control over the IT system and its use. This finding is in line

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with existing studies (see, for example, Davis, 1989; Klaus and Blanton, 2010; Moore and Benbasat, 1991; Rogers, 1983; Schaper and Pervan, 2007; Sharma and Yetton, 2007; Sykes et al., 2014; Venkatesh et al., 2003) that suggest that when individuals perceive an IT system as being easy to use, they are more likely to respond to it positively and look for more benefits from using the IT system. On the other hand, participants who felt that the IT system was complex and difficult to use mostly responded in a negative manner, matched with perceptions of low control over the IT system and its use. This reinforces the long-standing finding of Rogers (1983) who reported that users are more likely to react negatively to IT innovations that are technically complex and require advanced skills for its users.

However, these findings are inconsistent with those of Chau and Hu (2002) who found that IT instrumentality and effort expectancy did not have a significant influence on an individual's response to an IT system. This may be related to the difference in technology contexts and nature of the participants of the two studies. For the study reported in this thesis, for example, the findings can be attributed to the fact that the participants were mostly accustomed to traditional methods of land administration, whereas those from the study of Chau and Hu (2002) were physicians who had relatively high competence and cognitive capacity and, as such, may more quickly and easily have comprehended the use of IT (Kijsanayotin et al., 2009).

IT infrastructure had a significant influence on participants' responses to the IT system implementations in their case organisation. The effects of IT infrastructure on user responses to IT have been studied as part of the 'facilitating condition' construct in prior IS research. In terms of Internet availability, both agencies experienced slow-speeds and sporadic Internet connectivity. As for hardware equipment, CASE B used state-of-the-art computers and servers. That was not the case in CASE A where participants had to rely on old and slow computers and, in some cases, on improvising by temporarily using desktop computers as servers. This had a negative impact on participants' perceptions of the IT systems and participants' perceived levels of controllability over their IT system use. This finding is in line with prior studies (see, for example, Taylor and Todd, 1995; Thompson et al., 1991; Venkatesh et al., 2003) that found that IT infrastructure has

a direct influence on an individual's response to an IT system. In particular, this resonates with findings from Marcus (1983), Klaus and Blanton (2010), and Jiang et al. (2000) who suggest that inadequate IT infrastructure may lead to negative responses about the IT system implementation and its use. However, this finding is to be interpreted with caution owing to the limited amount of information about this factor within the IT use literature. Further research is needed to confirm and understand this finding.

Having discussed the findings related to the theme 'influencing factors', the next section presents a discussion of the findings related to the 'user responses' theme.

6.2.4: User Responses

Another important feature of the model introduced in section 2.5, is the theme 'user responses'. As presented in sections 4.6 and 5.6 across each of the case studies, the theme 'user responses' is a combination of the themes primary appraisals and influencing factors, which shows an individual user's perception about all of the themes and, importantly, shows how individual users' perceptions changed over the period of time covered in each case study. Three user response categories were uncovered across the two cases – **engaged**; **compliant**; and **reluctant responses** – while the **deviant response** category did not emerge in either of the two case studies.

Engaged responses were evident in each of the cases, resulting from opportunity appraisals matched with a strong sense of control over use and ownership of the IT systems at the agencies. Influencing factors played a significant role in shaping engaged responses in each case. For instance, at CASE A many participants had high self-efficacy owing to their prior knowledge and experience with GIS. This was because of the agency's recruitment policy that mandated prospective candidates needing GIS experience and expertise in order to work at the agency. This policy was adopted nine years before the IT system implementation being investigated in this study. Even though the agency did not have a functioning IT system when the recruitment policy was introduced, it was still enforced during recruitment exercises at the agency. On the other hand, CASE B introduced a

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similar policy after their IT system implementation. Rather than recruiting an entire new set of staff to use the IT system, CASE B heavily invested in training their current staff in order for them to successfully use the IT system for their work. Some staff already had GIS experience, although GIS use at the agency then was voluntary and was not provided by the agency. At CASE B, effective management communication and adequate training played a major role in giving participants a high sense of control over their IT system use.

Participants who responded in an engaged manner showed enthusiastic support and innovative use of the IT system, using the IT system in ways that extended and went beyond its intended purposes in order to achieve optimum benefits. These findings are conceptually similar to IT usage behaviours from prior studies, such as feature extension (Jasperson et al., 2005), trying to innovate (Ahuja and Thatcher, 2005), engaged use (Lapointe and Beaudry, 2014), enhanced use (Bagayogo et al., 2014), and innovative use (Li et al., 2013; Saga and Zmud, 1993). Additionally, these findings are consistent with prior IT adaptation and user response studies that draw on Coping Theory (see, for example, Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Elie-Dit-Cosaque and Straub, 2011; Fadel and Brown, 2010) and which suggest that if an individual appraises an IT system as an opportunity and, at the same time, has perceptions of high control over his/her IT system use, he/she will be even more motivated to find active ways of getting the most benefit from using the IT system.

Compliant responses were evident in each case study, resulting from opportunity appraisals matched with a sense of limited control over IT system ownership and use. Perceptions of inadequate IT infrastructure, low self-efficacy, and inadequate training significantly influenced compliant responses among participants. For example, participants from each of the cases explained during the interviews how they relied on the knowledge that they had gained from training in order to use the IT system. These participants highlighted that their low self-efficacy meant that they could only use the IT system in a limited manner when compared to participants with an engaged response. Across the two cases, some participants also felt that the training they had received was inadequate because they believed the

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training was, in some instances, not enough in terms of the number of sessions and the training not being task specific.

More specifically, participants who responded in a compliant manner mostly adopted a set of IT features directly related to their work and what they learned from training and/or other sources (for example, colleagues and supervisors) and used those IT features on a regular basis to accomplish their tasks. Participants who responded to the IT systems in a compliant manner were happy to have mastered using the main IT features related directly to their tasks, with no inclination to learn other features. These findings are conceptually similar to IT usage behaviours from prior studies, such as deep structure use (Burton-Jones and Straub, 2006; DeSanctis and Poole, 1994), routine use (Li et al., 2013; Thatcher et al., 2010), and standardised use (Saga and Zmud, 1993). These findings are in line with those of Beaudry and Pinsonneault (2005), Elie-Dit-Cosaque and Straub (2011), Bala and Venkatesh (2016), and Bhattacherjee et al. (2017) who suggest that if an individual appraises an IT system as an opportunity, but has perceptions of low control over his/her IT system use, he/she is likely to resort to using a known set of IT features in a standardised and repetitive manner to satisfy their needs.

Reluctant responses emerged across the two case studies as a result of threat appraisals matched with a sense of limited or no control over IT system use by participants. Perceptions of inadequate IT infrastructure, low self-efficacy, and inadequate training significantly influenced reluctant responses among participants. For instance, some participants believed that the IT system slowed down the pace of their work, since they had perceptions of low self-efficacy and complexity of IT system. This meant that participants with such perceptions struggled to accomplish their tasks and often had to rely on support from others in order to accomplish their tasks. Inadequate access to IT infrastructure also played a significant role in shaping reluctant responses in both cases. CASE A faced both hardware and Internet connectivity issues, while CASE B mainly faced Internet connectivity issues. Since the IT systems relied on the quality of these infrastructures, it meant that an inadequate level of access and slow connectivity would negatively affect IT system use and participants' responses towards it.

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Participants who responded in a reluctant manner were often resistant towards the IT systems and only used the systems to comply with organisational mandates. This set of participants believed that the IT systems were forced upon them and used the IT systems in a standardised and repetitive manner, with no inclination to explore other IT system features not related to their tasks. These findings are conceptually similar to IT usage behaviours from prior literature, such as passive resistance and resigned use (Lapointe and Beaudry, 2014), avoidance (Bala and Venkatesh, 2016), and self-preservation (Beaudry and Pinsonneault, 2005). Additionally, these findings are consistent with prior IT adaptation and user response studies that draw on Coping Theory (see, for example, Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Elie-Dit-Cosaque and Straub, 2011; Fadel and Brown, 2010) which suggest that if an individual appraises an IT system as a threat and perceives him/herself not to have the resources or ability to use the IT system effectively, they are likely to try to avoid the use of the IT system as much as possible.

Deviant responses were not evident in either of the case studies. Prior studies suggest that when an individual appraises an IT system as a threat and perceives a high level of control over his/her IT use, that individual will respond in a deviant manner. The findings in this study contrast with those of Bala and Venkatesh (2016), Beaudry and Pinsonneault (2005), Bhattacherjee et al. (2017), and Elie-Dit-Cosaque and Straub (2011) who identified deviant behaviours. A possible explanation could associated with the nature of the IT use policy at the case organisations that participated in this study. In both cases, use of the IT systems was mandatory, with the management in each case organisation often reaffirming that non-use of the IT systems at any point in time would not be tolerated. As such, even participants who were mostly resistant towards the IT systems would not openly engage in any sort of deviant behaviour or admit to it, even during the interviews. Organisational behaviour literature has shown that in mandatory use contexts even the most resistant individuals hardly admit to committing deviant organisational behaviours, since in such contexts the consequences of deviant behaviour may be highly detrimental (Robinson and Bennett, 1995).

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Bala and Venkatesh's (2016) study was conducted in a voluntary use context, Elie-Dit-Cosaque and Straub's (2011) was in form of lab experiment, Beaudry and Pinsonneault's (2005) study was conducted in a mandatory use context, although the mandate at both cases was a soft mandate, while Bhattacherjee et al. (2017) found limited support for the deviant response category in their study, noting that the majority of resistant participants left the hospital during their study. This may be a possible explanation for the contradiction in findings, but it is felt that more research may need to be needed in order to shed additional light on deviant responses from IT users during mandatory IT-induced organisational change. The next section moves on to discuss findings in relation to transitions in user responses across the two cases.

6.2.5: Transitions in User Responses

Participants were interviewed across two points in time in order to examine if changes in appraisals would result in transitions in user responses towards the IT systems. Transitions in user responses were experienced in each of the case studies. At CASE A, progressive and regressive transitions were experienced, while at CASE B only progressive transitions were experienced. Although progressive transitions were experienced in each of the cases, the way in which user responses evolved was different, depending on the influencing factors in each case study. Training, social networks and IT infrastructure significantly influenced progressive transitions, whereas regressive transitions were influenced by IT infrastructure.

As discussed earlier, participants who had negative responses towards the IT systems at their case organisations mostly attributed it to perceptions of inadequate training and inadequate access to IT infrastructure, matched with strict organisational mandates to use the IT systems. In order to address these issues, particularly with regards to training, each of the two agencies introduced initiatives to boost user morale and IT system utilisation, such as individualised training, extra training sessions and peer-to-peer learning groups. The new training initiatives played an important role in positively influencing transitions in user responses, as presented in sections 4.7 and 5.7. Through individualised training and attendance

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at extra training sessions, participants at both cases gained more knowledge of the IT systems and subsequently changed their negative appraisals and perceptions of low control over their IT system usage. These findings agree with those of Bala and Venkatesh's (2016) study that found that effective training has a significant positive and direct effect on user responses to IT implementation in their work environments. Also, it confirms the findings of studies that have investigated user responses to mandatory IT-induced changes in organisations (see, for example, Barki and Hartwick, 1994; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Klaus and Blanton, 2010; Sharma and Yetton, 2007).

Social networks, through processes such as peer-to-peer learning, significantly influenced transition in user responses towards the IT systems in a positive manner. As part of the initiatives introduced to improve IT system use at CASE B, participants were encouraged to pair with colleagues who had adequate knowledge of how to use the IT system without facing many struggles. This initiative proved to be fruitful, as many participants who often complained about using the IT system significantly improved their IT system use and realised more benefit from using it to accomplish their tasks. Similarly, at CASE A, participants were placed in peer-teams led by colleagues who were knowledgeable in terms of using the IT system. Surprisingly, in both cases, social networks significantly influenced perceptions of self-efficacy. Interaction and exchange of knowledge about the IT systems boosted the morale of participants and improved their understanding of the IT systems, consequently leading to progressive transitions in user responses. These findings corroborate the results of published studies that have suggested that social networks have a significant influence on user responses to IT-induced organisational changes. In particular, this resonates with findings from Bruque et al. (2008), Sykes et al. (2014), and Beaudry and Pinsonneault (2010) which suggest that social networks positively influence an individual's response and use of an IT system.

IT infrastructure had both a positive and negative influence on the transition of user responses across the cases. Perceptions of improved and adequate access to IT infrastructure shaped positive transitions within the case organisations. For instance, at CASE B the major issue with IT infrastructure was slow Internet connectivity. This issue was addressed by providing complimentary Internet

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dongles to employees and expanding the network coverage within the agency. This positively influenced participants' perception of low control over their IT system usage, as some participants attributed their inability to accomplish tasks at the expected time to slow Internet connectivity. At CASE A, the issues regarding IT infrastructure were slow Internet connectivity and shortage of computers. These issues were partly addressed, as some units received new computers and the agency provided Internet dongles for field workers. Participants who received new computers and Internet dongles changed their perceptions of control over the IT system from low to high, in turn experiencing progressive transitions in user response.

On the other hand, a participant who continued to face issues with slow Internet connectivity and lack of computers unfortunately transitioned in a regressive manner owing to the nature of tasks that the participant had to accomplish using the IT system. Certain units, for instance the Geometry unit, heavily relied on the speed of the Internet and on the processing power of computers and, since both were considerably slow, this participant perceived himself as having low levels of control over his IT system use. Regarding the significance of IT infrastructure on transitions in user responses, these findings reinforce those of Taylor and Todd (1995), Thompson et al. (1991), and Venkatesh et al. (2003). Also, these findings are in line with past studies (see, for example, Marcus, 1983; Jiang et al., 2000; Klaus and Blanton, 2010) which suggest that inadequate IT infrastructure may lead to negative responses towards the IT system implementation and its use. However, since only a relatively small number of studies were found to investigate the impact of IT infrastructure on transition in user response towards IT system in IT-induced organisational change, these results should be interpreted with caution. Future studies may wish to further investigate this factor to provide better insights into its influence on transitions in user responses during and after an IT-induced organisational change.

Having discussed the findings related to the transition in user responses over time, the next section presents extensions to the model based on the cross-case analysis, and implications for practice.

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6.3: Theoretical Contributions of the Research

This study offers two areas of theoretical contribution: contributions in relation to the model adopted for the study; and contributions in relation to the IT user behaviour and response literature. The contributions are discussed in detail in the following sub-sections.

6.3.1: Reflections on the Model and Extensions Based on the Cross-case Analysis

This study builds on prior research in the area of IT user behaviour and responses in organisational settings which has argued that users respond differently to the same IT system implementation in their work environment. More importantly, the study builds on Coping Theory and its extensions to study how users respond to IT-induced organisational change in a mandatory use context. In this respect, this study offers three contributions, associated with: (i) reinforcing, through empirical evidence, the appropriateness of Coping Theory and its extensions to study and identify different user responses to IT in the user's work environment; (ii) offering in-depth insights into the factors that influence user responses to IT in the user's work environment; and (iii) identifying factors that influence transitions in user responses to IT over time. Each of these contributions will be discussed in the following paragraphs.

As highlighted in previous chapters, the model adopted for this study is an extension of Coping Theory. When the model was first introduced in section 2.5 it was explained that the important features were: **primary appraisal** (a process whereby an individual evaluates if the consequences of implementing an IT system in his/her work environment is positive (i.e. **opportunity**) or negative (i.e. **threat**)); **secondary appraisal/influencing factors** (a process whereby an individual evaluates his/her level of control (i.e. high or low) over the IT system implementation, in light of the resources available at an individual's disposal); and **usage behaviours** (how an individual actually uses the IT system to accomplish his/her tasks).

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Findings from the cross-case analysis have indicated that Coping Theory and its extensions offer a promising framework to explain how individuals respond to mandatory IT-induced organisational changes in their work environment. In this study, the findings revealed that IT users respond to mandatory IT-induced organisational changes in three ways: **engaged**; **compliant**; and **reluctant responses**. These usage behaviours were based on how individuals appraised the IT systems as being an opportunity or threat to their professional and personal well-being, and their perceptions of low or high control over the resources made available to support individual IT system usage. Prior studies have also revealed that users are likely to respond positively to an IT system if they perceive it as being beneficial (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Venkatesh et al., 2003). Findings from this study revealed that the IT system users appraised the IT systems positively through perceptions of: **improved information tracking**; **improved personal and professional development**; **improved work transparency**; **safer data storage**; and **speeding up of work processes**.

In contrast, individuals may respond negatively if they perceive the IT system as being harmful (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Lapointe and Rivard, 2005; McNally and Griffin, 2010; Wu and Wu, 2005). Findings from this study revealed that the IT system users appraised the IT systems negatively through perceptions of: **perceived job uncertainty**; **loss of power and autonomy**; **slowing down of work processes**; and **reduced teamwork and interaction**. Overall, this study reinforces the importance of Coping Theory and its extensions as models for understanding how users respond to IT-induced organisational changes. It reinforces the conclusions of a number of previous studies (such as Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005, 2010; Bhattacherjee et al., 2017; Elie-Dit-Cosaque and Straub, 2011; Fadel and Brown, 2010; Stein et al., 2015) concerning the fact that Coping Theory and its extensions offer a useful research tool, which has garnered consistent empirical support, for understanding how users respond to IT-induced organisational changes.

With regards to **influencing factors**, previous studies that have adopted Coping Theory and its extensions have not extensively investigated contextual factors that

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influence users' response to mandatory IT-induced organisational changes. Studies that have attempted to fill this gap have done so in a piecemeal approach, looking at only a specific number of factors. For instance, Fadel and Brown (2010) studied the influence of performance and effort expectancy on primary appraisals, and the influence of facilitating conditions on secondary appraisals. Bala and Venkatesh (2016) investigated the influence of experimental engagements (i.e., user participation and training) and psychological engagements (i.e., user involvement and management support) on users' IT appraisal, while placing more emphasis on how adaptation behaviours affect job performance and job satisfaction. As such, this study is a response to calls of many researchers (Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Chen et al., 2019; Fadel and Brown, 2010; Kashefi et al., 2015; Liang et al., 2019) that have suggested the need to advance our understanding of the factors that influence user responses to IT-induced organisational changes. In this respect, this study has extended previous studies by identifying three factors that influence a user's response to an IT system in a mandatory use context: **Individual-related factors** (*Self-efficacy and Social influence*); **Organisational and Process-related factors** (*Training, Management communication, User involvement, and participation*); and **IT System-related Factors** (*IT instrumentality and IT infrastructure*). It can be therefore argued that this study has provided a more nuanced perspective of the factors that influence user responses to mandatory IT-induced changes in their work environment.

The major contribution of this study is identifying and shedding more light on the factors that influence **transitions in user responses** at different points in time and across periods. These findings are in response to calls of researchers (for example, Bala and Venkatesh, 2016; Beaudry and Pinsonneault, 2005; Bhattacherjee et al., 2017; Fadel and Brown, 2010) who have studied user responses to IT systems in organisational settings, and have emphasised the need for a more nuanced understanding of factors that influence transitions in user response and adaptation over different time periods. For instance, Fadel and Brown (2010) suggest that "future research might address such issues as differences in use behaviour resulting from being positive vs. challenge IS appraisals, or how particular appraisals change over time as beliefs are modified" (2010, p. 118). Bala and Venkatesh (2016) state

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that a "potentially interesting research opportunity will be to conduct a field study in which researchers examine changes in cognitive appraisals and adaptation behaviours over time and predictors of such changes" (2016, p. 177). Bhattacherjee et al. (2017) suggest "future research may consider influence mechanism that can be used to change users' behaviours, from say compliant or reluctant use to engaged use" (2017, p. 22).

This study answers the above calls and extends these previous studies by identify the influence of **training**, **social networks** and **IT infrastructure** on **transitions in user responses** over a period of time. As discussed in section 6.2.5, this study found that progressive transitions (illustrated in diagram 6.1 using the upward moving arrows between response categories) were significantly influenced by training, social networks and IT infrastructure, while regressive transitions (illustrated in diagram 6.1 using the downward moving arrows between response categories) were only influenced by IT infrastructure. More specifically, this study adds to the limited body of knowledge concerning the influence of social networks on IT user behaviour and responses. It has enhanced our understanding of the importance of social networks in influencing progressive transitions in user responses during and after an IT system implementation project in organisations. Figure 6.1 provides a diagrammatic illustration of the extended model (with a simple interpretation matrix) based on the findings from this study. Having discussed the contributions related to the research model, the next section discusses the study's contribution related to the IT user responses and behaviour literature.

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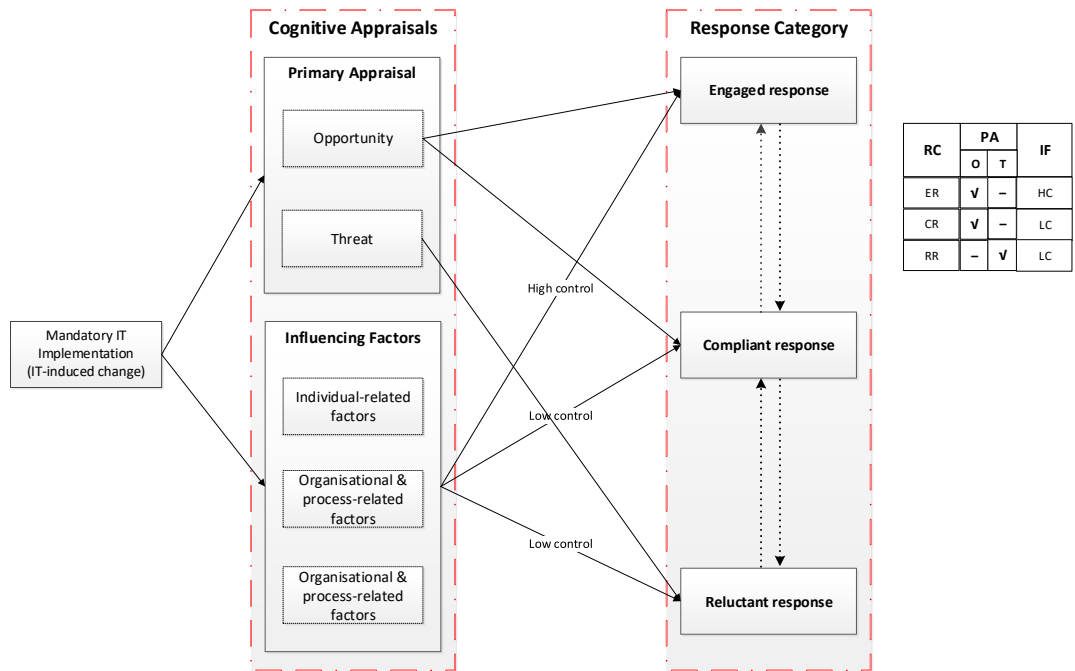
Figure 6.1 The extended theoretical model based on the findings from the study

6.3.2: Contributions in Relation to the IT User Responses and Behaviour Literature

The study has also contributed in two areas to ongoing research on user responses and behaviour to mandatory IT-induced organisational change: (i) the specific context of the study – the Nigerian context; and (ii) the general IT user responses and behaviour literature.

Concerning the specific context, this is (to the best of the researcher's knowledge) the first empirical study to investigate user responses to mandatory IT-induced organisational changes which draws on Coping Theory and its extensions as theoretical lens in the Nigerian context. There have been studies that have attempted to shed light of the phenomenon of user responses to IT in this context, however those studies have adopted the traditional approach of studying IT acceptance and resistance separately. Related to the previous point, this study has also added to the limited body of knowledge of user responses to mandated IT use in organisations within the context of developing countries. In reviewing the literature, it was clear there was a lack of empirical research in this context when compared to developed countries. As such, this study is a response to the calls of researchers (Kashefi et

al., 2015; 2018) suggesting the need to advance our understanding of how IT users respond to mandatory IT-induced changes in their work environment within the context of developing countries.

This study has contributed to the growing stream of research in IS literature calling for the integration of IT acceptance and resistance studies (Barki et al., 2007; Bhattacherjee et al., 2017; Bhattacherjee and Hikmet, 2007; van Offenbeek et al., 2013), in order to provide a richer, more accurate, description of behavioural reactions to new technologies in the work environment. By researching how users respond to mandatory IT-induced changes in their work environment and adopting Coping Theory and its extensions as a theoretical lens, the research reported in this thesis has integrated IT acceptance and resistance research in a single study, contributing to the growing body of academic research in the IS literature.

In the next section, implications for practice are discussed.

6.4: Implications for Practice

The findings from this study have several implications for a number of stakeholders including: academic researchers; and government agencies and managers involved in computerisation/IT-induced change initiatives. A thorough discussion of the implications relevant to each stakeholder will be presented in the next three sub-sections.

6.4.1: Implications for Academic Researchers

The findings of this study have significant implications for the research community. These implications can be classified into three areas: literature and context-related; methodology-related; and model/findings-related.

From a literature and context-related viewpoint, this study has a number of implications. First, unlike prior studies in the IS literature that have dichotomised IT acceptance and resistance research, this study has sought to integrate the two research streams, hopefully making the scholarly community more cognizant of the

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phenomenon of user responses towards IT-induced organisational changes. Combining the two research streams may help to provide a more nuanced perspective of individual responses to IT-induced organisational change. This study therefore serves as a motivation for researchers to carry out and continue other user responses to IT related research, particularly by combining IT acceptance and resistance studies in a mandatory use context.

In addition, the corpus of studies of user responses to IT-induced change that have integrated IT acceptance and resistance have generally focused on organisational settings in developed countries. This study has extended the knowledge of user responses to mandatory IT-induced organisational change in developing countries. Therefore, this study will help researchers to gain greater insights into how IT users respond to IT-induced changes in a less-researched context (i.e., developing countries). Another issues that stems from the previous implication is that the study should allow researchers to compare and contrast the trends and factors between developing and developed country contexts, in turn improving our understanding of the phenomenon of interest. It is hoped that this study will motivate researchers in both contexts to investigate and understand how user responses to IT-induced changes unfold in organisational settings.

From a methodology-related viewpoint, this study has an important implication. The study has successfully employed the use of a two-phase longitudinal research design, with the use of interviews to study the phenomenon of user responses to IT-induced organisational change in a mandatory-use context. This resonates with Bala and Venkatesh's (2016) view that it would be a potentially interesting research opportunity for researchers to conduct field studies at different points in time to examine users' cognitive appraisals and adaptation to IT during and after IT project implementations in organisations. Therefore, it is hoped that researchers in the IS domain are encouraged to employ various research methods to produce better and more reliable findings (Benbasat and Barki, 2007; Mingers, 2001; Mingers et al., 2013) and to improve our knowledge of user responses to IT in IS research.

From a model/findings-related viewpoint, this study has a number of implications. This study used Coping Theory and its extensions as a theoretical lens to investigate

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how users respond to IT-induced changes in a mandatory-use context. In this respect, the study reaffirms the applicability of Coping Theory as a reliable theoretical tool for studying user responses to IT. In addition, the findings from this study have highlighted the importance of certain individual-related factors, organisational and process-related factors, and IT system-related factors that influence individual user responses during an IT-induced organisation change. Also, the significance of training, social networks, and IT infrastructure to transitions in user responses to IT were highlighted from the findings of this study. Therefore, researchers may have a stake in examining the above mentioned factors and their potential on user responses to IT in future studies.

6.4.2: Implications for Government Agencies and Managers

This study offers key implications for government agencies and managers responsible for managing IT-induced changes in organisations. This study demonstrates that the introduction of new IT in organisations is not just an implementation project, but rather a change project that requires system planning and user management over time. Findings from this study reveal that users respond differently to the same IT system implementation in their work environment. This presents government agencies and managers with the daunting task of ensuring successful implementation and continued use of IT systems in their organisations.

Findings from this study offer insights into users' responses to IT system implementations and the factors that influence those responses in their work environment. Based on the findings, agencies and mangers can develop change management strategies and provide resources that are suitable for their IT-driven change initiatives. Managers can use the model extended in this study to identify factors that may influence user responses to IT in the pre-implementation and post-implementation stage of the IT-driven change initiative. For example, the findings indicate that training plays a significant role in shaping user responses during IT-induced organisational change. Even though users may have attended a number of training sessions at different levels, some users do not feel comfortable and

confident using the IT system. Users resist the IT system if they feel they are lacking in abilities or unskilled enough to use it, consequently leading to the manifestation of resistant behaviours. More importantly, the findings indicate that training in both IT system features and business processes is more important than IT system feature training alone, since both sets of training will aid in improving users' overall understanding of the change initiative.

Drawing on the findings, agencies may develop better communication strategies that clearly show the benefits and opportunities that the IT system offers to the organisation. Agencies should develop comprehensive communication plans that convey the answers to questions such as "why is the IT system being implemented?", "how will the IT system implementation affect us?", "how long will the IT system implementation last?", and so forth. This may help users better to understand the change initiative and its implications for their jobs. In addition, this study suggests that managers can help reduce the perceptions of uncertainty among users by explaining how the IT system may benefit its users and the organisation at large.

The findings also reveal that user responses may transition in a progressive or regressive manner. For instance, progressive transitions were influenced by the social networks of users; as such, managers may identify users who have a positive influence on their colleagues and assign them to the role of 'super users' in order to train and encourage their colleagues to engage more fully with the IT system. Managers may also encourage the formation of informal user support groups, where colleagues can freely learn about the IT system and share information with one another in a non-threatening environment. On the other hand, lack of training and support influenced negative transitions in user responses. It is very easy for agencies and managers to 'take their eyes off' an IT system after it has been implemented. This study revealed the significance of frequent and continuous monitoring of users' responses towards the IT system, by engaging users continuously and making sure that they receive appropriate resources to support their IT system use.

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6.5: Summary

This chapter has presented and discussed the findings related to the themes identified in this study. The discussion of the results revealed how users respond to mandatory IT-induced changes in their work environment, the factors that influence their responses, and the factors that trigger transitions in user responses over time. The chapter highlighted the appropriateness of Coping Theory and its extensions as tools that can be used to investigate user responses during and after a mandatory IT-induced change in their work environment. The chapter also presented the theoretical contributions and implications for practice from this study. The following and final chapter serves as a conclusion to the thesis, presenting an overall summary of the study, a re-cap of the study's contributions, a discussion of the limitations of the study, and highlights directions for future research.

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Chapter 7: Conclusion

7.1: Introduction

Chapter 6 presented a cross-case analysis and discussed the findings from the two case organisations considered as part of this study. This was followed by a detailed presentation of the theoretical contributions and the implications for practice that emerged from the research. This chapter aims to present an overall summary of the entire research effort. The chapter is divided into five further sections. Section 7.2 provides a summary of the thesis chapters. Section 7.3 provides a summary of the major findings of the research. Section 7.4 provides a summary of the theoretical contributions and contributions to practice. This is then followed by section 7.5, which aims to discuss the research limitations. Section 7.6 follows on from this, proposing directions for future research.

7.2: Summary of Thesis Chapters

This section presents a summary of the chapters covered in this thesis.

Chapter 1 introduced the research by presenting the research rationale, research aims and objectives. This was then followed by the presentation of the research questions. The chapter concluded with a presentation of an overview of the thesis chapters.

Chapter 2 presented a review of the literature relevant to this study in order to provide a better understanding of the research gap and set the context for the analysis and discussion in chapters 3, 4, 5 and 6. The chapter concluded with the presentation of the theoretical model that was adopted for use in the practical elements of the study.

In Chapter 3, the research approach adopted for the study was presented. A detailed description and justification was provided for the research assumptions, research design, data collection techniques, data analysis approach and ethical considerations that underpinned this study.

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Chapter 4 presented the organisational context, analysis, and findings of the first case study. Organisational context information presented in this chapter included the case background, the organisation's IT infrastructure, the history of IT system implementation, and participant information. Themes that emerged from the case were first presented horizontally (structured around the themes) in order to make the findings easier to follow, then vertically (structured around users by matching the 'influencing factors' and 'primary appraisals' themes) to show an individual user's perception about all of the identified themes, and how an individual user's perception changes critically over a period of time.

Chapter 5 followed the same approach taken in Chapter 4, presenting the organisational context, analysis, and findings of the second case study. Themes that emerged from the second case study were presented horizontally in order to make the findings easier to follow, then vertically to show an individual user's perception about all of the identified themes, and how an individual user's perception changes critically over a period of time.

Chapter 6 discussed the findings from chapters 4 and 5, presenting a cross-case analysis based on the findings from the two cases followed by a detailed presentation of the theoretical and practical contributions of this study.

In the next section, a summary of the research findings is presented.

7.3: Summary of the Research Findings

This section presents a summary of the research findings organised in relation to the research questions presented in chapter 1 (section 1.3). The findings related to each research question are outlined individually in the following sub-sections.

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7.3.1: Research Question 1

How do users respond to IT–induced organisational changes in mandatory use contexts?

In chapters 4 (see sections 4.4 and 4.5) and 5 (see sections 5.4 and 5.5) an analysis of the themes 'influencing factors (individual-related, organisational and process-related, and IT system-related factors)' and 'primary appraisals (opportunity and threat)' were presented, drawing on the positive and negative perceptions of the participants in each case, and their perceived levels of controllability over the IT system implementation. While the statements from the participants in relation to the two themes were insightful, these themes did not show an individual's perspective in relation to the changes brought about by the IT system over a period of time. To address this, sections 4.6 and 5.6 presented analysis (for case 1 and 2, respectively) for each user by theme in order to show an individual user's perception about all of the themes and, importantly, to show how individual users' perceptions changed over the period of time covered by the cases.

The theme 'user response' reflects how users respond to mandatory IT-induced organisational changes in their work environment. The findings show that users respond to mandatory IT-induced organisational changes in three different manners: engaged; compliant; and reluctant.

Engaged responses emerged in instances where participants appraised the IT system as an opportunity and where they felt that they had a high level of control over the IT system implementation and its use in their work environment. Participants who responded in an engaged manner were oriented towards taking full advantage of the opportunities offered by the IT system. This set of participants showed a willingness to extend the usage of the IT system beyond its required and anticipated use, by experimenting and discovering novel uses of the IT system.

Compliant responses emerged in instances where participants appraised the IT system as an opportunity but felt that they had a low level of control over the IT system implementation and its use in their work environment. Participants who responded in a compliant manner were content in using the IT system to accomplish

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their tasks and satisfy organisational mandates without attempts to explore further IT system features. This set of participants used the IT systems in a standardised and repetitive usage pattern, with no indication of further IT system exploration.

Reluctant responses emerged in instances where participants appraised the IT system as a threat and where they felt that they had a low level of control over the IT system implementation and its use in their work environment. Participants who responded in a reluctant manner were typically against the implementation and use of the IT system at the case organisation. This set of participants only used the IT system with the intention of complying with the organisational mandate regarding the IT system.

7.3.2: Research Question 2

How do user responses to mandatory IT–induced organisational changes evolve over time and what are the factors that influence these changes?

As noted in sections 4.7 and 5.7, findings from each of the case organisations revealed that user responses transitioned in both progressive and regressive manners, although progressive transitions were much more common. Transitions in user responses were experienced as a result of changes in influencing factors and primary appraisals. Progressive transitions were significantly influenced by training, social influence and IT infrastructure. At each case organisation, new training initiatives were introduced to complement previous training activities and improve the users' understanding of the IT systems. The new training initiatives included activities such as individualised training, extra training sessions and peer-to-peer learning groups.

Social influence positively impacted user responses through activities such as peer-to-peer learning and mentorship programs. In both cases, social networks significantly boosted users' perceptions of self-efficacy and improved users' confidence while using the IT systems. With regards to IT infrastructure, in both cases, issues like inadequate access to the required IT infrastructure were addressed by providing more laptops and desktop computers, subscribing to better Internet

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plans and providing Internet dongles to compliment and improve access for both desk and field officers.

The findings revealed one instance were a regressive transition was witnessed. This instance was influenced by IT infrastructure. A user who still faced issues with slow Internet connectivity and inadequate access to the required computer transitioned in a regressive manner. This was owing to the nature of the tasks that the user had to accomplish; as such inadequate access to IT infrastructure delayed the speed of task completion, eventually leading to negative perceptions towards the IT system.

Having presented the summary of the findings in relation to each research question, the next section provides a summary of the research contributions and implications for practice.

7.4: Summary of Research Contributions and Implications for Practice

This section presents a tabulated summary of the research findings and implications for practice. This section is divided into two sub-sections: section 7.4.1 presents a summary of the theoretical contributions; and section 7.4.2 presents a summary of the implications for practice.

7.4.1: Theoretical Contributions of the Research

The study offers two areas of theoretical contribution: contributions in relation to the research model adopted for the study (summarised in Table 7.1); and contributions in relation to the IT user response and behaviour literature (summarised in table 7.2).

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Table 7.1 Summary of contributions in relation to the research model

S/N	Summary of contributions
1	Through empirical evidence, the study has reinforced the appropriateness of Coping Theory and its extensions as a theoretical lens to study user responses to IT-induced organisational changes in a mandatory-use context.
2	The study offers a more nuanced perspective on the factors that influence individual user responses to IT in a mandatory-use context during and IT-induced organisational change.
3	The study has identified the factors that influence transitions in user responses over time during and IT-induced organisational change.

Table 7.2 Summary of the contributions in relation to the IT user responses and behaviour literature

S/N	Summary of contributions
1	To the best of the researcher's knowledge, this is the first empirical study to investigate user responses to mandatory IT-induced organisational changes which draws on Coping Theory and its extensions as theoretical lens in the Nigerian context.
2	The study has responded to multiple calls by IS researchers for the need to integrate IT acceptance and IT resistance research. In response, this study investigated how users respond to mandatory IT-induced changes in their work environment by adopting Coping Theory and its extensions as a theoretical lens. The research reported in this thesis has integrated IT acceptance and IT resistance research in a single study, providing a richer and more accurate description of user behavioural reactions to new technologies in the work environment.

7.4.2: Implications for Practice

The study offers several implications for a number of stakeholders. In terms of implications for academic researchers, issues under three different perspectives were identified (summarised in Table 7.3).

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Table 7.3 Summary of implications for academic researchers

S/N	Summary of implications
1	**From a literature and context-related perspective** - The study sought to integrate the IT acceptance and IT resistance research streams. It is hoped that this study serves as a motivation for future researchers to continue research in this area, particularly by combining these two streams in a mandatory-use context. - Unlike the majority of user responses to IT studies that have focused on organisational settings in developed countries, this study was carried out in the context of developing countries. Therefore, this study has improved our understanding of user responses to IT in a less-researched context. Additionally, the study will allow researchers to compare and contrast the trends and factors between developing and developed countries contexts. Hence, it is hoped that this study will motivate researchers in both contexts to conduct further research in this area.
2	**From a methodology-related perspective** - The study has successfully employed the use of a two-phase longitudinal research design, with the use of interviews. It is hoped that researchers in the IS domain will be encouraged to employ various research methods to produce better and reliable findings in future studies.
3	**From a model/findings-related perspective** - The study has successfully used Coping Theory and its extensions as a theoretical lens. In this respect, the study reaffirms the applicability of Coping Theory as a reliable theoretical tool. It is hoped that future studies may be conducted using Coping Theory to improve our understanding and it explore its applicability in other research contexts. - The study has highlighted the importance of certain individual-related, organisational and process-related, and IT system-related factors that influence individual user responses in a mandatory-use context. Researchers may be interested in examining these factors and their potential impact on user responses to IT in future studies.

In terms of implications for government agencies and managers, three distinct issues (summarised in Table 7.4) were identified.

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Table 7.4 Summary of implications for government agencies and managers

S/N	Summary of implications
1	The study has demonstrated that the introduction of new IT in organisations is not just an implementation project, but rather a change project that requires system planning and user management over time. This presents government agencies and managers with the daunting task of ensuring successful implementation and continued use of IT systems in their organisations.
2	The study has emphasized the importance of communication strategies during IT-induced organisational change. As such, agencies should develop comprehensive communication plans that convey the answers to questions such as "why is the IT system being implemented?", "how will the IT system implementation affect us?", and "how long will the IT system implementation last?".
3	The study has revealed that user responses may transition in progressive or regressive manners. Therefore, managers are encouraged to continuously identify with initiatives that lead to progressive transitions and continuously engage with users, making sure users receive appropriate resources to support their IT system use.

7.5: Research Limitations

This study has attempted to improve our understanding of how users respond to mandatory IT-induced changes in their work environment, the factors that influence user responses, and changes in user responses over time. Adopting an interpretive case study research strategy, with the use of semi-structured interviews as the primary data collection tool, the study has successfully achieved its aim and answered the research questions that were presented in section 1.3. However, the study has limitations that should be acknowledged. For ease of discussion, these limitations have been organised into two sub-sections: methodological and focus/context-related limitations. Limitations in relation to each section are presented in more detail in the following sub-sections.

7.5.1: Methodological Limitations

The first limitation is related to the retrospective nature of some parts of the interviews during the data collection exercise. This might have left room for there to be recall bias from some participants. This issue was mitigated by asking the participants prompting statements to help them recall circumstances and elicit a

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response (Huber and Power, 1985). Additionally, where possible data was collected from other, secondary sources such as project documents, internal memos, training manuals and reports in order to verify some information obtained during the interviews.

The second limitation is related to the time scheduled between the two data collection points and the amount of data collected. The interval between the two phases was six months. It may have been better if more time could have been allowed between the two phases. Also, more information could have been obtained if data was collected at more than two phases. The constraints of the research period – as part of a doctoral degree programme – meant that this was not possible. However, attempts were made to mitigate these limitations through the in-depth data collection exercise during the study, which allowed the researcher to uncover individual user responses and changes in user responses over time.

7.5.2: Focus/Context-related Limitations

The first context-related limitation is that this study investigated user responses to mandatory IT-induced organisational changes in two public sector agencies, involved in similar activities and mandates in Nigeria. Therefore, the findings from this study may be influenced by a specific organisational context. However, it is believed that the nuanced perspectives offered by this study serve as a starting point for future studies that may want to investigate the impact of mandatory IT-induced changes in other organisational contexts, such as the private sector. This is considered further in section 7.6, which addresses areas for future research.

The second limitation is that this study only focused on how users respond to mandatory IT-induced organisational changes, the factors that influence the user responses, and the factors that influence the changes in user response over time, without explicitly investigating the impact of user responses on individual and organisational performance. This is because, based on the literature review in Chapter 2 (which clearly reveals the need for further studies on user responses to mandatory IT-induced organisational change), it was deemed necessary to first

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understand the above mentioned issues, before investigating the impact of user responses on individual and organisational performance.

Having identified the key limitations of the study, recommendations for future research including those to address the highlighted limitations, are discussed in the following section.

7.6: Directions for Future Research

Having successfully met the aim of this study highlighted in section 1.3, there is a need to address the limitations identified in section 7.5 and to identify further research that would build on the findings from this study. Therefore, avenues for future research are presented in this section.

Data were collected in the context of two mandatory IT-induced organisational change projects from two public sector agencies. It would be interesting to repeat the study in the context of private sector organisations where mandatory IT-induced change projects are being, or have been, executed. The aim would be to understand if there are similarities and/or differences in user responses, and the factors that influence the user responses, as a result of sector-specific practices. Also, future research could repeat this study in the context of other types of IT systems (e.g., healthcare information systems) since both case agencies that were investigated in the study used GIS and LAS technologies.

In the study, data was collected twice with an interval of six months between the two collection points. It is expected that users' responses will change over time as they gain more hands-on experience with a new IT system. A potentially interesting research avenue would therefore be to examine changes in user responses over longer periods of time, factors that influence such changes, and the impact of such changes on job outcomes such as job performance, employee relationships, job anxiety, and job satisfaction (Bala and Venkatesh, 2016; Bhattacherjee et al., 2017). Such future work would provide a more integrated and informed understanding of the impacts of mandatory IT-induced organisational change on employees and their work environment. This could be achieved by adopting other research methods,

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such as a mixed methods research approach or an ethnographic study. These two approaches would accommodate the collection of larger amounts of data and also provide better opportunities to investigate users' responses deeper.

A mixed method approach could offer great promise by drawing from the strengths of both qualitative and quantitative research methods (Johnson and Onwuegbuzie, 2004). This could be achieved following the suggestions of Johnson and Onwuegbuzie (2004) by including a qualitative and quantitative phase in an overall study, operating largely within a dominant qualitative paradigm conducting the phases of the study in a sequential time order. Data collected from the qualitative phase can be used to design a survey that can be administered in the quantitative phase to a larger number of participants through other convenient means. Through this approach, expansion can be achieved (i.e., expanding the breath and range of the study using by using different methods for different inquiry components) (Greene et al., 1989).

Also, since the investigation of user responses to mandatory IT-induced organisational changes involves human, social and organisational aspects, ethnographic research is well positioned to provide researchers with rich insights into the phenomenon of interest. This is because ethnographic research is one of the most in-depth research methods in IS research, as it enables a researcher to see what people are doing as well as what they say they are doing (Baskerville and Myers, 2015; Myers, 1999). This will improve the validity and reliability of findings in future studies. Finally, future research could explore further mechanisms that managers can use to facilitate positive transitions in user responses, for instance, from reluctant responses to engaged responses.

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References

Adams, B., Berner, E. S., and Wyatt, J. R. 2004. "Applying Strategies to Overcome User Resistance in a Group of Clinical Managers to a Business Software Application: A Case Study.," *Journal of Organizational and End User Computing* (16:4), pp. 55–64. (https://www.igi-global.com/article/journal-organizational-end-user-computing/3792).

Agarwal, R., and Prasad, J. 1997. "The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies," *Decision Sciences* (28:3), pp. 557–582.

Ahuja, M., and Thatcher, J. 2005. "Moving beyond Intentions and toward the Theory of Trying: Effects of Work Environment and Gender on Post-Adoption Information Technology Use," *MIS Quarterly* (29:3), pp. 427–459. (http://dl.acm.org/citation.cfm?id=2017269).

Ajzen, I. 1991. "The Theory of Planned Behavior," *Organizational Behavior & Human Decision Processes* (50), pp. 179–211.

Ashford, S. 1988. "Individual Strategies for Coping with Stress during Organizational Transitions," *The Journal of Applied Behavioral Science* (24:1), pp. 19–36. (http://journals.sagepub.com/doi/abs/10.1177/0021886388241005).

Bagayogo, F. F., Lapointe, L., and Bassellier, G. 2014. "Enhanced Use of IT: A New Perspective on Post-Adoption," *Journal of the Association for Information Systems* (15:7), pp. 361–387.

Bagozzi, R. P. 2007. "The Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift," *Journal of the Association for Information Systems* (8:4), pp. 244–254.

Bala, H., and Venkatesh, V. 2016. "Adaptation to Information Technology: A Holistic Nomological Network from Implementation to Job Outcomes," *Management Science* (62:1), pp. 156–179.

Barki, H., and Hartwick, J. 1994. "Measuring User Participation, User Involvement, and User Attitude," *MIS Quarterly* (18:1), pp. 59–82. (https://www.jstor.org/stable/249610).

Barki, H., Titah, R., and Boffo, C. 2007. "Information System Use-Related Activity: An Expanded Behavioral Conceptualization of Individual-Level Information System Use," *Information Systems Research* (18:2), pp. 173–192.

Baskerville, R. L., and Myers, M. D. 2015. "Design Ethnography in Information Systems," *Information Systems Journal* (25:1), Blackwell Publishing Ltd, pp. 23–46.

Khalipha Abubakar Nuhu

Bazeley, P., and Jackson, K. 2013. "Qualitative Data Analysis with NVivo," *Sage Publications* (Vol. 2nd).

Beaudry, A. 2009. "Coping with Information Technology," in *In Handbook of Research on Contemporary Theoretical Models in Information Systems*, IGI Global, pp. 516–528. (http://www.igi-global.com/chapter/coping-information-technology/35849).

Beaudry, A., and Pinsonneault, A. 2005. "Understanding User Responses to Information Technology: A Coping Model of User Adaptation," *MIS Quarterly* (29:3), pp. 493–524.

Beaudry, A., and Pinsonneault, A. 2010. *The Otherside of Acceptance: Studying the Direct and Indirect Effects of Emotions on Information Technology Use*, (34:4), pp. 689–710.

Benamati, J., and Lederer, A. L. 2001. "Rapid Information Technology Change, Coping Mechanisms, and the Emerging Technologies Group.," *Journal of Management Information Systems* (17:4), pp. 183–202.

Benbasat, I., and Barki, H. 2007. "Quo Vadis, TAM?," *Journal of the Association for Information Systems* (8:4), pp. 211–218.

Benbasat, I., Goldstein, D., and Mead, M. 1987. "The Case Research Strategy in Studies of Information Systems," *MIS Quarterly* (11:3), pp. 369–386. (http://www.jstor.org/stable/248684).

Benjamin, R. ., and Levinson, E. 1993. "A Framework for Managing IT-Enabled Change," *Sloan Management Review* (34:4), pp. 23–33.

Bhattacherjee, A. 2001. "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS Quarterly* (25:3), p. 351.

Bhattacherjee, A., Davis, C., Connolly, A., and Hikmet, N. 2017. "User Response to Mandatory IT Use: A Coping Theory Perspective," *European Journal of Information Systems*, pp. 1–21. (http://link.springer.com/article/10.1057/s41303-017-0047-0).

Bhattacherjee, A., and Hikmet, N. 2007. "Physicians' Resistance toward Healthcare Information Technology: A Theoretical Model and Empirical Test," *European Journal of Information Systems* (16:6), pp. 725–737.

Bhattacherjee, A., and Premkumar, G. 2004. "Understanding Changes in Belief and Attitude toward Information Technology Usage: A Theoretical Model and Longitudinal Test," *MIS Quarterly* (28:2), pp. 229–254.

Boudreau, M.-C., and Robey, D. 2005. "Enacting Integrated Information Technology: A Human Agency Perspective," *Organization Science* (16:1), pp. 3–18.

Bovey, W., and Hede, A. 2001. "Resistance to Organisational Change: The Role of Defence Mechanisms," *Journal of Managerial Psychology* (16:7), pp. 534–548. (http://www.emeraldinsight.com/doi/abs/10.1108/EUM0000000006166).

Khalipha Abubakar Nuhu

Boyatzis, R. E. 1998. *Transforming Qualitative Information : Thematic Analysis and Code Development*, Sage Publications. (https://uk.sagepub.com/en-gb/eur/transforming-qualitative-information/book7714).

Braun, V., and Clarke, V. 2006a. "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* (3:2), pp. 77–101.

Braun, V., and Clarke, V. 2006b. "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* (3:2), pp. 77–101. (http://www.tandfonline.com/doi/abs/10.1191/1478088706qp063oa).

Braun, V., Clarke, V., and Terry, G. 2014. "Thematic Analysis," *Qualitative Research in Clinical and Health Psychology* (24), pp. 95–114. (https://books.google.com/books?hl=en&lr=&id=mpe7BgAAQBAJ&oi=fnd&pg=PA95&dq=Braun,+Clarke+and+Terry,+2014&ots=7TNYsP477n&sig=TcVDm2soKnYQXtA3O1nb2-TxIRg).

Brown, S. A., Massey, A. P., Montoya-Weiss, M. M., and Burkman, J. R. 2002. "Do I Really Have to? User Acceptance of Mandated Technology," *European Journal of Information Systems* (11:4), pp. 283-295*.

Bruque, S., Moyano, J., and Eisenberg, J. 2008. "Individual Adaptation to IT-Induced Change: The Role of Social Networks," *Journal of Management Information Systems* (25:3), pp. 177–206.

Bryman, A., and Bell, E. 2007. "Business Research Methods," *Social Research*.

Burrell, G., and Morgan, G. 1979. "Sociological Paradigms and Organizational Analysis Heinemann," *Portsmouth, NH*. (https://scholar.google.com/scholar?hl=en&q=Burrell%2C+G.+and+G.+Morgan%2C+Sociological+Paradigms+and+Organization+Analysis%2C+Heinemann+Books%2C+London%2C+1979.&btnG=&as_sdt=1%2C5&as_sdtp=).

Burton-Jones, A., and Gallivan, M. 2007. "Toward a Deeper Understanding of System Usage in Organizations: A Multilevel Perspective," *MIS Quarterly* (31:4), pp. 657–679.

Burton-Jones, A., and Grange, C. 2012. "From Use to Effective Use: A Representation Theory Perspective," *Information Systems Research* (24:3), pp. 632–658. (http://pubsonline.informs.org/doi/abs/10.1287/isre.1120.0444).

Burton-Jones, A., and Straub, D. W. 2006. "Reconceptualizing System Usage: An Approach and Empirical Test," *Information Systems Research* (17:3), pp. 228–246.

Cartwright, S., and Cooper, C. L. 1996. "Coping in Occupational Settings," in *Handbook of Coping: Theory, Research, Applications.*, pp. 202–220. (http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=1996-97004-010&site=ehost-live).

Cenfetelli, R. T. 2004. "Inhibitors and Enablers as Dual Factor Concepts in Technology Usage," *Journal of the Association for Information Systems* (5:11–12), pp. 472–492.

Khalipha Abubakar Nuhu

Chattopadhyay, P., Glick, W. H., and Huber, G. P. 2001. "Organizational Actions in Response to Threats and Opportunities," *Academy of Management Journal* (44:5), pp. 937–955.

Chau, P. Y., and Hu, P. J. H. 2002. "Investigating Healthcare Professionals' Decisions to Accept Telemedicine Technology: An Empirical Test of Competing Theories," *Information & Management* (39:4), pp. 297–311. (https://www.sciencedirect.com/science/article/pii/S0378720601000982).

Chau, P. Y. K., and Hu, P. J.-H. 2001. "Information Technology Acceptance by Individual Professionals: A Model Comparison Approach," *Decision Sciences* (32:4), pp. 699–719.

Chau, P. Y. K., and Hu, P. J. 2002. "Examining a Model of Information Technology Acceptance by Individual Professionals: An Exploratory Study," *Journal of Management Information Systems* (18:4), pp. 191–230.

Chen, J., Tran, A., and T Nguyen. 2019. "Understanding the Discontinuance Behavior of Mobile Shoppers as a Consequence of Techno-Stress: An Application of the Stress-Coping Theory.," *Computers in Human Behavior,* (1:95), pp. 83–93. (https://www.sciencedirect.com/science/article/pii/S0747563219300305).

Chen, W., and Hirschheim, R. 2004. "A Paradigmatic and Methodological Examination of Information Systems Research from 1991 to 2001," *Information Systems Journal* (14), pp. 197–235. (http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2575.2004.00173.x/full).

Cho, J. 2016. "The Impact of Post-Adoption Beliefs on the Continued Use of Health Apps," *International Journal of Medical Informatics* (87), pp. 75–83. (http://www.sciencedirect.com/science/article/pii/S1386505615300836).

Chua, W. F. 1986. "Radical Developments in Accounting Thought," *The Accounting Review*, pp. 601–632. (http://www.jstor.org/stable/247360).

Compeau, D., and Higgins, C. 1995. "Development of a Measure and Initial Test," *MIS Quarterly*, pp. 189–211.

Cooper, R. B., and Zmud, R. W. 1990. "Information Technology Implementation Research - A Technological Diffusion Approach," *Management Science* (36:2), pp. 123–139.

Creswell, J. W. 1998. "Qualitative Inquiry and Research Design: Choosing among Five Traditions," *Sage* (Vol. 9).

Creswell, J. W. 2009. "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches," *Research Design Qualitative Quantitative and Mixed Methods Approaches*, p. 398.

Creswell, J. W. 2012. *Qualitative Inquiry & Research Design : Choosing among Five Approaches*, (3rd ed.), SAGE Publications, Inc.

Crozier, M., and Friedberg, B. 1977. "Actors and Systems. The Politics of Collective Action. (Translation of 'L'Acteur et Le Système')," *The*

Khalipha Abubakar Nuhu

University of Chicago Press.

Damanpour, F., and Schneider, M. 2006. "Phases of the Adoption of Innovation in Organizations: Effects of Environment, Organization and Top Managers," *British Journal of Management* (17:3), pp. 215–236.

Damanpour, F., and Schneider, M. 2009. "Characteristics of Innovation and Innovation Adoption in Public Organizations: Assessing the Role of Managers," *Journal of Public Administration Research and Theory* (19:3), pp. 495–522.

Davenport, T. H. 1998. "Putting the Enterprise into the Enterprise System.," *Harvard Business Review* (76:4), pp. 121–131.

Davis, F. D. 1989. "Perceived Usefulness , Perceived Ease Of Use , And User Acceptance," *MIS Quarterly* (13:3), pp. 319–339.

Denzin, N. K., and Lincoln, Y. S. 2011. *The Sage Handbook of Qualitative Research*, (4th ed.), Sage.

DeSanctis, G., and Poole, M. S. 1994. "Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory," *Organization Science* (5:2), pp. 121–147.

Dimitriadis, S., and Stevens, E. 2008. "Integrated Customer Relationship Management for Service Activities," *Managing Service Quality: An International Journal* (18:5), (M. Sigala, ed.), pp. 496–511.

Doty DH, and Glick WH. 1994. "Typologies as a Unique Form of Theory Building: Toward Improved Understanding and Modelling.," *Academy of Management Review* (19:2), pp. 230–251. (https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=+Typologies+as+a+unique+form+of+theory+building%3A+toward+improved+understanding+and+modeling.+Academy+of+Management+Review+19%282%29%2C+230–251&btnG=).

Doyle, L., Brady, A.-M., and Byrne, G. 2016. "An Overview of Mixed Methods Research – Revisited," *Journal of Research in Nursing* (21:8), SAGE PublicationsSage UK: London, England, pp. 623–635.

Eder, L. B., and Igbaria, M. 2001. "Determinants of Intranet Diffusion and Infusion," *Omega* (29:3), Pergamon, pp. 233–242.

Edwards, R., and Holland, J. 2013. *What Is Qualitative Interviewing?*, A&C Black. (https://books.google.co.uk/books?hl=en&lr=&id=GdCOAQAAQBAJ&oi=fnd&pg=PR1&dq=Edwards+and+Holland,+2013)&ots=vx4wKLuQZZ&sig=w05IyD5_m74GfYZj-exkZHL_3ic).

Eisenhardt, K. M. 1989. "Building Theories from Case Study Research.," *Academy of Management Review* (14:4), pp. 532–550.

Eisenhardt, K. M., and Graebner, M. E. 2007. "Theory Building from Cases: Opportunities and Challenges," *Academy of Management Journal* (50:1), pp.

Khalipha Abubakar Nuhu

25–32.

Elie-Dit-Cosaque, C. M., and Straub, D. W. 2011. "Opening the Black Box of System Usage: User Adaptation to Disruptive IT," *European Journal of Information Systems* (20:5), pp. 589–607.

Fadel, K. J. 2012. "User Adaptation and Infusion of Information Systems," *Journal of Computer Information Systems* (52:3), pp. 1–10.

Fadel, K. J., and Brown, S. A. 2010. "Information Systems Appraisal and Coping: The Role of User Perceptions," *Communications of the Association for Information Systems* (26:1), pp. 107–126.

Fereday, J., and Muir-Cochrane, E. 2006. "Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development," *International Journal of Qualitative Methods* (5:2), pp. 80–92.

Ferneley, E., and Sobreperez, P. 2006. "Resist, Comply or Workaround? An Examination of Different Facets of User Engagement with Information Systems," *European Journal of Information Systems* (15:4), pp. 345–356.

Finnegan, D., and Willcocks, L. 2006. "Knowledge Sharing Issues in the Introduction of a New Technology," *Journal of Enterprise Information Management* (19:6), pp. 568–590.

Fishbein, M., and Ajzen, I. 1975. "Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research," *Reading, MA: Addison-Wesley*, pp. 1–18.

Folkman, S. 1992. "Making the Case for Coping," *Personal Coping: Theory, Research, and Application.*, viii, 268.

French, J. R. P., Rodgers, W., and Cobb, S. 1974. "Adjustment as Person-Environment Fit," in *Coping and Adaptation*, pp. 316–333. (internal-pdf://french_etal_1974-3573181696/french_etal_1974.pdf).

Galliers, R. 1990. "Choosing Appropriate Information Systems Research Approaches: A Revised Taxonomy," in *In Proceedings of the IFIP TC8 WG8. 2.* (http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.471.143).

Gallivan, M., Hofman, J., and Orlikowski, W. 1994. "Implementing Radical Change: Gradual versus Rapid Pace," in *Association for Computing Machinery*, Vancouver, British Columbia, pp. 325–339. (https://dspace.mit.edu/bitstream/handle/1721.1/48237/implementingradi00gall.pdf?s).

George, E., Chattopadhyay, P., Sitkin, S. B., and Barden, J. 2006. "Cognitive Underpinnings of Institutional Persistence and Change: A Framing Perspective," *Academy of Management Review* (31:2), pp. 347–365.

Gill, T. G. 1996. "Expert Systems Usage: Task Change and Intrinsic Motivation," *MIS Quarterly* (20:3), pp. 301–329. (https://www.jstor.org/stable/249658).

Khalipha Abubakar Nuhu

Glaser, B. G., and Strauss, A. L. 1967. "The Discovery of Grounded Theory: Strategies for Qualitative Research," *Observations* (Vol. 1).

Goldkuhl, G. 2012. "Pragmatism vs Interpretivism in Qualitative Information Systems Research," *European Journal of Information Systems* (21:2), pp. 135–146.

Goodhue, D. L., and Thompson, R. L. 1995. "Task-Technology Fit and Individual Performance," *MIS Quarterly* (19:2), pp. 213–236.

Grasha, A. F., and Kirschenbaum, D. S. 1986. *Adjustment and Competence: Concepts and Applications*, (MN: West.), Saint-Paul. (https://scholar.google.com/scholar?q=Grasha%2C+A.+F.%2C+%26+Kirsch enbaum%2C+D.+S.+%281986%29.+Adjustment+and+competence%3A+Co ncepts+and+applications.+Saint-Paul%2C+MN%3A+West.&btnG=&hl=en&as_sdt=0%2C5).

Gray, D. 2013. *Doing Research in the Real World.*, Gray, D.E., 2013. Doing research in the real world. Sage. (https://books.google.co.uk/books?hl=en&lr=&id=N_WGAwAAQBAJ&oi= fnd&pg=PP1&dq=gray+2013+interviews&ots=QuVLc028DH&sig=Th2Esbt UBVCac_JTU14-V5mTot4).

Grbich, C. 2012. *Qualitative Data Analysis: An Introduction*, Sage. (https://books.google.com/books?hl=en&lr=&id=B4dkAEIuDz4C&oi=fnd& pg=PP2&dq=grbich+2012+qualitative+data&ots=aEOUKs62lU&sig=IV_1H BNzsWtXsYRNxce4JlhKSpI).

Greene, J. C., Caracelli, V. J., and Graham, W. F. 1989. "Toward a Conceptual Framework for Mixed-Method Evaluation Designs," *Educational Evaluation and Policy Analysis* (11:3), American Educational Research Association (AERA), pp. 255–274.

Griffith, T. L. 1999. "Technology Features as Triggers for Sensemaking," *Academy of Management Review* (24:3), pp. 472–488.

Guba, E. G., and Lincoln, Y. S. 1994. "Competing Paradigms in Qualitative Research," in *Handbook of Qualitative Research*, pp. 105–117.

Han, S., Mustonen, P., Seppanen, M., and Kallio, M. 2004. "Physicians' Behavior Intentions Regarding the Use of Mobile Technology: An Exploratory Study," in *PACIS 2004 Proceedings*, p. 49. (https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1192&context=pacis200 4).

van der Heijden, H. 2004. "User Acceptance of Hedonic Systems," *MIS Quarterly*, pp. 695–704.

Hiltz, S. R., and Johnson, K. 1990. "User Satisfaction with Computer-Mediated Communication Systems," *Management Science* (36:6), pp. 739–764.

Hirschheim, R., and Newman, M. 1988. "Information Systems and User Resistance: Theory and Practice," *The Computer Journal* (31:5), pp. 398–

Khalipha Abubakar Nuhu

408.

Hirschhorn, L. 2002. "Campaigning for Change," *Harvard Business Review* (80:7), pp. 98–104. (http://www.academia.edu/download/30346912/Campaigning_for_Change.pdf).

Huber, G. P., and Power, D. J. 1985. "Retrospective Reports of Strategic-Level Managers: Guidelines for Increasing Their Accuracy," *Strategic Management Journal* (6:2), pp. 171–180.

Ives, B., and Olson, M. H. 1984. "User Involvement and MIS Success: A Review of Research," *Management Science* (30:5), pp. 586–603.

Jackson, S. E., and Dutton, J. E. 1988. "Discerning Threats and Opportunities," *Administrative Science Quarterly* (33:3), pp. 370–387. (https://www.jstor.org/stable/pdf/2392714.pdf).

Jasperson, J., Carter, P. E., and Zmud, R. W. 2005. "A Comprehensive Conceptualization of Post-Adoptive Behaviours Associated with Information Technology Enabled Work Systems," *MIS Quarterly* (29:3), pp. 525–557.

Jeyaraj, A., and Sabherwal, R. 2008. "Adoption of Information Systems Innovations by Individuals: A Study of Processes Involving Contextual, Adopter, and Influencer Actions," *Information and Organization* (18:3), pp. 205–234.

Jiang, J. J., Muhanna, W. A., and Klein, G. . 2000. "User Resistance and Strategies for Promoting Acceptance across System Types," *Information & Management* (37:1), pp. 25–36. (https://www.sciencedirect.com/science/article/pii/S0378720699000324).

Johnson, R. B., and Onwuegbuzie, A. J. 2004. "Mixed Methods Research: A Research Paradigm Whose Time Has Come," *Educational Researcher* (33:7), pp. 14–26.

Jones, M. C., Zmud, R. W., and Clark Jr, T. D. 2008. "ERP in Practice: A Snapshot of Post-Installation Perception and Behaviors," *Communications of the Association for Information Systems* (23:1), pp. 437–462. (https://aisel.aisnet.org/cgi/viewcontent.cgi?article=3385&context=cais).

Joshi, K. 1991a. "A Model of Users' Perspective on Change: The Case of Information Systems Technology Implementation," *MIS Quarterly* (15:2), pp. 229–242.

Joshi, K. 1991b. "A Model of Users' Perspective on Change: The Case of Information Systems Technology Implementation," *MIS Quarterly*, pp. 229–242.

Judge, T. a., Thoresen, C. J., Pucik, V., and Welbourne, T. M. 1999. "Managerial Coping with Organizational Change: A Dispositional Perspective.," *Journal of Applied Psychology* (84:1), pp. 107–122.

Kahn, W. A. 1990. "PSYCHOLOGICAL CONDITIONS OF PERSONAL

Khalipha Abubakar Nuhu

ENGAGEMENT AND DISENGAGEMENT AT WORK.," *Academy of Management Journal* (33:4), pp. 692–724.

Kane, G. C., and Labianca, G. 2011. "IS Avoidance in Health-Care Groups: A Multilevel Investigation," *Information Systems Research* (22:3), pp. 504–522.

Karahanna, E., and Straub, D. W. 1999. "The Psychological Origins of Perceived Usefulness and Ease-of-Use," *Information & Management* (35:4), pp. 237–250.

Karahanna, E., Straub, D. W., and Chervany, N. L. 1999. "Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs," *MIS Quarterly* (23:2), p. 183.

Kashefi, A., Abbott, P., and Ayoung, A. 2015. "User IT Adaptation Behaviors: What Have We Learned and Why Does It Matter?," *AMCIS 2015 Proceedings*, pp. 1–14. (http://aisel.aisnet.org/amcis2015/EndUser/GeneralPresentations/12).

Kashefi, A., Nuhu, K., Abbott, P., Ayoung, D., and Alwzinani, F. 2018. *Investigating Users' IT Adaptation Behaviors: A Case of a Computerized Work System*. (https://bura.brunel.ac.uk/handle/2438/17190).

Kijsanayotin, B., Pannarunothai, S., and Speedie, S. M. 2009. "Factors Influencing Health Information Technology Adoption in Thailand's Community Health Centers: Applying the UTAUT Model," *International Journal of Medical Informatics* (78:6), Elsevier, pp. 404–416.

Kim, H., and Kankanhalli, A. 2009. "Investing User Resistance To Information Systems Implementation: A Status Quo Bias Perspective," *MIS Quarterly* (33:3), pp. 567–582. (http://www.jstor.org/stable/20650309%5Cnhttp://about.jstor.org/terms).

Klaus, T., and Blanton, J. E. 2010. "User Resistance Determinants and the Psychological Contract in Enterprise System Implementations," *European Journal of Information Systems* (19:6), pp. 625–636.

Klein, H. K., and Myers, M. D. 1999. "A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems," *MIS Quarterly* (23:1), p. 67.

Klein, H., and Myers, M. 2001. "A Classification Scheme for Interpretive Research in Information Systems," *Qualitative Research in IS: Issues and Trends*, pp. 218–239. (https://books.google.com/books?hl=en&lr=&id=RCsTTaWmkecC&oi=fnd&pg=PA218&dq=A+classification+scheme+for+interpretive+research+in+information+systems',+Qualitative+research+in+IS:+issues+and+trends,+&ots=IL4lTVq5Xn&sig=TSccWQemzyRq75WcYNNvhEZs7dk).

Komiak, S., and Benbasat, I. 2006. "The Effects of Personalization and Familiarity on Trust and Adoption of Recommendation Agents," *MIS Quarterly* (30:4), pp. 941–960. (http://www.jstor.org/stable/25148760).

Khalipha Abubakar Nuhu

Lapointe, L., and Beaudry, A. 2014. "Identifying IT User Mindsets: Acceptance, Resistance and Ambivalence," in *47th Hawaii International Conference …*, Waikoloa, Hawaii: IEEE, pp. 4619–4628. (http://ieeexplore.ieee.org/abstract/document/6759169/).

Lapointe, L., and Rivard, S. 2005. "A Multilevel Model of Resistance to Information Technology Implementation," *Mis Quarterly* (29:3), pp. 461–491.

Lapointe, L., and Rivard, S. 2007a. "A Triple Take on Information System Implementation," *Organization Science* (18:1), pp. 89–107.

Lapointe, L., and Rivard, S. 2007b. "A Triple Take on Information System Implementation," *Organization Science* (18:1), pp. 89–107.

Lazarus, R. 1966. *Psychological Stress and the Coping Process.*, New York: McGraw-Hill. (http://psycnet.apa.org/psycinfo/1966-35050-000).

Lazarus, R., and Folkman, S. 1984. *Stress, Appaisal and Coping*, New York: Springer Publishing company, Inc.

Lee, A., and Baskerville, R. 2003. "Generalising Generalisability in Information Systems Research," *Information Systems Research* (14:3), pp. 221–243. (http://pubsonline.informs.org/doi/abs/10.1287/isre.14.3.221.16560).

Lee, S., Kim, Y., and Lee, J. 1995. "An Empirical Study of the Relationships among End-User Information Systems Acceptance, Training, and Effectiveness," *Journal of Management Information Systems* (12:2), pp. 189–203. (http://www.tandfonline.com/doi/abs/10.1080/07421222.1995.11518086).

Lennie, J. 2006. "Increasing the Rigour and Trustworthiness of Participatory Evaluations: Learning from the Field," *Evaluation Journal of Australasia* (6:1), pp. 27–35. (https://eprints.qut.edu.au/26035/).

Leonard-Barton, D. 1988. "Implementation as Mutual Adaptation of Technology and Organization," *Research Policy* (17:5), pp. 251–267. (http://www.sciencedirect.com/science/article/pii/0048733388900066).

Lewis, Agarwal, and Sambamurthy. 2003. "Sources of Influence on Beliefs about Information Technology Use: An Empirical Study of Knowledge Workers," *MIS Quarterly*, pp. 657–678.

Li, X., Hsieh, J. J. P.-A., and Rai, A. 2013. "Motivational Differences Across Post-Acceptance Information System Usage Behaviors: An Investigation in the Business Intelligence Systems Context," *Information Systems Research* (24:3), pp. 659–682.

Liang, H., and Xue, Y. 2009. "Avoidance of Information Technology Threats: A Theoretical Perspective," *MIS Quarterly* (33:1), pp. 71–90.

Liang, H., Xue, Y., and Pinsonneault, A. 2019. "WHAT USERS DO BESIDES PROBLEM-FOCUSED COPING WHEN FACING IT SECURITY THREATS: AN EMOTION-FOCUSED COPING PERSPECTIVE," *MIS*

Khalipha Abubakar Nuhu

Quarterly (43:2), pp. 373–394. (https://pdfs.semanticscholar.org/892c/d67e4563926e24c28965748c11a4f91 5a2c9.pdf).

Limayem, M., Hirt, S. G., and Cheung, C. M. K. 2007. "How Habit Limits the Predictive Power of Intention: The Case of Information Systems How Habit Limits the Predictive Power of Intention: The Case of Information Systems Continuance1," *Source: MIS Quarterly* (31:4), pp. 705–737. (http://www.jstor.org/stable/25148817%5Cnhttp://about.jstor.org/terms).

Lincoln, Y. S., and Guba, E. G. 1985. "Naturalistic Inquiry," *Newbury Park CA Sage Publications*.

Liu, F., and Myers, M. 2011. "An Analysis of the AIS Basket of Top Journals," *Of Systems and Information Technology* (13:1), pp. 5–24. (http://www.emeraldinsight.com/doi/abs/10.1108/13287261111118322).

Lucas, H. J., Swanson, E., and Zmud, R. 2008. "Implementation, Innovation, and Related Themes over the Years in Information Systems Research," *Journal of the Association For* (8:4), pp. 206–210. (http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1411&context=jais).

Majchrzak, A., Rice, R. E., Malhotra, A., King, N., and Ba, S. 2000. "Technology Adaptation: The Case of a Computer-Supported Inter-Organizational Virtual Team," *MIS Quarterly* (24:4), p. 569.

Marakas, G., and Hornik, S. 1996. "Passive Resistance Misuse: Overt Support and Covert Recalcitrance in IS Implementation," *European Journal of Information Systems* (5:3), pp. 280–220. (http://link.springer.com/article/10.1057/ejis.1996.26).

Markus, M. L. 1983. "Power, Politics, and MIS Implementation," *Communications of the ACM* (26:6), pp. 430–444.

Markus, M. L. 2004. "Technochange Management: Using IT to Drive Organizational Change," *Journal of Information Technology*, pp. 4–20.

Martinko, M., Zmud, R., and Henry, J. 1996. "An Attributional Explanation of Individual Resistance to the Introduction of Information Technologies in the Workplace," *Behaviour & Information* (15:5), pp. 313–330. (http://www.tandfonline.com/doi/abs/10.1080/014492996120085a).

McCrae, R. R. 1984. "Situational Determinants of Coping Responses: Loss, Threat, and Challenge.," *Journal of Personality and Social Psychology* (46:4), pp. 919–928.

McNally, R. C., and Griffin, A. 2010. "Mandatory Adoption of Customer Relationship Management Information Technology: The Role of Customer Support in an Attitude-Intention Model," *International Journal of Business Innovation and Research* (4:1), p. 30.

Meissonier, R., and Houzé, E. 2010. "Toward an 'IT Conflict-Resistance Theory': Action Research during IT Pre-Implementation," *European Journal of*

Khalipha Abubakar Nuhu

Information Systems (19:5), pp. 540–561.

Meyer, J.-A. 1997. "The Acceptance of Visual Information in Management," *Information and Management* (32:6), pp. 275–287. (http://www.scopus.com/inward/record.url?eid=2-s2.0-0031275192&partnerID=40&md5=3c387ccdd63c6a523e50b2185473563a).

Miles, M. B., and Huberman, A. M. 1994. *Qualitative Data Analysis: An Expanded Sourcebook*, sage.

Miller, T., Birch, M., Mauthner, M., and Jessop, J. 2012. *Ethics in Qualitative Research*, Sage. (https://books.google.co.uk/books?hl=en&lr=&id=g2pEAgAAQBAJ&oi=fnd&pg=PP2&dq=research+ethics&ots=sHGlY-MtNb&sig=RbsYil_TM2IQzm5nhNjONJ5PtTE).

Mingers, J. 2001. "Combining IS Research Methods: Towards a Pluralist Methodology," *Information Systems Research* (12:3), pp. 240–259.

Mingers, J., Mutch, A., and Willcocks, L. 2013. "Critical Realism in Information Systems Research," *MIS Quarterly* (37:3), pp. 795–802.

Mitchell, J. I., Gagné, M., Beaudry, A., and Dyer, L. 2012. "The Role of Perceived Organizational Support, Distributive Justice and Motivation in Reactions to New Information Technology," *Computers in Human Behavior* (28:2), pp. 729–738.

Moore, G. C., and Benbasat, I. 1991. "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation," *Information Systems Research* (2:3), pp. 192–222.

Myers, M. 2009. *Qualitative Research in Business and Management*, Sage.

Myers, M. D. 1999. "Investigating Information Systems with Ethnographic Research," *Communications of AIS* (2:1), p. 23. (https://aisel.aisnet.org/cgi/viewcontent.cgi?article=2522&context=cais).

Myers, M., and Newman, M. 2007. "The Qualitative Interview in IS Research: Examining the Craft," *Information and Organization* (17:2), pp. 2–26. (http://www.sciencedirect.com/science/article/pii/S1471772706000352).

Nan, N. 2011. "Capturing Bottom-up Information Technology Use Processes: A Complex Adaptive Systems Model," *MIS Quarterly* (35:2), pp. 505–532. (https://www.jstor.org/stable/23044054).

National Bureau of Statistics. 2017. "National Population Estimates." (https://nigerianstat.gov.ng/elibrary?queries[search]=population).

Nelson, R. R., and Cheney, P. H. 1987. "Training End Users: An Exploratory Study," *MIS Quarterly* (11:4), pp. 547–559.

Nelson, R. R., Todd, P. A., and Wixom, B. H. 2005. "Antecedents of Information and System Quality: An Empirical Examination within the Context of Data Warehousing," *Journal of Management Information Systems* (21:4), pp. 199–

Khalipha Abubakar Nuhu

235. (https://www.tandfonline.com/doi/abs/10.1080/07421222.2005.11045823).

Nevo, S., Nevo, D., and Pinsonneault, A. 2016. "A Temporally Situated Self-Agency Theory of Information Technology Reinvention," *MIS Quarterly Theory and Review* (40:1), pp. 127–157.

Nowell, L. S., Norris, J. M., White, D. E., and Moules, N. J. 2017. "Thematic Analysis: Striving to Meet the Trustworthiness Criteria," *International Journal of Qualitative Methods* (16:1), p. 160940691773384. (http://journals.sagepub.com/doi/10.1177/1609406917733847).

Nuhu, K., Swift, S., Lakoju, M., and Macredie, R. 2018. "INVESTIGATING USER RESPONSES TO MANDATORY IT-INDUCED ORGANISATIONAL CHANGES: A PRE-IMPLEMENTATION STUDY," in *ECIS 2018 Proceedings*, Portsmouth: Association for Information Systems. (https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1026&context=ecis2018_rip).

Oates, B. J. 2006. "Research Information Systems and Computing.," *SAGE Publications Ltd* (Vol. 26).

Oborn, E., Barrett, M., and Davidson, E. 2011. "Unity in Diversity: Electronic Patient Record Use in Multidisciplinary Practice," *Information Systems Research* (22:3), pp. 547–564.

van Offenbeek, M., Boonstra, A., and Seo, D. 2013. "Towards Integrating Acceptance and Resistance Research: Evidence from a Telecare Case Study," *European Journal of Information Systems* (22:4), pp. 434–454.

Onwuegbuzie, A., and Leech, N. 2006. "Linking Research Questions to Mixed Methods Data Analysis Procedures 1," *The Qualitative Report* (11:3), pp. 474–498.

Orlikowski, W., and Baroudi, J. 1991. "Studying Information Technology in Organisations: Research Approaches and Assumptions," *Information Systems Research* (2:1), pp. 1–28. (http://pubsonline.informs.org/doi/abs/10.1287/isre.2.1.1).

Orlikowski, W. J. 1996. "Improvising Organizational Transformation over Time: A Situated Change Perspective," *Information Systems Research*, pp. 63–92.

Patton, M. Q. 1999. "Enhancing the Quality and Credibility of Qualitative Analysis.," *Health Services Research* (34:5 Pt 2), p. 1189. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1089059/).

Rai, A., and Tang, X. 2014. "Coevolution Perspective for Future Research Information Technology-Enabled Business Models : A Conceptual Framework and a Coevolution Perspective for Future Research," *Information Systems Research* (25:1), pp. 1–14.

Rivard, S., and Lapointe, L. 2012. "Information Technology Implementers'

Khalipha Abubakar Nuhu

Responses to User Resistance: Nature and Effects," *MIS Quarterly* (36:3), pp. 897–920. (https://pdfs.semanticscholar.org/a5ac/06fc88e81515c609767ebf166ed7c81c73fc.pdf).

Rizzuto, T. E., Schwarz, A., and Schwarz, C. 2014. "Toward a Deeper Understanding of IT Adoption: A Multilevel Analysis," *Information and Management* (51:4), pp. 479–487.

Robey, D., Ross, J., and Boudreau, M. 2002. "Learning to Implement Enterprise Systems: An Exploratory Study of the Dialectics of Change," *Of Management Information ….* (http://www.tandfonline.com/doi/abs/10.1080/07421222.2002.11045713).

Robinson, S. L., and Bennett, R. J. 1995. "A Typology of Deviant Workplace Behaviours - a Multidimensional-Scaling Study," *Academy of Management Journal* (38:2), pp. 555–572.

Rogers, E. M. 1983. "Diffusion of Innovations," *Macmillian Publishing Co.* (3rd Editio.), New: Free press.

Rogers, E. M. 1995. "Diffusion of Innovations," *Macmillian Publishing Co.* (3rd Editio.), New York: Free press.

Rosenthal, P. 2004. "Management Control as an Employee Resource: The Case of Front-Line Service Workers," *Journal of Management Studies* (41:4), pp. 601–622.

Sabherwal, R., Jeyaraj, A., and Chowa, C. 2006. "Information System Success: Individual and Organizational Determinants," *Management Science* (52:12), pp. 1849–1864.

Saga, V., and Zmud, R. 1993. "The Nature and Determinants of IT Acceptance, Routinization, and Infusion," in *Proceedings of the IFIP TC8 Working Conference on Diffusion, Transfer and Implementation of Information Technology*, Elsevier Science Inc, pp. 67–86. (http://dl.acm.org/citation.cfm?id=686655).

Saunders, M., Lewis, P., and Thornhill, A. 2015. "Research Methods for Business Students," in *Research Methods for Business Students* (7th ED.), UK: Pearson Education, p. 768.

Schaper, L. K., and Pervan, G. P. 2007. "ICT and OTs: A Model of Information and Communication Technology Acceptance and Utilisation by Occupational Therapists.," *International Journal of Medical Informatics* (76), pp. S212–S221. (https://www.sciencedirect.com/science/article/pii/S138650560600150X).

Schultze, U., and Avital, M. 2011. "Designing Interviews to Generate Rich Data for Information Systems Research.," *Information and Organization* (21:1), pp. 1–16. (https://www.sciencedirect.com/science/article/pii/S1471772710000412).

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Schwarz, A., and Chin, W. 2007. "Looking Forward: Toward an Understanding of the Nature and Definition of IT Acceptance," *Journal of the Association for Information* (8:4), pp. 230–243. (http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1407&context=jais).

Selander, L., and Henfridsson, O. 2012. "Cynicism as User Resistance in IT Implementation," *Information Systems Journal* (22:4), pp. 289–312.

Sharma, R., and Yetton, P. 2003. "The Contingent Effects of Management Support and Task Interdependence on Successful Information Systems Implementation," *MIS Quarterly* (27:4), pp. 533–556. (https://www.jstor.org/stable/30036548).

Sharma, R., and Yetton, P. 2007. "The Contingent Effects of Training, Technical Complexity, and Task Interdependence on Successful Information Systems Implementation," *MIS Quarterly* (32:3), pp. 219–238. (https://www.jstor.org/stable/25148789).

Smith, M. L. 2006. "Overcoming Theory-Practice Inconsistencies: Critical Realism and Information Systems Research," *Information and Organization* (16:3), pp. 191–211.

Stein, M.-K., Newell, S., Wagner, E. L., and Galliers, R. D. 2015. "Coping with Information Technology: Mixed Emotions, Vacillation, and Nonconforming Use Patterns," *MIS Quarterly* (39:2), pp. 367–392.

Streeton, R., Cooke, M., and Campbell, J. 2004. "Researching the Researchers: Using a Snowballing Technique," *Nurse Researcher* (12:1), p. 35. (http://search.proquest.com/openview/c18c37f3e93316c7b977e8b1ceff36a6/1?pq-origsite=gscholar&cbl=33100).

Stringer, E., and Genat, W. 2004. *Action Research in Health.*, Merrill Prentice Hall. (https://scholar.google.co.uk/scholar?hl=en&as_sdt=0%2C5&q=Stringer+and+Genat%2C+2004%29&btnG=#d=gs_cit&p=&u=%2Fscholar%3Fq%3Dinfo%3ASCjsqvD5U5AJ%3Ascholar.google.com%2F%26output%3Dcite%26scirp%3D0%26hl%3Den).

Strong, D., and Volkoff, O. 2010. "Understanding Organization-Enterprise System Fit: A Path to Theorizing the Information Technology Artifact," *MIS Quarterly* (34:4), pp. 731–756.

Subramanian, G. H. 1994. "A Replication of Perceived Usefulness and Perceived Ease of Use Measurement," *Decision Sciences* (25:5–6), pp. 863–874.

Sun, H. 2012. "Understanding User Revisions When Using Information System Features: Adaptive System Use and Triggers," *Management Information Systems Quarterly* (36:2), pp. 453–478. (http://content.ebscohost.com/ContentServer.asp?T=P&P=AN&K=74717010&S=R&D=buh&EbscoContent=dGJyMNXb4kSep7A40dvuOLCmr0qeqLFSr6i4SLCWxWXS&ContentCustomer=dGJyMPGqtEmxqbZIuePfgeyx44Dt6fIA).

Khalipha Abubakar Nuhu

Sykes, T. A., Venkatesh, V., and Johnson, J. L. 2014. "Enterprise System Implementation and Employee Job Performance: Understanding the Role of Advice Networks.," *MIS Quarterly* (38:1), pp. 51-A4. (http://ra.ocls.ca/ra/login.aspx?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=94003339&site=bsi-live).

Taylor, S., Bogdan, R., and DeVault, M. 2015. *Introduction to Qualitative Research Methods: A Guidebook and Resource.*, John Wiley & Sons. (https://books.google.co.uk/books?hl=en&lr=&id=pONoCgAAQBAJ&oi=fnd&pg=PR11&dq=Introduction+to+Interview+Research&ots=Qhwfaw9A_V&sig=AsgcoGE_me5mO7naQzvfSFowEFc).

Taylor, S., and Todd, P. A. 1995. "Understanding Information Technology Usage: A Test of Competing Models," *Information Systems Research* (6:2), pp. 144–176.

Teo, H.-H., and Yang, X. 2007. "How Do Users Cope with Trial Restrictions? A Longitudinal Field Experiment on Free Trial Software," in *International Conference on Information Systems (ICIS)*, Montreal, Canada, pp. 1–18. (http://aisel.aisnet.org/icis2007).

Thatcher, J. B., McKnight, D. H., Baker, E. W., Arsal, R. E., and Roberts, N. H. 2010. "The Role of Trust in Postadoption IT Exploration: An Empirical Examination of Knowledge Management Systems," *IEEE Transactions on Engineering Management* (58:1), pp. 56–70. (https://ieeexplore.ieee.org/abstract/document/5462835/).

Thompson, R. L., Higgins, C. A., and Howell, J. M. 1991. "Personal Computing: Toward a Conceptual Model of Utilization," *MIS Quarterly* , pp. 125–143. (https://www.jstor.org/stable/249443).

Tobin, G. A., and Begley, C. M. 2004. "Methodological Rigour within a Qualitative Framework," *Journal of Advanced Nursing* (48), pp. 388–396.

Tsai, H., Compeau, D., and Haggerty, N. 2007. "Of Races to Run and Battles to Be Won: Technical Skill Updating, Stress, and Coping of IT Professionals," *Human Resource Management* (46:3), pp. 395–409. (http://onlinelibrary.wiley.com/doi/10.1002/hrm.20170/full).

Turel, O. 2015. "Quitting the Use of a Habituated Hedonic Information System: A Theoretical Model and Empirical Examination of Facebook Users," *European Journal of Information Systems* (24:4), pp. 431–446.

Turel, O., Yuan, Y., and Connelly, C. E. 2008. "In Justice We Trust: Predicting User Acceptance of E-Customer Services," *Journal of Management Information Systems* (24:4), pp. 123–151.

Tyre, M. J., and Orlikowski, W. J. 1994. "Windows of Opportunity : Temporal Patterns of Technological Adaptation in Organizations," *Organization Science* (5:1), pp. 98–118.

Vaast, E., and Walsham, G. 2005. "Representations and Actions: The Transformation of Work Practices with IT Use," *Information and*

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Organization (15:1), pp. 65–89.
(https://www.sciencedirect.com/science/article/pii/S1471772704000533).

Venkatesh, V. 2000. "Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model," *Information Systems Research* (11:4), pp. 342–365.

Venkatesh, V., Bala, H., and Sykes, T. A. 2010. "Impacts of Information and Communication Technology Implementations on Employees' Jobs in Service Organizations in India: A Multi-Method Longitudinal Field Study," *Production and Operations Management* (19:5), pp. 591–613.

Venkatesh, V., and Davis, F. D. 2000. "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science* (46:2), pp. 186–204.

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. 2003. "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27:3), pp. 425–478.

Venugopal, C., and Rao, K. S. 2011. "Learning from a Failed ERP Implementation: A Case Study Research," *International Journal of Managing Projects in Business* (4:4), pp. 596–615. (http://www.emeraldinsight.com/doi/pdf/10.1108/17538371111164038).

Waddell, D., and Sohal, A. S. 1998. "Resistance: A Constructive Tool for Change Management," *Management Decision* (36:8), pp. 543–548.

Wagner, E. L., and Newell, S. 2007. "Exploring the Importance of Participation in the Post-Implementation Period of an ES Project: A Neglected Area.," *Journal of the Association for Information Systems* (8:10), p. 32. (https://aisel.aisnet.org/jais/vol8/iss10/32/).

Walsham, G. 1993. *Interpreting Information Systems in Organizations*, England: John Wiley and Sons Ltd. (http://dl.acm.org/citation.cfm?id=583196).

Walsham, G. 1995. "Interpretive Case Studies in IS Research: Nature and Method," *European Journal of Information Systems* (4:2), pp. 74–81. (http://search.proquest.com/openview/ff765f5ff1877647fcd2b7b71cf94e60/1?pq-origsite=gscholar&cbl=30520).

Walsham, G. 2006. "Doing Interpretive Research," *European Journal of Information Systems* (15:3), pp. 320–330. (http://www.ingentaconnect.com/content/pal/0960085x/2006/00000015/00000003/art00013).

Wareham, J., Zheng, J., and Straub, D. 2005. "Critical Themes in Electronic Commerce Research: A Meta-Analysis," *Journal of Information Technology* (20), pp. 1–19. (http://link.springer.com/article/10.1057/palgrave.jit.2000034).

Wasko, M. M., and Faraj, S. 2005. "Why Should I Share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice.,"

Khalipha Abubakar Nuhu

MIS Quarterly (29:1), pp. 35–57. (https://pdfs.semanticscholar.org/158e/131aac4ed0751a0e6752f8618b4528da 879b.pdf).

White, K. B., and Massello, J. 1987. "Implementing Computer-Mediated Communication Technologies: A Technoacceptance Approach to Critical Mass Utilization," *Information and Management* (13:4), pp. 197–208.

White, R. 1974. "Strategies of Adaptation: An Attempt at Systematic Description," *Coping and Adaptation*, pp. 47–68. (https://scholar.google.com/scholar?q=White%2C+R.+W.+%281974%29.+S trategies+of+adaptation%3A+An+attempt+at+systematic+description.+In+G .+V.+Coelho%2C+D.+A.+Hamburg%2C+%26+J.+E.+Adams+%28Eds.%29 %2C+Coping+and+adaptation+%28pp.+47- 68%29.+New+York%3A+Basic+Bo).

Wixom, B., and Todd, P. 2005. "A Theoretical Integration of User Satisfaction and Technology Acceptance," *Information Systems Research* (16:1), pp. 85–102.

Wu, I.-L., and Wu, K.-W. 2005. "A Hybrid Technology Acceptance Approach for Exploring E-CRM Adoption in Organizations," *Behaviour & Information Technology* (24:4), pp. 303–316.

Yin, R. 2003. *Case Study Research: Design and Methods*, London: Sage Publications. (https://books.google.co.uk/books?hl=en&lr=&id=OgyqBAAAQBAJ&oi=fn d&pg=PT243&dq=Case+Study+Research:+Design+and+Methods&ots=FaN 7j8i-1k&sig=tbxZk9eM-0y345xqmjnQgBLisT8).

Yin, R. 2013. *Case Study Research: Design and Methods. Applied Social Research Method Series*, ((5th ed., Vol. 5).), New York, USA: Sage Publications. (https://books.google.co.uk/books?hl=en&lr=&id=OgyqBAAAQBAJ&oi=fn d&pg=PT243&dq=Case+Study+Research:+Design+and+Methods.+Applied +Social+Research+Method+Series&ots=FaN7j8l4- d&sig=qC9jFviv4XGoMKCktYqMkuyOOoE).

Zaltman, G., Duncan, R., and Holbek, J. 1977. "Innovations and Organizations," *New York Wiley*, New York: John-Wiley & Sons.

Zhu, K., Kraemer, K., and Xu, S. 2006. "The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on e-Business," *Management Science* (52:10), pp. 1557–1576. (http://pubsonline.informs.org/doi/abs/10.1287/mnsc.1050.0487).

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Appendix A: Interview Guides

Interview Guide for the IT system Users

User Background

1. What is your job role & How long have you been working in this unit/office?
2. Could you please tell me about your job duties and current responsibilities?
3. Did you have any experience of working with computers? If yes, for how long?
4. What was your view about the previous way of doing things before the change to the new system? Was it ok or you hoped for a change?

Communication about the New System

5. When did you first hear about the implementation of the new system? (Early implementation stages or after full deployment?)
6. How did management announce the introduction and implementation of the new system?
7. In your opinion, was there a good communication channel between employees and the management?
8. Do you feel the management has fully communicated the benefits of the new system?

User Involvement & Participation & Transition

9. Do u feel you played a role in the development & implementation of the new system? If yes how?
10. Where your opinions considered in development & implementation of the new system?
11. Could you please describe the transition/implementation process from the previous system to the new system? (i.e. smooth, rough, perfect)
12. How long did the implementation phase take?

IT & Work Routine Perceptions & Control

13. Could you please explain your initial impression after using the new system for the first time
14. How different/disruptive was the new system from the old one in your own views?
15. Has the new system changed your previous work routine? Was it positive or negative?
16. Has the change in your work routine enabled you to accomplish tasks/work more quickly?
17. How do you use the new system to accomplish your task? What do you use it for?
18. Is the new system easy to use?
19. Does the new system provide opportunities to improve your work?
20. Has the change in your work routine increase your productivity?
21. Are you worried that the system my decrease your work output?
22. Do you feel stressed about having to use the new system?
23. Are you confident of being able to use the system without any problems?

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24. Have you discovered new ways of using the new system to accomplish other tasks or novel uses?

Coping Responses, Influencing factors, Resources & Management Support

25. Do you feel the management has supported the implementation process of the new system?
26. Do you feel the management fully understands the benefits of this system?
27. Were you familiar with such kind of system before implementation?
28. How did you deal with the changes brought about by the new system? Could you explain how you coped please?
29. Do People you consider important (e.g., co-workers, supervisors, managers) think that you should use the new system
30. Has social influences from your colleagues, managers and others affected how you have perceived the new system in any way over time?
31. Have you asked for advice from your colleagues about how to use the new IT?
32. How often do u discuss issues related to the new IT with your colleagues? What normally do you discuss about it?
33. Has your colleague's advice help you cope with the new change better emotionally?
34. Did the management provide necessary help/resources for using the new system (e.g. training, user manuals, and workshops)?
35. Were the coping resources & supportive activities available to you sufficient enough to help you adapt to the new system?
36. Did management organize/send you to computer training sessions? How was it in terms of both quantity (number of sessions) and quality? Could you please explain?
37. Did the coping resources and supportive activities available to you affect or influence your appraisal of the new system? (positively or negatively)
38. Did you face any difficulties or challenges while coping and using the new system? If any, could you please name them and how you dealt with such difficulties?
39. Did you change/adjust your coping strategies with time? If yes could you please tell me how?

Level of Control over IT, Task & Self

40. Have you changed your personal work routines & work processes in order to take advantage of the new system? If yes, how please?
41. Have you adjusted yourself personally in order to take advantage of the new system? If yes, how please? (E.g. seeking support from colleagues, learning more how to use the system), if not why please?
42. Have you adjusted the new system to fit your current work routines & objectives? If yes, how please?

Conclusion

43. Would you recommend this new system to another organization or what would be your advice to another organization planning to implement this same system?
44. Given the chance, what would you have done differently in terms of the whole system implementation process?
45. Do you have any suggestions that you believe can improve the new system and help users adapt easily to its use?

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Interview Guide for the Agency's Management Team

1. What is your job role please?
2. How long have you been working here?
3. Why did your organization decide to implement this new system?
4. What were the expected organization benefits after implementing the new system?
5. How was the decision–making process for acquiring and implementing the new system?
6. Were all stakeholders involved in the decision making process (e.g. users, training officers & IT support)?
7. When did your organisation start implementing the new system? How long did it take to implement the new system?
8. How was the new system introduced to users by the management?
9. Which units/departments have implemented the new system?
10. Which modules do they use?
11. Has the new system affected or changed previous work processes and patterns? If yes, how please?
12. Has the new systems affected the skills needed by employees to undertake their job roles using the new system? If yes, how please?
13. How did your organization manage changes that occurred during the new system implementation?
14. What challenges/problems, if any, did your organization encounter during and after the implementation of the new system?
15. In your candid opinion, how has the new system affected your organisation? What benefits or drawbacks has your organisation achieved from its implementation?
16. What was the employees' initial perception about the new system? How did users' initially respond or react (positively or negatively)?
17. How were employees supported to help them adapt successfully to the new system? (E.g. training, workshops).
18. How has the management encouraged employees to use the new system?
19. Has the new system improved employee efficiency and effectiveness? Has it increased their work quality and output?
20. Have employees complained about the new system?
21. How would you categorize employees according to the use of the system (e.g. experts, novice, resistant).
22. In your candid opinion, do you have any suggestions for improvement for the new system?

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Interview Guide for the IT support Team and Training Officers

1. Please what is your job role and responsibility?
2. How long have you been working here?
3. Where you involved at any stage during the new system implementation?
4. How do you support users of the new system?
5. Has the new system been customized to suit the previous work processes of the organization or it has changed everything? If yes, how please?
6. Were any challenges experienced during the implementation process of the new system? If yes, what sort please?
7. In your own candid opinion, how difficult was the transition from the previous system to the new system?
8. In your own candid opinion, what are the disadvantages or weaknesses of the new system compared to the previous system?
9. When supporting users and catering to their problems, what sort of feelings do they express and what are their opinions about the new system?
10. Did you and your team obtain training from consultants/vendors about the new system? If yes, for how long and what sort of training?
11. Are you responsible for training the new system users?
12. How long have training sessions normally lasted and how often do staff receive training and support?
13. How would you classify various users of the system? (Experts, novice, resistant).
14. What do the system users normally complain about the new system?
15. What do you feel can be done to improve the new system and its implementation?

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Appendix B: Ethical Approval Letters

Brunel Ethical Approval Letters

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London
Kingston Lane
Uxbridge
UB8 3PH
United Kingdom

www.brunel.ac.uk

15 August 2017

LETTER OF APPROVAL

Applicant: mr Khalipha Nuhu

Project Title: user adaptation to IT-induced organisational changes

Reference: 6474-LR-Aug/2017- 8119-1

Dear mr Khalipha Nuhu

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.
- Start date has passed. Please be advised that no research involving human participants or their data may commence until final ethical approval has been obtained.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.
- Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.
- The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study
- You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor Hua Zhao

Chair

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London

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Khalipha Abubakar Nuhu

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London
Kingston Lane
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United Kingdom

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3 July 2018

LETTER OF APPROVAL

Applicant: Mr khalipha nuhu

Project Title: User Adaptation to IT-induced organisational changes (case study 3)

Reference: 11855-LR-Jun/2018- 13295-2

Dear Mr khalipha nuhu

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.

Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.
- Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.
- The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study
- You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor Hua Zhao

Chair

College of Engineering, Design and Physical Sciences Research Ethics Committee
Brunel University London

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Appendix C: Participant Information Sheet and Consent Form

PARTICIPANT INFORMATION SHEET

Researcher: Khalipha Abubakar Nuhu

Email: khalipha.nuhu@brunel.ac.uk

Introduction and invitation

This is an invitation to take part in a PhD research study. Please read this information sheet to gain an insight about this research and what it entails. Participation is voluntary and you may withdraw your participation at any time without having to explain or provide any reason. You may discuss this information with others and if you have any questions, please feel free to ask me.

What is the purpose of the study?

The aim of this research is to understand how users' respond to Information Technologies that bring about changes in organisations. These changes include: business process changes; change in skillsets and change in infrastructure. Through this research, user behaviours identified will help in improving IT implementations in organisations. This research is being carried out as a partial fulfilment of the requirements of the award of a Doctor of Philosophy (PhD) in Computer Science from Brunel University London.

Why have I been invited to participate?

You have been chosen because you are a current user of the newly implemented IS system (project Tiger) and this study requires the participation of people involved in the IT system implementation project, ranging from the project team to the final system users.

Do I have to take part?

As highlighted earlier, participation is entirely voluntary; even after signing a consent form, you may withdraw participation at any point. Withdrawing from the study will not affect you in any way.

What will happen to me if I take part?

You will be asked to take part in an interview session, which will last between 1hour or 1.5 hours. Interviews may be recorded electronically with a participant's consent.

What are the possible disadvantages and risks of taking part?

To the best of the researcher's knowledge, there is no apparent risk in participating in this study. The interviews will be no longer than 1 to 1.5 hours. Notes will be taken during the interview and interviews may be recorded with prior consent of the participant.

What if something goes wrong?

In an event where a participant has any reservation about the conduct during an interview, and does not wish to engage the researcher directly, a participant may contact the researcher's principal supervisor Dr Stephen Swift by email at stephen.swift@brunel.ac.uk. There is also information later in this document on how to raise issues if you have other concerns you feel might need further addressing.

Will my taking part in this study be kept confidential?

Confidentiality and anonymity is fully assured, as no names will be mentioned and no comment will be attributable to a specific participant from the information obtained from the interviews. Data obtained during the study will only be used for academic purposes, which includes writing a thesis as a requirement for the award of a PhD**.**

Who has reviewed the study?

This study has been reviewed through Brunel Research Ethics Online in accordance with the standards of the University Research Ethics Committee (UREC).

Passage on Research Integrity

Brunel University is committed to compliance with the Universities UK Research Integrity Concordat. You are entitled to expect the highest level of integrity from our researchers during their research.

Contact for further information and complaints

If you have any concerns or complaints regarding the ethical aspects of this project please contact res-ethics@brunel.ac.uk.

Thank You for your time.

Khalipha Abubakar Nuhu

Consent Form

RESEARCH PARTICIPANT CONSENT FORM

		YES	NO
The participant should complete the whole of this sheet			
	Please tick the appropriate box		
Have you read the Research Participant Information Sheet?		☐	☐
Have you had an opportunity to ask questions and discuss this study?		☐	☐
Have you received satisfactory answers to all your questions?		☐	☐
Who have you spoken to?			
Do you understand that you will not be referred to by name in any report concerning the study?		☐	☐
Do you understand that you are free to withdraw from the study:			
• at any time?		☐	☐
• without having to give a reason for withdrawing?		☐	☐
• (where relevant, adapt if necessary) without affecting your future care?		☐	☐
(Where relevant) I agree to my interview being recorded.		☐	☐
(Where relevant) I agree to the use of non-attributable direct quotes when the study is written up or published.		☐	☐
Do you agree to take part in this study?		☐	☐

Signature of Research Participant:

Date:

Name in capitals:

Researcher name:	Signature:
Supervisor name:	Signature:

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Appendix D: Summaries with Chains of Evidence for Participants

Summaries with chains of evidence for other participants within the engaged user response category in CASE A.
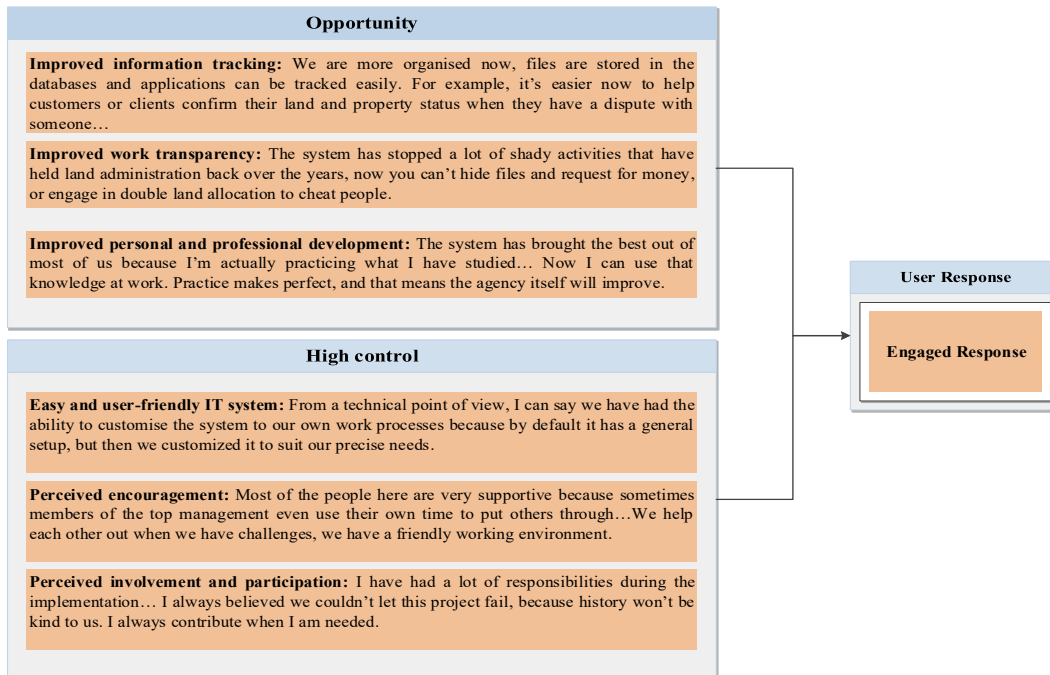
Engaged response: evidence chain for A09

Engaged response: evidence chain for A06

Khalipha Abubakar Nuhu

Opportunity

Improved personal and professional development: … With the system now, I'm even learning newer things than what I learned in University, so my skills are improving. I'm really happy that now I'm able to practice what I have learned at the University.

Safer data storage: you can always say that digital work is far better than analog work (paper-based), it's faster, and it's more accountable you can account for everything that has been done, since the system keeps access and usage logs, unlike paper files that can be misplaced or altered by anyone at any time.

High control

Adequate training: We went for a workshop/seminars with an NGO called 'E-health'. The workshop was really good because it involved the use of GIS technologies and techniques that helped us improve the way we work with our current IT system.

High self-efficacy: Basically, computers have been my life ...I have been using computers for over 15 years. That knowledge has been an advantage to me throughout this change. Because of it, I use the system easily without having any problems.

User Response

Engaged Response

Engaged response: evidence chain for A08

Summaries with chains of evidence for other participants within the compliant user response category in CASE A.

Opportunity

Improved information tracking: The new IT system has made keeping and tracking records easier and safer. Since files don't have to move physically from one office to another, the processes are faster, all you need to do is log in to your computer, and if you have access rights, you just go to a file and do what you need to do, that's all.

Improved work transparency: I think the biggest advantage offered by the system is the reduction in the level of fraud, because before people could hide a client's file and request money from the client, claiming they can speed up the processing for them, even though they are the ones that have slowed down the process.

Low control

Difficult and complex IT system: There are somethings we would want to adjust on the GIS module, but unfortunately, at the moment it's not possible and it has made my work more difficult.

Inadequate access to IT infrastructure: Lack of constant power supply is a major infrastructural issue. So, as far as there is no power, the system will definitely not work. The power in this building is epileptic, it is very difficult to have stable power that would last for 5 hours straight. Management has not fully supported us, to be honest. Not yet. Most of the computers we use are old, because they have been here for a while.

User Response

Compliant Response

Compliant response: evidence chain for A11

Khalipha Abubakar Nuhu

Summaries with chains of evidence for other participants within reluctant user response category in CASE A.

Threat
Perceived job uncertainty: There was too much confusion, today you hear staff saying the system will be implemented, tomorrow you hear a different thing. The worst part of it is now that the system has been implemented, there is a high level of uncertainty. Many people fear for their jobs, especially those that are not really good with computers.
Slowing down of work processes: I don't work or process files as fast as I used to do with the forms and paper-based system. I could process more applications before, the manager complains that we are slowing down the process intentionally, but I guess he won't understand the difficulty since he doesn't use the system to do his work
Reduced team work and interaction: Before the system, we usually worked in teams, the spirit was high because we also had interactive activities. That has changed now because mostly everyone does his work on a computer, and if not a problem arises, all we do is send each other documents. The human element is gone, and that's not good

Low control
Low Self-efficacy: I'm not an expert in the use of computers, all of this is new to me. My work relied on my filed expertise, and now I have to use computers more than I can imagine. I will be honest with you, it's a huge struggle, and it's something I'm not used to.
Perceived discouragement: In my unit, even the more experienced staff are complaining, let alone people like me, so it's not like I can go to them to teach me, because I might even be better than them. Honestly, it's not a good feeling, because then you are put in an awkward position, and you won't feel confident using the system yourself.
Ineffective management communication: A lot of rumours all over the agency. As we speak, we have not been really involved in most of the decisions, I don't even know what my new job role might be.

User Response
Reluctant Response

Reluctant response: evidence chain for A13

Summaries with chains of evidence for other participants within the engaged user response category in CASE B.

Opportunity
Safer data storage: Problems like applications being misplaced from moving physically from one office to another, staff delaying applications and requesting for money or documents being forged have been tackled with the use of the system.
Improved personal and professional development: Using the system has exposed me to some of the latest technologies in my field. It has improved my knowledge of my job, even though I have used AutoCAD before, with the new system, I'm learning new features on a daily basis.
Improved work transparency: The biggest problem we face in land administration, which is fraud, has almost been completely eliminated. The new system has improved transparency, we have fewer cases of fraud and our clients trust the agency more compared to before.

High control
High self-efficacy: I have been using computers at the office for over four years, and most of the things we did involve the use of computers even before the new GIS system, although then it wasn't mandatory…
Perceived encouragement: Our head of unit has been very helpful, he has encouraged us a lot. He even convinced some of the people that were scared they would lose their jobs, and that the system is not here to replace them, rather it's here to improve their productivity and give clients a better impression about the agency in general…
Adequate training: Training wasn't only about using the new system, people were grouped into different levels of computer literacy. Training started from the basics like computer operations, office packages and then to the system. I was really impressed by the training…

User Response
Engaged Response

Engaged response: evidence chain for B08

Khalipha Abubakar Nuhu
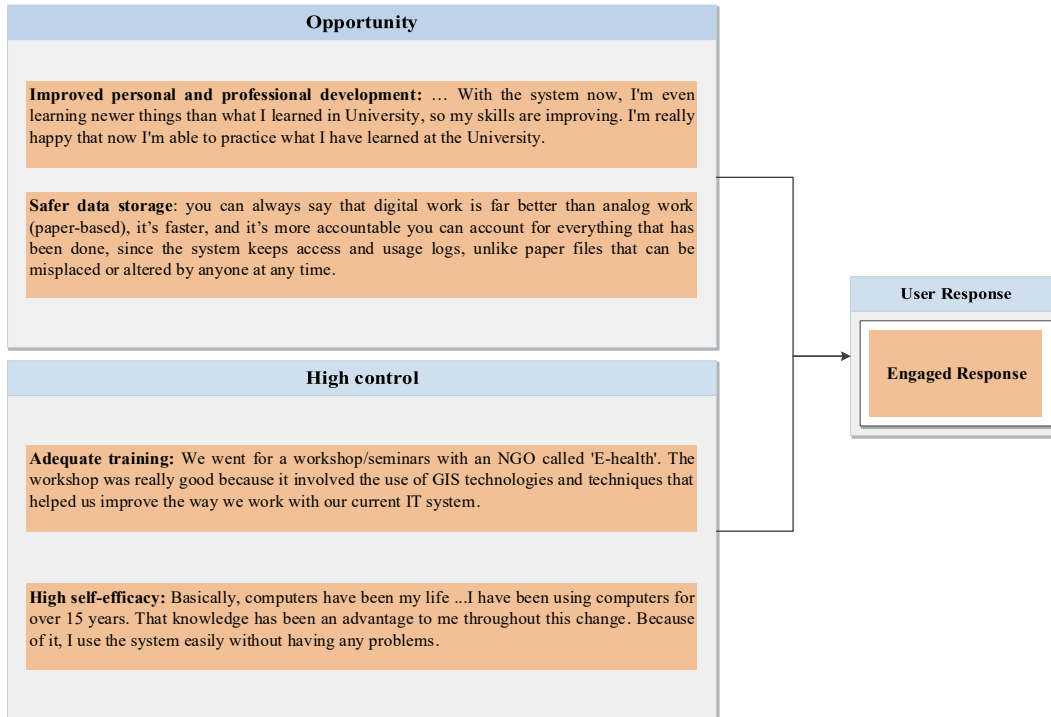
Engaged response: evidence chain for B13

Summaries with chains of evidence for other participants within the compliant user response category in CASE B.
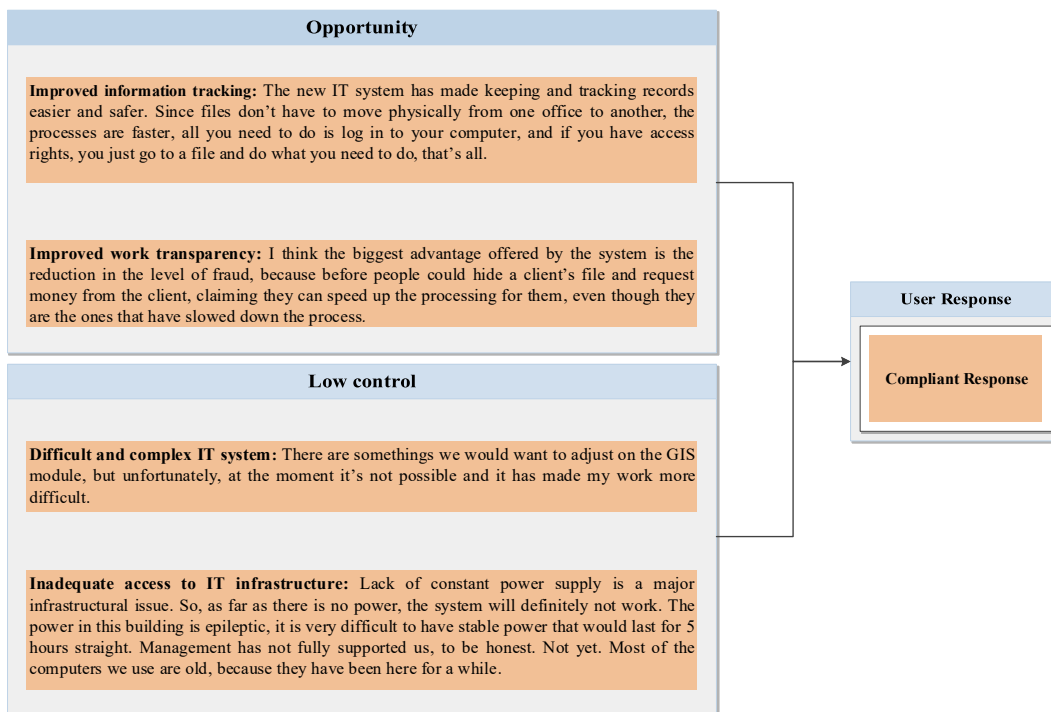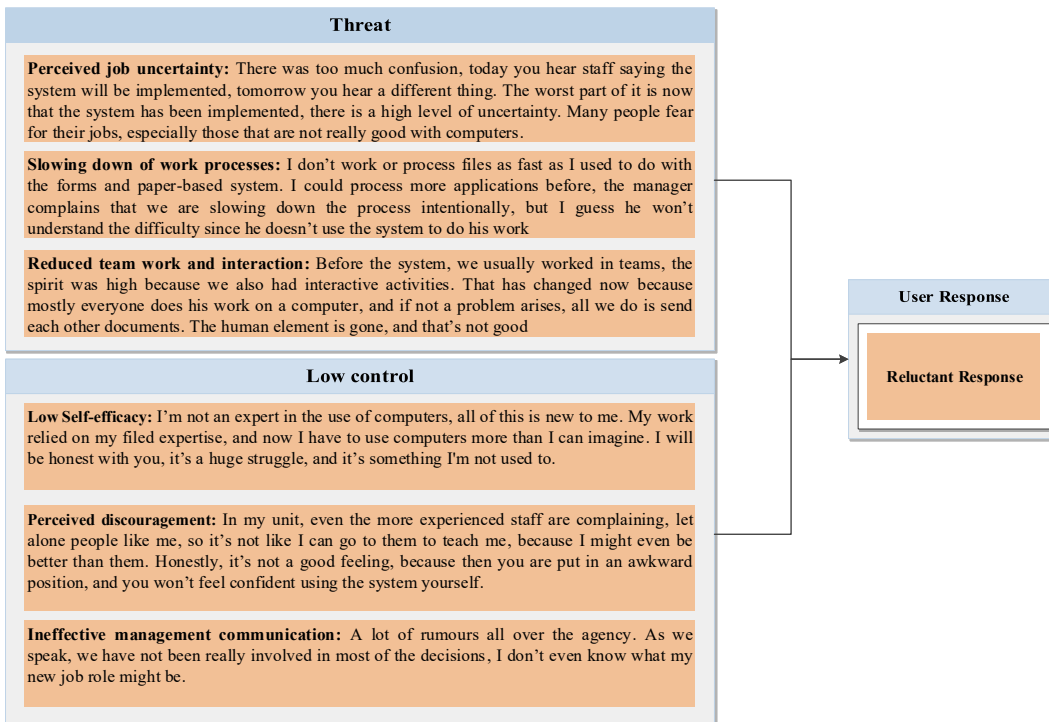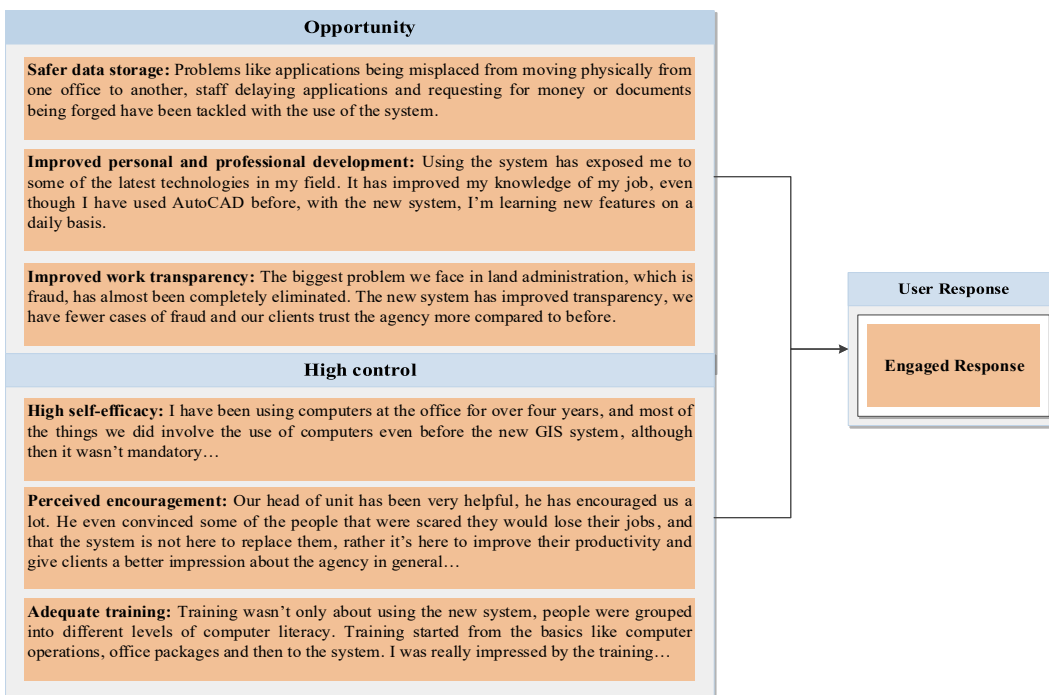

Compliant response: evidence chain for B06

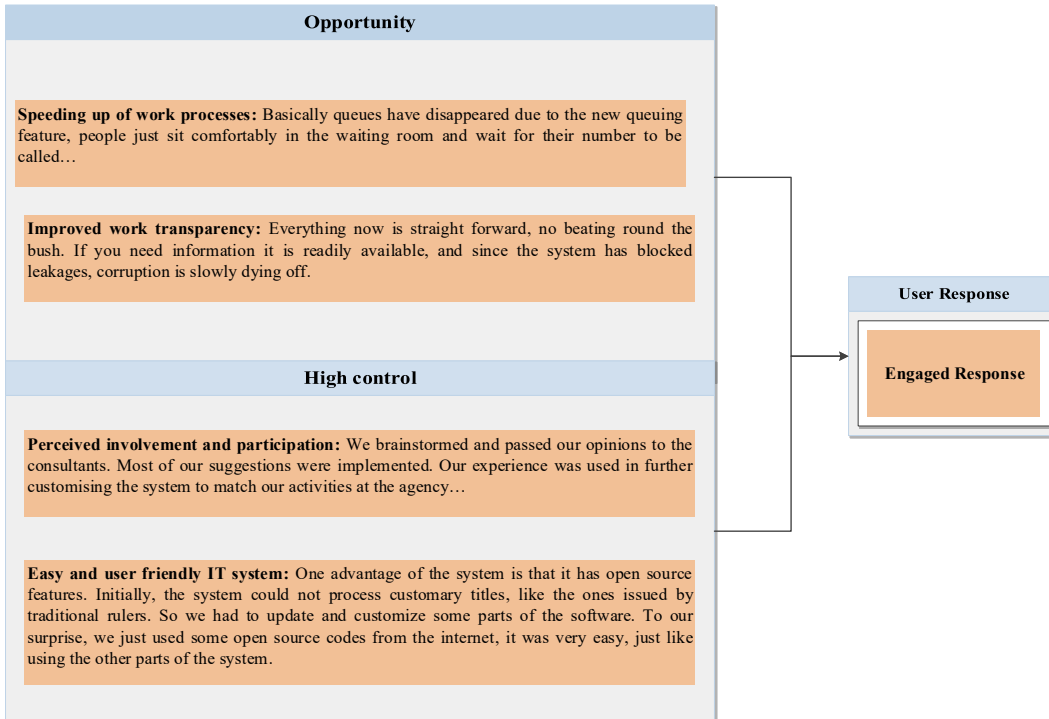Summaries with chains of evidence for other participants within reluctant user response category in CASE B.

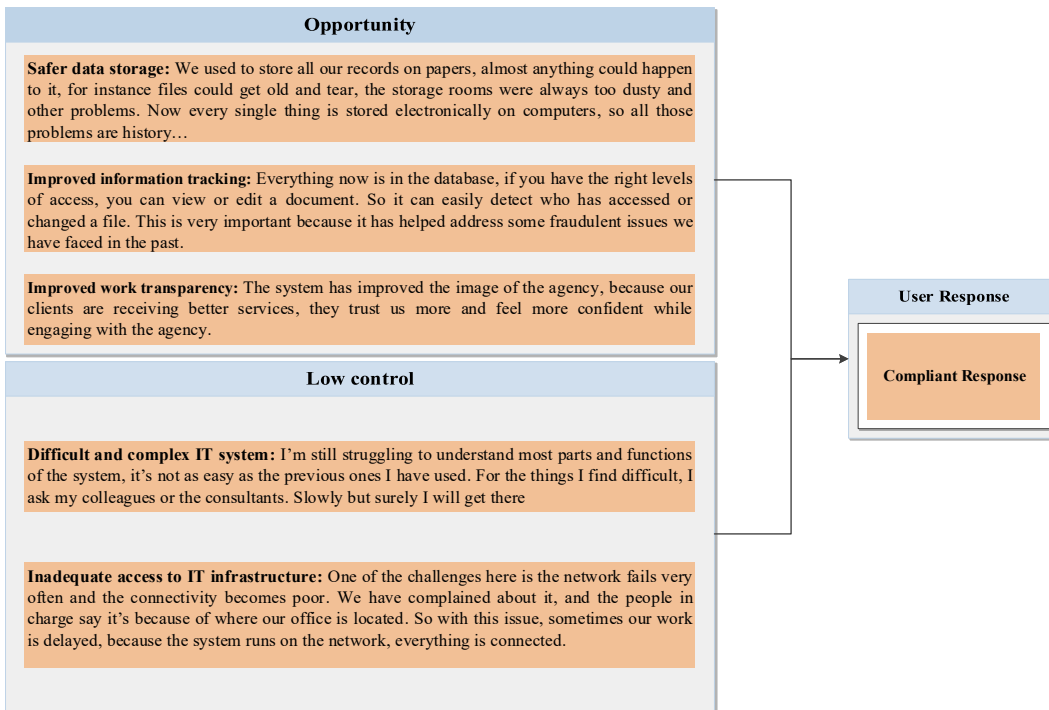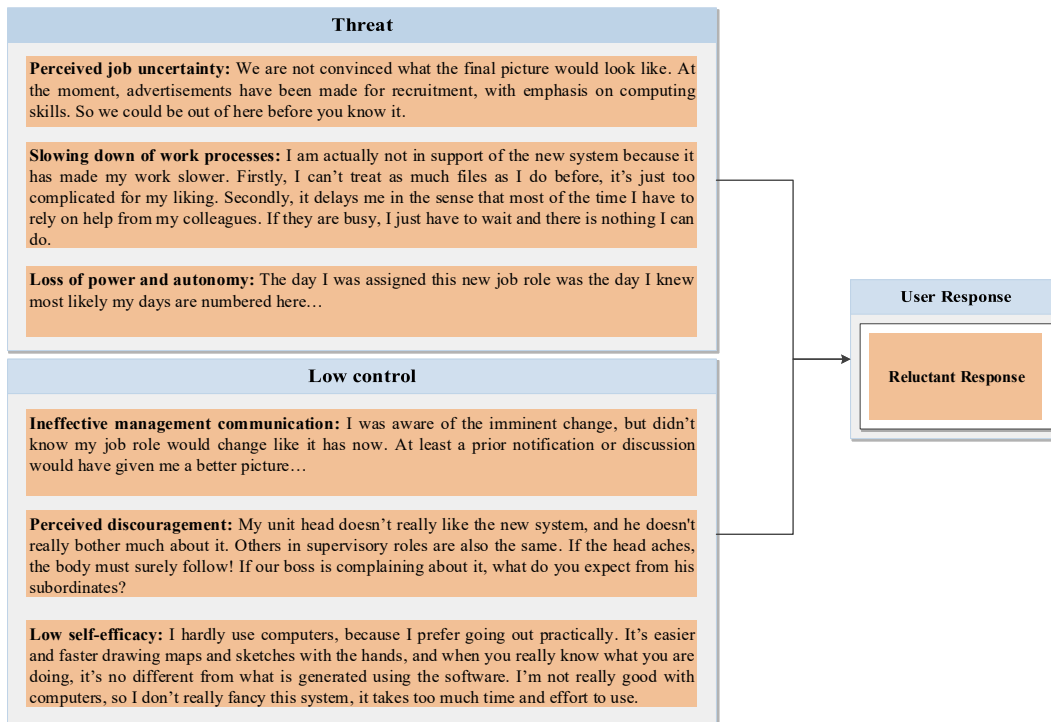

Threat
Perceived job uncertainty: We are not convinced what the final picture would look like. At the moment, advertisements have been made for recruitment, with emphasis on computing skills. So we could be out of here before you know it.
Slowing down of work processes: I am actually not in support of the new system because it has made my work slower. Firstly, I can't treat as much files as I do before, it's just too complicated for my liking. Secondly, it delays me in the sense that most of the time I have to rely on help from my colleagues. If they are busy, I just have to wait and there is nothing I can do.
Loss of power and autonomy: The day I was assigned this new job role was the day I knew most likely my days are numbered here…

Low control
Ineffective management communication: I was aware of the imminent change, but didn't know my job role would change like it has now. At least a prior notification or discussion would have given me a better picture…
Perceived discouragement: My unit head doesn't really like the new system, and he doesn't really bother much about it. Others in supervisory roles are also the same. If the head aches, the body must surely follow! If our boss is complaining about it, what do you expect from his subordinates?
Low self-efficacy: I hardly use computers, because I prefer going out practically. It's easier and faster drawing maps and sketches with the hands, and when you really know what you are doing, it's no different from what is generated using the software. I'm not really good with computers, so I don't really fancy this system, it takes too much time and effort to use.

User Response
Reluctant Response

Reluctant response: evidence chain for B10

Khalipha Abubakar Nuhu