THE CHALLENGE OF INTEGRATING INFORMATION AND COMMUNICATIONS TECHNOLOGY INFRASTRUCTURE TO ACHIEVE SUSTAINABLE ORGANISATIONAL CHANGE

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STATEMENT OF ORIGINALITY

The thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library**, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

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The Case Organisation:

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LIST OF PUBLICATIONS

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SUMMARY

This study explores the role of Information and Communications Technology (ICT) infrastructure in facilitating the sustainability of organisational change. The focus of this study centres particularly on ICT that facilitates knowledge transfer, and the effectiveness of the organisational change process and outcomes. Research examining ICT and organisational change prevalently addresses these two research fields as independent subject areas. Limited research exists on ICT and organisational change as interrelated factors. Studies concerning organisational change generally view ICT as an aspect of organisational change amongst other influential factors, rather than a driver. This study identifies that sustainable organisational change necessitates considering ICT as a facilitator of organisational change.

The findings of this study propose that in a technologically advanced era where organisations have increasingly turned to technology for competitive advantage, ICT enables organisations to enhance business sustainability through more robust intra and inter-organisational knowledge transfer, and streamline critical business processes for enhanced operational effectiveness. ICT improves adaptability and receptivity towards change, and as a result leads to enhanced business sustainability. Correspondingly, the role of HR departments is critical in endowing employees with the latest knowledge to embrace the latest technology with confidence, in order to maintain or enhance effectiveness at the individual and organisational level.

The findings complement the literature in validating a reciprocal link between ICT and organisational change, and support a wide consensus amongst management researchers that ICT has a positive flow on effect on organisational performance, through its ability to influence business practices. The study proposes that ICT and organisational change are major interrelated discipline areas. The Sustainable Technology and Change Linkage (STCL) Model developed in this study provides a managerial framework that potentially assists organisations in effectively utilising organisational resources, particularly organisations that are extensively ICT oriented, and similar to the organisation studied. This model also has the potential to enhance the compatibility of new technology with the existing culture of organisations, and achieve sustainability of technology and organisational change.

Keywords: Information and Communications Technology; Knowledge Transfer; Organisational Change; Leadership; Change Agency; Sustainability.

ABBREVIATIONS

CAQDAS	Computer aided qualitative data analysis software
CIO	Chief Information Officer
HR	Human Resources
ICT	Information and Communications Technology
IRD	Information Requirements Determination
IS	Information Systems
IT	Information Technology
KPIs	Key Performance Indicators
QASP	Qualitative analysis software package
RA	Requirements Analysis
RQ	Research question
SLA	Software License Agreement
SPI	Software process improvement
SQ	Sub question
UAT	User Acceptance Testing

Chapter 1

Introduction

1.1 Background to the Research

Effective ICT integration is a global challenge faced by organisations in undertaking organisational change involving ICT. New strategies are required to address the continually changing environment businesses face, which is increasingly competitive and global (Andrews, Cameron, & Harris, 2008; Cairncross, 2003; Nickerson & Silverman, 2009; Peng, Liu, & Tao, 2009; Primmer & Wolf, 2009). Technology has the potential to enhance organisational change outcomes (Barrett, Grant, & Wailes, 2006). Correspondingly, there is an increasing trend for organisations to integrate new technology, particularly in terms of collaboration tools. The adoption of ICT within organisations and society has risen due to increased availability, greater affordability, and simplified usability (Arlandis & Ciriani, 2010; Hughes & Scott Morton, 2005).

New technologies enable further collaboration within organisations (Cette, Kocoglu, & Mairesse, 2010). ICT has the potential to alleviate issues of isolation amongst individuals within organisations, which are typically encountered in traditional means of communication (Stephens, 2007). Cairncross (2003) highlighted some years ago that the Internet increasingly exhibits profound influence on organisational structures and many business practices, and that reality remains today (Cette, et al., 2010; Cette, Mairesse, & Kocoglu, 2004; Stephens, 2007). The Internet is progressively becoming a fundamental element of the ICT strategies adopted by organisations (Cascio & Shurygailo, 2008; Jameson, 2009; von Krogh, Spaeth, & Lakhani, 2003; Wakefield, Leidner, & Garrison, 2008). The challenge now is to complement electronic delivery channels with the physical delivery channels in order to realise the Internet's potential (Cairncross, 2003).

There is a widely shared view within the literature that ICT is one of several factors influencing the success or otherwise of organisational change (Kuruppuarachchi, 2000; Lyons, 2005; McKendrick & Wade, 2010; Rusu, 2007; Taylor & Helfat, 2009; Tusubira & Mulira, 2004; Watson, 2006). A contemporary model enabling a sustainable relationship between ICT and organisational change remains to be developed. This study works towards the development of such a model for linking ICT and sustainable organisational change, capable of tackling challenges encountered in organisational change when utilising ICT. The main objectives of this research are to understand the role of ICT in the sustainability of organisational change, and conceptualise the findings into a practical model for management practice. Figure 1.1 below indicates the sequence of subsequent sections of this chapter.

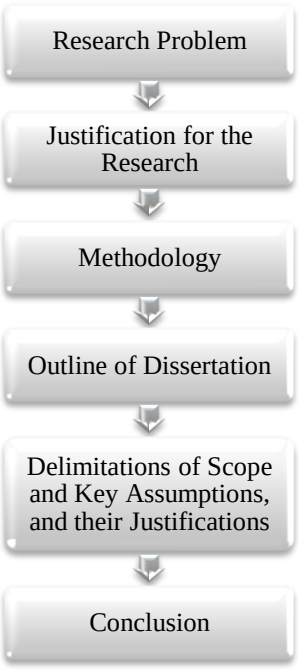


Figure 1-1: Structure for Introduction Chapter

1.2 Research Problem

The existing literature concerning the role of ICT integration in sustaining organisational change is limited. Research connecting ICT and organisational change as interrelated factors remains limited to a certain extent, particularly within studies of organisational development. Presently, the aforementioned subject areas have mostly remained as distinct subject areas. Whilst both research fields are common topics for discussion within studies of business and organisational development, an extensive discussion on these two discipline areas as interlinked concepts remains to develop. In this respect, a research question arises on the influence of ICT on organisational change, and building a sustainable relationship within these two critical elements of business sustainability. Thus, a preliminary review of literature of these two fields of research and their interconnections result in the following overarching research question:

> RQ: How does the integration of ICT infrastructure influence the implementation and sustainability of organisational change?

In addition, sub questions emerged to answer the primary research question, and link directly to the propositions defined in Section 2.7 respectively. The research sub questions are as follows:

> SQ1: What relationship exists between ICT infrastructure and organisational change?

SQ2: What relationship exists between ICT infrastructure and organisational performance following ICT change implementation?

SQ3: How does the integration of ICT infrastructure influence the momentum of change?

SQ4: To what extent do formalised training programs facilitate employee acceptance of ICT infrastructure change?

SQ5: To what extent does informal learning facilitate employee acceptance of ICT infrastructure change?

SQ6: To what extent does transparency in the communication of change facilitate the acceptance of ICT infrastructure change?

1.3 Justification for the Research

This study explores the effects of ICT infrastructure on organisational change, and the association of technology with knowledge transfer, change momentum, the scope of change, and human resources. In addition, the research proposes greater emphasis on technology within organisations, and its implications for employees and organisational sustainability, particularly where major organisational change is concerned. This study has the potential to streamline ICT infrastructure performance, in terms of relevance, usage, and acceptance, and significantly improve success rates in ICT integration.

In this perspective, the study potentially identifies and instils clarity on the underlying factors that continue to influence technology diffusion and infusion, and the successful integration of ICT for organisational change. The Sustainable Technology and Change Linkage (STCL) Model shown in Figure 5.2, combines observations of the literature and findings of the case study undertaken in this research. This model advocates a move to a new system of thinking for addressing implementation issues related to ICT integration. This model strives to create a management pathway to facilitate wider acceptance and utilisation of technology, through its defined association of organisational factors relevant to ICT implementation. The departure of the model from existing approaches to ICT and organisational change bears the possibility of creating a shift in attitude to facilitate enhanced awareness and acknowledgement of the critical role ICT plays in organisational change, and to the same extent, business sustainability.

1.4 Methodology

The unit of analysis for this study is the Australian branch of a multinational corporation operating in the computer networking industry. The basis of the case organisation selection was its recent organisational change involving the implementation of new technology, technology intensiveness, extensive focus on Information and Communications Technology, and in particularly, the application of ICT in communication. The premise of selecting the case organisation bases on the expectation that technology-intensive organisations exhibit attributes with a pronounced effect, which effectively magnifies less visible elements of ICT that otherwise remain potentially unexplored, to provide a holistic exploration of the issues surrounding the

research problem identified earlier. Further, the selection of a multinational corporation as the case organisation is justified in order to gain a local and global perspective on the role of ICT in organisational change, and enhance the transferability of the findings beyond the demographics of the studied organisation.

The qualitative approach employed in this study exhibits a constructivist approach within a single case study, to study the relationship between Information and Communications Technology and organisational change. The doctrine of the constructivist approach is to determine reality through people, rather than objective and external factors (Easterby-Smith, Thorpe, & Lowe, 2002, p. 59). The epistemological characteristics of transaction and objectivity in the constructivist approach enhance the knowledge and sophistication of a researcher through the progression of research (E. G. Guba & Lincoln, 1994). The study involved in-depth interviewing of 15 middle and senior management staff, in order to obtain multiple perspectives on the research problem. In-depth interviewing with a face-to-face and semi-structured approach expectantly provides the required strategy to address the research questions, and enhance the relevance and practicality of the emergent model shown in Figure 5.2.

1.5 Outline of Dissertation

This dissertation is developed within a five-chapter structure, as suggested by Perry (1998), and consists of an introduction, literature review, research design, analysis and findings, and a final chapter discussing conclusions, limitations, and future research. This approach is selected to ensure a unified structure, consistency, and a clear and

logical development of ideas (Perry, 1998). This initial chapter establishes the core of the research to identify at the outset its focus and delimitations, the circumstances in which the research problem emerged, and its implications in an organisational context. Figure 1.2 below conceptualises the outlay of this dissertation.

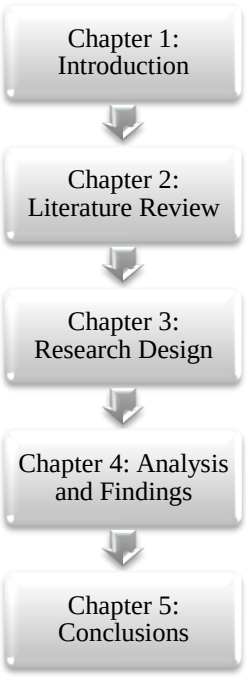


Figure 1-2: Dissertation Structure

Subsequently, Chapter 2 provides a summary of the literature, identifies literature gaps, and explores the initial conceptual model and propositions tested through the single case study employed in this research. Chapter 3 explores the methodology employed in this study, and discusses the elements pertaining to the research design and approach. Chapter 4 provides a summary and discussion of the research findings. Chapter 5 summarises the key findings within the context of ICT and organisational change, discusses the emergent model, highlights the theoretical and practical implications, limitations of the research, and describes potential future research.

1.6 Delimitations of Scope and Key Assumptions, and their Justifications

The researcher foresees this study identifying elements and characteristics pertaining to organisational change, provide an indication of the issues faced by organisations in integrating ICT infrastructure, and insight into implementing sustainable organisational change. Research findings depend on the abilities of interviewees to perceive, recall, and transmit their experiences (Bolman & Deal, 2003; Bryman & Bell, 2007). Interviews are subject to common issues of bias, poor recall, and poor or inaccurate articulation. The environmental awareness of research participants determines the information perceived, and subsequently, the amount of data available to researchers. Interviewees potentially provides important insights into affairs and events if participants are well-informed (Yin, 2009, p. 108).

Indeed, the outcomes of qualitative research are influenced to a great extent by the capacity of individuals to understand their surroundings (E. G. Guba & Lincoln, 1994; Lincoln & Guba, 1985). The relevance of the research to respondents is a determinant of the level of engagement exhibited by respondents (Easterby-Smith, et al., 2002). However, the influence of research participants is not limited to their motivations for involvement. The ability of an individual to interpret their surroundings has a profound effect on research findings (Veal, 2005). Participants respond differently depending on knowledge, beliefs, experiences, perceptions, attitudes, role within a setting, and understanding of phenomena occurring around them (Bolman & Deal, 2003; Marshall & Rossman, 2006; Silverman, 2006).

1.7 Conclusion

In conclusion, the existing research linking ICT integration and organisational change remains minimal, mainly focusing on these two research areas as separate and distantly related fields of study. The increasing robustness of technology requires a revision of existing implementation strategies to accommodate more complex information systems and technologies. Further research is required in this respect to provide a comprehensive understanding of the factors involved in this relationship. Thus, an exploration of Information and Communications Technology, knowledge transfer, and change management is required to gain better understanding of the relationship between these interplaying factors, and their implications for the successful implementation of ICT within organisations.

The main objective of this research is to facilitate greater understanding of the role of ICT in organisational change, in order to address a continued gap in the literature regarding the association between these two fields of study. In addition, this study seeks to bridge the gap in management practice through the development of a managerial framework linking ICT to the sustainability of organisational change. The succeeding chapter delves deeper into the body of knowledge surrounding ICT and organisational change, in order to build a foundation of knowledge.

Chapter 2

Literature Review

2.1 Introduction

The literature supports a strong positive relationship between investment in ICT infrastructure and organisational performance (Cette, et al., 2010; Cette, et al., 2004; Crespi, Criscuolo, & Haskel, 2007; Hughes & Scott Morton, 2005; Taylor & Helfat, 2009). However, the implementation of new technology is only beneficial to an organisation when the existing human systems and resources support its implementation (Cairncross, 2003; Cummings & Worley, 2009; Kuruppuarachchi, 2000; Stephens, 2007; Tusubira & Mulira, 2004). This section identifies the related body of knowledge, and knowledge gaps resulting in the research questions (see Section 1.2). Figure 2.1 below outlines the structure of succeeding sections in this chapter.

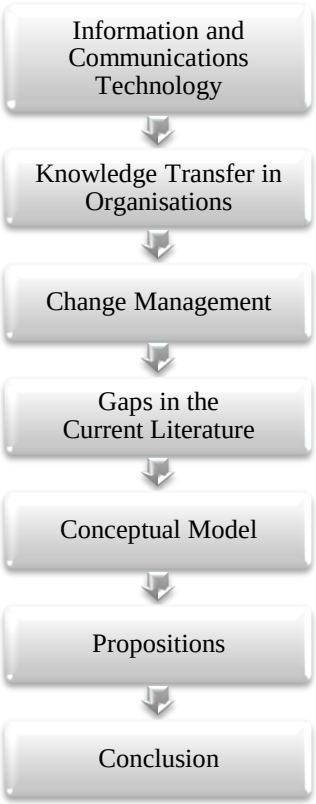


Figure 2-1: Structure for Literature Review Chapter

2.2 Information and Communications Technology

Organisations are increasingly turning to collaboration through ICT in light of increased global competition and rapid technological change. The ability of new technology to process information faster facilitates enhancements in business practices and management structures (Cette, et al., 2010). However, organisations still face difficulties in collaborating due to difficulties in managing such undertakings and the high rate of failure (Cairncross, 2003). Society now functions within a technological era (Shah, 2007). ICT has ingrained into the infrastructure of organisations (Fransman, 2009; Leonardi, 2007; Lyons, 2005; Mohapatra, 2011; Rusu, 2007). The benefits gained from ICT largely depend on the compatibility of existing structures and resources. The implementation of new ICT requires utilising existing assets, and the acquisition of new assets that are complementary and strategically aligned to the ICT being implemented (Arlandis & Ciriani, 2010).

Arlandis and Ciriani (2010) propose an ecosystem view of ICT, where an ICT ecosystem consists of contents, platforms, networks, and technologies. The authors imply that organisations compete in a level playing field. However, other research contradicts the view that organisations evenly compete in terms of technology. Studies of ICT implementations suggest that the level of ICT adoption, usage patterns, and the timing of technology adoption varies across individuals and organisations. Correspondingly, the increased use and effective integration of ICT within organisational structures is a source of competitive advantage (Berry & Nelson, 2009; McKendrick & Wade, 2010).

2.2.1 Information Requirements

Information Systems (IS) implementation is defined as "an organisational effort to diffuse an appropriate information technology within a user community" (Kwon & Zmud, 1987, p. 231). IS implementation is viewed as technological innovation (Ashry & Taylor, 2000). The characteristics and experiences of individuals influence successful technological innovation. Receptivity towards change and learning are the main factors in the successful adoption of technology (Kuruppuarachchi, 2000). Kwon and Zmud (1987) claim there are five major categories of factors influencing successful implementation of technological innovation in organisations. These concern individual, structural, technological, task-related, and environmental variables (Kwon & Zmud, 1987).

Within studies of IS implementation, it has long been held that organisational innovation comprises of three stages; initiation, adoption, and implementation (Ashry & Taylor, 2000). However, Kwon and Zmud (1987) propose an additional three stages of acceptance, use-performance-satisfaction, and incorporation. Rogers (1995) views innovation as a five-stage process entailing agenda setting, matching, redefining/restructuring, clarifying, and routinising. Organisational agenda and innovation compatibility is planned and designed at the matching stage (Rogers, 1995). Similarly, Koch, Lam, and Meyer (1996) propose viewing technology integration as a three-stage process involving Knowledge-Awareness, Evaluation-Choice, and Adoption-Implementation.

Recent studies support a link between the support of senior management staff in change initiatives, and the successful implementation of Information Systems. Discussions of Software Process Improvement (SPI) eventuate within studies of Information Systems implementation. SPI is defined as "large-scale, complex organization-wide change initiatives", which require significant human and financial resources (Ngwenyama & Nørbjerg, 2010, p. 303). The issue remains that professionals who are responsible for implementing technology within an organisation are delegated minimal authority to develop change frameworks for SPI, which as a result hinders the ability of professionals to undertake SPI and implement change. Thus, where inadequate support from management exists, SPI professionals rely on collaboration with organisational members (Muller, Mathiassen, & Balshoj, 2010).

Innovation diffusion theory is suitable for studies concerning "technology evaluation, adoption, and implementation" (Ashry & Taylor, 2000, p. 2). However, to acquire an understanding of the implications of innovation diffusion within organisations, distinct definitions of innovation and diffusion are required first. Organisational innovation is defined as "the adoption of an idea or behaviour that is new to the organisation adopting it" (Daft, 1978, p. 197). Diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 1995, p. 10). Hence, the diffusion of innovation is "the pattern of its adoption by an organisational population over time" (Swanson, 1994, p. 1071).

The nature of the operating environment influences innovation diffusion. Attributes of innovation, the organisation, and boundary-spanning all play important roles in diffusion. Particularly where market competition is strong, organisations exhibit greater receptivity to ICT. Within such a rapidly changing environment, organisations increasingly exhibit more rapid innovation diffusion (Ash & Goslin, 1997, p. 751). Innovation attributes are key determinants of "the spread of usage (internal diffusion) and depth of usage (infusion)" (Ash & Goslin, 1997, p. 751). Boundary-spanners are defined as people in roles that cross between the departments that implement the technology and the users (Ash & Goslin, 1997). Boundary-spanning between an organisation and the surrounding environment needs to take place in order to propagate the spread of IT usage (Lysonski & Woodside, 1989).

Ashry and Taylor (2000) propose viewing requirements analysis (RA) as an early stage of information technology diffusion into an organisation (Ashry & Taylor, 2000, p. 3). Requirements Analysis (RA) is defined as "the process of eliciting, gathering, modelling, specifying, and analysing data and information that are needed either to automate an organisational task or to support the decision-making process of knowledge workers" (Ashry & Taylor, 2000, p. 3). Requirements analysis (RA) is a formal process of collecting in-depth information, and culminates in technology acquisition. The nature of RA is to develop activities enabling the implementation of a proposed system in order to address a specific problem or opportunity (Ashry & Taylor, 2000). The RA process is potentially linked to the Evaluation-Choice stage of the medical technology adoption model developed by Koch, Lam and Meyer (1996).

However, RA continues to remain inadequate, as the majority of IS implementations require revision to achieve, at a minimum, partial fulfilment of the information requirements of management (Ashry & Taylor, 2000). The authors also find that a lack of association exists between Information Requirements Determination (IRD) strategies and innovation diffusion theory. Existing research on the development of IRD strategies has touched on development efforts, user-community characteristics, technology characteristics, environmental characteristics, and task characteristics (Ashry & Taylor, 2000, p. 3).

2.2.2 Role of ICT in Organisational Change

Organisations are increasingly seeking the use of technology to enhance operational sustainability (Cairncross, 2003). Technology also has the potential to enhance the outcomes of organisational change initiatives (Albritton, 2010; Crespi, et al., 2007; Kuruppuarachchi, 2000; Rusu, 2007). New technologies enable further collaboration within organisations, and innovation is also enhanced through the improved ability to share information and expertise (Stephens, 2007). Importantly, the characteristics of innovation are crucial predictors of successful implementation, and determine the benefits of ICT, particularly when ICT is extensively used (Ash & Goslin, 1997).

Organisations face a challenge in promoting understanding and creativity in change initiatives through utilising Information Technology. Technological-use mediation (TUM) is one approach to creativity achieved through employing a certified group of individuals within an organisation to modify technology for alignment with end-user needs. These individuals are responsible for implementing boundaries for the use of

technology. Correspondingly, the technology frames of reference (TFR) model considers the knowledge and level of comprehension of individuals regarding certain technology (Albritton, 2010).

Poor design and complexity of ICT is a common problem, which arises due to the availability of software and hardware (Ashry & Taylor, 2000). ICT implementation has the potential to increase demands on employees, and results in elevated levels of stress. Other effects are identified to be "mental and physical exhaustion, fatigue, irritability, decreased productivity, and feelings of low self-esteem and professional failure" (Mudge & Swiger, 2007, p. 407). Further, lack of trust potentially arises from inappropriate planning, setting up, and costing of IT projects. Equally important is the issue of negated integration through the dichotomy of infringement of privacy and sharing of information. In addition, undefined responsibilities pose a threat to the successful diffusion of technology (Ashry & Taylor, 2000).

Radical change in technology poses risks to change recipients. Whilst a general view exists within the literature that incremental change in technology is not subjected to such risks, frequent incremental change potentially disadvantages organisations due to minimal value creation. This is attributed to inadequate planning of technological change, and the associated disruptions caused due to the prolonged use of resources in change activities (McKendrick & Wade, 2010). The sustainability of organisations to a great extent rests on their capabilities in recognising and responding to opportunities and threats that are presented by changes in ICT (Hughes & Scott Morton, 2005).

2.3 Knowledge Transfer in Organisations

Knowledge is a socialisation process, and to a great extent informal, whereby it is gathered "through observation, induction and increasing participation, rather than formal inquiry" (Eraut, 2000, p. 122). Training programs further facilitate knowledge transfer at an organisational level. Training provides members of an organisation with knowledge, skills (Elena P. Antonacopoulou, 2006), and area-specific knowledge (E. P. Antonacopoulou, 2006). The learning that occurs within an organisation is affected by shortcomings in existing systems that are employed in the transfer of knowledge (Schimmel & Muntslag, 2009).

In this respect, transparency becomes relevant when studying knowledge transfer, and is increasingly vital to organisations. Transparency in communication has become increasingly important to organisations (Cairncross, 2003). Transparency is defined as "letting the truth be available for others to see if they so choose, or perhaps think to look, or have the time, means, and skills to look" (Oliver, 2004, p. 3). However, Oliver (2004) argues this is a long-held view, and that transparency is now moving towards 'active disclosure'.

2.3.1 Learning within Organisations

Knowledge transfer entails cross-learning among specialists and organisational members, results in the successful implementation of organisational change (Kieser & Koch, 2008). Formal education and training assists individuals to adapt to environmental changes in an organisation (Casey, 2005). Training programs create well-

informed individuals who subsequently utilise a system confidently and effectively. Training involves learning (Elena P. Antonacopoulou, 2006). The majority of learning initiatives have involved formal training, and as a result have been unable to achieve consistency in the retention of information in terms of the period of time knowledge is held (E. P. Antonacopoulou, Ferdinand, Graca, & Easterby-Smith, 2005).

Learning and knowledge transfer are paramount to successful organisational change, as these assist in resolving technological issues associated with implementing an innovation (Chinowsky & Carrillo, 2007; Cummings & Worley, 2009). Integrating previously distinct knowledge areas is the approach used for developing most new technology. However, such use of knowledge is limited to a small number of companies and research organisations who have the extensive knowledge required. Organisations potentially resolve this issue through collaboration (Barnes, Pashby, & Gibbons, 2000). Thus, ICT integration concerns both the technological issues associated with the innovation being implemented, and the marketing of the innovation to organisational members (Ash & Goslin, 1997).

2.3.2 Role of ICT in Knowledge Transfer

ICT enhances knowledge transfer through digital convergence, whereby unified communications enables the relaying of auditory and visual information within synchronised communication systems. Within ICT firms, convergence has taken increasing importance in driving organisational strategies. Digital convergence is enabling organisations to deliver information in different ways to suit the differing information needs of individuals. Convergence is argued to drive innovation in

telecommunications and transgress communication boundaries (Arlandis & Ciriani, 2010). Organisations also use text-based communication extensively. However, limited effectiveness is achieved when technology is used in isolation (Hughes & Scott Morton, 2005). Particularly in communication technologies, use of text-based technology in a combinatorial approach with other communication methods is feasible (Stephens, 2007).

Cairncross (2003) argues that new technologies are simultaneously reducing the cost and increasing the rate at which information is processed, transmitted, and stored. Technology has the potential to enhance internal communications in organisations by providing staff with access to corporate news and views (Cairncross, 2003). Chinowsky and Carrillo (2007) contradict the consensus view that whilst technology has positive implications for learning, information systems disturb learning in an organisation. Increasing the use of ICT potentially creates information overload, and possibly results in non-response or ignorance of communications (Stephens, 2007, pp. 499-500). However, Chinowsky and Carrillo (2007) also argue that IT is a crucial source of support for learning and the transfer of knowledge.

ICT has a significant impact on the ability of an organisation to communicate globally, and increase time availability for employee collaboration. Further, ICT is enabling organisations to select the most appropriate staffing for carrying out projects. As a result, the use of virtual teams is becoming an increasingly important part of knowledge management strategies within organisations. The applicability of virtual teams is considered to be wide reaching, and includes “research and development, customer support, software development, and product design” (Wakefield, et al., 2008, p. 434).

Organisations further facilitate acceptance of new technology through computer literacy and training. Organisations most likely benefit from an onsite training centre (Ashry & Taylor, 2000).

2.4 Change Management

There is wide consensus that organisational change is an important topic in management research (Isckia & Lescop, 2009; Street & Gallupe, 2009; Uwah, Ewa, & Edu, 2009; Visser & Crane, 2010). There is also wide consensus that the process of organisational change is one of great complexity (Albritton, 2010; Cummings & Worley, 2009; Peng, et al., 2009; Reissner, 2005; Street & Gallupe, 2009; Yolles & Iles, 2003). In this respect, a greater understanding of organisational change is imperative. Gupta (2005) refers to change as any "modification of status quo, which occurs in the overall work environment of an organization" (p. 1) (p. p. 1) (p. p. 1) (p. 1). Organisational change is the subsequent process of assigning resources for change implementation and adoption (Reissner, 2005).

Organisational change involves questioning current practices. Thus, change inherently involves confronting conflict. In this respect, the ability of an organisation to implement successful organisational change is dependent upon the conflict resolution capabilities of leaders (Holmes & Marra, 2010). Two basic objectives of organisational change are recognised by Gupta (2005) as "changes in an organisation's level of adaptation to its environment" and "changes in the internal behavioural patterns of employees" (p. 3) (p. 3) (p. p. 3) (p. 3). Change is viewed as a cyclical process, alternating between clarity

and ambiguity, and leading to greater clarity at the end of the cycle. Ambiguity is a potential product of change, and organisations are required to identify and understand ambiguity to facilitate clarity in the change process (Corley & Gioia, 2004).

2.4.1 Change Stimulus

Organisational change is stimulated when a need for change emerges. Change arises as organisations are subjected to shifts in the operating and external environment in the form of planned, unplanned, frequent and diverse changes (Casey, 2005). Internal change is required as external forces emerge, such as "enhanced competition, technological advancements, government legislation and compelling social requirements" (Gupta, 2005, p. 3). Governments have encouraged organisations to identify ways of improving efficiency in innovation in light of increased competition at an international level, and rapid advancements in technology, in order to enhance wealth creation. From an industry point of view, these rapid changes have increased the difficulty to sustain competitive advantage (Barnes, et al., 2000).

The source of change is influential in the nature and implications of organisational change, and drivers of change are broad and varied (Ash & Goslin, 1997). Forces of change develop stress at an individual and organisational level. External sources of pressure resulting in stress consist of "threats from competitors, declining profits, decreasing market share, scarcity of resources, deregulation, technological demands, and problems with suppliers and groups of customers" (Kets de Vries, Guillen, & Korotov, 2009, p. 4).

Internally, organisational policies, procedures, and politics are key determinants of the implications of change, and how change is potentially influenced by leadership, culture, and structure (Cummings & Worley, 2009). Stress-causing internal pressures comprise of "ineffective leadership, morale problems, a high turnover of capable people, absenteeism, labour problems, increased political behaviour in the company, and turf fights" (Kets de Vries, et al., 2009, p. 4). The scope of change is also an influential factor in organisational change, and the attitude and commitment of employees towards change (Street & Gallupe, 2009). The characteristics of organisational change are crucial predictors of successful change implementation (Ash & Goslin, 1997).

Individual and organisational stress facilitates change, which is caused by ignorance of changes in the operating environment, and a realisation that existing practices are not sustainable (Kets de Vries, et al., 2009, p. 3). Learning leads to change (E. Antonacopoulou & Chiva, 2007), and change itself potentially causes further change (Hannan, Polos, & Carroll, 2003). Change is a constant, and as such, organisations "need to recognise change as a process rather than an event" (Gupta, 2005, p. 1). Organisational change requires an environment receptive to change to ensure its success (Elena P. Antonacopoulou, 2006). Developing change consciousness amongst employees to facilitate change acceptance and unified direction of individual efforts (Uwah, et al., 2009).

The time in which change is implemented also determines how change is approached by an organisation, and the pace in which change is implemented affects organisational change outcomes (Street & Gallupe, 2009). The momentum of change is defined as "the energy associated with pursuit of a change goal" (Jansen, 2004, p. 276). The momentum

of organisational change is characterised by the velocity, rate of recurrence, and period over which change is implemented. Within ICT firms, change momentum in technology is internalised when organisations are able to master and facilitate autonomy in technology through the control of ICT infrastructure. In this respect, internalisation involves learning from external sources, and adopting growth strategies employed in other organisations. Gaining self-sufficiency within technological change momentum enables organisations to remain independent in their innovation and gain competitive advantage (Arlandis & Ciriani, 2010).

2.4.2 Human Resource Management

Culture forms the foundation of an organisation, and reflects in all operational aspects. Organisational culture establishes behaviours and interpretations of surroundings, interactions and events (Shah, 2007). Meyer, Hecht, Gill, and Toplonytsky propose that organisational culture comprises four components, which consist of human relations, open systems, internal process, and rational goal. Shah defines organisational culture as "the collection of norms, values, beliefs, expectations, assumptions, and philosophy of the people within it" (2007, p. 4). Organisational culture is a critical aspect for consideration in organisational change, as this underlying factor affects organisations in their entirety, in terms of attitudes to work, and how individuals respond to their environment (Meyer, Hecht, Gill, & Toplonytsky, 2010).

Employees are a source of resistance in organisational change. Individuals across an organisation exhibit varying levels of resistance to change. The cognitive capabilities and expectations of employees towards organisational change differ at the individual

level (Smollan, Sayers, & Matheny, 2010). The cultural fit of individuals within organisations is particularly important in changes affecting organisational culture. Correspondingly, the link between individual perceptions of culture, and the actual cultural fit of individuals, plays a role in commitment to organisational change. In this respect, commitment to change by organisational members is a product of individual cultural fit with an organisational culture. The compatibility between an organisation and individual determine employee commitment to change, and employee turnover (Meyer, et al., 2010). Employee satisfaction and motivation is borne by the organisational culture. Leaders are challenged to develop an organisational culture and HR practices to retain highly-skilled employees (Shah, 2007).

Diversity of individual experiences in the change process influences organisational change. Individual encounters with organisational change differ at both the individual and group level. In addition, it is important to consider how employees interpret organisational change (Parish, Cadwallader, & Busch, 2008). In order for organisational change to enhance productivity, the commitment of individuals is required to ensure the successful implementation of change (Cummings & Worley, 2009; Parish, et al., 2008). Taylor and Helfat (2009) concur with this view, proposing that the link between technology implementers and asset enablers is subject to economic, structural, social, and cognitive factors. The successful adoption of new technology within an organisation involves creating a link between the employees implementing technology, and employees responsible for organisational assets assisting the adoption of new technology (Taylor & Helfat, 2009).

Changes in technology potentially require organisations to implement radical technological change, and are typically resource-laden. Thus, in the implementation of major technological change, Managers must utilise the expertise and potential of existing resources, which are complementary to the new technology adopted (Taylor & Helfat, 2009). Whilst organisations implement a well-developed change structure, increased workload resulting from organisational change is potentially unavoidable. However, organisations reduce strain on human resources and enhance employee morale through facilitating an environment supportive of employees at a social level (Mudge & Swiger, 2007; Smollan, et al., 2010). Tarnoff (2009) proposes employing multidisciplinary teams consisting of individuals dispersed across various departments to implement organisation-wide evaluation. The use of multidisciplinary teams within the assessment process facilitates unification of the culture across an organisation, and promotes enhanced focus on learning (Rankinen, Suominen, Kuokkanen, Kukkurainen, & Doran, 2009; Tarnoff, 2009).

2.4.3 Leadership

The leadership of an organisation is an influential element in organisational performance (O'Keefe & Wright, 2010). Management support during the change process influences organisational change outcomes (Rubin, Dierdorff, Bommer, & Baldwin, 2009). The robustness of change exhibits a positive relationship to control and support. Middle management staff plays a key role in enabling and sustaining this linkage through encompassing a diversity of skills across an organisation (Taylor & Helfat, 2009). In this respect, the role of leadership in valuing human resources and conveying this sentiment towards employees is pivotal in establishing a positive

organisational culture (Kets de Vries, et al., 2009, p. 2). Correspondingly, leaders play a pivotal role in establishing the direction of an organisation (Kets de Vries, et al., 2009). The literature points to a reciprocal role between leaders and organisational members in the strategic planning process (Kets de Vries, et al., 2009; O'Keefe & Wright, 2010; Rubin, et al., 2009; Taylor & Helfat, 2009).

Whilst leaders are required to guide the decisions of employees in achieving organisational objectives, leaders need to consider the perspectives of individuals across an organisation in decision-making, and incorporating feedback into strategy development. However, it is observed in the literature that despite a need for organisational change, dominance of leadership aspirations in strategic decision-making is exhibited, which potentially inhibits the acknowledgement and consideration of 'critical voices' (O'Keefe & Wright, 2010).

Leadership attitude towards change reflects in the commitment of employees to organisational change initiative. The cynicism of leaders towards organisational change inflicts influence on change outcomes and organisational performance (Rubin, et al., 2009). CEO and senior management commitment contribute to developing a positive work environment (Kets de Vries, et al., 2009, p. 2). The literature within the field of SPI also highlights the important role of senior management commitment in the success of SPI initiatives (Muller, et al., 2010; Ngwenyama & Nørbjerg, 2010). Developing changes in mindset is a more involved task, and requires collaboration at an organisational level (Kets de Vries, et al., 2009, p. 12).

Managerial inertia and flexibility are therefore influential in organisational change, and exhibit a dynamic and fluid relationship (Zhang & Kong, 2009). There is also wide consensus in the literature on the importance of employing an appropriate leadership style that is compatible with organisational change initiatives (Bommer, Rich, & Rubin, 2005; Jung, Chow, & Wu, 2003; Kets de Vries, et al., 2009; Lowder, 2007, 2009a, 2009b; Nahrgang, Morgeson, & Ilies, 2009; Rubin, et al., 2009). An adaptive approach to organisational behaviour is required for sustained competitive advantage (Kets de Vries, et al., 2009, p. 2). Zhang and Kong (2009) argue the importance of balancing managerial inertia and flexibility, as excessive flexibility minimises the sustainability of organisational change.

The effective implementation of organisational change envisages consultation with stakeholders affected by change throughout the entire change process (Rankinen, et al., 2009). Key aspects of effective leadership that result in successful organisational change include communication of the rationale for change, the ability to gain the support of employees to implement change, and the evaluation of change implemented (Ray & Goppelt, 2011). Another key role of leadership is to proactively recognise stalling of the strategic planning process (O'Keefe & Wright, 2010). Leadership is effective when the values of leaders are evident across all levels of hierarchy. In this respect, the ability of a leader to provide a clear articulation of vision is key (Kets de Vries, et al., 2009, p. 2).

Thus, the critical influence of leadership becomes apparent in strategic planning (O'Keefe & Wright, 2010). Correspondingly, foresight is crucial in identifying potential problems during the planning process, and proactively implementing solutions to potential future problems. The consideration of factors influencing organisational

change is critical to undertaking effective action during the organisational change process (Rankinen, et al., 2009). Successful organisational change requires leaders to "simultaneously address the "hard" issues (structures, technology and systems) and "soft" issues (corporate culture and values)" (Kets de Vries, et al., 2009, pp. 12-13).

2.5 Gaps in the Current Literature

Studies of ICT and organisational change are extensive (Albritton, 2010; Ash & Goslin, 1997; Barrett, et al., 2006; Crespi, et al., 2007; Kuruppuarachchi, 2000; Leonardi, 2007; McKendrick & Wade, 2010; Muller, et al., 2010; Nistor, Hanzu-Pazara, & Adascalitei, 2009; Rusu, 2007; Tusubira & Mulira, 2004; Volkoff, Strong, & Elmes, 2007). Limited discussion exists on specific ICT systems facilitative of organisational change and sustainability, and the complementary organisational assets of ICT (Meyer, et al., 2010; Stephens, 2007; Taylor & Helfat, 2009). Further, studies of different forms of ICT in organisational change have taken a broad approach (Arlandis & Ciriani, 2010; Fransman, 2009; Lyons, 2005), requiring further exploration for enhanced understanding and improved management practice. In this respect, the first research sub question becomes evident.

SQ1: What relationship exists between ICT infrastructure and organisational change?

Whilst some research exists inquiring into the role of ICT in productivity (Cette, et al., 2010; Crespi, et al., 2007; Hughes & Scott Morton, 2005), these generally focus on the

use of ICT in day-to-day business. The relationship between ICT and environmental sustainability also remains relatively unexplored in the context of organisational change. There is limited discussion of how ICT sustains organisational performance immediately following the implementation of ICT change. These shortcomings in the literature lead to the development of the second research sub question.

SQ2: What relationship exists between ICT infrastructure and organisational performance following ICT implementation?

Whilst change timing and momentum are generally viewed as critical considerations of organisational change (Jansen, 2004; McKendrick & Wade, 2010; Ray & Goppelt, 2011; Smollan, et al., 2010; Zhang & Kong, 2009), limited discussion exists on the role of ICT in change momentum, leading to the third research sub question.

SQ3: How does integrating ICT infrastructure influence the momentum of change?

The role of training in organisational change is well versed in the literature (Behaghel, Caroli, & Roger, 2011; Chen, 2008; Leonardi, 2007; Smith, Oczkowski, Noble, & Macklin, 2004). However, the role of training in ICT change remains relatively unexplored. This leads to the development of the fourth research sub question.

SQ4: To what extent do formalised training programs facilitate employee acceptance of ICT change?

Informal learning is a common form of learning encountered in organisations in the day-to-day interactions of employees with peers and stakeholders (Barchiesi, Battistoni, Iacobone, & La Bella, 2008; Eraut, 2000; Leonardi, 2007; Wray & Fellenz, 2007). Although an in-depth exploration of the role of informal learning in facilitating the acceptance of ICT change remains to eventuate. Consequently, a review of the literature results in the discovery of the fifth research sub question.

SQ5: To what extent does informal learning facilitate employee acceptance of ICT change?

The role of communication in facilitating successful organisational change is studied exhaustively (E. Antonacopoulou & Chiva, 2007; Chen, 2008; Chinowsky & Carrillo, 2007; Lucas & Kline, 2008; Ruel & Magalhaes, 2008). Communication during organisational change is widely accepted to provide clarity and vision (Alvesson & Sveningsson, 2003; Cairncross, 2003; Leonardi, 2007; Ma, 2009; Parish, et al., 2008; Schimmel & Muntslag, 2009; Wray & Fellenz, 2007). The role of transparency is also viewed as critical to successful organisation change (Berry & Nelson, 2009; Ifrim, Militaru, & Daraban, 2009; Oliver, 2004; Schimmel & Muntslag, 2009). However, limited research exists regarding the role of transparency in facilitating receptiveness to ICT change. Thus, a review of the literature leads to the sixth and final research sub question.

SQ6: To what extent does transparency in the communication of change facilitate the acceptance of ICT change?

In light of the identified research questions, further research is required to provide a comprehensive understanding of the factors influencing the relationship between ICT and organisational change. A comparative table of the reviewed literature (shown in Appendix D) provides a summary of the contributions and limitations of the existing literature encompassing the research problem addressed in this research.

2.6 Conceptual Model

Based on a review of the relevant literature, a conceptual model ensues, correlating ICT, business processes, change management, and knowledge transfer. The association between the four main constructs shown in the conceptual model below in Figure 2.2 demonstrates that organisational change implementation involves a synergy between ICT, knowledge transfer, organisational change, and business processes. The conceptual model incorporates the propositions outlined in Section 2.7, and categorises the respective research fields addressed in the research questions identified in Section 1.2.

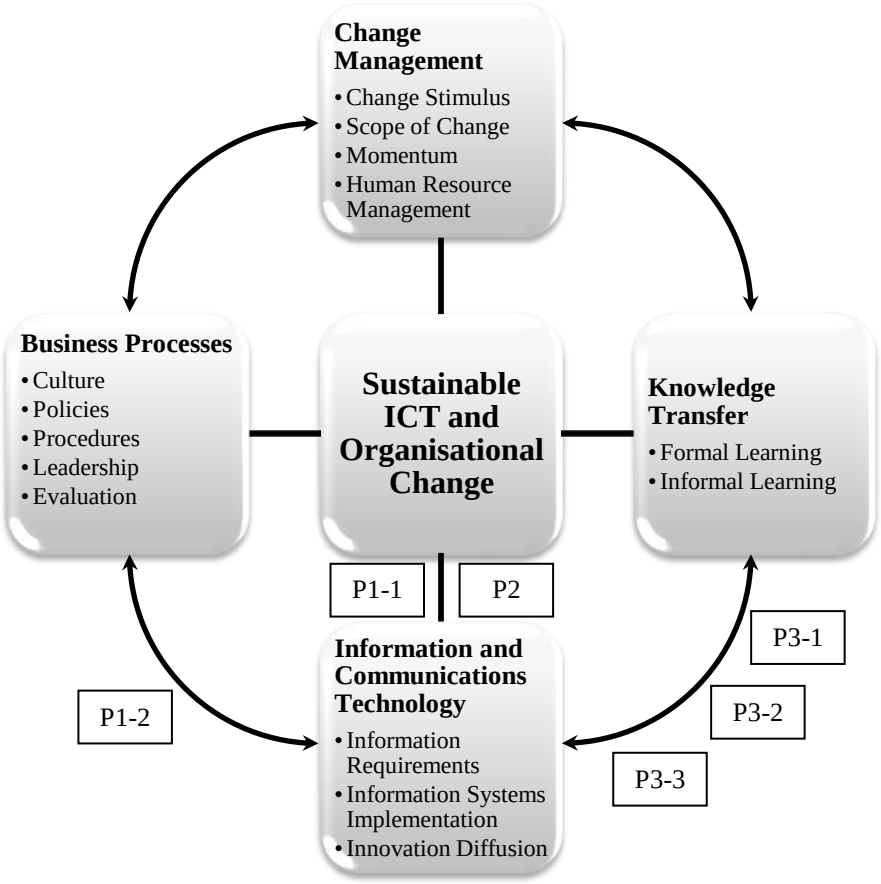


Figure 2-2: Conceptual Model - Sustainable ICT and Organisational Change

From an investigation of the literature, there is evidence that a balance of these elements is required to eliminate backlash from contrasting sub-elements attributed to the relationships defined in the conceptual model. The placement of the propositions within the literature is according to the respective association lines in the conceptual model. The positions of the propositions in the conceptual model in Figure 2-2 are as follows:

- Proposition P1-2 concerns the relationship between business processes and ICT;
- Propositions P1-1 and P2 concern the relationship between ICT and change management; and

- Propositions P3-1 through P3-3 concern the relationship between knowledge transfer and ICT.

2.7 Propositions

This study explores the influence of ICT infrastructure on organisational change and performance, and examines the influence of knowledge transfer within this relationship. It is anticipated that the propositions are further refined as the research progresses through a semi-structured interview approach. To answer the research sub questions set out in Section 1.2, around which this study is primarily developed, the following corresponding propositions are tested.

P1-1: Organisations facilitate sustainable change through integrating ICT infrastructure.

P1-2: Organisations increase performance in regular business processes through integrating ICT infrastructure.

P2: Organisations increase the perceived momentum of organisational change through integrating ICT infrastructure.

P3-1: Organisational members accept ICT infrastructure change following a formalised training program.

P3-2: Organisational members accept ICT infrastructure change following informal learning.

P3-3: Organisational members accept ICT infrastructure change when leaders clearly communicate the purpose for implementation.

2.8 Conclusion

A discussion of the theoretical and practical gaps leading to this research, and a review of the literature surrounding ICT and organisational change, establishes a firm foundation upon which to build knowledge, and to a certain extent, provide direction in the exploration of the propositions outlined in Section 2.7 above. This chapter provides a stepping-stone for the subsequent definition and exploration of the research techniques employed to address the research problem and test the propositions, in order to remedy inadequacies in the literature and management practice, and gain insight into the role of ICT in facilitating sustainable organisational change.

Chapter 3

Research Design

3.1 Introduction

This chapter defines and explores the research techniques employed to address shortcomings in the literature and management practice. This chapter begins by justifying the use of a constructivist approach, coupled with a comparison between constructivism and alternative research paradigms. Following this is a discussion on the methodology employed to gather data, and test the propositions (see Section 2.7), and an exploration of the analysis techniques employed to interpret data and create meaning from the research. This chapter provides a discussion on the issues encountered in the research procedures in terms of reliability and validity, the ethical implications of the research design, and the strategies employed in this study to address these issues. Figure 3.1 below demonstrates the sequence of this chapter.

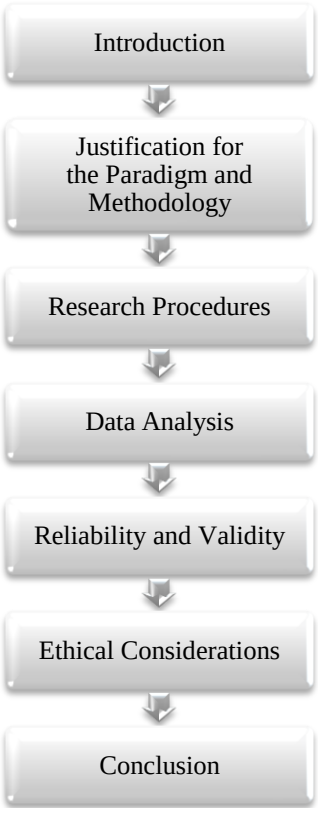


Figure 3-1: Structure for Research Design Chapter

3.2 Justification for the Paradigm and Methodology

3.2.1 Justification for the Paradigm

This study employs the social constructivist approach. The doctrine of this method is to determine reality through people, as opposed to objective and external factors (Easterby-Smith, et al., 2002, p. 59). Constructivism employs epistemological characteristics of transactionalism and objectivism. The focus of the researcher within this paradigm is revelation, whereby the reconstruction of existing views is undertaken, allowing new constructs to emerge. Research participants potentially influence the researcher in this approach, through the inherent characteristic of constructivism whereby knowledge emanates from investigator and research participant interaction (E. G. Guba & Lincoln, 1994). Constructivism involves data co-construction through the interaction between a researcher and respondent (Roulston, 2010). Thus, the creation of knowledge, and the constructs that ensue occur through the progression of research (E. G. Guba & Lincoln, 1994).

The constructivist approach relies on a transparent relationship between a researcher and research subjects, specifically in terms of the research objectives, as this assists research participants in providing relevant information. For this reason, research employing a constructivist paradigm is subject to individual perceptions of the surrounding environment, and adeptness in relaying such information influences the perspectives of individuals. Participant motivation facilitates the development of constructs that are considerate of the perspectives of both the researcher and those researched (E. G. Guba & Lincoln, 1994). In such instances, a researcher is able to instil ‘multi-voice reconstruction’ (E. Guba & Lincoln, 1998, p. 207).

The purpose of constructivism is the consolidation of the differing views that exist across individuals involved in research. This process of mitigation invokes the need for robustness in the adopted research approach. Researchers and research participants attain mutual benefit through successful mitigation. In this respect, constructivism builds a central construct, or instils progress towards the development of a central construct. The development of such constructs is inclusive of multiple perspectives amongst those with an understanding of a particular construct, and requires consideration of past views to build new constructs (E. G. Guba & Lincoln, 1994). Whilst competing paradigms advocate a single perspective on reality, constructivism allows multi-perspective endorsement, in-line with the objectives of social science, proposing a balanced approach to construct development that is inclusive, rather than argumentative (Easterby-Smith, et al., 2002).

The constructivist paradigm advocates immersion into the research process. Researchers engage with respondents, rather than remaining independent. Thus, subjectivity is accepted, and an inductive approach is employed (Veal, 2005). Correspondingly, ethics are intrinsic to this approach for its engagement of research participants within the inquiry process. Constructivism is inclusive of values, which are formative, and therefore more likely to emphasise values than other paradigms. The constructivist approach involves the researcher undertaking the role of orchestrator and facilitator of the process of inquiry, which provides greater authority in the gathering and transfer of knowledge, and the influence of research subjects. The ‘passionate participant’ stance of constructivism is congruent to research centred on organisational development, thereby justifying its use in this study (E. G. Guba & Lincoln, 1994).

3.2.2 Justification for the Methodology

Qualitative research embarks to understand a phenomenon, and thus useful for studying social phenomena within a specific context (Veal, 2005). This approach to research is suitable in cases where data requires analysis through hermeneutics (Remenyi, Williams, Money, & Swartz, 1998), which is the case in this research. Qualitative researchers are more influenced by interpretivism (Bryman & Bell, 2007, p. 415). Bryman and Bell (2007) propose that interpretivism is viewed as the product of a merger between several paradigmatic stances, comprising interpretive understanding (Prus, 1996), symbolic interactionism, and phenomenology. A widely-held view amongst qualitative researchers exists that the underlying principle in studies of science is the subject matter of the social sciences differs from that of the natural sciences (Bryman & Bell, 2007).

The established view of evaluating qualitative research is to assess research based on its merits in terms of reliability and validity. Contrastingly, Lincoln and Guba (1985) have moved away from these criteria, arguing these criteria imply that "a single absolute account of social reality is feasible" (Bryman & Bell, 2007, p. 411). Lincoln and Guba (1985) propose assessing qualitative studies based on their trustworthiness and authenticity. Further, they challenge the view that absolute truths exist about the social world, arguing the possibility of more than one account of reality, hence these alternative criteria are formed (Bryman & Bell, 2007, p. 411).

3.3 Research Procedures

This study employs qualitative research in order to create new findings in an area where limited studies have been undertaken (Silverman, 2006). A single case study of a multinational corporation in the computer networking industry gathered data on events and experiences of individuals (Yin, 2009). The rationale for selection of a technology-intensive organisation is strategic to enhance the generalisability of the findings (B. Flyvbjerg, 2011). The literature suggests a single case study approach is feasible where the context studied is considered holistic (Baxter & Jack, 2008; Siggelkow, 2007).

Data collection methods employed in this study encompass in-depth interviews, and documents and reports obtained from the case organisation. The qualitative research framework within which this study is based involves social interaction throughout the process of data collection, in order to develop understanding on the real-world implications of the studied context (Easterby-Smith, et al., 2002). Data collection involved digital recording of interviews and transcription for subsequent detailed grounded analysis. In addition, field notes documented during and immediately following interviews supplemented interview data.

3.3.1 Single Case Study

Understandings of case studies vary, and critiques of this approach point to a certain degree of ambiguity, numerous misconceptions, and a lack of consensus on the capabilities of case study research (Bent Flyvbjerg, 2006; Gerring, 2004; Verschuren, 2003). Gerring (2004) defines case studies as "an intensive study of a single unit with an aim to generalize across a larger set of units" (p. 341)(p. p. 341)(p. 341). The case study approach explores the nature and cause of current phenomena. This approach entails observation without influencing the research subjects (Fiss, 2008). The case study approach gathers data from individuals in order to gauge contextual characteristics, and the forms of interaction which exist therein (Baxter & Jack, 2008). This approach is suited to research that solely seeks to observe and gather data, rather than imposing influence on research subjects (Easterby-Smith, et al., 2002). New perspectives are gained on contemporary issues through the consideration and analysis of the past, and identification of elements of the past that influence the present (Yin, 2009).

The hermeneutical characteristic of case studies implies gathering context-specific data. In this respect, the contextual nature of this approach implies that research is focused on phenomena-related attributes, which take the form of an event, organisation, or specific department within an organisation (Denzin & Lincoln, 2011). The nature of case studies inherently enables researchers to examine phenomena exhibiting great complexity. In studies regarding social phenomena, the case study approach facilitates understanding of context-specific attributes, and intra- and inter-contextual relationships (Baxter & Jack, 2008).

The case study approach is specifically inclined to explore phenomena within one context to gain 'context-dependent knowledge' (Bent Flyvbjerg, 2006, p. 221), which is limited to a department within an organisation, an entire organisation, industry, or region. This function of case studies curtails the relevance of data to a specific context. In this respect, case studies are a feasible approach to conducting management research (Easterby-Smith, et al., 2002). The main intention of this approach is not to generalise findings outside of a certain context, as found in the majority of research within the field of management, and therefore this is not a central concern for researchers undertaking this approach (Bryman & Bell, 2007). Although, whilst the generalisability of case studies is perceived as limited, Flyvbjerg (2006) argues that such an approach potentially provides a certain degree of consensus on attributes of a phenomenon within other contexts. The "strategic choice of case" in social science also contributes to the implications of research within a broader context (Bent Flyvbjerg, 2006, p. 226).

Specifically where researchers are faced with difficulty in determining the phenomenon-context boundary, a case study approach facilitates definition through triangulation of multiple data sources (Bryman & Bell, 2007). Correspondingly, whilst case studies generally take the form of qualitative research (B. Flyvbjerg, 2011), the explanatory, descriptive, and exploratory forms of research employed in case studies exist within alternative modes of data collection. This characteristic enhances the compatibility of this approach with research involving several data collection methods (Gerring, 2004). This feature of case studies is attributed to its compatibility of research paradigms across the spectrum of approaches to utilise either a positivist, relativist or constructionist approach (Easterby-Smith, et al., 2002).

Naturally, the methodology employed in case studies allows for refinement of information, facilitating alignment with the research problem and objectives (Yin, 2009). When applied to business in practice, the findings of case studies facilitate greater efficiency in operability, and effect improved organisational performance through renewal and refinement of practices (Stoecker, 1991). Consequently, the use of case studies has traversed across a diverse range of research fields within the social sciences, and studies of behaviour and medicine (Yin, 2009). Case studies are used extensively in studies of ICT, as evident in the research of Adner and Kapoor (2010); Damian, Zowghi, Vaidyanathasamy and Pal (2004); Gasser (2004); Geels (2002); Gill, Gossett, Corman, Loyall, Schantz, Atighetchi and Schmidt (2005); Hjelmgren (2011); Hughes and Scott Morton (2005); Lee and Lee (2004); Mandal and Gunasekaran (2003); Robey, Ross and Boudreau (2002); Ruel and Magalhaes (2008); Stam and Stanton (2010); Taylor and Helfat (2009); and von Krogh, Spaeth and Lakhani (2003).

The case study approach was selected to facilitate broader relevance and significance of the findings to the studied organisation, and potentially other organisations with similar hierarchy structures (Bryman & Bell, 2007). This approach inherently induces rigour for thorough phenomena exploration, which is synonymous with the objectives of qualitative research to delve into a topic to its most fundamental aspects. As such, this approach allows comprehensive understanding of attributes visible at the surface of a phenomenon, down to the root characteristics which underpin those attributes (Hamel, Dufour, & Fortin, 1993). In this respect, the use of case studies enables far greater depth and induced value in research (Gerring, 2004), in comparison to quantitative methods that simply quantify phenomenal characteristics (Verschuren, 2003).

3.3.2 In-Depth Interviewing

The in-depth interviewing approach was selected for data collection, as this study aims to understand the interplay between multiple aspects of the studied phenomenon, which is ascertainable using this approach (Easterby-Smith, et al., 2002). In-depth interviewing is one of two methods utilised in this research project to collect data, due to the ability of this approach to accentuate past events, behaviours and attitudes, and deeply explore the core elements and extent of a phenomenon (Bryman & Bell, 2007; Esterberg, 2002; Yin, 2009). The in-depth interviewing technique employs an open-ended process, in which propositions develop progressively for continual refinement of research. The nature of in-depth interviewing potentially uncovers previously unknown knowledge, which through other data collection methods potentially remains dormant (Silverman, 2006). Easterby-Smith, Thorpe, and Jackson (2002) refer to information collected through the interviewing of organisational members as 'natural language data'. This form of data is inherently obtained using the in-depth interviewing approach (Easterby-Smith, et al., 2002).

Burgess (1982) argues that in-depth interviewing holds unequivocally significant implications for qualitative research. The in-depth interviewing technique enables researchers to "probe deeply to uncover new clues, open up new dimensions of a problem and to secure vivid, accurate inclusive accounts that are based on personal experience" (Burgess, 1982, p. 165). Thus, this approach to data collection is capable of capturing and discovering a 'worldview' of phenomena studied through an understanding and interpretation of phenomena within a world perspective (Easterby-Smith, et al., 2002).

However, a multitude of issues exist when conducting interviews, which encompass gaining the trust of respondents, maintaining awareness of social interactions, communicating using appropriate language, selecting a location to conduct interviews, and recording of interviews. These issues require attention by researchers, as they have the potential to influence the outcomes of research (Easterby-Smith, et al., 2002). One critical consideration is the level of structure employed in interviewing. In-depth interviews take the form of structured, semi-structured and/or unstructured questions, which exhibit different advantages and varying suitability depending on the required characteristics of research methods employed (Bryman & Bell, 2007).

A semi-structured interview process was employed in this study to enable further refinement of the propositions as the research progressed (Bryman & Bell, 2007; Veal, 2005). Structured interviewing provides a greater level of standardisation through set questioning, whilst semi-structured and unstructured interviews facilitate an enhanced degree of dialogue with respondents, which are generally of a more personal nature. Further, this approach enables researchers to obtain significant data in an area where limited research exists. Thus, a semi-structured approach is utilised in this study in order to maintain a balanced research approach through capitalising on the advantages of both structured and unstructured interview approaches, which exist at each end of the interview structure spectrum (Easterby-Smith, et al., 2002). This approach is utilised in this study to provide research participants with greater freedom in engaging with the research project, whilst remaining relevant to the research questions and objectives, and facilitating more in-depth discourse.

The study involved face-to-face interviewing using an interview guide approach, as interviewees are encouraged to impart knowledge, through the enhanced interviewee confidence that results from more personal, rather than virtual, interaction (Bryman & Bell, 2007). Interviews covered all questions in the interview schedule (see Appendix B) with each participant, combined with supplementary questions to probe interviewees. The cooperation of research study participants was enhanced by selecting an interview location that was familiar, comfortable and secure, as these are all important factors for consideration when selecting an interview location (Bolman & Deal, 2003; Yin, 2009). Thus, interviews took place in meeting rooms at the organisation studied during normal working hours, to prevent undue distraction and interruptions, and as a result facilitate more in-depth investigation of the research problem.

The role of qualitative research is to provide a reflection of the personal experiences and insights of research participants. This is achieved through the researcher-respondent interaction exhibited in in-depth interviewing, a process known as interactionism, which essentially involves exploring a phenomenon through the exchange of knowledge. Correspondingly, the capturing of significant data is achieved through employing the technique of active listening (Silverman, 2006). Complimentary to a semi-structured interview approach, focused probing was employed during interviews to gain further insight into the subject matter (Easterby-Smith, et al., 2002). To this effect, active listening was pivotal in the refinement of the probing technique adopted, and the development of supplementary interview questions throughout the process of data collection. Through the new perspectives gained in each interview, an increasing number of questions developed, and asked in subsequent interviews.

Lengths of in-depth interviews ranged between 30 minutes to 100 minutes, with the majority of interviews taking over 50 minutes. The length of interviews did not appear to exhibit a link to the quality of responses, and to a certain extent were determined by the ability of interviewees to summarise and deliver information, and the role of the interviewer in facilitating the exchange of knowledge (Bryman & Bell, 2007). However, the interviews satisfied the expectation of the researcher that as the number of supplementary questions increased, the length of interviews generally increased also, particularly towards the end of the data collection phase. Supplementary questions arising from the responses of interviewees earlier in the data collection phase were standardised to accompany the original interview questions in succeeding interviews, in order to facilitate consistency in responses.

3.3.3 Unit of Analysis and Observation

The unit of analysis for this study is a multinational corporation operating in the computer networking industry, which recently implemented new technology for organisational change. The case organisation implemented ICT to instil multiple points of change. These changes are characterised under the main change features proposed by Gupta (2005). The case organisation appeared to be engaged in several of these changes (Gupta, 2005, p. 2):

- Increase in job flexibility;
- Increase in organisational flexibility;
- Increasing recognition of project and teamwork; and
- Increased use of technology.

The units of observation are (i) Senior Management or Middle Management staff members employed when the most recent ICT integration took place, (ii) Senior Management or Middle Management staff members who are end-users of the current ICT system, and (iii) implementers of the current ICT system. This study encompasses the perspectives of Managers, Senior Managers, and Executives, and avoids a highly technical perspective on the research problem from employees at lower hierarchy levels. This study recruited fifteen participants to obtain multiple perspectives on the research problem, and collected data from multiple levels of responsibility within the case organisation to facilitate detailed analysis of the influence of ICT across various hierarchy levels.

The researcher selected participants from a prospective list of employees, who were subsequently shortlisted and purposefully selected. Interviews encompassed several upper managerial hierarchies, as there are profound benefits to viewing phenomena from a multi-lens perspective (Bolman & Deal, 2003). Obtaining differing perspectives on the same phenomenon provides broader phenomenological insights, promotes representativeness of a studied population, and facilitates depth of exploration on phenomena-specific attributes. A multi-perspective approach induces increased understanding of the studied phenomenon (Bryman & Bell, 2007; Yin, 2009).

3.4 Data Analysis

Whilst the collection of data poses various challenges in terms of access to information, the analysis of gathered data yields to issues surrounding the interpretation of such information. Researchers are faced with the challenge of drawing on the insights gathered within a research study, and condensing this information into understandable formats (Easterby-Smith, et al., 2002). The constructivist approach is utilised to analyse the relationship between ICT and organisational change. Social constructivism relies on the convergence of the collection and analysis of data (Easterby-Smith, et al., 2002). This study uses a seven-stage process of analysis proposed by Easterby-Smith, Thorpe, and Jackson (2002), depicted in Figure 3.2. This approach to analysis is employed for its specific relevance to the analysis of in-depth interview transcripts (Easterby-Smith, et al., 2002, p. 178).

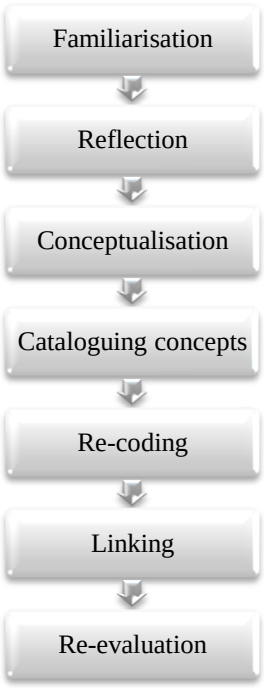


Figure 3-2: Data Analysis Process (Source: Easterby-Smith et al., 2002)

Strauss and Corbin (1998) propose that the process of data sampling exhibits either open, axial, or selective coding, where sampling ranges from indiscriminate to discriminate. This study employs axial coding, which utilises variational and relational sampling, providing a midpoint between the two extremes of the coding practice spectrum (Strauss & Corbin, 1998). This approach involves gathering data from a focused sample of people, demographics, and contexts in order to ascertain construct properties, dimensions, and associations (Bryman & Bell, 2007).

The descriptive nature of qualitative research required the use of verbatim transcripts in data analysis (Bryman & Bell, 2007). Verbatim transcripts are necessary in provisioning complete accounts of interviews. Improved research validity results through the subsequent enhancement of data accuracy. This approach ensures that individual experiences and their significance are replicated (Veal, 2005). Analysis of the collected qualitative data entailed classification of data into broader categories to facilitate construct development at an intra-categorical level based on theme areas. Subsequently, constructs emerged inter-categorically to develop findings inclusive of the broader research context, and supportive of a new managerial model and its development (see Section 5.2).

The use of computer aided qualitative data analysis software (CAQDAS) ensures systematisation of the data analysis process. Within the qualitative research literature, wide support exists for the notion that the rigour and quality of qualitative research is improved through the use of CAQDAS (Easterby-Smith, et al., 2002; Wickham & Woods, 2005). NVivo 9 is the selected qualitative analysis software package (QASP) for this project. This program was selected for its ability to organise complex and

extensive data within one database file, categorise data into specific manageable constructs, and map information (QSR International, 2010). Analysis involved the use of NVivo to construct topic hierarchies manually. The tree node structure was utilised to create main categories and sub-categories for sorting data. The main categories (parents nodes) were established a priori, whilst the category elements (child nodes) were developed as the research progressed (see Appendix C), combining literature observations and analyses of interview transcripts. Analysis involved manual extraction of interview transcripts within NVivo to locate and sort data into the relevant categories (nodes).

3.5 Reliability and Validity

A multitude of issues exist when conducting interviews, which consist of gaining the trust of respondents, maintaining awareness of social interaction, communicating using appropriate language, selecting a location to conduct interviews, and the recording of interviews. These issues require attention by researchers, as they have the potential to influence the outcomes of research (Easterby-Smith, et al., 2002). Achieving research rigour requires a multipronged approach to simultaneously conducting research, remaining relevant to the research issues, and maintaining perspective on the research objectives. Qualitative researchers are challenged to develop a research design that facilitates the emergence of new theories (Creswell, 1994). However, it is arguable this key characteristic of qualitative studies has the potential to impair research (Bryman & Bell, 2007).

Thus, issues of reliability and validity arise throughout this process. The individuals conducting a research project and the subjects of a study influence reliability and validity. Within the literature, several perspectives exist on the various issues encountered in qualitative research. Qualitative research is affected by reliability and validity in both internal and external domains (Kirk & Miller, 1986; LeCompte & Goetz, 1982; Mason, 1996).

Contrastingly, Lincoln and Guba (1985) depart from the widely held views of merely applying criteria of reliability and validity to assess qualitative research, holding the view that multiple perspectives of reality exist, and a single view of sociology is not feasible. In this respect, the authors propose that qualitative studies in general exhibit two main issues of trustworthiness and authenticity. The criteria of trustworthiness are credibility, transferability, dependability, and confirmability. Whilst credibility and transferability are parallel to internal and external validity respectively, dependability is parallel to reliability, and confirmability parallels objectivity (Lincoln & Guba, 1985).

Subtle differences exist across the views of authors on issues in qualitative research designs. Nonetheless, issues raised in the literature generally focus on confirming collected data and facilitating research quality. Herein, a discussion of the merits of qualitative research is based on two alternative criteria of trustworthiness and authenticity, proposed by Lincoln and Guba (1985). Trustworthiness refers to the honesty of data obtained on research subjects, and consists of four criteria, consisting of credibility, transferability, dependability, and confirmability. Trustworthiness is a significant factor in qualitative research, as it determines the extent to which research findings represent reality (Lincoln & Guba, 1985).

The trustworthiness of participant responses is affected by intentional and unintentional mechanisms (Blaxter, Hughes, & Tight, 1996). Individuals respond intentionally based on conscious thoughts consisting of knowledge, ideas, opinions and attitude, whereas responses emanating from unintentional thoughts are the result of subconscious knowledge and attitude (Blaxter, et al., 1996). These elements determine the relevance and significance of participant responses (Bolman & Deal, 2003; Bryman & Bell, 2007). Therefore, it is important to understand how subconscious thoughts and attitudes influence individuals, and how the setting in which an individual operates affects their behaviour (Bolman & Deal, 2003). Studies of individuals within a single context potentially reveal that individuals share certain characteristics as a result of being conditioned to a similar setting (Blaxter, et al., 1996).

A primary consideration in both qualitative and quantitative research is the time over which research is conducted (Bryman & Bell, 2007; Veal, 2005). Due to the nature of qualitative data, a researcher may find the selection of an appropriate time frame for conducting research more cumbersome than in quantitative research (Engeström, Kerosuo, & Kajamaa, 2007). A researcher may employ a longer period of data collection to confirm data, or to observe the effect of a phenomenon over a period of time (Veal, 2005). However, it is argued that longitudinal research faces the issue of discontinuity which may in fact reduce research validity (Engeström, et al., 2007).

Data saturation is also an important issue faced by qualitative researchers. Researchers are accountable for determining a suitable data saturation point (Creswell, 1994). This issue arises due to the descriptive nature of qualitative research, and poses a difficult decision for qualitative researchers (Veal, 2005). The individual judgement of a

researcher to define a data boundary determines the amount of data collected. An overly conservative research design limits the availability of data, and reduces the significance and breadth of findings. Similarly, collecting a large amount of data may result in the accumulation of data bearing minimal relevance to the research question (Auerbach & Silverstein, 2003; Bryman & Bell, 2007). Therefore, qualitative researchers are required to meticulously analyse data requirements in order to determine a saturation point that is sufficient in satisfying the research objectives (Creswell, 1994).

The concept of credibility, proposed by Lincoln and Guba (1985), is defined as the confidence level of a researcher and users of research in the findings, and the merit of its validity (Lincoln & Guba, 1985). The validity of research depends upon how accurately reality is represented. The ability to perceive and transmit truth is determined by how an individual is conditioned to the surrounding environment (Blaxter, et al., 1996), and influences the distance between perceived truth and actual truth (Lincoln & Guba, 1985). Individuals distance themselves from the truth through their knowledge, behaviours and bias (Blaxter, et al., 1996; Bolman & Deal, 2003).

Correspondingly, the willingness of research participants involved in a research study influences the credibility of their responses. Participation by coercion has the potential to influence the responses of research participants negatively, and consequently, the trustworthiness of data obtained. Genuine motives by research subjects and a motivation for involvement in research facilitate trustworthiness. In this respect, this study employs voluntary participation, in order to facilitate the trustworthiness of the findings. The conscious and unconscious awareness of research participants is determinate of the ability of researchers to represent reality, the resulting distance imposed from reality

(Blaxter, et al., 1996), and the ability of individuals to convey reality as perceived (Lincoln & Guba, 1985). However, reality has the potential to change through researcher-respondent interaction (E. G. Guba & Lincoln, 1994). For this reason, researchers encounter the issue of credibility when attempting to create a representation of reality (Lincoln & Guba, 1985).

Researchers may address the issue of credibility in qualitative research by employing several methods. Credibility is addressed through the use of a systematic research approach, which provides uniformity and results in improved data validity (Lincoln & Guba, 1985). Triangulation further improves the credibility of research findings. This method entails collecting data from multiple sources, and provides an additional means for ensuring data accuracy (Yin, 2009). Triangulation furthers the ability of a researcher to obtain numerous accounts of reality (Bryman & Bell, 2007) through its consideration of multiple perspectives (Lincoln & Guba, 1985).

Authenticity provides a further measure of assessing rigour in qualitative research, in terms of a broader perspective to analyse the influence of research within a wider context. Criteria of authenticity include ontological, educative, catalytic, and tactical authenticity. These criteria measure the impact of the research on the research participants and wider society (Bryman and Bell, 2007). Whilst different research methods possess unique characteristics and challenges, effective data gathering is incumbent upon the researcher. Arguably, a research design combining a multiplicity of approaches to confirm collected data induces a pronounced effect on the ability of a researcher to represent reality (Blaxter, et al., 1996; Bryman & Bell, 2007; Lincoln & Guba, 1985; Yin, 2009).

3.6 Ethical Considerations

Some form of risk towards research participants is possible. One such risk concerns the experience of research participants in interviews. This is important to consider, as negative participant experiences bear consequences both for the well-being of participants, and research validity. Thus, this research project was conducted in accordance with the Principles of Ethical Conduct, contained in the National Statement on Ethical Conduct in Human Research, which requires that research involving humans protects "the welfare and rights of participants in research" (NHMRC, 2007, p. 11). The study was developed within an ethical research framework to reduce risk to participants and maintain the confidentiality of individuals, corresponding with the objectives of The University of Newcastle to achieve "the highest standard of ethical practice in research involving or impacting on humans" (The University of Newcastle, 2011).

The researcher initially approached a senior executive, and obtained written consent to conduct this study. Subsequently, The University of Newcastle Human Research Ethics Committee (HREC) provisioned Expedited Approval prior to the commencement of data collection. Once the HREC provided Notification of Expedited Approval, the researcher proceeded to contact participants. Participant selection involved scoping and short-listing of prospective individuals to minimise risk and undue influence, and ensure a broad representation of the case organisation across the Management, Senior Management, and Executive levels. Participants who nominated to participate did so voluntarily, and provided written informed consent through a standardised Participant Consent Form. Participants also received written notification that participation in the study is voluntary. The identity of the studied organisation and its employees remain

confidential. To ensure the anonymity of participants, alphanumeric identifiers replace the names of those interviewed, and details of employee demographics are limited to ensure de-identification (see Figure 4.2).

3.7 Conclusion

Scholarly research involves a holistic approach to address both the research question, and the issues that arise in the course of a study. A researcher may obtain greater value from research findings by narrowing the gap between perception and reality. However, it is also arguable that the role of a researcher in qualitative studies is simply to present perspectives of research participants and develop constructions from these. Therefore, it is imperative to design research in such a way that facilitates an accurate representation of reality (Bryman & Bell, 2007). Key issues in this form of research are also applicable in quantitative research, and consist of designing efficient methods of data collection, selecting participants appropriate to the research question, and maximising research trustworthiness. Effective research also seeks to minimise undue influence from both research subjects and the researcher. Following the analysis of the literature on the characteristics and issues of qualitative research, in particular the credibility of research, it is arguable that qualitative research, as with its quantitative counterpart, is effective when undertaken systematically, logically, and ethically. In addition, the significance of the research in terms of its focus on contemporary issues, and practical implications determine the level of contribution to theory and practice. Following an exploration of the research design employed, this study may now proceed to a discussion of the resultant findings.

Chapter 4

Analysis & Findings

4.1 Introduction

This penultimate chapter discusses the findings of this study, and critically compares the findings to the existing literature surrounding ICT, knowledge transfer, and organisational change. Research involved in-depth interviews to obtain the insights of employees within a single organisation spanning across the upper hierarchy levels. The constructivist approach employed in the analysis of the findings ties together differing perspectives to broaden knowledge within the areas of ICT and organisational change, and explores the role of knowledge transfer within this interchange. This chapter culminates with a summary of the key findings of the study. Figure 4.1 below indicates the structure of this chapter.

Figure 4-1: Structure for Analysis and Findings Chapter

This research study entailed purposeful sampling of fifteen employees across the Management (4), Senior Management (6), and Executive (5) levels. Participants encompassed a diverse range of responsibilities, experience, and expertise to provide multiple perspectives on the research problem, and ensure a representative sample of the case organisation within the upper hierarchies. The majority of participants interviewed comprised Managers, Senior Managers, and Executives. Baby Boomers (4), which are defined as "the population born between 1946 and 1964" (U.S. Census Bureau, 2006), accounted for one Executive and several Senior Managers. Generation X (11), which are "the generation born after that of the baby boomers (roughly from the early 1960s to mid 1970s), typically perceived to be disaffected and directionless" (Oxford Dictionaries). Figure 4.2 below details the demographics of participants according to their allocated alphanumeric identifier.

Participant	Position	Hierarchy Level	Generation type
RP1	Vice President	Executive	X
RP2	Regional Manager	Senior Management	X
RP3	Chief Technology Officer	Executive	Baby Boomer
RP4	Collaboration & Communication	Management	X
RP5	Sales BDM	Management	X
RP6	Director	Executive	X
RP7	Sales Account Manager	Management	X
RP8	Services Regional Manager	Senior Management	X
RP9	Sales Director	Executive	X
RP10	Senior Manager – Inside Sales	Senior Management	Baby Boomer
RP11	Services Regional Manager	Senior Management	X
RP12	Sales Manager	Management	X
RP13	Commercial Regional Manager	Senior Management	Baby Boomer
RP14	Head of Managed Services	Executive	X
RP15	Customer Operations Manager	Senior Management	Baby Boomer

Figure 4-2: Research Participant Demographics

4.2 Information and Communications Technology Adoption

A wider array of resources is now available through ICT. The increased adoption of ICT within society has led to increased adoption of ICT within organisations. This is evident in the following statement by RP1: "The consumerisation of IT, and more and more devices, particularly mobile devices and mobility are becoming ubiquitous in society, clearly they are becoming ubiquitous in the corporation". This perception corresponds with the views of Hughes and Scott Morton (2005), and Mark and Su (2010) that ICT is becoming ubiquitous within organisations. RP1 continues that the characteristic of new technologies to increase the availability and accessibility of information is an attributing factor. Further, there is an expectation of new technology to provide accessibility, continual connectivity, usability, and convenience (e.g. RP1). There is consensus amongst 60 percent of participants that technology provides flexibility in communication. The different modes of communication available through ICT are enabling organisations to communicate effectively through numerous channels to satisfy the differing information preferences of individuals.

> "Dealing with all kinds of people who respond to communication in different ways, and that's really a big thing of technology that enables you to kind of be different things to different people." (RP15)

4.2.1 Role of ICT in Knowledge Transfer

RP15 believes that technology is driving the delivery and content of messaging. RP5 adds that ICT enables the immediate distribution of messages globally. The findings support a study by Wray and Fellenz (2007) that ICT plays a key role in enabling organisations to deliver learning to employees through formal and informal means. The

ability of new technology to process information faster has facilitated enhancements in business practices and management structures. There is general agreement amongst 53 percent of those interviewed that most employees source their learning online. RP1 reiterates the views of many participants that ICT facilitates the level of information available: “I can not only get ideas through technology from all of my organisation people... but more importantly from people outside of your company”. The consensus view amongst 60 percent of research participants is that ICT provides individuals with real-time access to information, and a sense of being informed and up-to-date.

> “ICT creates those channels for the collaboration to take place... it [ICT] allows you to speak directly to the person virtually... it’s no longer about memory, it’s about actual, and it’s captured.” (RP4)

4.2.1.1 Enhanced Collaboration

There is wide consensus amongst 87 percent of participants that ICT enhances collaboration, and facilitates broader employee input. ICT is also enabling organisations to exchange knowledge at a community level, RP1 describes, and “most intelligence is outside your organisation... technology plays a key role in allowing you to link to those stakeholders, to those constituents, outside of your own organisation” (RP1). The Managers interviewed generally perceive that the idea creation process is highly influenced by technology. RP1 describes:

> “Technology is playing a foundational role in the collation of those ideas, and also letting people provide their ideas, without fear of failure, or... embarrassment... technology is letting... those people that didn’t feel confident enough to put their hand up with an idea, actually just doing it.” (RP1)

The underlying intention of technology in communication is broader collaboration at reduced cost (e.g. RP5 and RP7). RP5 clearly identifies the role of ICT in increasing the level of collaboration across an organisation.

> "We're basically just distributing management of the company down to expertise, no matter what expertise, what time, or what location, though we can do that without causing personal or financial hardship for the company to a certain degree, because we've got the technology foundation there to be able to connect to people when they need to be connected." (RP5)

ICT provides repeatability in the training process, and on-demand access to resources when made available online (RP4). Correspondingly, online collaboration broadens the level of individual engagement across an organisation.

> "The online collaboration spaces are key... a collaboration space online allows people to say things they wouldn't say in person... online everyone's having a go because they have no fear almost... and it's time to chat, I can think about what I'm going to say, formulate my message, I don't get nervous and stumble over my question." (RP4)

Technology has replaced traditional means of communication whilst maintaining the same level of interaction (RP6). However, RP4 perceives that communication through video and online facilitates broader collaboration. Some of the more effective forms of ICT are those emulating natural human interaction, particularly videoconferencing. RP4 highlights the ability of ICT in enhancing communication through an ability to overstep the physical boundaries imposed by face-to-face interaction.

> "It helps you all be a bit more closer than you are physically... it allows you to have a voice where you can't physically be... it allows for the communication and the education to be scaled." (RP4)

Similarly, RP8 adds:

> "Immediacy of contact between people... ICT has a really critical role to play around enabling people to collaborate in groups, whether they are geographically in the same place, or spread across the globe." (RP8)

RP5 highlights an increasing trend towards the use of virtual interaction.

> "Where it was face-to-face communication in group meetings and in-house, now a lot more of it is around video, so multiple people that aren't even in the office can leverage from those face-to-face interactions." (RP5)

Similarly, the introduction of Cloud computing potentially changes the way businesses operate (RP14). Cloud computing allows users real-time and on-demand access to the uploading and sharing of resources. Consequently, enhanced collaboration results during the implementation of organisational change (e.g. RP4). Organisations have traditionally managed their own ICT infrastructure. However, Cloud computing now enables organisations to outsource their computer networks and reduce internal overheads (RP2).

> "There is no doubt that the Internet has come broken a lot of those barriers, but we're still moving into the next phase which is the phase of cloud computing and virtualised and device agnosticism." (RP9)

The robustness of social networking within the context of organisations is also providing further means of collaboration. This is evident in the following statement by RP5.

> "Now you've got crowd sourcing [outsourcing of tasks], power by social networking enables people to seek questions and guidance from others who might not be in a position of authority that might be well informed or have asked the question previously." (RP5)

RP5 revealed that ICT facilitates a high quality of communication. RP5 summarises the role of ICT in maintaining a knowledge link between Managers and employees: "ICT is providing instrumental ability in being able to distribute information to management, but management is able to share that and explain that to staff". The following statement by RP6 reiterates the views of participants across the Management and Senior Management levels of the ability of ICT to enhance collaboration.

> "High-definition videoconferencing, that enables me to stay in touch not just through audio and through phone calls, but also an almost in-person experience, so there's a lot of subtlety of interaction you get in person that I can achieve through technology." (RP6)

4.2.1.2 Reliability in Communication

ICT provides clarity and consistency in the communication of strategic objectives, and preventing "liberations of the message" (RP5). RP13 concurs with this view: "the ability to drive the consistency and... regularity of messaging to keep everybody informed, because in the absence of information everybody assumes the worst". RP5 shares the view of many participants that ICT is increasingly improving the effectiveness of communication.

> "IT is becoming far more intelligent around users and how they interact with the network, and with that intelligence you can then start to use it as a way of improving when information is delivered and ultimately consumed." (RP5)

RP6 strongly agrees that the use of ICT in communications has a profound impact on knowledge transfer: "Our communication technology plays a vital part in driving the ability to facilitate that communication on a regular and consistent basis". Similarly, RP1 emphasises on the role of ICT in providing communication scalability:

> "Technology plays a massive role in being able to connect with people, at scale, and deliver single messages without worrying and relying on the traditional human forms... You can deliver a clear, consistent message with the knowledge that it's not going to be interpreted along the way... technology allows you to break through those layers of manipulation of message." (RP1)

The perception that ICT facilitates the scalability and reliability of communication is strongly evident across the upper hierarchy levels. RP8 explains:

> "ICT can have an important role to play in that communication, particularly around the quality of the communication, around how well that communication is captured, how well it's delivered, and ensuring that the people are consuming the information, understand exactly what it is that's intended by the communication." (RP8)

RP5 also points out that ICT is reinforcing positivity within the spread of rumours across organisations. However, RP2 holds the view that ICT prevents the circulation of rumours through effective communication, and highlights the role of ICT in organisational change: "One of the most important things whenever you make organisational change is constant communication, clear communication, to stop rumour mill... ICT plays an important part".

4.2.2 Role of ICT in Organisational Processes

Managers and Senior Leaders strongly agree that the use of ICT in organisational processes is highly pervasive, supporting the findings of Mohapatra (2011). Sixty percent of Managers and Senior Leaders interviewed point to a global push for employing ICT in organisations, and the subsequent digitisation of objects where possible (e.g. RP3). ICT is identified as providing support in terms of Human Resource Management, selling, billing (RP9), financial systems, supply chain, manufacturing, and taking orders (RP12). RP8 explains that ICT has a critical role to play in monitoring sales performance: "The amount of reporting and capturing our activities around our customer engagements, knowing where we're tracking against our targets, and reporting that up the line". ICT plays an overarching role in the modern organisation.

> "ICT is part of the fabric of that organisation, so the way in which they transact, the way in which they interact not only involves but relies on ICT... it's the whole communications infrastructure, so it extends to the way we use e-mail... Web and audio conferencing... high-definition videoconferencing... instant messaging... the way we do expenses... forecast our business... process transactions with customers and our partners, all rely on ICT." (RP6)

RP5 concurs with this view, commenting the pervasiveness of ICT within organisations as providing a foundation and overall influence, extending across communication, reporting, and collaboration. RP12 also highlights an important function of ICT in customer support.

> "Our support business in terms of customers contacting us in the process we use around resolving issues is incredibly technology reliant and uses collaboration and communications technologies as part of their work." (RP12)

RP6 adds:

> "The information systems that we have give us a richness of detail around our business, whether its historical trending, or whether it's historical analysis of how our customers are spending, and that onus can then be put on the users of that information system, asking them to put more and more information into the systems." (RP6)

RP12 adds that business processes rely significantly on technology, and as such require accuracy, reliability, and availability for effective operation. Business processes operating in a vacuum from technology are quite few (RP14). The majority of participants (80 percent) were unable to identify business processes not impacted by ICT. The extensive use of ICT in organisations is emphasised in the following statement of RP12: "I really struggle to think of a standard business processes that we use that doesn't use a critical function of IT". RP8 also highlights this critical link: "If I didn't have access to the range of information technology that I do have access to, perhaps the performance of my business processes day-to-day wouldn't be so good". RP15 reiterates that extent of ICT usage in business processes is to the point where it provides sensemaking in business processes, supporting the research of Albritton (2010). RP6 emphasises the nature of ICT in underpinning organisational processes.

> "ICT is an integral part of how we operate in a day-to-day business... in terms of access to information through either making an informed decision, or to transact with our customers and our partners and resellers, the need for us to collaborate or interact on a day-to-day basis in order for standard business processes to take place is sort of a given." (RP6)

Organisations enhanced performance through integrating ICT into their business processes. RP11 highlights the obsolescence of manual processes in organisations.

> "In today's environment, you get a lot more churn and change, you cannot rely on manual processes because people come and go so quickly, so then you have a lot of downtime as people come and go into those processes." (RP11)

RP9 adds that the benefits of ICT are realised when ICT aligns with organisational processes and people. Similarly, RP1 states: "We need to make all technologies aligned to the business process without having to understand too much about how to use them". RP7 agrees with the majority of participants that ICT streamlines and enhances business processes. RP1 adds that particularly in the use of collaboration technologies, organisations are able to enhance productivity.

> "The process of filtering those ideas, prioritising those ideas, and getting the business to decide around those ideas... with the new collaboration technologies, real-time video, real-time document handling, real-time comments, real-time prioritisation processes, we can accelerate those timescales." (RP1)

Correspondingly, ICT significantly assists employees to undertake their roles, which is particularly evident in the following response of RP8.

> "Without access to my customer management system, without access to tools that enable me to turn that raw data into something... if I didn't have the ability to do that, I would just not have the level of visibility into the business that I need to effectively do my job day-to-day." (RP8)

RP12 states that ICT supports business processes once they are standardised and integrated into an organisation. However, where ICT can cause delays is through the nature of the process it is automating. RP6 states:

> "It can overlay, or create more overhead in the way in which we function or operate, but I don't think that is a function of ICT, that's... a by-product of the processes we overlay... it's not ICT in isolation that hampers the productivity effort, it's the process with ICT backing it up." (RP6)

RP15 raises the issue of employee perspectives bearing a major influence on attitudes towards the use of ICT in business processes, stating: "It takes a while for people to see those [ICT tools] as something that would help them, as opposed to something extra that they need to learn to try and use". Within this view, RP1 highlights a need for the development of individual capabilities to connect ICT to business processes effectively. ICT enhances productivity through the automation of processes (e.g. RP9). RP2 concurs, emphasising that "ICT has a big impact, all those processes used to be manual, so they're now becoming more automated, more real-time, and more integrated". RP15 highlights the positive impact of ICT on organisational processes: "You realise the things that you could do with the technology, and therefore change the business process".

4.2.3 Role of ICT in Organisational Change

ICT plays a critical role in change by providing forums for employees to question and understand change (RP4). RP5 shares the general view that ICT provides a sense of inclusiveness during the change process, and influences the clarity, accuracy and the speed of change implementation, resulting in the improved performance of change.

RP12 adds that ICT also accelerates understanding of change. RP13 states that ICT enables organisations to develop and modify culture as required through multiple points of reinforcement. Similarly, RP1 highlights that ICT provides adaptability to different learning styles through the course of implementing change.

The critical role of ICT in communications is emphasised in the following statement by RP15: "You've got all the concepts of... real-time communication, consistency of message, and therefore the ability to jump in and make changes as you're going through the journey". There is consensus amongst 80 percent of participants that technology is a potent enabler of organisational change. The findings support research by Volkoff (2007) that technology embeddedness influences organisational change. This is evident in the following statement by RP1: "Technology is the foundation of sustaining organisational change... technology plays a key role in all those stages of that innovation or business development process". RP3 adds:

> "It facilitates organisational change by giving... employees all the way to management the power to do more than they could have otherwise, the power to communicate beyond the physical boundaries, the power to be more productive." (RP3)

4.2.3.1 Communication of Change

ICT provides the knowledge employees require during the process of change, and continual connectivity (e.g. RP4). Similarly, RP5 is of the view that ICT enables openness of information, and the utilisation of collective knowledge shared across an organisation. RP15 highlights the flexibility of ICT in communicating change: "It lets you do the change message in different ways, which is really important, but in

continuous ways". ICT enables a consistent articulation of the reasons for change (RP4). RP1 concedes with this view: "If it is used consistently, wisely, and by... change agents, to send a clear message to the organisation, technology allows you to accelerate change agendas, without a doubt". Managers hold the view that ICT supports change through reinforcing and developing awareness around the change objectives and outcomes. RP13 states: "The role of it is to keep reminding people that this is where we're going and this is why we've made these changes, and keep reinforcing what is required". ICT assists in constant communication and ensuring change follow-through. The response of RP15 below highlights this critical role of ICT.

> "If you introduce something once and then you disappear, there's absolutely no way that you're going to drive that change, that first time you deliver it is kind of almost nothing in the whole scheme of things, it is what happens after that... and technology enables that follow-up." (RP15)

RP5 highlights the pivotal role of ICT in communicating, evaluating, and executing organisational change.

> "A successful organisational change requires a vision, the strategy, and the execution of that strategy to be communicated and to be properly executed, and ICT is... probably the best vehicle for getting that information across and evaluate it and measure it." (RP5)

The following statement by RP8 reinforces this view:

> "When you're putting an organisation through a state of change, it always means... people have to start physically doing something different, that ensuring that people remain connected to their company, to their peers, to their customers and their partners... is really important... that's where technology plays a part." (RP8)

The role of ICT in communicating change is strongly emphasised in the following statement of RP6.

> "I'm leveraging collaboration tools all the time in driving changes in a strategy... our ability to collaborate and utilise those tools as a key part in us driving the change agenda, and the speed at which we do that is tied to the effectiveness of the use of those." (RP6)

RP4 highlights that the ICT industry is more prone to change due to the nature of the industry itself, and as a result attracts individuals motivated by change. RP9 concurs, explaining: "We generate so much change externally, because of the innovation cycles in technology themselves... that cycle of innovation is something that we are prepared to accept ourselves". RP5 emphasised the importance of considering ICT in communications plans: "If you have these tools and capabilities embedded in your communications plans, then that basically encourages a successful organisational change program".

4.2.3.2 Increased Change Momentum

RP5 emphasises the importance of change momentum by drawing attention to the point that effective organisational change requires rapid implementation. The majority of participants hold the view that ICT accelerates the momentum of change. RP9 describes that ICT "accelerates organisational change because people will see other people doing things a certain way, and will start doing it". RP15 states: "What technology enables you to do is drive the momentum by giving the focus, and giving the visual, and giving the reminder... on a continuous basis, driving that momentum". Managers perceived that

ICT enhances the momentum of change through replacing physical interaction with virtual collaboration. RP4 explains:

> "ICT allows you to keep that momentum up because you're not physically having to go around all the meetings delivering that message... the momentum can be driven still, and Managers can drive their teams... so it's reducing replication." (RP4)

RP5 continues:

> "The success and the momentum behind change is going to be how fast can you overcome those human barriers, how can you implicate the people and then reassure them, or put a corrective plan in place, and again this is where ICT is absolutely important... with that momentum it gathers pace, it keeps building and it drives through faster." (RP5)

RP5 highlights the extensive role of ICT in maintaining the momentum of change both during and after its implementation.

> "How it will influence the momentum of change is that not only will it help manage the flow of information leading up to change, once changes occur, it helps rebuild momentum in that restarted organisation." (RP5)

RP11 perceives that the momentum of change links to the change approach utilised. Similarly, RP7 explains the importance of a consistent approach towards organisational change.

> "If people don't feel that there is a common method or procedure for how it is going to be communicated... while the momentum may be moving forward, I think that the people end up getting very frustrated, and that the people actually have a negative experience with that organisational change." (RP7)

RP8 highlights that communication is key to maintaining the momentum of change.

> "Keeping up this momentum of change, it's critical that there is effective communication about that change ongoingly, so that people don't forget, or so that people don't get despondent or complacent about it." (RP8)

ICT plays an increasing role in successful organisational change (RP3). The responses of participants clearly support the studies of Rusu (2007), Volkoff (2007), and Fleck and Howells (2001) that ICT drives organisational change. RP2 views that ICT potentially accelerates change. RP15 states that ICT facilitates the momentum and acceptance of change, by providing communication channels that cater to individual learning needs and opportunities for contribution.

4.2.4 Role of ICT in Organisational Performance

Successful ICT implementation is analogous to a high-performing organisation. ICT directly results in sustained productivity gains and output growth (Cette, et al., 2004). The findings support the research of Crespi, Criscuolo, and Haskel (2007) that a link exists between ICT, organisational change and performance (e.g. RP1 and RP11 below). According to RP2, ICT streamlines business, and assists business units in meeting their expectations. The technologies that enable an organisation to communicate and collaborate have the potential to generate quantum leaps in productivity. The following statement by RP1 strongly emphasises this point.

> "We've got a five-fold increase in productivity in time to decision, and we put that mainly down to the use of technology to link people much more effectively, much more quicker, much more real time, in order to get to a decision point." (RP1)

Similarly, RP9 points out that ICT rapidly enhances organisational performance through a reduction in overheads. RP11 complements this view, describing the wide scope of influence ICT has on organisational performance.

> "By bringing technology in you can actually accentuate the performance of the organisation, so they can serve more sustainably, and you can target the technology around the key areas of performance, also then collect the data to ensure you're on track." (RP11)

Similarly, RP1 highlights that ICT plays a critical role in facilitating employee engagement. RP3 perceives that technology empowers employees to be more productive. RP5 reiterates this view, focusing on the increased mobility that ICT provides to employees: "IT is a great tool to be able to extend the hours of the day... If you're trying to maximise people's downtime, their mobility is the absolute key". RP4 highlights the importance of on-demand access to information for employee mobility.

> "There needs to be online, anywhere anytime ability... So that if people lose motivation or interest or understanding, there's resources there to pick them back up, and refresh them and engage them again." (RP4)

RP1 identified that high-end and mobile video conferencing facilitates growth in business, teamwork, and collaboration. Viral modes of communication also play a vital part in enhancing organisational performance, according to RP1.

> "The most powerful... for the new generations in your company, in the government, is the informal, ease of use, almost viral nature of certain applications, certain technologies to get to an outcome." (RP1)

Correspondingly, RP15 has experienced that ICT enhances evaluation of organisational performance through real-time measurement, and provides senior Managers with complete visibility (RP2). RP2 highlights that ICT plays an important role in real-time monitoring and visibility of organisational performance. RP5 points out that the ability of ICT to monitor the performance of organisational change, and instantly provide feedback, enables organisations to be proactive in their operations.

> "Evaluate that [change] really quickly without having to see the damage two or three months down the track, and roll out a subsequent set of changes to help address that as necessary, and that can be from communication down to how an organisation runs." (RP5)

Correspondingly, RP2 reiterates the view that continual lines of communication and the use of the ICT to gain feedback are important. RP15 points out that evaluation plays a critical role in organisational change. Similarly, RP11 points to the importance of evaluation in the adoption of technology in ensuring understanding of the roles and responsibilities amongst individuals across an organisation in integrating with technology.

4.2.5 Role of ICT in Business Sustainability

The responses of participants indicate that ICT is a source of competitive advantage, and a fundamental part of modern business (e.g. RP3). RP4 points to the role of ICT in facilitating sustainability through effective communication and consistency in individual understanding. Eighty percent of participants highlight significant reliance on ICT in reducing operational costs. There was consensus amongst 60 percent of participants on the positive and key associations of ICT with organisational culture and

processes. RP1 summarises that ICT underpins organisational culture and business processes, and is an important part of organisational strategy. RP10 perceives that business processes do not function effectively without ICT. There was general agreement that ICT is now critical to the survivability of organisations (e.g. RP6).

4.2.5.1 Decision-Making

ICT bears a significant positive impact on decision-making through a multitude of time and resource-based benefits. Ideas advance to the decision-making stage through the leveraging of ICT (RP7), and reduce decision and reaction time (RP6). This is evident in this statement by RP9:

> "By giving more timely access to information, by providing decision support through analytics, by connecting people so that they can make informed decisions by compressing time and space in terms of getting access to different content, it is a huge factor." (RP9)

RP1 reiterates the above statement, and perceives that "technology can accelerate the human process of discussion, debate, and decision". RP1 continues:

> "The future success of companies, the future success of government, is going to be moving from that command and control structure to a more collaborative, not consensus, but collaborative-based decision-making." (RP1)

There is general agreement that ICT enables individuals to gain instant feedback. RP1 emphasises that ICT plays a role in accelerated decision-making.

> "Richer sources of input, accelerated processes to get to decision, which means that if... you've made the right choice, you're going to get the product to market quicker, you're going to get your business process changed quicker." (RP1)

RP13 highlights that ICT enables people at all levels of hierarchy within an organisation to contribute.

> "It's available to... people at all levels of the organisation... the identification of opportunities for business development is... more likely now to be able to come out of anywhere in the organisation." (RP13)

4.2.5.2 Ability to Change

RP2 revealed that ICT is enabling businesses to develop a proactive approach. RP10 also supports this notion.

> "When you start moving into a dip [reduced productivity] use ICT to communicate to get feedback from stakeholders, you find out what's working and what's not working well, and you can react to that quickly, you can be proactive." (RP10)

RP6 highlights that change within organisations is a constant.

> "We work in an environment where there's fierce competition, and our need to change is a constant, and so to be able to react quickly is as much competitive advantage as it is key to our survival." (RP6)

Particularly in the ICT industry, the ability to change is fundamental to organisational sustainability (e.g. RP2). Similarly, RP7 adds:

> "Technology requires us to change because of how businesses communicate with one another, so as more and more companies become tech savvy and come online, we're required to adapt and change to meet their requirements." (RP7)

Managers identified that ICT is enabling organisations to replicate success. This was particularly evident in the response from RP5.

> "ICT is a necessary foundation to be able to ensure that the business development is done in one particular region of the company, or by one particular team, can be quickly harnessed and leveraged in another part of the organisation very quickly, but without making the same mistakes." (RP5)

4.2.5.3 Social Sustainability

RP15 perceives that when the actions of employees make sense within the community, organisational sustainability also improves. The statement by RP12 below emphasises this point.

> "Developing your employees, how you're ensuring that... people having worked... in your organisation have business skills and capabilities that can contribute to the development of our world... those are very key indicators of a successful company." (RP12)

RP5 articulates that ICT enhances the sustainability of organisations through an enhanced ability to remain connected with customers.

> "A lot of business development is around inspiring confidence with customers, so the way we use IT there is to actually connect the global experts of our organisation to our customers so if there's any degree of concern or risk or anxiety regarding a new initiative that we're driving, we can actually quell that anxiety immediately by connecting them to the person that might be most appropriate." (RP5)

RP8 strongly emphasises that organisations have a responsibility to create a positive social impact.

> "The social conscience that we have as a company globally, the resources at our disposal... it's incumbent on us to continue to innovate around technology that creates better social outcomes." (RP8)

ICT plays a key role in customer relations by enabling organisations to collate the views of their customers (RP15). RP3 reiterates this view:

> "How ICT influences the external side is today customers are interfacing with business in many many more ways than they used to... customers today are being impacted by how they access the brand, by how they perceive the brand." (RP3)

The importance of considering the social needs of employees is emphasised in the following statement by RP15.

> "As an organisation how healthy are you in terms of your people, and that's not only their development, but how they view the organisation, and the spirit of the organisation, I think that's a really important part of organisational performance." (RP15)

Similarly, RP15 reveals that ICT is also facilitating the sustainability of organisations through the control and rapid elimination of counter-productive behaviours. RP2 points out that the increasing use of ICT within organisations and corresponding reduction in personal space significantly influences the way in which employees undertake their roles (e.g. RP2). However, RP2 also points to the challenge of ensuring the satisfactory performance of employees while working outside an organisation.

> "If I give them all the tools where they can work in a cafe or work at home, am I going to get the same output... the perception is if you're not in the office, you're not working, which is the wrong thing, so I will put more measurements round your output, or dates that you've got to deliver by." (RP2)

ICT is an enabler of change through improved work-life balance (e.g. RP8). ICT may also change workforce structuring and potentially result in downsizing. Increased technology intensiveness may also result in organisations adopting work-from-home solutions to increase employee productivity (RP2). These findings correspond with the study of Heitzlhofer (2008) that work-life balance influences workforce change.

4.2.5.4 Environmental Conservation

The general view amongst participants is that ICT enables organisations to create better outcomes for business productivity and environmental sustainability. RP10 clearly emphasises the importance of considering the impact of an organisation on the environment.

> "The carbon footprint, how to give back to society as a whole, the role that your company plays, and how it manages the harm it does in society as well, these are all important factors, and if you don't take those seriously, and if you turn

> forward-looking your organisation's performance will not be deemed as effective." (RP10)

The following statement by RP5 outlines how collaboration tools are enabling organisations to minimise their impact on the environment.

> "This more specifically when we're dealing with remote workforces, so the key theme, and it's inside... but for a lot of our customers it's around property compression. So large offices like this, where the whole idea is that with people being dynamic and being in and out of the office all the time, you've got desk space and resources sitting around doing nothing... heating and cooling systems, basically just going to waste, so there's a desire to have more dynamic and flexible workspaces." (RP5)

The study identified that ICT minimises unnecessary impact to the environment, particularly through communication tools and technologies that simulate an in-person experience. RP10 describes:

> "In most companies it's just not feasible to have a group of change Managers travel, fly around the world delivering that message, the most impactful way to do that is to do it consistently, and to do it regularly is to use ICT, and that's using telecommunications, it's using video communications, electronic communications, but being creative as well." (RP10)

RP3 states organisations are able to collaborate virtually, and no longer need to rely on communicating in-person, except where it is essential, as new technologies are replicating the same experience with a reduced impact on the environment. Visual communication tools reduce the need for travel, and result in significantly reduced operational costs and environmental impact. ICT also enhances collaboration at a global scale, in terms of enabling more frequent leader-employee interaction, and more effective team management at a global scale.

4.2.6 ICT Implementation within Organisations

Participants identified the need for deliberate and strategic use of ICT within organisations. The timing and rationale for implementing ICT has broad implications for an organisation in terms of culture and strategy (RP14), which correlates with the research of Stam and Stanton (2010). At the same time, organisations need to convey the benefits obtained to stakeholders of ICT. RP5 adds that ICT implementation must be justified by a tangible business and value proposition. RP10 also stresses the need for ICT implementation to be strategic and justified.

> "It's critical nowadays that you have an integrated ICT strategy in place, it just facilitates that communication, it makes your messaging more impactful, it enables you to reach a large diverse audience quickly, and it also enables you to understand more about, and get more feedback from your stakeholders and what they're really thinking, because otherwise if you don't take that into consideration the change project may have the best intentions, but it won't reach its goals, or it will take significantly longer to reach its goals." (RP10)

The importance of amalgamating culture with technology also resonates in the response of RP15. The response of RP15 supports the research of Strebinger and Treiblmaier (2006) that brand architecture must precede ICT implementation in order to ensure strategic resource usage.

> "The idea is that your process... and through that your service definition... the whole culture of the brand and everything is defined first, and then you build your tools and implement the technology to match them." (RP15)

Implementing technology without consideration of equally critical people and process elements is potentially counter-productive (RP3). RP7 emphasises the need for a strategic approach to ICT implementation.

> "As a company we need to have a clear strategy on where we're going with our technology, which will influence the technology we use internally, from a communications, a collaborations, as well as a process perspective." (RP7)

Similarly, RP5 perceives the need for a strategy encompassing diversity within an organisation, both in terms of employees and ICT.

> "You can't make a single assumption regarding the attitudes or the capabilities of your staff population, unless you have a multipronged ICT strategy that actually is designed to cater towards people of different ills." (RP5)

Similarly, RP12 reiterates "without the business process aligning behind it and the counterculture accepting change and embracing it, on its own I don't think that will be very influential". ICT implementation involves user acceptance testing, feedback, and buy-in from user groups involved in beta trials (e.g. RP14). RP15 concurs:

> "There is a big part of the project that is around testing and implementation and change management, but it's very censored and very often it is marked that it is not done well." (RP15)

RP6 believes that successful ICT implementation involves alignment and evaluation. The importance of evaluating ICT is emphasised by RP1.

> "ICT is just an enabler... unless you have the cultural and business process vision indicators that you're mapping to, you're not going to know how effective

> you are... what are your measures of success, either culturally or business process, or preferably both, then ICT becomes the enabler to achieve those objectives." (RP1)

4.2.7 Challenges of ICT Implementation within Organisations

A major barrier that organisations face when attempting to internalise technology they have developed, is that often the required technical support is not available (e.g. RP4). Similarly, RP10 perceives that a more proactive approach is required to adopting technology internally. RP4 describes:

> "Often, the stuff we sell our customers is the ultimate version, and we get a cut down version internally... We don't get the latest version of those things, all our customers get the latest version of things... because this internal team will only sign an SLA [service level agreement] to what standard they believe they have the confidence to support it to... Very limiting and frustrating, that they don't roll out the full versions of things." (RP4)

RP15 highlights a major and widespread reality that organisations have limited resources available to expend in organisational change.

> "If you look at a plan for something that involves technology, one of the downsides to it is that the plans are… big and expensive, and in an existing operation, they always have an inherent problem where they are looking for existing people, so resources that are already busy with the run of business." (RP15)

4.2.7.1 Alignment of People, Process, and Technology

Managers and Senior Leaders highlighted that a critical aspect of successful technology implementation requires alignment between people, process, and technology. RP6 describes:

> "ICT needs to be tightly linked to the change agenda... Slows down the process of change if the systems aren't aligned to that change... If it's not aligned or backed by process and cultural/people change, the technology itself is not going to be the agent for change." (RP6)

Correspondingly, RP12 conveys that where technological change is concerned, ICT exhibits a dual nature to either facilitate or hinder change.

> "If the change required a significant technology change, and that can sometimes take time and be a project in itself, and delay what the business wants to do, and it can, to the same extent... enable change by being a platform for you to be able to communicate or get information about it." (RP12)

RP5 believes that where change relies on ICT, establishing a unified direction for employees to channel their efforts towards a change is challenging. RP12 emphasises a point many participants raised that poorly implemented ICT potentially produces negative outcomes for organisational change.

> "You could also impede your change if you didn't have the right systems or the right platform or it wasn't a good quality and it fell over and didn't provide you with the right information... it's a double-edged sword, it absolutely can accelerate and enable, but it could also delay and impede." (RP12)

The response of RP5 clearly identifies that technology needs to be borne from and aligned to the requirements of its users. Similarly, RP7 points out that whilst ICT intends to enhance performance, there is also the possibility of creating a more complex environment within an organisation.

> "Generally... it enhances, but there are simple things that get complicated, once you move to that technology environment... If it's too hard for the user, it's not going to have that positive effect." (RP7)

There is consensus within the case organisation that the alignment of technology, process, and culture is pivotal to the successful integration of technology (e.g. RP6).

> "In isolation, it does nothing, if it's not aligned to process and cultural objectives... if you don't actually then drive some cultural changes around the way in which people interact... will end up seeing that technology fail." (RP6)

4.2.7.2 Humanisation of Work Environment

Whilst ICT generally has positive implications for organisations, as identified within the organisation studied, 40 percent of participants (mostly Senior Managers) hold the consensus that ICT also has the potential to dehumanise an organisation, particularly within communication and change. Inherently, the development of technology is a human process, and the effective utilisation of technology requires human input and involvement throughout business processes. Where technology suffers is through the excessive use of ICT, in which case an organisation may become dehumanised. Dehumanisation within an organisation results directly from the minimisation of in-person face-to-face human interaction. RP7 explains that e-mail has become a preferred

form of communication, and consequently a major source of dehumanisation within organisations.

> "Email has become such a norm communication that people don't talk... we're finding that the actual communication, voice-to-voice, is becoming less, email is becoming the preferred communication." (RP7)

RP8 concurs the human factor is lost through the increased use of ICT. Correspondingly, RP4 emphasises strongly that a balance of technology with human interaction is necessary: "More in person, don't be too reliant on technology only... it should be part of the suite of communication tools, don't remove that human contact piece". RP7 shares this view:

> "You need that face-to-face... There's always going to need to be human intervention, there is always going to need to be discussion around people in terms of capabilities, in terms of skill sets, that you can't really hand off to ICT." (RP7)

Participants reveal that whilst ICT is enabling collaboration at a global level, there are implications for the morale of employees. RP2 perceives that maintaining motivation in teams through virtual interaction is a challenge. RP8 reiterates this concern.

> "They might not even be in the same time zone as a person that they now report to, as a result of change, and that can be a real challenge for people, particularly to keep up their day-to-day motivation and to feel as though they're part of a team, to feel as though they're getting that sort of attention and support that you want from your line manager." (RP8)

4.2.7.3 Rationalisation of Information

RP7 highlights that organisations must manage the level of information available to employees, and devise ways of filtering and providing the most relevant information. RP7 emphasises the need to rationalise and simplify information using tools to support employees and customers, and subsequently improve organisational and stakeholder performance. RP5 emphasises that an excessive amount of information is counter-productive to the efforts of employees: "People's concerns, people's security, we can have too much information where nothing is credible, and everything changes". Correspondingly, organisations face difficulty in standardising on the technologies used, according to RP8.

> "The challenge we face is getting it integrated and getting a uniform [consistent across the organisation] approach to what we use, and when we use it, and what do we use it for." (RP8)

According to RP7, decisions on standardising ICT from documents to real-time communication have proved the most challenging. RP7 describes that overly diversifying communication methods within an organisation has negative connotations for collaboration, organisational change, and ultimately productivity.

> "In a number of situations if you have too many means of communicating and too many different methods from a technology perspective to actually get the information out there, people become disorganised and actually don't take advantage of one particular source of information." (RP7)

The findings support the research of Harrison and Humphrey (2010) that workforce diversity proves a constant challenge for organisations in their strategies. Further, individual technology preferences, and the vast array of technology available create a further hindrance to the consolidation of ICT usage within organisations (e.g. RP7).

4.2.7.4 Relevance of Technology

RP7 points to the fact that change is a constant. To the same degree, changes in technology are expected, and such changes occur rapidly according to 27 percent of participants. Correspondingly, RP5 highlights the importance of ensuring that employees remain focused on all of the technologies being utilised in an organisation, not only the new technology that is being implemented. Further, the relevance of information provided through ICT is critical. Participants generally concede that the usability of technology plays a critical role in its acceptance (e.g. RP5). RP11 perceives that extensive use of ICT is required to collaborate further with stakeholders affected by change. RP5 exclaims that replicating the same experience on multiple technologies is a challenge.

> "There's some challenges in there as well as to how to use IT more intelligently, and even... How do you make it cross platform... Take that experience where someone can be sitting in front of their desktop, and then they can take that onto their mobile, and have a consistent delivery of the message without having to restart and replay." (RP5)

4.2.8 Conclusions on Information and Communications Technology Adoption

ICT and organisational change link through the knowledge transfer paradigm (RP1, RP5, RP13, and RP15). ICT bears a significant impact on organisational change through the ability to enhance the constancy and consistency of communication (RP1, RP4-RP6, RP9, and RP15). Communication technologies are fundamental in providing consistent direction across an organisation (RP2, RP4, RP5, RP10, and RP15), particularly technologies that embrace both the visual and auditory senses (RP1 and RP4-RP6), complementing the work of Stephens (2007). ICT enables organisations to instantly deliver messages globally (RP1, RP4-RP6, RP8, RP13, and RP15). Correspondingly, ICT also significantly assists leaders in communicating the objectives and benefits of change (RP2, RP4, RP8, and RP15), and obtaining the support of employees in accepting change. Leaders are also able to maintain a close connection with employees whilst driving change through collaboration tools. Thus, the ability to drive consistency in organisational change becomes evident (RP1, RP4-RP6, and RP10), confirming the validity of Proposition 1-1.

> **P1-1:** Organisations facilitate sustainable change through integrating ICT infrastructure.

The findings indicate that ICT influences financial and non-financial aspects of performance (RP1-RP3, RP11, and RP15). Collaboration technologies in particular have unequivocal influence on decision-making ability in terms of the quality and frequency of interaction, and reducing the time to decision implementation (RP1, RP6, RP7, RP9, and RP15). The use of ICT in evaluation mechanisms has a profound impact

on the visibility of Senior Leaders, Managers, and employees (RP2 and RP8) in terms of organisational performance, and progress towards business targets and organisational objectives (RP2, RP5, and RP15). Thus, these findings validate Proposition 1-2.

> **P1-2:** Organisations increase performance in regular business processes through integrating ICT infrastructure.

The findings of this study also provide evidence that ICT increases the momentum of organisational change (RP4, RP5, RP8, RP9, and RP15). ICT was found to increase the speed at which knowledge transfer occurs (RP14 and RP15), particularly with real-time communication technologies such as video conferencing and audio conferencing (RP1, RP4, RP6, and RP10). The findings suggest that ICT results in accelerated decision-making (RP1 and RP6). Consequently, ICT increases the rate at which communication occurs, and leads to accelerated change momentum (RP1, RP5, RP9, RP12, and RP15), confirming Proposition 2.

> **P2:** Organisations increase the perceived momentum of organisational change through integrating ICT infrastructure.

Organisations utilise ICT in order to support the mobility of employees and their level of collaboration. Mobile technologies in particular address time constraints by increasing opportunities for employees to collaborate and contribute. Consequently, enhanced employee mobility creates a task-rich time-rich environment, which ultimately produces significant enhancements in productivity (RP1, RP4, and RP5). ICT surpasses traditional methods of communication in terms of scalability and reliability

(RP1, RP5, and RP8). ICT facilitates change through enhanced communication, and the transparency and clarity of information is therefore improved, confirming a link between Proposition 2 and 3-3 (see Section 2.7).

4.3 Knowledge Transfer in Organisations

The main learning objective of individuals is competence, according to RP9. This corresponds with the findings of Antonacopoulou, Ferdinand, Graca, and Easterby-Smith (2005) that individual capabilities influence organisational learning. Learning initially involves establishing knowledge and awareness, and progresses to mentoring, evaluation, developing people skills, and ultimately creating efficiency (RP5). Learning develops the effectiveness of employees through enhanced understanding, engagement, communication, and the working environment.

RP12 explains that the accessibility of information is important: "With more information you can come up with your possibilities, you have better analysis of information, you can make faster decisions". RP15 highlights that the selection of communication methods are pivotal in effective communication. The discussions around knowledge transfer frequently referred to the differing roles of formal and informal learning in developing competence in individuals. RP11 perceives the role of formal learning as obtaining engagement at an intellectual level, whereas informal learning facilitates the engagement of individuals at a personal level, thus instilling deeper commitment. RP10 responds similarly, focusing on the level of contribution of each approach to learning.

> "Formal training programs... that's going to give them 30 percent of what they need to learn, so the rest is about getting out there and finding things out as they go in that quick efficient manner." (RP10)

4.3.1 Formal Learning within Organisations

Training within an organisation provides the means by which individuals acquire understanding, and as a result gain confidence in utilising the prescribed systems and tools employed within an organisation. Training is critical to the roles of employees remaining relevant and in line with organisational objectives and stakeholder expectations. Formal learning is also required where change is time-critical (RP7). RP2 and RP6 perceive that formal training is necessary to test and maintain the skills of employees. Whilst the majority of participants perceive a need for flexibility in modes of knowledge transfer within an organisation, the need for structured formal training within critical business areas is evident. This point echoes vividly in the response of RP1.

> "For some of the more conservative, more command control areas of your business, this is very important, and you need to show a rigid, well thought-out, documented... sustainable process in order to train and enable people to learn new ways of working." (RP1)

4.3.1.1 Modes of Formal Learning

Participants highlight that whilst ICT is appropriate for self-paced online learning in systems, tools and processes, other forms of training related to career development and leadership require more personal, face-to-face interaction, often in the form of

mentoring, one-on-one with a supervisor, senior leader, or a person looked up to (e.g. RP11). RP8 holds the view that instructor-led training is the most effective.

> "Most people would probably respond to live instructor-led training, reason being is that... then you've got a captive audience, so you're not necessarily going to be distracted by other things, you're there physically in a room with an instructor, perhaps with some colleagues learning how to use a new piece of technology, you can ask questions on the fly... you're basically engaging all the senses, you've got a person physically there, you've got tangible technology that you can demonstrate, other people you can see, hear and touch." (RP8)

In respect to ICT, RP1 alludes to the changing focus of training, shifting from an aspect-centred view of technology towards its capabilities and outcomes. Participants point to the fact that the increasing simplicity of ICT has reduced the need for training to a certain extent. However, RP1 adds that specialised in-depth training is still required under certain circumstances, and such training is "partitioned now to deep subject matter experts". RP11 holds the view that employee training needs to occur after organisational change is accepted.

> "Training is important, but it's probably the tail end of the change, so you will see fear factors out, why are we doing this, what does it mean to them. Once they're [employees] on-board, then you train them, because they're on-board." (RP11)

RP3 believes that mentoring is the most powerful type of formal learning. RP14 outlines that mentoring enables individuals in an organisation to undertake cross learning and seek other perspectives from employees working in other business units. According to RP11, mentoring also has the potential to change the behaviour of individuals, and as a result facilitate the acceptance of change. RP14 states:

> "It's very good to get information from another part of the organisation, and to get coaching from someone who is to some extent removed from where you are in the organisation... there's definite value in that, if there is a personal click." (RP14)

Mentoring also assists in employee inductions to develop awareness of the tools potentially required in undertaking their roles (RP7). Mentoring is particularly suitable for high-performing individuals impacted by significant changes in roles or organisational structure, and others affected to the greatest extent due to change (RP11). Mentoring also suits succession planning at the Executive level. Although mentoring at this level is typically longer-term, and ranges between two to three years (RP15). However, for mentoring at lower levels of the organisational hierarchy, which are more short-term, RP15 highlights the need for an informal approach to mentoring. RP7 concurs with the view that informal mentoring is more effective, adding this is due to the personal connection that is established. Although to a similar degree, RP14 believes that semiformal mentoring is challenging.

> "Some people use it effectively, very often it's hard to agree on what the objectives are and how you structure it and how you make sure you get value out of it." (RP14).

RP15 adds that in the absence of a structured mentoring arrangement, the selection of a mentor is even more critical. RP15 also highlights the importance of developing a structure for mentoring.

> "If you structure meetings... it means they're locked in and they're going to happen, whereas if you leave it open and the person's really hard to get hold of, then it's just hopeless." (RP15)

4.3.1.2 Role of Formal Learning in ICT

Employee knowledge and skills influence effectiveness in the use of ICT. There is general agreement that formal training is required for the implementation of ICT, and the changes in process that occur as a result of implementing new technology, in order to drive consistency (e.g. RP15). RP7 draws attention to the fact that formal training is necessary for changes in mainstream tools that are critical to the effective functioning of employees within their roles. Similarly, RP10 explains that formal training is critical when stimulated by a legal requirement, or major change involving an entire organisation. However, the receptivity of an organisation towards adopting a new technology depends upon the diffusion of such technology across an industry in which an organisation exists. RP8 perceives that the need for training depends on individual learning needs and the industry.

> "If you're not dealing with an ICT company... and you're rolling out new technology... some sort of formal training is probably critical to getting buy-in and ongoing usage of that technology." (RP8)

The following statement by RP6 outlines the role of formal training in promoting the acceptance of ICT.

> "People need to understand the background and context around these tools, understand why, because that then breaks down some of the resistance or barriers that people might have around learning new programs and utilising new tools." (RP6)

RP8 points out that within an organisation, differing levels of competence on ICT exists. RP5 states that formal training provides employees with the basic skills of utilising technology, and provides employees with confidence, and progress towards developing effectiveness. RP15 perceives that training facilitates the adoption of new technology through enhanced confidence and frustration. Correspondingly, RP7 highlights the importance of training in the adoption of ICT.

> "One of the biggest barriers to actually adopting technology is the training piece... if users do not understand how to use the technology, then they won't understand the value of it." (RP7)

RP15 perceives that interactive introductions in a formal format are required to obtain buy-in for changes in technology. RP12 agrees, highlighting the critical role of formal training in the acceptance of technology.

> "If there isn't a formalised process of make sure people really understand the technology available to them, how do you use it, how could it benefit them, then you won't get any benefit from it... if there isn't that user training... it becomes a real problem for a project." (RP12)

RP11 believes that formal training is complimentary and necessary following the implementation of organisational change to ensure employees are competent in utilising technology.

> "Whether you do formal or informal, once the change has been accepted, and you flip the switch, then there is still some need for on-the-job training or monitoring to ensure that people are really in sync with the tool, that comes back to the measures of the performance." (RP11)

4.3.1.3 Advantages of Formal Learning

Benefits of formal training include confidence (RP4, RP6, and RP15), feeling involved (RP15), acceptance, awareness, appreciation (RP5), understanding (RP5 and RP6), vision for capability (RP5), and the highest rate of success (RP4). RP9 perceives that training demonstrates the benefits of technology, and is particularly useful where the work schedules of employees prevent informal learning.

> "To the point where the benefits aren't readily realised, if it is a sophisticated change process, than actually taking people out of their day jobs and giving them the opportunity to practice and learn the benefits and realise, and see the big picture, formalised training programs can be really powerful." (RP9)

Formal training is pivotal in learning how to utilise a new technology. Training sets a foundation for people to accept new technology, and "puts people into the right frame of mind" (RP15). Training programs also play a role in identifying peers with differing perspectives who can support others (RP5). RP10 perceives that formal training plays a significant role as a feedback mechanism for organisational change, by providing a connection with recipients and implementers of change.

> "It's a great way of extracting the concerns, the negativity, the cynicism, the challenges that you may face... it gives you a chance to slightly adjust your roadmap in the process to make it happen." (RP10)

RP13 believes that formal training is necessary to establish a sustainable foundation for knowledge expansion. This is also evident in the interview with RP10.

> "Training programs give them the basics, the fundamentals, so they don't have to feel their way... it gives you that basis to then develop and learn the rest, without that you can go off completely on the wrong track." (RP10)

RP3 highlights several other benefits of successful formal training in this respect.

> "If it's done well, and it's fit for purpose, it accelerates productivity, it accelerates enjoyment in your work, because you've got these tools that are helping you be more productive, add more value." (RP3)

Effective training programs allow employees to access training aligned with their learning needs. RP11 highlights increased usage of self-paced online training in organisations.

> "We tend to do a lot of online training... and that's good because people can do it in their own space and time, and at their own pace, we're finding that's been quite effective." (RP11)

4.3.1.4 Challenges of Formal Learning

RP5 holds the view that during the initial stages of adoption, whilst training is pivotal to inspiring confidence, it has a minimal effect on the effectiveness of employees in utilising technology. Within organisations where the roles of employees are time-critical, training is difficult to implement (RP3). RP5 highlights a challenge in addressing employee willingness to participate in formal training.

> "If it's formal, people are instructed to attend for a particular purpose, so are they there because they want to be there, or are they there because they've been told to be there, so you could also argue that if people are attending formal training for the wrong reasons, they're not going to accept, they aren't going to be brought willingly into a technology." (RP5)

RP5 highlights the challenge for organisations to determine whether formal training is relevant for their employees.

> "Some companies you have to have formalised training programs, others I think they can actually do more harm than good, it really comes down to the propensity of staff to adopt technology." (RP5)

Similarly, RP4 highlights that contrasting views exist between Management and employees towards formal learning. RP5 highlights a fatal flaw in formal training that individual learning needs are not considered.

> "The idea of formal training is that it feels a little bit rigid, it doesn't adapt to my needs at a point in time, my mood on the day, or my workload... a big downfall in formal training that it caters for everyone the same way." (RP5)

However, RP9 draws attention to the fact that informal learning is sometimes more appropriate. RP8 concurs that this is evident in the ICT industry. RP5 points to the fact that training provides a foundation for individuals to adopt technology. RP11 shares this view, emphasising the introductory role of formal learning in developing competency.

> "Training is like the introduction, until people actually work with the technology to carry out their role, or to deliver to a customer or produce an outcome, it's not until then that they're going to have the confidence in the change." (RP11)

However, effectiveness largely depends on individual capabilities and willingness to use technology. RP5 states:

> "Effectiveness ultimately comes down to the individuals once they have been trained, how they build the linkage between knowledge of what the technology is capable of doing, and how they choose to apply that to the context of their day-to-day role, that's when they personalise it." (RP5)

RP5 cites a link between change acceptance and the quality of implemented training programs. RP5 also believes that a long-term strategic approach to training is required. RP14 specifically emphasises the view of many participants that formal training does not satisfy all of the learning needs of employees.

> "Avoid the resistance of... adapting the system... using it to the fullest, that's often not where formalised training works in the best way... a formal program is good to tell people what to do and how to do it... it doesn't necessarily convince them why to do it." (RP14)

RP5 reiterates this point:

> "A formal training program will help people realise they exist, but it's not going to actually go as far as help people understand how they can use those tools, how they can change their personal workflows and what the personal benefit is to them." (RP5)

4.3.2 Informal Learning within Organisations

Informal and collaborative training programs are the most effective forms of learning (RP1). Similarly, RP15 highlights the view of many participants that informal learning occurs during the process of change, and is more important than formal learning. RP11

shares the majority view amongst the participants that informal learning methods are more constructive than formal learning approaches, and assist in developing the confidence and understanding of individuals. This view is synonymous with the majority of Managers interviewed. RP13 describes: “That informal piece is probably where... people themselves work out how to do things even better and share that amongst each other, and it probably enhances the use”. RP3 complements this view, adding that informal learning allows individuals to learn about the significance and implications of ICT. RP14 states: “Informal learning is more important in that why, how do I learn through the system, through people, through early adopters, that there is a reason to accept this technology”.

4.3.2.1 Modes of Informal Learning

Within the organisation studied, the majority of learning involves informal learning through ICT. This supports the research of Eraut (2000) that knowledge is mainly informal in nature. The findings reveal that employees learn informally through a multiplicity of communication methods. Employees learn through a range of online informal learning tools including Internet browsing; YouTube; blogs (RP3); wikis (RP5); social media; web training programs; email; instant messaging (RP10); Video on Demand; playbooks containing written, video and animation content (RP6); troubleshooting forums (RP7); online innovation portal (RP1); and collaborative websites (RP15). The use of wikis in particular has increased according to RP5.

> “We’ve seen a huge uptake in wikis internally, so it’s just self-run communities where people just jump on the wiki to contribute and to learn, taking themselves out of any training program.” (RP5)

Informal learning within organisations also occurs through conversing with informal champions, involving employees in the development and testing process, and identifying enthusiasts (RP9). RP12 also highlights the importance of peer support in informal learning.

> "Peer-to-peer, listening, support, overhearing or just questioning in amongst the team, we sometimes pose a problem in a meeting and someone will come up with an idea and everybody learns from it." (RP12)

Technology uptake is also industry-dependent, and participants strongly agree that within the ICT industry, adoption rates are higher. RP8 in particular reiterates this point.

> "In an ICT company... you'll have a much higher number of people that will just naturally grab a hold of the new piece of technology that has been rolled out, and effectively teach themselves... They'll have a play around with it, they'll create their own communities of interest, some people even go so far as to create some sort of wiki or blog with some helpful hints on how to use the new technology." (RP8)

ICT facilitates informal learning through self-inquiry (e.g. RP5 and RP6). RP3 believes that the use of ICT in the form of informal learning provides individuals with the ability to listen and filter. First-hand experience of the effectiveness of ICT facilitates its adoption for use in informal learning. The ease of usability and intuitiveness of technology facilitates learning (RP8). Complementing this view, RP9 perceives that user interfaces are a contributing factor to the willingness of individuals to learn about a technology. Thus, the design, functionality, and usability of technology contribute to learning in this respect (e.g. RP9). Likewise, the opposite applies for technologies that are more difficult to use (RP11).

Advantages of Informal Learning

Learning in an informal manner facilitates social sustainability within an organisation: "Informal training can be a really great way of just bringing people together in an organisation... because it is all about communities of people helping communities of people" (RP8). The majority of participants allude to the role of informal learning in completing the learning process. Formal learning provides employees with the underlying knowledge required to undertake a task. However, successful adoption results from informal learning (e.g. RP15). RP11 adds:

> "It's not until it's used in anger for what it's really designed for that people will have their true confidence up. You can start to build their confidence, but until it's there and tangible, it's very difficult." (RP11)

The acceptance of ICT through informal learning occurs through value realisation, whereby an individual sees the usefulness and effectiveness of a technology, resulting in self-driven acceptance. This corresponds with the research of Skaret, Bjørkeng, and Hydle (2002) of a link between knowledge and value creation. RP5 describes:

> "You've got people who have instinctively made their own determination of the value of a technology, and they've made their own internal assessment on the return on investment... of trying to train on it... I think informal learning is a result of a value proposition being realised... and because that value proposition has been realised... that underpins the acceptance of a technology." (RP5)

Organisations facilitate informal learning through providing resources for individuals to undertake learning using their preferred approach (e.g. RP5 and RP9). Managers strongly agree that informal learning leads to the discovery of new knowledge in the use

of technology (e.g. RP8). RP9 highlights that experiential learning provides individuals with the effectiveness and confidence they require to utilise a technology. RP6 points out that the exposure and experience gained from applied learning and on-the-job training develops the effectiveness of employees. RP7 holds the view that informal learning suits non-compulsory technology that may potentially assist employees in undertaking their work.

Challenges of Informal Learning

RP11 emphasises the need to conduct informal learning earlier in the change process to introduce change and gain feedback. RP5 firmly believes that individuals only engage in informal learning on new technologies when the effort is justified: "Unless there's a compelling reason for me to do the informal training, I'm never going to take the time to try and learn... which is symptomatic of all technologies". The following response of RP7 highlights a need for organisations to allocate time during working hours for employees to engage in learning. Similarly, RP7 continues that informal learning requires a follow-up of a viral nature to bolster learning gained.

> "Only way the informal [learning] would occur is if it were something viral... that would assist or if there is a direct project opportunity... that supports that informal... A positive informal experience then needs to have some sort of follow on to other communities to ensure that it actually spreads." (RP7)

RP13 highlights the need for a proactive approach to learning: "Any organisation needs to build themselves into a learning organisation where you don't just wait for training to learn, you actively seek out learning opportunities".

4.3.3 Conclusions on Knowledge Transfer in Organisations

Training is key to the acceptance of ICT (RP2-RP4, RP6, RP7, RP9, RP11, RP12, RP14, and RP15), through its provision of understanding on the importance of ICT being implemented (RP1, RP5, RP6, and RP14). Formal training establishes knowledge at an introductory level to introduce new technology, and begin to develop the confidence of users (RP5, RP11, and RP14). Formal training is the foundation upon which individuals subsequently build a sustainable practical framework through informal learning to rectify breaches in knowledge, and facilitate usage of ICT (RP5, RP10, RP13, and RP15). The findings suggest that formal learning is required for rollouts of major change and new technology (RP7 and RP10).

Face-to-face interaction is still required for certain training, particularly where change has significant implications for the roles of employees (RP11). Where the benefits of face-to-face training exceed that of online training is where individuals have a greater ability to learn from each other. Such an environment emphasises a culture of learning amongst employees, and supports stakeholders and customers. Instructor-led training is the most effective type of formal learning for its ability to engage individuals and facilitate the exchange of knowledge between peers (RP8). These findings support Proposition 3-1.

> **P3-1:** Organisational members accept ICT infrastructure change following a formalised training program.

However, formal training has the potential to develop employee effectiveness when supplemented with informal learning (RP1). Effective training often requires a face-to-face in-person environment where people are able to obtain hands-on experience, and become deeply involved with a new technology or a new process to utilise it effectively. Training through videoconferencing (RP1 and RP6) and other online collaboration tools (RP1, RP3, RP5, RP7, RP9, and RP15) are suitable in situations where face-to-face in-person interaction is impractical, or the benefits replicate easily.

The majority of learning occurring through ICT is of an informal nature (RP3, RP5, RP7, RP9, and RP10). Consequently, informal learning has a comparatively greater ability to influence the adoption of ICT in comparison to formal learning (RP7, RP8, RP9, RP11, and RP15). The findings also point to informal learning as a feedback mechanism. Social networking and online collaboration tools are also highly influential in gaining stakeholder engagement (RP5, and RP8-RP10). The findings clearly establish that informal learning builds on the confidence of individuals, and moves to developing their effectiveness in the use of technology to enhance sustainability in its usage. The informal learning encountered by individuals in day-to-day work, and through collaboration with colleagues, significantly influences the confidence and effectiveness of individuals in utilising ICT (RP3, RP5, RP6, RP9, RP11, RP13, and RP15). Thus, these finding provide evidence to support Proposition 3-2.

> **P3-2:** Organisational members accept ICT infrastructure change following informal learning.

Organisations now operate in a knowledge-driven economy (Kets de Vries, et al., 2009, p. 8), and the availability and effective utilisation of information is critical to business sustainability. Effective knowledge transfer involves a combination of formal and informal modes of learning, and the availability, transfer and transparency of knowledge has significant implications for the success of organisational change (RP1, RP5, RP6, RP8, and RP10). Formal training is not always necessary, as informal learning may provide the required expertise to utilise technology effectively, as RP8 describes: "That sense of community and... innovation around how to use a piece of technology, can only really come out of informal training". Formal and informal learning play different roles.

> "Formal training to highlight the introduction of something, the availability of something, to provide a baseline set of skills, and awareness, and then have that complemented by an... informal program that allows people once exposed and aware, to decide themselves how to take the next step and to what speed." (RP5)

Participants strongly agree on the need for a balance between the formal and informal modes of learning. RP10 states:

> "If you get to a point where everything becomes informal, you're going to have a negative impact on the organisation, there is always going to be the core there, needs to be formalised." (RP10)

Organisational learning combining formal and informal approaches is the most effective approach to accommodating differing learning needs and engaging employees at a broad scale, according to 47 percent of interviewees. RP6 perceives the most effective method of learning is a combination of formal and informal learning occurring simultaneously. RP1 concurs:

> "You can't be too fluid, and you can't be too rigid, and it's getting that balance right, and constantly adapting that to the state of the change agenda that you're in." (RP1)

Correspondingly, the role of the CIO in implementing successful organisational change becomes evident. Planning how the CIO instigates change is critical to the communication of organisational change (RP2). Based on these findings, Proposition 3-3 is validated.

> **P3-3:** Organisational members accept ICT infrastructure change when leaders clearly communicate the purpose for implementation.

4.4 Change Management

The successful adoption of ICT requires alignment between process, culture, and change. RP13 raises the issue that the ability of an organisation to integrate people, process, and technology together bears critical influence on the success of change management. This corresponds with the findings of Fleck and Howells (2001) that consideration of technology and people elements is necessary. A lack of association and alignment between these key aspects of an organisation result in uncertainty and complexity, hindering change. Similarly, RP14 highlights the need for interlock between these key components. RP13 states:

> "You might have the technology, but if it's not aligned to the other two pieces, then it's probably not going to work, if you don't have the technology to support it, then it doesn't matter how much people want to change, if you don't have the vehicle to get there, it's also not going to work." (RP13)

RP12 outlines that the fundamental elements of change success are developing awareness and understanding, the ability to implement change, and instilling the right behaviours. RP13 concurs:

> "Change management depends on whether people understand the change, buy-in the change, understanding where they're going, what's the picture... it gives organisations the ability to build all those things... if you don't have those things then ICT isn't necessarily going to help that anyway." (RP13)

ICT change also requires alignment with the operational timescales of an organisation (RP6). This is evident in the response of RP12.

> "Change comes about because of the change in process, and the change in culture, and potentially some of those will be underpinned by technology, but unless all three are adopted and work together, then we don't think that it will be a really successful change." (RP12)

The effectiveness of technology in a geographically-dispersed organisation requires further levelling of resources (RP4). Correspondingly, RP7 emphasises the need for a robust change strategy.

> "There needs to be a clear strategy by which the organisation is looking to move forward... you need to re-evaluate your resources and realign, so as the economy changes, as the industry changes, we need to be realigning to not only customers, but also globally as to what is happening within the economic environment." (RP7)

4.4.1 Change Agency

RP11 perceives that the presence of change agents depends on the nature of change, which supports the work of Chreim, Williams, Janz, and Dastmalchian (2010). Change agents exist at the leadership level. However, all individuals within an organisation have the capability to drive change (e.g. RP9). There is an 87 percent consensus amongst the research participants that multiple change agents exist within an organisation, and are necessary to implement change. RP6 states that: "Ideally everyone has to be a change agent, or everyone becomes an agent of change to effectively drive change through the organisation". Eighty percent of employees interviewed agree that change agency diversifies across organisations. RP8 highlights the views of 67 percent of employees in saying: "it's incumbent on all of us to be change agents". To a similar extent, RP5 shares this widespread view amongst 53 percent of employees that change agency is a responsibility placed upon all individuals.

> "To a certain degree everyone is empowered, but also everyone is expected to be a change agent within your own personal spheres, so when... a new approach comes down, people are expected to embrace that and adopt that." (RP5)

RP1 concurs:

> "One would hope that the majority of your organisation are change agents... the change agents need to be as many in your organisation at all levels, at all functions as can be... that should exponentially rise as you go through your change agenda." (RP1)

Several Managers perceive that often the ideas for change do not originate from change agents. Correspondingly, RP7 holds the view that those who raise ideas for change, and the change agents who implement ideas, are different people. This is particularly emphasised in the following response of RP15.

> "Often the people with the ideas are the worst change agents... there's the next group down that are centred on reality, that are quite excited by the sense of movement, they're the ones who can make it happen... a different person that's... willing to listen to everyone, willing to communicate often and continuously, and has the patience for that." (RP15)

There was general agreement that change agents arise of their own accord during the change process. RP15 states:

> "You can't really have a decided change agent, because you do your formal piece, you roll it out… it's only as people start using it and implementing it." (RP15)

RP14 outlines the role of change agents:

> "Seeing where the change is needed... having the guts to vocalise that out and then daring to challenge the framework... coming up with a group that would like to address the change... rally the troops behind you to actually implement that and make it happen." (RP14)

Some participants also perceive that change agents as the champions of an organisation. Correspondingly, the findings of Visser and Crane (2010) support the views of participants in this study that change agents facilitate organisational sustainability. The need for champions within organisations to drive change is emphasised in the following statement of RP6.

> "Need champions in the business, and they're not necessarily people with Senior Leadership titles, the champions are people who carry influence around the office environment, people that may be long-standing employees are seen as mentors to a lot of others, may be seen as the wise owls of the organisation that people turn to, these champions can carry a lot of influence in helping drive the change, in the day-to-day communication that they have with people, but also in the more subtle and powerful one." (RP6)

RP11 highlights that when change agents are at the same hierarchical level as employees targeted for change, those employees more readily accept change. Similarly, change agents encourage employees to adopt change through consistently employing the new approaches and technologies implemented (e.g. RP15). Similarly, RP12 states:

> "They personally have to be passionate about it, so then they start to vocalise it, or communicate with someone whether it's their peers or sounding boards, or people around, and then to the appropriate authorities." (RP12)

Managers believe the challenge for successful change agency is to identify change agents who can assist leaders in gaining adoption of change (RP11). Change agents develop a positive reaction towards change by generating "the right spirit, the productivity, and help with the change" (RP15). RP10 also highlights the importance of identifying champions, increasing their visibility within an organisation, and involving them in the change process and communication of change. Similarly, RP2 adds that employees aligned with a change are quicker to adopt it, and encourage other employees to accept change. Peers exude a highly influential role in technology adoption, according to RP14.

> "When certain people that you work with see value, then you're a lot more likely to adopt it, and actively search for and implement or download the technology, than if it's kind of like if it's pushed through from above." (RP14)

Stimulus for Change Agency

Change agency normally emanates from those affected most by change, and in such cases, the need for change instils at a personal level (RP11). Correspondingly, individual frustration is also a cause of change agency, whereby frustration reaches a critical level, at which point an individual either leaves the organisation, or becomes motivated to implement change (RP14). The findings concur with a study by Chreim, Williams, Janz, and Dastmalchian (2010) that change agency arises at any point in time where change is needed. The following statement by RP11 summarises this point.

> "You don't even need to have [to]... instigated change, you could find that a company or a part of the organisation is deteriorating, it's not meeting its business goals, it may not be meeting its people's satisfaction goals and retention rates go up." (RP11)

Involving employees in change, and allowing them to instigate change, facilitates the likelihood of change agents arising, which consequently supports change further. RP15 explains:

> "If people are part of the change, and if people come up with the change themselves... then they are more likely to become change agents, and let the change happen and drive it." (RP15)

Change agency requires an environment supportive of change. RP14 holds the view that change agency is easier for employees who are new to an organisation. Individuals employed over a long-term within an organisation experience difficulty in instigating change unless they exhibit a high level of enthusiasm (RP14). However, RP15 highlights that facilitating an environment supportive of change agency is difficult, in

terms of providing the required time and resources. RP15 believes that change at a smaller scale also requires change agents outside of Management. Concurrently, change agents need to exist across an organisation when implementing major change, particularly for cultural changes (e.g. RP15).

4.4.1.1 Role of Leaders in Organisational Change

RP14 emphasises the importance of leaders gaining support for change: "Getting people behind it and rallying troops is of fundamental importance to drive change in the first place". The capabilities of leaders in conveying and implementing change play a fundamental role in the ability to drive change, according to RP6: "An effective leader... and people who are tasked with driving those changes need to help explain what the change means, what they gain, or what they may lose". RP2 perceives that change is difficult to develop from the lower hierarchy levels. Correspondingly, RP1 emphasises the importance of maintaining a connection between leaders and employees: "Very quickly need to establish links into various pockets at an individual contributor level to come along for the whole journey".

The findings identify that managerial approaches towards change define employee attitudes to change, supporting the research of Parish, Cadwallader, and Busch (2008); Rubin, Dierdorff, Bommer, and Baldwin (2009); and Tamasila, Taucean, Pugna, and Giuca (2009). Further, manager-employee relationships affect employee commitment to change (Parish, et al., 2008). Leaders are a focal point of attention in terms of how change ensues, and influence employee attitudes towards change (e.g. RP6). RP2

highlights the pivotal role of leaders in driving change, and the need for commitment in the upper hierarchies when instilling change across an organisation.

> "If he's picked the change, endorsed the change, he must drive the change, believe in it, own it, and make sure it's communicated clearly... It requires that person to drive change, not just manage the business." (RP2)

Participant perceptions correspond with the work of Acharya (2010), Eggers and Kaplan (2009), and Luscher and Lewis (2008) that change needs to be driven from the upper hierarchies of an organisation. Senior Leaders are viewed as the main change agents. Strategic foresight in technological trends is critical to the ability of a leader in creating a competitive organisation, particularly at the Executive level. RP6 states:

> "It starts at the top, the CEO and the leadership team... the CEO in particular sets the pace, and drives and sets the climate and offers the clarity and the vision for what that change needs to look like, and the leadership team also need to be... a key part of that." (RP6)

From the interviews, it is evident that a culture of change is pivotal in the empowerment of employees. Thus, the relationship between empowerment and the culture of change is reciprocal. RP9 explains:

> "There has to be a culture of risk, there has to be some level of, people feel safe about challenging orthodoxies, there has to be a willingness to listen, open communications, trust." (RP9)

Amongst the research participants, a consensus of 67 percent indicates that senior organisational hierarchies encourage employees to instil organisational change through empowerment. RP1 states:

> "Without breaching what the overall vision or strategy is for the company, we for one absolutely empower and expect our teams to be constantly reinventing, disrupting... creating their own change agendas." (RP1)

RP7 is adamant that change agency instils empowerment into individuals, and leads to enhanced organisational performance.

> "If you empower your employees, they're going to work harder for you, that if you give your employees a sense that they own or have a result in the fate of the organisation, and they can influence where the organisation goes, then that's a huge sense of pride, and I think you would see higher performance out of those people." (RP7)

The findings support the research of Luscher and Lewis (2008) that leaders are the executors of change within an organisation. Although, they may source ideas for change from others (RP3). Participants also highlight the need for leaders to establish a personal connection with employees when implementing change (e.g. RP12). Across the case organisation, 47 percent of participants share the view of RP10 that employee empowerment facilitates a culture of change. Instilling autonomy at an organisational level supports change agency, which results in the establishment of a culture of change.

4.4.2 Human Resource Management

HR is one of the most important aspects of business (e.g. RP2). HR plays a fundamental role in the resistance exhibited within an organisation through their ability to employ people who fit with the organisational culture, according to RP2. The approach of HR towards the management of employees has a significant influence on organisational change (e.g. RP15). Barriers may include an increase in policies and procedures resulting in reduced empowerment (RP2). Similarly, RP7 perceives a link between employee retention and employee satisfaction with organisational performance.

> "If you can't keep the employees happy with that organisational performance, the internal piece, they're going to go elsewhere, and you lose talented people, and not only do you lose talented people that you've invested a lot of time in, but then they go to competitors." (RP7)

Participants constantly referred to the importance of considering the impact of change on the human resources within an organisation when implementing technology. The research of Stam and Stanton (2010) also confer the need for analysing the influence of technology change on workplace characteristics and behaviours. Similarly, HR departments face a challenge in utilising technology to increase flexibility, in order to enhance employee satisfaction and loyalty (e.g. RP3 and RP5).

> "You need to look at the people that are going to be impacted by that technology, and as a worker what processes will change as a result of that or be impacted." (RP3)

Organisational change involves changes at a personal level, and may encompass thoughts, behaviours, and the processes and technologies used (RP4), supporting the research of Stam and Stanton (2010). To this point, RP3 highlights that the task of hiring new employees becomes more difficult when an organisation changes. Managers perceive that change has the potential to create a need for a new position, raising an issue of endowing an employee with the responsibility of hiring a person for a previously non-existent position (RP3). The findings reveal that both HR practices and employees pose barriers. HR practices play a critical role in forming the environment within an organisation, and influencing the social boundaries in which individuals interact.

4.4.2.1 Organisational Culture

RP2 shares the view of many participants on the criticality of understanding the culture within an organisation when driving change. RP2 continues: "If we're going to make a radical change, and the culture is wrong, you have the dilemma as to how can I change the culture". Change and training are continually recurring processes within organisations (e.g. RP2 and RP6). RP10 perceives that individuals are more receptive to change when they are accustomed to it. There is general agreement that establishing a culture of change facilitates continuous improvement and an eagerness for learning within an organisation. Similarly, RP1 points to an expectation within the Senior Leadership level for employees to identify ways of improving their productivity continually.

> "There should be a culture of, I need to keep learning every day, and change is something that I need to accept... You need to have a culture that accepts change

> or harnesses change... having a culture of change is critically important in addressing those human resource barriers." (RP6)

RP15 highlights that an inclusive personality facilitates acceptance of change, and strongly feels the need for developing networks across the boundaries of an organisation, and internalising the outcomes of those networks. RP13 points to the importance of having an organisational culture of shared success. Within this perspective, RP15 adds:

> "Have people that share knowledge, and like to share success, as opposed to the opposite which is, knowledge is power... The sharing one is without doubt the one that drives performance and success." (RP15)

4.4.2.2 Communication of Change

Participants across the upper organisational hierarchies studied acknowledge the importance of communication in organisational change, confirming the research of Gilley, Gilley, and McMillan (2009). Participants strongly agree on the need for clarity across an organisation when implementing organisational change. RP10 perceives a need to ensure "everybody has a consistent understanding of what you're doing, why you're doing it, and what the intended outcomes are". Participants perceive communication as a key path to obtaining acceptance of change. Managers through to Executives stress the importance of communicating the outcomes of change, supporting the findings of Wray and Fellenz (2007). The response of RP6 draws attention to this point.

> "An important part of driving a change is to help people understand... what's the positive impact and in particular, what is it that they may lose but then more importantly, what it is they gain as a result." (RP6)

RP5 emphasises the important role of communication in organisational change.

> "It's got a significant influence that organisational change, if it's executed successfully is about communication, and fundamental to that, you've got to have those solid communication flows, they have to be timely, they have to be accurate, they have to be dependable." (RP5)

RP8 underscores the view held by Managers and Senior Leaders that obtaining buy-in to change from employees is potentially a challenging, yet important task. Participants share the view of RP4 that employees "need to understand the whys, and the expectations of them to ensure that, and that means communication". A variety of communication mediums are required to sustain organisational change (RP10). Correspondingly, regularity and consistency in communication are paramount to engaging stakeholders, ensuring widespread understanding of the rationale for change to obtain employee buy-in, and facilitating achievement of change objectives (RP4). RP13 emphasises the need for multiple communication channels.

> "Having that actual framework and training is probably the first piece, then it's also applying all those tools to the actual change management process itself, so having a multipronged approach... e-mail... voicemails going out to everybody's phones... digital media, and messaging... some face-to-face." (RP13)

This is also evident in the following statement by RP5.

> "There's got to be a consistent view, and it's got to be multimedia and the fact that why place your bet on one, when it might not reach all the people, when you've got the ability to hit multiple variants of change through multiple means." (RP5)

RP2 stresses the importance of employees having the skills to engage in cross learning at an organisational level, in order to seek other perspectives, and subsequently generate valuable outcomes.

> "Have competence to go to the CIO, and to other business units in the organisation, understand their requirements, and look at the pockets of money they have, and trying to turn that into gold." (RP2)

The similarities that exist between organisations enable cross learning at an industry level, and facilitate internalisation of successful approaches employed in other organisations. RP11 summarises this point: "Most cases, it is very rare to have an organisation that is so different that it has to do something completely different". RP4 highlights the need for obtaining support from the people who are the existing or potential subjects of change: "A change program is all about buy-in from your audience, from the people... who are part of the organisation that are going to make the change happen" (RP4). RP9 concedes with this view:

> "People have to believe that they're heading to a better place for themselves in some way... they have to understand the benefit of the change before they all move through the fear." (RP9)

Within this view, RP14 emphasises the need to communicate with individuals according to their preferences for information: "The different approaches of communication and convincing and influencing are often needed to get people to actually buy into the new technology". Employee mobility is also changing the nature of communication (RP5). Constant communication is required during and after change implementation, regardless of the communication methods used. RP15 explains that reiteration in the communication of change is of paramount importance to its acceptance, and organisational sustainability. RP15 continues:

> "After the change has come in, what people are looking for is the feeling that the change has been successful, and the feeling that we must keep down the same path." (RP15)

RP8 also emphasises the importance of constant communication in the following statement.

> "One of the critical factors of organisational change is the ongoing communication from a leadership perspective around the change, so why change is happening, what does change look like, over what period of time is the change going to happen, what do we expect the results of the change are going to be... importantly, what should our messaging be to our customers and partners as we go through a change agenda." (RP8)

RP4 urges that organisations need to maintain an equitable level of information between existing and incoming employees. Similarly, RP5 reiterates the importance of ensuring a link amongst employees to channel their efforts into a single direction.

> "If you're looking at how to sustain change and ensure its success and it carries out the objectives, you can make sure that everyone is... connected to the rest of the organisation in a way that their issues are dealt with, that they're fully

> informed, and they're aligned to the new directions and the new strategies put down in place." (RP5)

RP5 continues, adding a point raised by many participants that "the biggest danger is when there is change, but no one knows what that change necessarily might be". The importance of ICT in maintaining constancy and consistency in communication throughout the change process is evident in the following statement by RP4: "If you rely on humans alone to pass the message along and hope it gets to its intended audience in its original form, it doesn't happen". Barriers to change also arise from the leadership level. RP9 identifies that leaders can adversely affect change outcomes through deficiencies in vision, communication, and benefit. RP6 also points to the role of leaders in successful organisational change, stating "that also relies on how well leaders communicate those changes, impact those changes, and what it means to the individual".

4.4.2.3 Managing Generational Diversity

RP1 highlights the importance of engaging younger generations in organisational objectives: "If you can't get that attachment, so it aligns to your overall vision and strategy, you're going to lose them". Managers and Senior Leaders consider effective communication with younger generations important. Adapting communication styles to differing information needs across generations is essential to ensuring that individuals across an organisation are motivated. RP1 emphasises that: "The way that you inspire people is going to vary... The way that you get that personal and empathetic connection is going to vary between generational cultural types". Formalised training is potentially

of interest to older employees, whereas younger employees favour less formal and engaging means of learning. RP1 states:

> "The younger generation aren't going to care too much about official training programs, they want to see some buy-in from the broad organisation, but they will pick and choose what works for them." (RP1)

Differing information preferences exist between younger and older generations. Younger generations prefer information that is convenient and mobile. RP1 states:

> "The younger generation expect information, they want to be connected... multiple streams of information... They want to choose... be in control... have a mixture of business and private messaging and communication." (RP1)

Senior Leaders agree that the younger generation are more open to online and instant messaging, and organisations need to engage younger employees through social networking, video, SMS (RP1). The propensity of the younger generation towards ICT, and their receptivity towards its adoption, is a source of competitive advantage. RP3 in particular (Generation X) brings this to light, describing: "Gen Y brings in the whole digital age, the age of being very familiar with... ICT, being online... That's really important and vital to business". To this effect, collaboration with younger generations is critical to maintaining their alignment with organisational objectives. RP1 stresses this point:

> "If you can't connect direct to them, they're going to be the blockers of change as well, and if you can't show what's in it for them, they're just going to keep going about doing what they want to do, with very little tie-in to the top line agendas." (RP1)

RP1 considers that maintaining traditional modes of communication with a more personal experience is often necessary for middle and older generations to gain widespread change adoption. RP13 strongly emphasises the importance of ensuring that older generations are competent and confident in using technology. RP8 shares this view:

> "Particularly where you're dealing with older generations who are just not necessarily at one with technology, and they have a great fear of technology not being able to understand it and use it in an effective way... if you leave those kinds of people to their own devices to learn how to use a new piece of technology or to rely, or hope that they will embrace some sort of informal training... is really risky, and the risk is that they just won't use it, or they'll use it really ineffectively... and that obviously has enormous impact on a person's self-confidence, on their motivation and morale." (RP8)

RP1 adds that there are variations in the way in which different generations engage in change, either through an individual or collective call to action. The majority of participants agree that ICT is enabling organisations to cater to the different information needs of the younger and older generations (e.g. RP1).

4.4.2.4 Receptiveness towards Change

Most Senior Leaders brought to attention the importance of engaging employees at a personal level, supporting the research of Nahrgang, Morgeson, and Ilies (2009) that leader-member exchange is important in gaining agreement. Leader-member exchange (LMX) influences employee loyalty, contribution, and trust. Greater LMX agreement is achieved through repeated social interaction (Nahrgang, et al., 2009). RP1 supports this view: "If you can't make that connection emotionally, and professionally with your workforce, either through the use of technology or not, you're going to fail, clearly".

Most participants share the concern that a major component of change is instilling clarity across an organisation, and obtaining acceptance of change. RP15 in particular emphasises this point: "How do you make people understand the reasons for change, and accepting the change... that's the single biggest thing".

RP2 highlights that the availability of skills within an organisation also define the direction of change: "Whenever you want to make compelling changes in an organisation, finding the right skill set is going to, not just manage it, but lead it in a different direction". RP1 perceives this is of particular importance when engaging the younger generation in organisational change stating: "If you can't embrace, connect, inspire that generation, and that me culture, you will fail". To this effect, Senior Leaders within organisations must provide a large percentage of the momentum for change (e.g. RP2). Participants strongly agree that maintaining a link between management and employees is critical to ensuring cohesiveness, particularly RP4.

> "You get a disconnected workforce, you get people who don't really know what to believe in any more, of why they're working for a company and pretty soon that's when it all starts to fail, because they haven't got that connection." (RP4)

The confidence of employees plays an important role in their receptiveness towards change. RP15 describes:

> "People that are more receptive to change are more self-confident... If you feel less self-confident, you can be threatened by the change, and read it as... I don't fit in here anymore." (RP15)

Concerns regarding retention also influence receptivity towards change (e.g. RP15). Correspondingly, RP13 exclaims that creating an environment where people are valued facilitates employee support for change. RP15 adds that the valuing of employees is critical to employee receptiveness towards change. Extensive stakeholder engagement across all levels of organisational hierarchy is required, supporting the research of Rankinen, Suominen, Kuokkanen, and Kukkurainen (2009). Further, the findings from the interviews suggest that such support is required from the outset of organisational change, in order to effect widespread adoption, and thus, successful change. Allowing for anonymous feedback facilitates honesty, and potentially has potent implications for change (RP2). Correspondingly, participants across the management and Senior Leadership levels view that obtaining feedback from employees is critical. Gauging the feedback of employees is important to gaining the support of employees for organisational change (e.g. RP2).

Barriers to Organisational Change

The resistance encountered in change depends upon the nature of change. Characteristics of employees that hinder change include fear, nostalgia, passive aggressive cultures (RP9), concern, and morale (RP5). Changes to the underlying human structure of an organisation in particular potentially have significant connotations. RP8 states:

> "A shift in morale and a shift in culture can be a risk from a human element... Any sort of organisational change, particularly large-scale change, can really impact morale, which then put some of those really positive aspects of your culture at risk." (RP8)

RP10 points out that differing work legislation globally governing employee role changes creates a challenge for the successful implementation of ICT. The continually changing skill requirements within organisations poses a challenge, particularly within the ICT industry (RP2). RP10 highlights that uncertainty regarding the outcomes of change is a key source of resistance. Organisational change is hindered by a lack of clarity. RP6 emphasises that "People aren't afraid of change... people are more afraid of what it is they lose as a result of change". To a similar extent, RP5 brings to attention that "There are levels of change that people are comfortable with". RP11 firmly holds the view that the role of leaders is pivotal in addressing resistance amongst employees. RP11 continues, highlighting the role of leaders in gaining support for change.

> "Grab the leaders, get them to bring over as many as you can, and for the others, you're just going to go... let's just find something else for them, or go through some performance management." (RP11)

A major issue arose from the interviews on a lack of individual training on change management theory for Regional Managers. Consequently, Regional Managers have relied on obtaining the knowledge they require from the Internet. This poses a dilemma for organisations to expect either that (i) the knowledge of Managers on change management theory is adequate, (ii) Managers explore change management theories in their own time where needed, or (iii) time needs to be dedicated to providing training in this regard. Similarly, RP5 highlights a paradox in determining the level of information provided to employees.

> "In dealing with these human barriers, keeping people in the dark, and feed them credible information that might take time to get there, or do you keep them fully exposed to the inner workings of the organisation, which are great in their own form, are probably not any better off." (RP5)

RP5 alludes to the fact that organisations face a challenge in obtaining acceptance of organisational change.

> "In every organisational change, there's always winners and losers, and I think those that believe they're going to be winning are the ones that are aggressively embracing it, and the ones that believe that they could potentially be losing out of it, are the ones that are going to be slightly obstructive." (RP5)

RP6 summarises that "the barriers tend to be related to people who don't either readily accept change, or are afraid of what the change means to them". RP8 reveals that employees who are unwilling to change may bear a significant negative influence on other employees. The majority of participants agree with this view, underscoring the importance of managing such a negative impact. RP8 stresses the point that managing those resisting change is critical to preventing a negative impact on other employees.

4.4.3 Conclusions on Change Management

In the existing business arena, the transfer of knowledge has grown to become of significant importance. The selection of communications methods bears a significant influence on the momentum of organisational change (RP5, RP7-RP9, and RP15). In this respect, the communication methods available within an organisation require capping to prevent burdening employees with greater work complexity. Successful organisational change requires clear communication of objectives, expectations, and direction (RP4-RP6, RP8, RP10, RP13, and RP15). However, individuals are inspired differently, and multiple channels of communication are required to deliver information according to the different information needs of individuals (RP1, RP5, RP10, RP13, and RP14).

Irrespective of the communication approaches utilised, the communication of change initiatives needs to be continual (RP4 and RP15). The planning of communication methods is therefore paramount to effective communication (RP4 and RP15), and therefore essential in driving the successful adoption of ICT (RP1 and RP5), and influences the timeframe in which change is implemented (RP8 and RP11), thus highlighting a link to Proposition 2. Correspondingly, this study finds that the successful adoption of ICT change requires the identification of change agents (RP1, RP6, RP14, and RP15) and champions (RP2, RP6, RP10, and RP15) who are able to distribute the information necessary to invoke change effectively. This needs to occur both throughout the implementation of change, and at the outset where possible (RP9, RP11, RP12, RP14, and RP15).

Leaders are viewed as the main change agents, and those tasked with driving change and gaining acceptance (RP1-RP3, RP6, and RP14). Leaders provide direction and a vision for change (RP1, RP6, and RP9). The findings support the work of Bommer, Rich, and Rubin (2005) that leadership attitudes influence employee receptivity towards change. Leaders also play a key role in establishing the momentum of change (RP1, RP2, and RP4). However, change agents exist across numerous hierarchy levels in organisations (RP1, RP5, RP6, RP8, RP9, and RP15). Change agency is more effective when it arises from employees who readily adopt change, and are the target of change (RP2, RP11, RP12, RP14, and RP15). Correspondingly, creating an environment that allows individuals to be creative and active participants in their environment drives the usability and robustness of technology (RP1 and RP7-RP10).

Human Resource Management practices influence organisational culture (RP2, RP3, RP5, and RP15). HRM personnel bear the task of addressing the changing needs of an increasingly mobile workforce, bearing implications for organisational culture (RP5). Similarly, leaders must gain the acceptance of employees in change to prevent faltering of employee morale. Negative influences from individuals who are resistant towards change also pose a risk to the sustainability of change. Employee skills are also influential in determining the direction of change (RP2). Similarly, confidence at the individual level largely influences receptiveness towards change (e.g. RP15). Personal engagement in change also facilitates acceptance (RP1 and RP12). Thus, channelling the efforts of individuals into a single direction to achieve a common goal is pivotal in this regard (RP4-RP6, RP8, RP9, and RP15).

Engaging different generations through their preferred communication methods is pivotal in gaining support for organisational change. Collaboration with Generation Y is important in facilitating technology adoption across an organisation (RP1). Generation Y are defined as "the generation born in the 1980s and 1990s, comprising primarily the children of the baby boomers and typically perceived as increasingly familiar with digital and electronic technology" (Oxford Dictionaries). Generation Y are important to organisations due to their receptiveness towards technology, and their facilitation of receptivity towards technology across an organisation (RP1 and RP3). However, informal learning, rather than formal learning, is required for Generation Y in gaining acceptance of change (RP1). Equally important is the engagement of Generation X and Baby Boomers, to ensure competence, confidence, and effectiveness in engaging with technology (RP1, RP8, and RP13).

Instilling a culture of change enhances employee empowerment, and facilitates continuous improvement (RP1, RP2, RP6, RP8-RP10, RP13, and RP15). Although, radical changes to organisational culture have more severe implications for the social aspects of an organisation. Thus, incremental change is comparatively more sustainable (RP8). Establishing an environment where employees perceive a sense of value is pivotal in maintaining a positive organisational culture and establishing confidence (RP13 and RP15). Enabling individuals to contribute knowledge to improve work practices results in value perception and attribution. In this respect, feedback from stakeholders of change is critical to maintaining a connection between leaders and employees, and implementing sustainable organisational change (RP2, RP4, RP11, and RP12). Similarly, cross learning may provide vital information for successful organisational change and long-term sustainability (RP2 and RP11).

4.5 Conclusion

The findings draw a link between ICT and organisational sustainability, and are indicative of characteristics exhibited by organisations globally in respect to the implementation and utilisation of ICT, and its implications for organisational culture and business processes. Sustainability in this context refers to the viability of an organisation in respect to business, technology, society, and the environment, and the ability of an organisation to make decisions that prolong its viability and that of its stakeholders. The successful adoption of ICT involves understanding the capabilities of individuals and creating a work environment within their capacity, whilst facilitating opportunities for personal and professional development. A balanced approach to

integrating people and technology is required to find a midpoint between technology and its stakeholders. Thus, the sustainability of an organisation relies on a balance between three key focus areas of people, process, and technology. This study identified numerous linkages across the areas of ICT, knowledge transfer and change management, which are demonstrated in the Map of Key Terms shown in Appendix A.

The Summary of Propositions in Table 1 below lists the key findings supporting the propositions outlined in Section 2.7, excluding participant identifiers to provide a succinct summary. Section 4.2.8 provides a detailed discussion on the findings that support Propositions 1-1, 1-2, and 2, whilst Section 4.3.3 discusses the findings supporting Propositions 3-1, 3-2, and 3-3. These aforementioned sections include participant identifiers and provide an indication of the range of support for the propositions within the context of the organisation studied. The findings provide evidence to support the Propositions, particularly P1-1 and P1-2, and indicate that ICT provides wide-ranging support for employees irrespective of hierarchy and activity.

Propositions		**Supporting Findings**

P1-1	Organisations facilitate sustainable change through integrating ICT infrastructure	• ICT enables:
		  ○ constant and consistent communication
		  ○ instant global delivery of messages
		  ○ consistency in organisational change
		• ICT assists leaders to:
		  ○ maintain close connection with employees whilst driving change
		  ○ communicate change objectives and benefits
		  ○ obtain employee support for change

P1-2	Organisations increase performance in regular business processes through integrating ICT infrastructure	• Collaboration technologies influence decision-making ability:
		  ○ quality of interaction
		  ○ frequency of interaction
		• Use of ICT in evaluation mechanisms has a profound impact on the visibility of:
		  ○ Senior Leaders
		  ○ Managers

		○ employees • ICT: ○ influences financial and non-financial performance ○ reduces time to decision implementation ○ enables monitoring of progress towards business targets and organisational objectives
P2	Organisations increase the perceived momentum of organisational change through integrating ICT infrastructure	• ICT creates task-rich time-rich environment • ICT increases: ○ rate of knowledge transfer ○ rate of decision-making ○ organisational change momentum ○ frequency of collaboration ○ employee mobility ○ productivity ○ communication scalability and reliability
P3-1	Organisational members accept ICT infrastructure change following a formalised training program	• Formal training: ○ key to acceptance of new technology ○ facilitates ICT usage ○ begins to develop user confidence ○ required for rollouts of major change ○ provides enhanced ability to learn from peers ○ when combined with informal learning has potential to develop employee effectiveness • Instructor-led training most effective type of formal learning • Significant changes to employee roles requires face-to-face interaction
P3-2	Organisational members accept ICT infrastructure change following informal learning	• Informal learning ○ builds confidence ○ begins to develop user effectiveness ○ feedback mechanism • Majority of learning through ICT informal • Informal learning more influential in ICT adoption • Effective knowledge transfer involves combination of formal and informal learning mode • Social networking and online collaboration tools highly influential in stakeholder engagement
P3-3	Organisational members accept ICT infrastructure change when leaders clearly communicate the purpose for implementation.	• CIO plays key role in implementing successful organisational change • Planning of CIO involvement in change critical to change communication

Table 1: Summary of Propositions

The succeeding chapter discusses the results of this study in respect to the research problem, and explores the theoretical and practical implications of the findings. This follows with a review of the newly developed model for a sustainable linkage between ICT and organisational change.

Chapter 5

Conclusions

5.1 Introduction

The findings of this study are consistent with the current literature embodying studies of Information and Communications Technology and organisational change as interrelated areas. This final chapter of the dissertation examines the findings to test the propositions developed at the outset of this study, address the research problem, and detail the specific implications for theory regarding the role of ICT in organisational change, and the practical significance of the findings for business. This follows with a discussion of perceived limitations, and suggestions for further research to explore the subject area in greater depth, with a particular focus on the human resources aspect of collaboration through ICT. Figure 5.1 below outlines the progression of discourse in this chapter.

Figure 5-1: Structure for Conclusions Chapter

5.2 Conclusions about the Research Problem

The findings of this study suggest that ICT integration plays a role in enhancing knowledge transfer, organisational performance, and environmental conservation. The multitude of issues present in organisational change centres around three key areas, which consist of people, process, and technology. Evaluating the impact of business architectures on business outcomes is pivotal to implementing sustainable organisational change. Correspondingly, stimulating the dynamic capabilities of individuals improves business sustainability. Creating an environment that facilitates individual performance leads to enhanced organisational performance. Within the domain of leadership capabilities, performance in respect to person and task orientation, and the focus of a leader on various aspects of planned organisational change are significant and related determinants of successful change.

This study differs from the existing literature, whereby the findings demonstrate that the benefit organisations attain from ICT is dependent upon the ability to successfully integrate ICT with other organisational factors. Thus, the researcher developed the Sustainable Technology and Change Linkage (STCL) Model depicted in Figure 5.2 below, based on the existing literature and the findings of this research surrounding ICT, organisational change, and knowledge transfer. This model provides a framework for managerial practice that potentially provides a strategy for ICT implementation, and builds on the conceptual model shown in Figure 2.2, which emanated from an initial review of the relevant literature. The STCL Model differentiates from the conceptual model in its greater emphasis on empowering employees, and engaging stakeholders affected, or potentially affected, by organisational change.

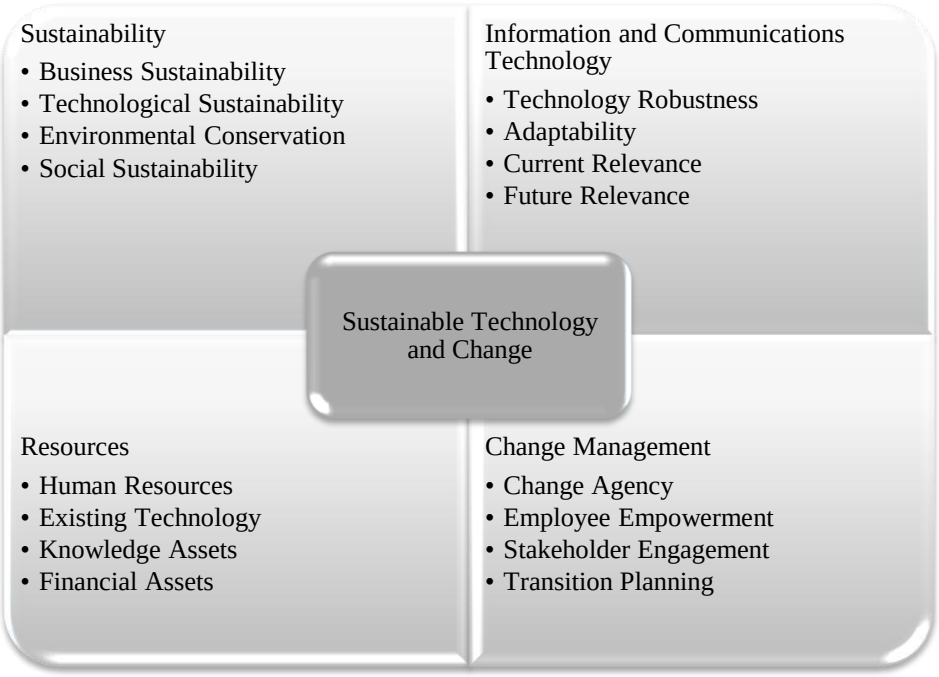


Figure 5-2: Sustainable Technology and Change Linkage (STCL) Model

The above model indicates that the sustainability of technology and change is dependent on four elements; Information and Communications Technology, change management, resources, and sustainability. Balancing these four elements produces an operating environment exhibitive of sustainable technology and organisational change. The STCL Model infers increased focus on organisational resource usage, and consideration of business performance as the combined measurement of social, technological, and environmental outcomes. In this respect, a further discussion of the model elements is required to gain enhanced understanding of the implications and significance of the findings, and the associations incited in the STCL Model. The succeeding sections explore these elements in respect of the findings from the case organisation.

5.2.1 Information and Communications Technology

The role of ICT within organisations has changed. ICT was previously used to improve internal performance, and now forms the collaboration tools used to engage with clients and stakeholders. The competitiveness of organisations now relies on the ability to digitise (Mohapatra, 2011). ICT enhances scalability and productivity, and results in greater connectivity amongst users. This study also identified the role of technology intensiveness in facilitating global collaboration. ICT facilitates international teams, whereby Managers largely rely upon virtual interaction to collaborate with and monitor subordinates. ICT is increasingly pervasive in employee monitoring. However, technology has simultaneously dehumanised the supervision process to a certain degree, and consequently rendered certain organisational positions obsolete (Cairncross, 2003).

The findings support a wide consensus in the literature that ICT positively influences labour productivity (Cette, et al., 2010; Crespi, et al., 2007; Hughes & Scott Morton, 2005). Whilst technology enables instant global communication, the findings identified that in some aspects of business, human contact is necessary for maintaining effective social interaction and employee morale. Widespread adoption and acceptance of ICT is subject to the combined sustainability of human, technological, and environmental resources. Imbalance between these forces may reduce productivity. Technology intensiveness without concern for the potentially wide-ranging impacts on individuals is detrimental to the social sustainability of an organisation, and counter-productive to the sustainability of organisational change. The ability of ICT to adapt to the needs of users is paramount to organisational sustainability. Thus, the successful adoption of technology requires balance with human processes (Volkoff, et al., 2007).

5.2.2 Change Management

Business in the contemporary globe now focuses on innovation and productivity (Adner & Kapoor, 2010; Hopkins, Tidd, Nightingale, & Miller, 2011; Teece, 2009). Empowering employees to become involved in change enables them to drive change (Kuruppuarachchi, 2000). The ability of individuals to contribute to change is determined by the level of authority provisioned by the leadership of an organisation (Brown & Cregan, 2008), which is particularly evident in employees endowed with the responsibility of implementing technology. Change agency may arise when individuals reach a threshold level of stress that initiates a need for change at a personal level. Change agency is a product of employee involvement, and therefore empowering employees and providing a certain level of autonomy facilitates creativity and innovation within an organisation. Change agency also links to organisational sustainability. Change agents take the form of experts, facilitators, catalysts and activists, who have the capacity to undertake the role of environmental or social champions, and base their actions upon values, inspiration, expertise, empowerment, strategic thinking and social contribution (Visser & Crane, 2010, p. 1).

Evaluation is a process of organisational change. The operating environment is constantly moving due to the introduction of new technology and software, the needs of customers, and changing trends. To this effect, ICT infrastructure is a constantly moving target within organisation planning, and requires a robust planning regime to deal with it in an agile manner. Whether evaluation is internal or external depends on the nature of the evaluation, and aims of organisations in conducting evaluations. Organisations have fewer tendencies to evaluate performance in certain situations.

Particularly during times of rapid growth, or when forecasts indicate stability and growth, performance evaluation must remain a key part of day-to-day operations to ensure that an organisation continues to perform optimally.

Thus, the need for transition planning becomes evident. Transition planning enables organisations to implement change through a systematic and measured process, where shock to the organisation is minimised. Within a shareholder view, employing this approach enables organisations to remain competitive from a technological perspective, and prevent a decline in share market performance. Internally, transition planning facilitates clarity amongst individuals on the strategic aspirations of an organisation, prevents uncertainty and undue influence on the working environment, and provides a lead into ensuing major changes. However, the nature and scope of transition planning is dependent upon the industry in which an organisation operates. The role of transition planning in the implementation of ICT infrastructure and change requires clear definition of implications, root causes for ICT to affect an organisation, and provisions for avoiding turbulence during a period of change. Transition planning is fundamental to successful organisational change through its determination of rational timing and momentum.

5.2.3 Resources

The sustainability of an organisation is not only dependent on the resources available to an organisation. The ability to utilise those resources effectively is equally, if not more important, to the competitiveness and sustainability of an organisation. Organisations need to adopt a tailored approach to change. Utilising a generic approach disregards

critical unique leadership characteristics, employee capabilities, and change related activities within an organisation. The findings suggest a link between organisational change and the level of individual empowerment and autonomy exhibited within an organisation. Further, clarifying the role of employees facilitates the success of change through enhanced confidence, and transparency in expectations and objectives. The level of clarity at the individual level is congruent to the ability of management staff in conveying individual responsibilities that emerge from organisational change. Promoting understanding of change amongst employees enhances role identification and the involvement of employees in organisational change. The personal development of employees in this regard is critical in enabling employees to effectively respond to their environment and utilise resources.

5.2.4 Sustainability

Organisations must develop organisational change within a framework of sustainability in terms of the human attribute, technology, and the financial resources available. In this respect, organisational sustainability entails consideration of the local and global impact of an organisation on technology, society, and the environment. Sustainability within the context of organisations incorporates a broad spectrum of issues, which include business, technological and social sustainability, and environmental conservation, which are all critical determinants of business and stakeholder longevity (Banerjee, 2011; Benn, Dunphy, & Martin, 2009; Melville, 2010; Parrish, 2010; Vinodh, 2011). Internally, organisations must consider the financial impact of ICT. Environmental performance is now also directly linked to financial performance with the introduction

of Carbon Pricing (Neuhoff, 2011). Therefore, the impact of employee attitudes towards the environment is now increasingly internalised.

Organisational culture plays a key role in organisational change. Strong organisational cultures are less likely to adopt change. Correspondingly, gaining acceptance of change from the counter-cultures that exist within an organisation is elementary to instilling widespread productivity, and ensuring that ICT implementation has positive implications for organisational culture. However, a strong culture of change ensures the continued facilitation of creativity and innovation in individuals, resulting in sustained adaptability and competitive advantage. Therefore, it is incumbent upon each individual to instigate change, work towards implementing best practices, and continually renew benchmarks. Organisations can only achieve this by instilling empowerment and autonomy, and a culture of continuous improvement.

Acknowledging the environmental effects of how an organisation operates, and considering that in the execution of business strategy, considerably improves the performance of organisations in terms of environmental resource consumption. Thus, organisations most likely benefit from implementing a sustainability plan. This is not only important to an organisation itself, but also for its customers. As such, organisations need to determine the level of involvement in influencing the impact on the environment, through either organisation-wide initiatives, or encouraging individuals to take responsibility for their impact on the environment by promoting widespread accountability at an individual level.

5.3 Implications for Theory

Organisational studies have often endured little exploration of humanistic issues engrossed in the linkage between ICT and organisational change (Barrett, et al., 2006). This study provides progress towards fulfilling the theoretical aspirations of Orlikowski and Barley (2001) in establishing greater connectivity between these two fields of research, through producing "research that embraces the importance of simultaneously understanding the role of human agency as embedded in institutional contexts as well as the constraints and affordances of technologies as material systems" (p. 158)(p. p.158)(p.158). This study also supports the research of Hughes (2005), proposing that ICT becomes strategically significant in organisations only when combined with other complementary assets.

The findings also confirm the notion that successful ICT integration drives organisational change through enhanced communicability (Barrett, et al., 2006), which significantly improves organisational performance (Cette, et al., 2010), and as a result enhances business sustainability (Stephens, 2007). This study also supports the research of Muethel and Hoegl (2010), proposing that the leadership of globally-dispersed teams is met with various cultural and task-related challenges. Correspondingly, informal online collaboration requires an adaptive approach to leadership to facilitate employee contribution, and develop a sense of value amongst individuals (Barchiesi, et al., 2008). Where organisations consider leadership visibility as paramount in formal or face-to-face interaction, online collaboration requires some degree of leader visibility to a level deemed appropriate per situation. Thus, leaders must exhibit paradoxical modes of

visibility and invisibility for the effective distribution of leadership, facilitation of trust, and success of online communities (Jameson, 2009).

The findings also support the literature on the importance of transparency in knowledge transfer. Interviews confirmed that ICT creates a fundamental shift in the way individuals seek information, and facilitates greater transparency and creativity in the knowledge creation process. This potentially leads to the discovery of new knowledge, and the development of new perspectives on existing knowledge (Leonardi, 2007). The existing literature remains somewhat incapable of accurately portraying the implications of momentum in the decision-making of leaders. O'Keefe and Wright (2010) argue that the existing literature remains distant from reality in measuring the extremities of the momentum of strategic decision-making in organisations.

This study provides some progress in terms of theory on decision-making momentum of from an ICT perspective, and cites a link between ICT and increased momentum in decision-making. This is particularly evident in virtual communication tools that enable the same sensory level of interaction as face-to-face communication, while at significantly lower cost, shorter time scales, and reduced impact on the environment. Combinations of these factors contribute to greater competitive advantage, and provide a key point of difference in organisational sustainability for technology-intensive organisations. This study builds on the research of Hughes (2005), who identified a need for investment in complementary assets and organisational change to enhance the significance of ICT.

5.4 Implications for Policy and Practice

The global competitive market in which organisations compete today demands new technology at lower cost. Therefore, value creation is a source of competitive advantage (Adner & Kapoor, 2010). Research and development within organisations therefore needs to be ongoing, as technology is constantly changing. However, research and development is becoming increasingly costly, and business environments are progressively competitive, all of which affect the sustainability of business. Where technological advancement is concerned, the human characteristic becomes less apparent. Organisations are tending to become more technical, rather than emphasising the humanistic side of operations. However, it is evident that the collaboration between these two forces is pivotal for ICT-oriented organisations. A number of implications emerge for management practice.

5.4.1 Ownership of ICT

The issue of ICT ownership within organisations poses another key element in the adoption of new ICT. Organisations prefer computer hardware ownership, firstly, as a matter of convenience, and secondly, autonomy in the use, modification and disposal of technology assets. However, renting of technology services may prove a more feasible approach, specifically during periods of change, at times when organisational change is quite rapid, and investment of capital into ICT must remain minimal. This depends to workforce size, operational characteristics, and the level of data security required. Cloud computing may provide some flexibility in this respect by reducing the need for hardware through outsourcing. Concurrently, the increased mobility, connectivity, and collaboration provided by Cloud computing creates expanded opportunity for employee

contribution through enhanced knowledge transfer (Rosenthal et al., 2010). Thus, it is anticipated that Cloud computing may potentially result in greater operational efficiencies and improved work-life balance (Mark & Su, 2010; Rosenthal, et al., 2010).

5.4.2 Managing Dehumanisation

Organisations are now utilising new collaboration tools to advance communication amongst employees, whilst reducing impacts on the environment. Technology intensiveness has become a reality and means of survival for organisations. However, whilst the use of collaboration tools such as video conferencing is reducing costs within a business, there is also an effect on the human side of an organisation. The majority of participants agreed that certain collaboration tools have produced a reverse effect on relationships with customers and stakeholders, resulting in dehumanisation. The study identified that the use of ICT tools such as videoconferencing have to a certain extent dehumanised the organisation, and there is less of a personal interaction within the organisation, and in communicating externally with customers and stakeholders. The overuse of ICT, particularly within ICT organisations, creates an environment of enhanced complexity in organisational processes, and corresponds to reduced efficiencies.

5.4.3 Knowledge Management

Knowledge management in respect to the transfer of knowledge from outside to inside an organisation is extremely important. Knowledge management is essential to the sustainability of an organisation, to know what the environment, external forces, and demands of customers are today. The transfer of knowledge is not restricted to

knowledge shared amongst individuals in terms of verbal communication or data. The tacit knowledge that exists within the minds of staff must become explicit in order to evaluate whether that knowledge is beneficial, or requires extension. This is important, as tacit knowledge contains potentially unexpected knowledge (Eraut, 2000). Externally, organisations not only need to consider the global side of knowledge, a focus on local knowledge is equally important. Correspondingly, it is evident that knowledge gatekeepers exist within organisations, most notably Business Development Managers and CIOs.

Organisations tend to invest in the visible technologies, applications and services. Leaders rarely thoroughly explore and invest in the tacit knowledge assets of organisational members. The environment inside an organisation is fundamental to uncovering tacit knowledge, and supporting innovative actions of stakeholders. An environment supportive of innovation potentially facilitates the development of solutions that are required in ICT enhancements. Particularly for the ICT industry, and organisations internalising their own technology developments, inspiring confidence at the technical support level is pivotal to organisational sustainability. This requires enhanced interaction between engineers and technical support staff, in order to ensure that well-established support mechanisms are available prior to the implementation of new technology.

5.4.4 Evaluation of Staff Capabilities

The planning of ICT implementation requires coordination between HR and technology to facilitate the successful emergence of new technology. Concurrently, technology

requires support through the materialisation of training commensurate with the nature of technology implemented. Organisations also face the issue of determining staff training requirements, particularly where change is unique. The impact of skill requirement evaluations is immense in the design of effective training and professional development. Thus, the evaluation of staff capabilities prior to training is critical in catering to individual learning needs, and the successful adoption of change.

The propensity of staff to utilise technology depends on the professional development undertaken and the technology available at the time when training is undertaken. Effective resource engagement requires identification of existing knowledge present at an organisational level. In situations where individuals have undertaken training within a different technological era, the education and professional development undertaken by such individuals during their careers are based on superseded knowledge. Consequently, knowledge and experience in this respect does not provide an indication of confidence in utilising new technology. Implementing a professional development database may enable organisations to evaluate staff knowledge on ICT, alongside other skills, and maintain a record of knowledge. Such a database potentially identifies where knowledge gaps exist, and developing such areas is critical. The mobility of workforces today is gaining momentum. Thus, on-demand access to online learning material is paramount to ensuring high accessibility to professional development resources.

5.4.5 Generational Management

The receptiveness of Generations X and Y towards technology is influencing the increasing adoption of ICT in organisations. A number of participants raised the issue

that companies are now prepared to bring in new workforces, in particular Generations X and Y. However, this poses various implications for the technologies within organisations, as Generation X and Y have a greater tendency towards using ICT to a similar degree in personal communications, and they therefore have higher expectations of the abilities of technology. In this respect, old technology is potentially frustrating for Generation X and Y.

5.4.6 Transition Planning

On a global scale, organisational change has become the means to drive sustainable business practices. Particularly within the ICT industry, where change ensues rapidly, technology life cycles have shortened dramatically. Changing technology within an organisation involves more than the simple introduction of a device through plug-and-play. A gradual phase-out of older technology is required to allow for the emergence of new technology and the modification of existing systems and processes to support implemented technology. Performance gaps may arise when moving from old technology to new technology. This arises through a lapse of momentum, caused by a period of uncertainty. One such performance gap is the potential loss of capital initially invested into recently superseded technology. Thus, where radical changes in technology are due for implementation, transition planning for the short-term is required to implement a provisional solution, whereby an organisation may remain contemporary in its selection of technology, to solidify organisational performance, and consequently, business sustainability, leading up to a major change. Transition planning is critical in such situations to prevent a negative impact on the momentum of organisational change, and enables an organisation to continue to innovate.

The design of transition planning requires more than a sole intention to implement a transition plan. Evaluation is required prior to transition planning, in terms of existing and future actions, the level of knowledge that currently exist within the organisation, and the positioning of the organisation within the short, medium and long-term. Organisations need to define pedagogy to engage in the training of staff in the development of a transition plan, which is critical to this process. Transition planning also requires provisioning directions to the CIO to facilitate involvement in the change process, and determine the level and monitoring of CIO involvement. Certainly, the CIO in this respect is a change agent, and ideally innovative, entrepreneurial, and adept with technology.

5.5 Limitations

The boundaries set by the adopted research design played a role in the extent of the implications of research for practice. Achieving quality in qualitative inquiry is discussed extensively in social research discourse (Roulston, 2010). Critiques of qualitative research cite that the range of tools available to conduct research of a qualitative nature reduce precision, and may adversely influence rigour (Diefenbach, 2009). The case study approach employed in this study is somewhat limited by an inherent bias towards verification, whereby researcher assumptions are confirmed (Bent Flyvbjerg, 2006). Case studies are also subject to limited external validity due to the narrow band of research units (Verschuren, 2003). Correspondingly, a further potential limitation is the study analysed one organisation. Single-case studies are generally considered less robust than a multiple-case study (Yin, 2009).

Another potential limitation of this study is skewing towards a management perspective. Whilst generalisability is often an issue associated with quantitative research, its importance in qualitative research has recently risen (Polit & Beck, 2010). The literature often perceives limited generalisability as synonymous with case study research (Fiss, 2008; Polit & Beck, 2010; Verschuren, 2003). The contextual nature of this study may potentially limit the extent to which the research findings are generalised, as the findings are specific to one organisation in one location. However, in business research the objective is normally to develop findings specific to an organisation or industry (Bryman & Bell, 2007).

To a similar degree, criticisms of the constructivist approach frequently infer limitations due to the sense-making abilities and practices of a researcher, and the conveyance of data in the reporting of findings (Roulston, 2010). In this respect, the nature of the constructivist approach is inherently confirmatory, and has no mediation of findings as genuine facts (E. G. Guba & Lincoln, 1994). A longitudinal study may have provided more insight into the relationship between ICT and organisational change. However, there is an expectation that due to the rapid innovation cycles in technology, research of a longitudinal nature may become obsolete in relation to certain aspects of technology adoption.

Some interviews raised the issue of the differing interests of Generation X and Y in the adoption of technology and their expectations. However, this research avoided exploring generational management and surrounding issues of human behaviour and workplace stress further, due to these fields of research being specialised aspects of human resource management. Whilst this study provided a holistic approach to studying

the relationship between ICT and organisational change, a potential argument may persist that, as the case organisation is technology-intensive, attributes of this relationship occur to a greater degree, in comparison to other organisations with a lower level of technology intensiveness.

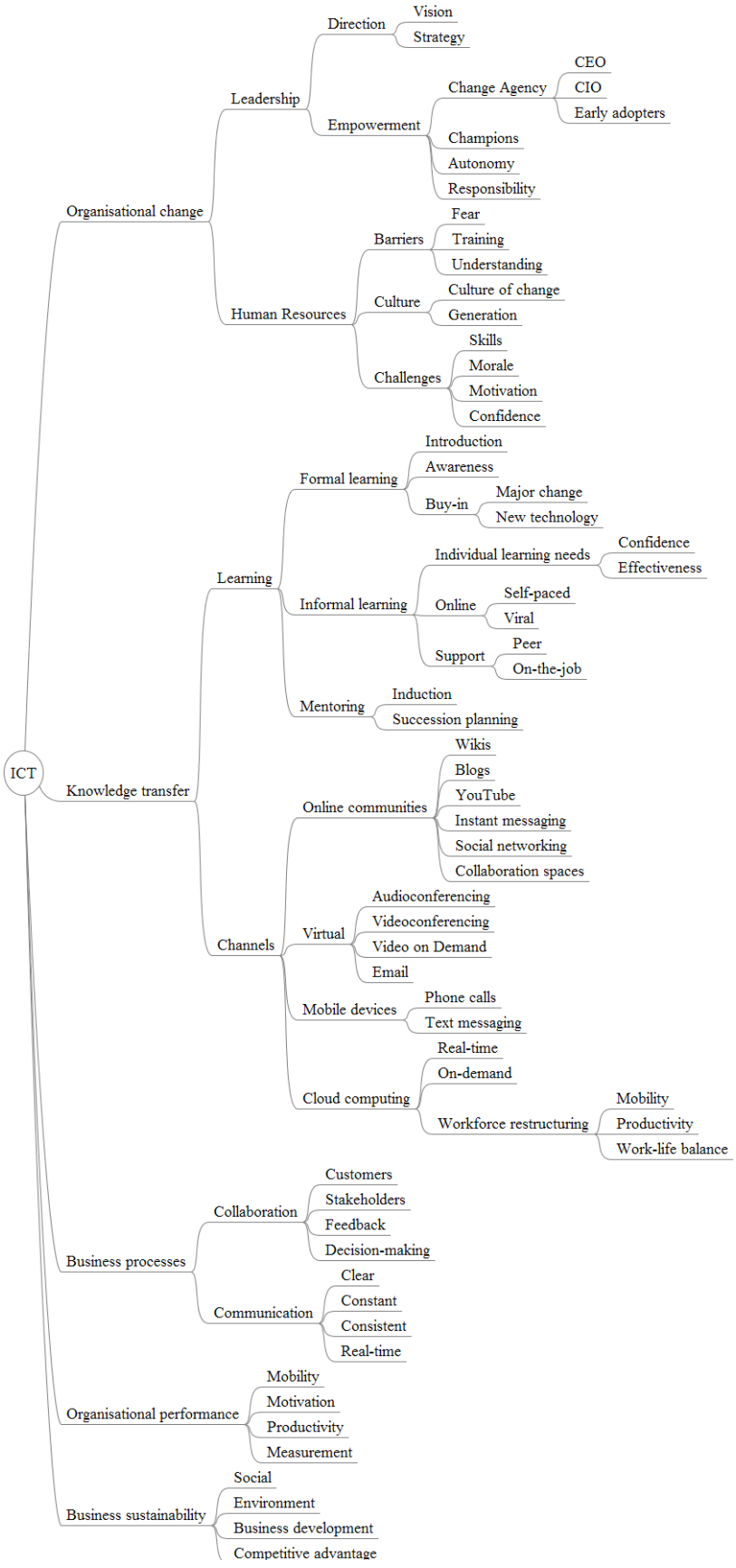
5.6 Further Research

Exploring the relationship between ICT and organisational change further may identify whether ICT exhibits differing roles in incremental and radical change. Obtaining a technical perspective may provide further insight into implementation-specific issues encountered in organisational change involving ICT. Future research potentially benefits from discovering the role of technology intensiveness in organisational change and receptiveness to ICT adoption, through a multiple case study of organisations exhibiting varying levels of ICT usage. The role of Cloud computing within organisations also remains relatively unexplored due to its recent nascence, potentially providing a foray for future research on the role of new technologies in creating and facilitating organisational change.

Finally, studying the role of human resource management in organisational change further may provide greater insight into the role of generational differences within organisations, and the implications for communication mechanisms, receptivity towards organisational change, and the adoption of ICT. The complementarities of leadership behaviour and decision-making in the successful adoption of ICT also require further exploration. Similarly, a deeper study of generational management in the context of ICT

change could provide valuable insight on the interplay between different generations and the implications for management, workplace relations, and organisational sustainability. The fundamental link identified between ICT and organisational change beckons continued study of these two fields of research as interrelated phenomena, and enablers of business, social, and environmental sustainability.

Appendix A: Map of Key Terms



Appendix B: Interview Schedule

Organisational Change	
OC1	What influence does Information and Communications Technology have on the sustainability of organisational change?
OC2	How does Information and Communications Technology influence business development?
OC3	How does the integration of Information and Communications Technology facilitate organisational change?
OC4	How does Information and Communications Technology integration influence the momentum of organisational change?
OC5	How does Information and Communications Technology integration in your organisation influence the momentum of change?
OC6	What are the human resource barriers to implementing organisational change?
OC7	Who is the change agent in the organisation?
Organisational Performance	
OP1	How would you define organisational performance?
OP2	To what extent is the performance of standard business processes influenced by Information and Communications Technology integration?
OP3	How does Information and Communications Technology integration influence the performance of the change process?
Knowledge Transfer	
KT1	How does a formalised training program influence the acceptance of Information and Communications Technology?
KT2	How does informal learning influence the acceptance of Information and Communications Technology?
KT3	How do training programs influence the confidence and effectiveness of organisational members in utilising technology?

Appendix C: Initial Second Level Node Structures

NVivo Parent nodes	NVivo Child nodes
4.2 Information and Communications Technology	4.2.1 Role of ICT in Knowledge Transfer
	4.2.2 Role of ICT in Organisational Policies and Processes
	4.2.3 Role of ICT in Organisational Change
	4.2.4 Role of ICT in Organisational Performance
	4.2.5 Role of ICT in Business Sustainability
	4.2.6 ICT Implementation Within Organisations
	4.2.7 Challenges of ICT Implementation Within Organisations
4.3 Knowledge Transfer in Organisations	4.3.1 Formal Learning Within Organisations
	4.3.2 Informal Learning Within Organisations
4.4 Change Management	4.4.1 Change Agency
	4.4.2 Change Momentum
	4.4.3 Human Resource Management

Appendix D: Comparative Table of Cited Journal Articles & Papers

The following table provides a comparison of journal articles and papers reviewed in Chapter 2:

Author(s)	Year	Topic	Demographics	Subjects	Methodology	Findings	Outcome(s)	Limitation(s)
Albritton	2010	Improvisation and sensemaking in IT and organisational change	International	Theory	Literature review	IT-induced organisational change influenced by improvisation and sensemaking	Model merging technological-use mediation (TUM) and technology frames of reference (TFR) models	Model influenced by limitations of TUM and TFR models
Alvesson and Sveningsson	2003	Role identity and leadership positions	Sweden	>40 senior Managers at R&D company	Qualitative: Single case study, interviews, observations	Lack of understanding at leadership level on their roles	Contribution to theory	Limited practical implications
Antonacopoulou	2006a	Individual and organisational learning	United Kingdom	78 Managers from three retail banks	Qualitative: Longitudinal, observation, questionnaire, critical incident technique	Complex relationship between individual and organisational learning	Conceptualisation of link between individual and organisational learning	Limited discussion of factors enabling the adoption of individual learning at an organisational level

Antonacopoulou and Chiva	2007	Organisational Learning	International	Theory	Literature review	Organisational learning is a source of tension capturing the dynamics of learning and organising	Contribution to theory	Limited practical implications
Antonacopoulou, Ferdinand, Graca and Easterby-Smith	2005	Dynamic capabilities of individuals and organisational learning	International	Theory	Literature review	Ontological issues raised by organisational change	Contribution to theory	Limited practical implications
Arlandis and Ciriani	2010	ICT Ecosystem	Asia, Europe, North America	347 companies representing 80% of market capitalisation of ICT firms globally	Quantitative: Cross-regional analysis	Growth in contents, platforms and networks; greatest expenditure and profitability in technologies	Multi-region firm database	Focussed only on financial performance
Ash and Goslin	1997	Information Technology Transfer and Innovation	United States	67 academic health sciences centres; employees (629); library staff (706)	Quantitative: Multiple case studies	Innovation diffusion influenced by communication, usability and accessibility of technology	Enhanced understanding of innovation diffusion for management practice	Limited conceptualisation of findings

Ashry and Taylor	2000	Requirements analysis	United Kingdom	17 employees from a Hospital	Qualitative: Single case study	Factors affecting diffusion of innovation	Contribution to theory	Limited practical implications
Barnes, Pashby and Gibbons	2000	Inter-organisational collaboration	United Kingdom	Warwick Manufacturing Group	Qualitative: Single case study	Cultural gaps influence university-industry collaboration	Best practice model for effective management of technological collaborations	Limited discussion of implications for external stakeholders
Behaghel, Caroli and Roger	2011	Technical and organisational change, training and employability of older workers	United States, United Kingdom, Germany, Netherlands, Norway, France	French organisations in the late 1990s	Survey databases	Age bias in technology change; training improves employability of older workers	Contribution to theory	Dataset used slightly outdated
Casey	2005	Individual and organisational learning	International	Theory	Literature review	Planning of learning facilitates multiple levels of learning	Sociological model of organisational learning	Model limited by shortcomings of cited literature
Cette, Kocoglu and Mairesse	2010	Productivity Growth	France, Japan, United Kingdom, United States	Organisations	Quantitative: Aggregate historical data	Increasing contribution of ICT capital to average annual productivity growth	Contribution to theory	Limited practical implications

Cette, Mairesse and Kocoglu	2004	ICT Diffusion and output growth	United States, Germany, France, Japan, Australia, Canada, Finland, United Kingdom	Survey data	Quantitative: Cross-country comparison	ICT usage resulted in labour productivity growth	Theoretical model	Broad analysis of ICT at country level
Chen	2008	Organisation-environment change	International	Theory	Literature review	Balance between imitation, rationality, and inertia required for knowledge creation	Contribution to theory	Limited practical implications
Chinowsky and Carrillo	2007	Knowledge management and learning organisations	United Kingdom	Four United Kingdom-based multinational engineering-construction organisations	Qualitative: Multiple case studies	Knowledge management strategy required for successful transition to a learning organisation	Bridge between knowledge management and learning organisation models	Limitations of adapted models
Corley and Gioia	2004	Role of values in organisations	United States	Organisation spin-off from Fortune 100 company	Qualitative: Single case study, inductive, interpretive	Overload and identity ambiguity experienced during organisational change	Conceptual framework	Lack of finding conceptualisation

Crespi, Criscuolo and Haskel	2007	IT, organisational change and productivity	United Kingdom	Datasets	Quantitative: Multiple case studies	Productivity growth influenced by interaction of IT and organisational change	Potential managerial implications at regional level	Limited finding conceptualisation
Daft	1978	Organisational innovation	Canada	Administrators and technical employees	Qualitative: Single case study	Innovation developed two-way in respect to hierarchies	Dual-core model of organizational innovation	Limited discussion of management perspectives
Eraut	2000	Informal learning and tacit knowledge	International	Theory	Literature review	Situated learning leads to increased individual variation	Contribution to theory	Limited practical implications
Hannan, Polos and Carroll	2003	Transparency in communication of organisational change	United Kingdom	Baring Brothers Bank	Quantitative: Single case study, interpretive, structural equation modelling	Organisational opacity leads to misconceptions about the timing and implications change	Extension of model for communication in organisational change	Limited finding conceptualisation
Hughes and Scott Morton	2005	ICT and productivity growth	United States, United Kingdom	Schneider National Inc., Qualcomm, Sainsbury, Tesco	Qualitative: Single case study	Effective use of ICT requires strategy and complementary assets	Contribution to Theory	Limited discussion of complementary assets to ICT

Isckia and Lescop	2009	Open innovation	United States	Amazon.com	Evaluation research	Open innovation is supported through the use of web services for collaboration	Contribution to theory	Limited finding conceptualisation
Jansen	2004	Momentum and strategic change	United States	U.S. Military Academy	Mixed methods: Single case study	Timing of communications affects change momentum; link exists between change momentum and goal attainment	Conceptualisation of change-based momentum	Limited finding conceptualisation
Kets de Vries, Guillen and Korotov	2009	Organisational culture, leadership, change, and stress	International	Theory	Literature review	Change is critical to organisational sustainability; a culture of innovation facilitates change	Contribution to theory	Lack of managerial framework
Kieser and Koch	2008	Organisational learning and change	Germany	Bank and subsidiary of large international pharmaceutical company	Qualitative: Observations, interviews, questionnaire	Organisational rules are repositories of knowledge	Concept of transactive organisational learning; reconstructed rule change processes in two organisations	Negates role of national culture in learning rules within organisations

Koch, Lam and Meyer	1996	Technology adoption	United States	300 innovation adoption proposals in 25 hospitals	Quantitative: Multiple case studies, longitudinal, multivariate analysis	Stages of innovation differ according to participants, forms of rationality, and predictor variables	Three-stage process for adopting technology innovations	Findings mainly limited to health-care sector
Kuruppuarachchi	2000	Organisational change and IT projects	International	Theory	Literature review	Planning of HR development strategies required for ICT change	Contribution to theory	Limited practical implications
Leonardi	2007	Capabilities of IT in organisational change	United States	Technicians at Government-funded research centre	Qualitative: Field observation, shadowing, semi-structured interviews	Advice networks activate information capabilities of technology	Contribution to theory	Limited practical implications
Lucas and Kline	2008	Organisational culture, learning and change	Canada	Municipality protective services department; management, fire officer, and EMS	Qualitative: Single case study, observations, semi-structured interviews	Organisations need to understand the cultural elements that facilitate learning	Contribution to theory	Lack of finding conceptualisation
Lyons	2005	ICT systems and business drivers	International	Theory	Literature review	ICT systems are a key enabler of organisational change	Contribution to theory	Limited practical implications

Lysonski and Woodside	1989	Boundary-spanning	New Zealand	69 industrial product Managers from New Zealand Telecom	Quantitative: Single case study, questionnaire	Organisational performance hindered by environmental uncertainty, role conflict and ambiguity, tension and dissatisfaction	Potentially improving product management effectiveness	Limited finding conceptualisation
McKendrick and Wade	2010	Incremental change	International	Floppy disk drive manufacturers	Qualitative: Multiple case studies	Organisations gain competitive advantage through frequent incremental change	Contribution to theory	Lack of finding conceptualisation
Meyer, Hecht, Gill and Toplonytsky	2010	Employment commitment to change and cultural fit	Canada	Employees in a large energy company	Quantitative: Single case study, polynomial regression, response surface analyses	Perceived culture and culture fit relate positively with organisational change	Implications for change management	Limited finding conceptualisation
Muller, Mathiassen and Balshoj	2010	Software Process Improvement	International	Theory	Literature review	Limited discussion in the literature on culture, dominance, psychic prison, and politics in SPI initiatives	Guide to literature surrounding Software Process Improvement and organisational change	Lack of finding conceptualisation

Ngwenyama and Nørbjerg	2010	Software Process Improvement (SPI)	Denmark	Denmark Electronics	Qualitative: Single case study, 3-year longitudinal	Lack of top management support may influence the success of organisational change initiatives involving SPI	Contribution to theory	Lack of finding conceptualisation
O'Keefe and Wright	2010	CEO inertia in strategic decision-making	United Kingdom	Employees prior to and following an intervention	Qualitative: Single case study	Despite situations where a strong need for change is identified, the aspirations of a CEO for change remain dominant in organisational change initiatives	Identified issues to facilitate early recognition of strategic intervention stalling	Limited conceptualisation of findings
Parish, Cadwallader and Busch	2008	Employee commitment to organisational change	United States	191 employees from a not-for-profit organisation	Quantitative: Single case study, online survey, structural equation modelling	Commitment to change is influenced by employee fit with organisational vision, employee-manager relationship quality, job motivation, and role autonomy	Model for different forms of commitment to organisational change	Limited implications of model

Rankinen, Suominen, Kuokkanen, Kukkurainen and Doran	2009	Work empowerment and organisational change	Finland	Hospital	Qualitative: Single case study, structured questionnaire	Successful organisational change requires employee cooperation throughout the planning and implementation of organisational change	Managerial implications for multi-disciplinary teams at studied organisation	Implications limited mainly to health-care industry
Ray and Goppelt	2011	Leadership development and organisational culture change	United States	Three leaders following their completion of a leadership development program	Qualitative: Single case study, narrative research	Researchers and practitioners play a critical role in the discovery of narratives and the implementation of organisational change	Methods for influencing organisational culture change	Limited finding conceptualisation
Reissner	2005	Relationship between learning, change, culture and narratives in organisations	United Kingdom	Employees across all hierarchy levels at ThyssenKrupp Automotive Tallent Chassis	Qualitative: Single case study, interpretive, narrative cross-national comparative research, in-depth interviewing	Integral relationship between organisational change, learning and culture	Management insight on learning, culture and change through narrative approach	Limited finding conceptualisation

Rubin, Dierdorff, Bommer and Baldwin	2009	Influence of leadership cynicism on organisational change	United States	106 manufacturing Managers	Qualitative: Multiple case studies	Cynicism about organisational change results in negative outcomes for leaders and employees	Contribution to theory	Limited discussion on the role of different levels of cynicism
Ruel and Magalhaes	2008	Transformational Human Resource Information Systems (HRIS)	Benelux: Belgium, the Netherlands, Luxembourg	Dow Chemicals' People Success System (PSS)	Qualitative: Single case study	Need to integrate HRIS with the knowledge and competitiveness of organisations	Organizational Knowledge Cycle conceptual tool	Limited discussion of knowledge-change relationship
Schimmel and Muntslag	2009	Learning barriers to organisational change	International	Theory	Literature review	Literature on organisational change is complimentary	Framework for the improved analysis of change management issues	Implications of study limited to findings of cited research
Shah	2007	Organisational culture and employee satisfaction and motivation	Pakistan	Managers and sub-ordinates in R & D organisation	Quantitative: Single case study, systematic sampling, self-administered structured questionnaire, and paired sample 'T' test	Employee satisfaction enhanced through a culture receptive to innovation	Contribution to theory	Limited practical implications

Smith, Oczkowski, Noble and Macklin	2004	Impact of organisational change on training	Australia	Human resource Managers from 3421 medium to large organisations	Qualitative: Multiple case studies, cross-case analysis, confirmatory factor analysis	Critical relationship between training and business strategy	Model of training impact on new management practices	Limited finding conceptualisation
Smollan, Sayers and Matheny	2010	Individual emotions and organisational change timing	New Zealand	24 employees from private and public sector, small-large businesses, and different departments and hierarchies	Qualitative: Multiple case studies, semi-structured interviews	Emotions negatively impacted by major change and time	Implications for change management approaches	Limited finding conceptualisation
Stephens	2007	Communications technology usage in organisations	International	Based on theory and findings of a doctoral dissertation	Literature review	The combinatory and successive use of ICT with other communication methods creates greater efficiency in communication	ICT Succession Theory for enhanced understanding of combinatorial ICT usage	Broad view of ICT usage; focus on short-term aspects of ICT usage
Street and Gallupe	2009	Organisational change	International	Theory	Literature review	Literature surrounding patterns of organisational change is theory-neutral	Common approach for measuring the scope and pace of organisational change	Limited finding conceptualisation

Swanson	1994	Information Systems (IS) innovation	International	Theory	Literature review	Literature on (IS) innovation requires further development to understand its implications for organisations	Contribution to theory	Limited finding conceptualisation
Tarnoff	2009	Multidisciplinary teams	United States	College of Business and Technology, East Tennessee State University	Qualitative: Action research	Systematic evaluation of organisational culture facilitates the consistency of culture across an organisation	Assessment process for establishing consistency in culture across organisations for enhanced focus on learning	Implications of findings mainly limited to the education sector
Taylor and Helfat	2009	Complementary assets in organisational change	United States	IBM and NCR	Qualitative: Multiple case studies	A link between ICT and complementary assets is required for the successful implementation of ICT change	Conceptual framework for linking ICT and complementary assets	Role of leaders in ICT change not explored
Uwah, Ewa and Edu	2009	Strategic change management interventions	Nigeria	Organisations	Qualitative: Multiple case studies, and observation research	Developing consciousness of organisational change facilitates change receptivity	Contribution to theory	Limited practical implications

Visser and Crane	2010	Corporate social responsibility	South Africa	30 sustainability Managers from corporations (19), consultancies (9), and non-profit organisations (2); executives, management and consultants	Qualitative: narrative, life-history, pilot interview, in-depth interviews, and second interviews	Four change agent types exist within organisations: expert, facilitator, catalyst and activist	Enhanced understanding of psychological dimensions of corporate sustainability; management tool for improving effectiveness of sustainability Managers	Limited discussion of sustainability activism at individual level
Wakefield, Leidner and Garrison	2008	Virtual teams	United States, Korea	159 virtual team members of a United States telecommunications corporation in the; several Korean corporations	Qualitative: Survey	Task conflict reduced through communication technologies	Implications for management practice in virtual teams	Limited analysis of leader influence on technologies employed
Wray and Fellenz	2007	Communication of change	International	Theory	Literature review	Link between change and communication	Development of communication strategies model	Limited practical implications
Zhang and Kong	2009	Management inertia and flexibility in organisational change	International	Theory	Literature review	Balanced inertia and flexibility required for sustainable organisational change	Management model for management inertia and flexibility	Limited discussion of managerial inertia during rapid change

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