The Impact of Individual's Identities on the Infusion of Information Systems within an Organisation

Farkhondeh Hassandoust

A thesis submitted to
Auckland University of Technology
in fulfilment of the requirements for the degree of
Doctor of Philosophy (PhD)

January 2017

Department of Business Information Systems
Faculty of Business, Economics and Law

Supervisors
Associate Professor Angsana A. Techatassanasoontorn
Professor Felix B. Tan

Table of Contents

List of Figures

List of Tables

List of Acronyms

Acronyms	Full name
AUT	Auckland University of Technology
AUTEC	Auckland University of Technology Ethics Committee
AVE	Average Variance Extracted
CMB	Common Method Bias
CRM	Customer Relationship Management
DV	Dependent Variable
IS	Information Systems
IT	Information Technology
IV	Independent Variable
LV	Latent Variable
OCB	Organisational Citizenship Behaviour
PLS	Partial Least Squares
SEM	Structural Equation Modelling

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Author's Name: Farkhondeh Hassandoust

Signature: 

Date: 19 September 2017

Acknowledgements

There are many people whom I would like to acknowledge and thank for helping me to complete my PhD journey. First and foremost, I would like to express my deepest appreciation to my primary supervisor Associate Professor Angsana A. Techatassanasoontorn who believed in me when I really needed her guidance. I sincerely appreciate her kindness, inspiring character, infinite patience, professionalism and support. Her attention to detail and constant review of my work, as well as her invaluable research advice and wonderfully listening ear, made me feel quite content and secure throughout the ups and downs of the doctoral journey. Her efforts expanded beyond her academic duties as a supervisor, with thoughtful gestures such as organising several social events in order to motivate her students and to add life and joy to an otherwise difficult endeavour. I would also like to express my profound gratitude to my secondary supervisor Professor Felix B. Tan, without whose support in gaining a VC Doctoral Scholarship my fascinating PhD journey would never have started. I sincerely acknowledge his constant support, guidance and encouragement throughout my journey and beyond. For me, it has been an honour working with these supervisors throughout my thesis and the entire PhD programme.

I would also like to thank the staff at the BIS Department who gave me support, advice and suggestions on the thesis and those in the AUT Postgraduate Office who helped to make the journey pleasant. These particularly include Associate Professor Antonio Díaz Andrade, Dr Harminder Singh, Dr Andy Godfrey, Dr. Eathar Abdul-Ghani, Ms. Carole Young and Ms. Ludwina Lafaele.

Many thanks to Ms. Sarah Trotman and Ms. Annie Gandar for their useful advice and help during the survey pre-test stage, and also the companies who took the time to participate and facilitate data collection, along with the participants who volunteered their time to participate in the survey.

I would like to express my heartfelt gratitude to my family: my parents for the unconditional love, affection and support that they have extended to me on every step of my life; and my siblings, my parents-in-law and my sisters-in-law for being understanding and providing emotional support for my academic aspirations.

Last but not least, I thank my beloved husband for supporting me throughout all my studies. Words cannot express how grateful I am to have you in my life.

DEDICATION

I would like to dedicate this thesis to my beloved husband Saman, for his patience, endless love, encouragement and support throughout this journey.

Abstract

Organisations invest substantially in enterprise systems such as customer relationship management (CRM) systems with the planned expectation that employees will utilise these systems to enhance organisational efficiency. An underutilisation of information systems (IS) by employees often impedes organisations from gaining the full expected benefits from their technology investments. While different reasons may explain why IS investments do not bring about the expected result, a recurrent theme is the fact that these systems are rarely infused into employees' work practices. Although much research effort has focused on identifying the influencing factors of IS infusion behaviours, most of the investigated factors are related to rational behaviours, which are more appropriate to explain IS use in the early stages of IS implementation. In order to examine political behaviours like IS infusion behaviours, psychological factors, particularly those related to identities, need to be examined.

Thus, this study aims to provide a better understanding of IS infusion behaviours by: i) examining IS infusion behaviour as well as extended use, integrative use and emergent use behaviours within an organisation.; ii) investigating the influence of individuals' IT identity as person identity and IS infusion role identity, on individuals' IS infusion behaviours within an organisation. IT identity as person identity refers to the extent to which a person views the use of IT as integral to her/his sense of self. IS infusion role identity refers to the extent to which employees personally view that using an information system to its fullest potential is an important part of their sense of self as employees.

Drawing on identity theories, two research models are developed to identify and evaluate the key psychological and sociological driving factors (i.e., identities) influencing IS infusion behaviours. Three identity theoretical lenses – Stryker's identity theory, Burke's identity theory, McCall and Simmons' identity theory – are adopted to explain the effects of IT identity and IS infusion role identity on employees' IS infusion behaviours within an organisation.

The integrated research models are empirically validated using a dataset of 413 cloud CRM users. The partial least squares – structural equation modelling (PLS-SEM) technique is used

to analyse the data. The results reveal that IT identity and IS infusion role identity positively influence employees' IS infusion behaviour as well as their extended use, integrative use and emergent use behaviours. IS infusion role identity mediates the relationship between IT identity and IS infusion behaviours. In addition, organisational valuing of IS infusion moderates the relationship between employees' IS infusion role identity and their IS infusion behaviour within an organisation.

This study has theoretical and practical contributions. Drawing on identity theories, this study provides an integrated theoretical model for understanding individual IS infusion behaviour and its three sub-dimensions in organisations. In addition, this study extends current identity theories by making a linkage between individuals' person identity and role identity. The findings provide managers with insights into factors that explain IS infusion behaviours. This study provides a framework for managers to develop guidelines to encourage employees to fully utilise IS in organisations. Moreover, managers may find it useful to prepare ongoing socialisation programs to reinforce and reward the desired identity-related behaviours of employees.

CHAPTER One: Introduction

1.1 Overview of Chapter One

The first section of this chapter outlines the significance and motivation of this research to examine the antecedents of individuals' information systems (IS) infusion behaviours in organisations. This section also provides an overview of the literature related to the topic and outlines the research problem. It then discusses the objective of the research and the research questions of the thesis. The next section outlines the research method. This is followed by a discussion on the theoretical and practical contributions of the research. Finally, the structure of the thesis is outlined with a brief description of each chapter. The final section is the summary of this chapter.

1.2 Significance and Motivation of the Research

Worldwide information technology (IT) spending is forecast to approach US$3.8 trillion by 2020 (Gartner, 2016). Organisations continue to invest substantially in enterprise systems such as customer relationship management (CRM) systems with the planned expectation that employees will utilise these technologies to enhance organisational efficiency, productivity, decision making, innovation and collaboration. Today, infusion of IT products, processes and services has made their productive use pivotal to organisational productivity and positive economic returns (Bala & Venkatesh, 2015; Venkatesh & Goyal, 2010).

IS implementation research has demonstrated that the most successful IS implementations are those in which users of the technology take full advantage of IS features (Chin & Marcolin, 2001; Jasperson, Carter, & Zmud, 2005; Leonard-Barton, 1988; Orlikowski, 1992; Tyre & Orlikowski, 1996). On the other hand, many studies have concluded that the underutilisation of IS is an important reason for failures in IS implementations (Burton-Jones & Grange, 2012; Jasperson et al., 2005). In addition, underutilisation of IS resources by individuals often impedes organisations from gaining the full expected benefits from their technology investments (Devaraj & Kohli, 2003; Saeed & Abdinnour-Helm, 2008; Venkatesh & Goyal, 2010). For example, up to 80% of CRM systems have been found to be

underutilised within an organisation (H. W. Kim & Gupta, 2014). While different reasons may contribute to why IS investments do not bring about the expected result, a recurrent theme is the fact that these systems are rarely infused into individuals' work practices. IS infusion behaviour is defined as the degree to which an IS application is used by end-users to its fullest potential within an organisation (Saga & Zmud, 1994). In other words, infusion represents the degree to which an individual proactively interacts with a wide range of specific features to conduct a certain task in a specific setting (Burton-Jones & Straub, 2006). Recognising that users' utilisation of IS beyond management's mandated and prescribed usages is critical to an outcome of IS implementation (S. S. Kim & Malhotra, 2005), this study aims to examine individual IS infusion behaviours and their influencing factors.

Thus far, IS infusion research has mostly been conducted at the organisational level (e.g., Cooper & Zmud, 1990; Winston & Dologite, 1999), and the individual level (Hsieh & Wang, 2007; H. W. Kim & Gupta, 2014; Oakley & Palvia, 2012; Pongpattrachai, Cragg, & Fisher, 2014). Those studies examining individual's IS infusion behaviour have evaluated the influence of technological factors (e.g., perceived ease of use, perceived usefulness, system self-efficacy, availability, portability, maturity), management and organisational factors (e.g., top management support, staff turnover, IS infrastructure, decentralisation), task characteristics (e.g., task complexity, mobility, interdependence) and end-user related factors (e.g., attitude, satisfaction, trust) on IS infusion behaviour. However, research has not paid enough attention to how an individual's unique characteristics (e.g., an individual's identity) in relation to IS and professional roles may shape infusion behaviours. According to Ortiz De Guinea and Markus (2009), psychological factors (e.g., an individual's identity) have not been studied in the IS continuance use literature. These factors can drive continuing IS use directly rather than through individuals' behaviours (Ortiz De Guinea & Markus, 2009). As a consequence of employee's close affiliation with a professional community in organisations, employees have developed powerful person, role and social identities that guide their organisational behaviours (Mishra, Anderson, Angst, & Agarwal, 2012; Weick, 1995). Employees' identities are suggested as central for understanding their decision making and IS-related behaviours within professional communities and organisations (Mishra et al., 2012). In addition, IS infusion behaviour is derived from organisational citizenship behaviour (OCB) as an extra-role behaviour and these kinds of behaviours primarily depends on user

characteristics and their psychological forces (Dávila & Finkelstein, 2010). OCB refers to "employee activities that exceed the formal requirements and contribute to effective functioning of the organisation" (Dávila & Finkelstein, 2010, p. 278).

IS infusion behaviour can be viewed through three related IS use: extended use, integrative use and emergent use behaviours. These uses are well established in the literature and seem appropriate for measuring individual level IS infusion (Fadel, 2012; Saga & Zmud, 1994). According to Saga and Zmud (1994), each of these behaviours presents a specified detailed pathway to IS infusion behaviour at the individual level. According to Saga and Zmud (1994), *extended use* refers to "using more of the technology's features in order to accommodate a more comprehensive set of work tasks" (p. 80). *Integrative use* involves "using the technology to establish or enhance flow linkages among a set of work tasks" (Saga & Zmud, 1994, p. 80). *Emergent use* refers to "using the technology in order to accomplish tasks that were not feasible or recognized prior to the application of the technology to the work system" (Saga & Zmud, 1994, p. 80). Prior studies evaluated the influence of individual and technological factors (e.g., empowerment, perceived ease of use and usefulness, satisfaction) on extended use of IS, and then individual and organisational factors (e.g., empowerment and novel situations) on integrative use of IS (e.g., Hsieh & Wang, 2007; H. W. Kim & Gupta, 2014). In addition, previous research examined the impact of individual, technological, organisational factors (e.g., perceived usefulness and ease of use, motivation, personal innovativeness with IT, management support and computer self-efficacy) on emergent use of IS (e.g., Nambisan, Agarwal, & Tanniru, 1999; Thatcher, McKnight, Baker, Arsal, & Roberts, 2011). Despite the importance of IS infusion behaviour through its sub-dimensions, however, relatively little attention has been devoted to examining the influencing factors on all the three sub-dimensions of IS infusion behaviour in the same study.

The point that individuals often work through reflexive intentionality and motivations, and what often motivates them are their identities (Stein, 2013; Stein, Galliers, & Markus, 2013; Thompson, 2012), has obtained little explicit consideration in the IS context. Recently, researchers have considered the relationship between IS and identity in the workplace (Stein et al., 2013). In order to comprehensively understand employees' work practices, researchers

should pay attention to the employees' identity for performing activities (Rasche & Chia, 2009). Identity relates to how a person defines her/himself with unique characteristics and self-concepts, and her/his claim to perform a role competently within the workplace (Burke, 1991). Previous studies argued that individuals construct meaning by creating identities in the workplace, which represents the importance of the relationship between individual identities and performance behaviours in the workplace (Farmer & Van Dyne, 2010; Mishra et al., 2012). Armitage and Conner (1999) stated that beyond beliefs and attitude, which influence an individual's behaviours, identity can be added to the behavioural model to improve and explain an individual's continuance behaviour. Leclercq-Vandelannoitte (2014) examined the coevolutionary process of identity and technology in IT assimilation. Several researchers have supported the inclusion of person and role identities within the behavioural models that can explain IS use behaviour, but it has not been well theorised in the literature (e.g., Armitage & Conner, 1999; Carter & Grover, 2015; Y. Lee, Lee, & Lee, 2006; Ortiz De Guinea & Markus, 2009).

Further, from the theoretical point of view, sociological psychology research implies that integrating the concept of identity into IS post-adoption studies as the primary motivator of long-term behaviours helps to fill the gap between present models of IS usage and models that can explain long-term IS use theories. Despite significant theoretical research about an individual's identity, it is understudied in extant literature (Tripsas, 2009), and empirical work investigating the impact of identity on behaviour is limited (Foreman & Whetten, 2002). Although identity theories have been applied in a variety of contexts, including workplaces, they have yet to be utilised to study IT-related phenomena (Mishra et al., 2012).

Individuals' identities in relation to IT are important to understand individuals' ongoing behaviours within an organisation. Individuals are likely to reinforce their identity claim in their outward presentation of the identity to others and in the way they represent the identity internally to themselves (McCall & Simmons, 1966, 1978). An individual is likely to develop multiple identities in her/his interactions with IS across different situations, in the roles she/he performs and through her/his personal characteristics. An individual's relationship with the system is significant to her/him because this relationship is a salient part of her/his self-concept that is not shared with other people (Carter, 2012). To develop an understanding of

long-term IS use behaviours within an organisation, it is important to consider an individual's interactions and perceived relationships with a particular IS that will provide answers to the question of, "Who am I, as an employee, through my use of this technology?". In general, the identities that individuals expose in the workplace influence their work-related and IS use behaviours (Farmer & Van Dyne, 2010). In addition, previous studies on identity in the IS domain found that there are significant relationships between an individual's person identity and her/his IS use behaviour (Carter & Grover, 2015; Mishra et al., 2012; Stein, 2013; Stein et al., 2013). Person identities can change the prospect of IT implementation in organisational processes. As individuals continue to interact with a specific IS through a variety of attributes, roles and situations in an organisation, their interactions in relation to IS become essential to the sense of who they are as individuals.

Despite a broad range of studies on identity, not much attention has been paid to IT and identity in the literature on person identity (Alvesson, Lee Ashcraft, & Thomas, 2008). Moreover, much of the research on the topic of IT and identity has examined the indirect relations between technology and an individual's identity through emotional factors (Stein et al., 2013). IT identity as an individual's person identity refers to the sense of who they are in relation to IT, which refers to "the extent to which a person views the use of an IT as integral to his or her sense of self" (Carter & Grover, 2015, p. 938). A strong IT identity demonstrates identification – the use of the target IT is integral to a person's sense of self (who I am) (Carter & Grover, 2015). This indicates that to investigate long-term IT use, it is requisite to assess the influence of individuals' person identities in relation to IT that they use on a regular basis. This study examines how an employee's IT identity influences her/his IS infusion behaviour as well as the sub-dimensions of IS infusion behaviour, namely extended use, integrated use and emergent use.

Similarly, workplace role identity is also significant to better understand employees' behaviours within an organisation. Workplace role identities are defined as "self-definitions based on occupying particular roles" (Farmer & Van Dyne, 2010, p. 503). Role identities are important because they can influence employees' work-related performance behaviours such as employee creativity (Farmer, Tierney, & Kung-Mcintyre, 2003), employee helping and industrious behaviours (Farmer & Van Dyne, 2010), organisational citizenship behaviours

(Finkelstein & Penner, 2004), volunteering (Grube & Piliavin, 2000), and IS assimilation behaviour (Mishra et al., 2012), among others. Furthermore, organisations can signal and encourage work-related role identities through incentives and strategies to promote desired behaviours (Farmer & Aguinis, 2005; Lord & Brown, 2004). The rationale behind including role identity as an additional influencer in the employee's IS use behaviour originates from theoretical arguments and empirical evidence. According to theoretical and empirical evidence, processes related to identity should be analysed in the prognosis of long-term behaviours, and role identity is identified as a predictor of behaviours (e.g., Biddle, Bank, & Slavings, 1987; P. L. Callero, 1985; Charng, Piliavin, & Callero, 1988), for example, IT acceptance behaviour (Y. Lee et al., 2006). Several researchers have examined the extent to which role identity has been found to contribute to the prediction of specific behaviours (e.g., Charng et al., 1988; Cook, Kerr, & Moore, 2002; Granberg & Holmberg, 1990; Y. Lee et al., 2006; Sparks, 2000; Stets & Biga, 2003; Terry, Hogg, & White, 1999; Theodorakis, 1994).

Previous studies proposed that individuals define role behaviours as a significant way to create meaning by constructing identities within their workplace (Farmer & Van Dyne, 2010; Parker, 2007; Wrzesniewski & Dutton, 2001). In the context of IS use, individuals who make decisions to keep using technologies are embedded in a network of roles and relationships (i.e., social structures) that shape their self-concepts and behavioural choices (Carter, 2012; Stets & Biga, 2003). Indeed, features of complex organisational systems (such as CRM) create a context that necessitates the investigation of IS use models through the lens of employees' identities in the workplace (Bharadwaj, 2000; Mishra et al., 2012). In addition, Tripsas (2009) argued that role identity is crucial to understand organisational and technological innovation behaviours. The comprehensive functionality of organisational systems such as CRM can also reinforce employees' role identity, thus enable them to perform their job tasks more competently and efficiently (DesRoches et al., 2008; Ford, Menachemi, Peterson, & Huerta, 2009). The more other people identify an individual with a specific role, the more the individual internalises the role and synthesises it into her/his self-concept. For example, the more colleagues see an employee with an IS infusion role, the more that employee internalises the IS infusion role and synthesises it into her/his self-concept. Despite the theoretical importance of work role-related identities in explaining work related performance, very little research has examined how role identities impact behaviours

within an organisation and, as this study investigates, to what extent an employee's IS infusion role identity influences her/his IS infusion behaviour as well as its sub-dimensions. An individual's IS infusion role identity refers to the extent to which the employee personally views that using the most features of a system or exploring the new features in innovative ways to accomplish multiple job tasks is an important part of her/his sense of self as an employee.

While person identities are very likely to represent master identities operating through roles, groups and situations, it is expected that person identities impact the selection of role and group identities (Burke & Stets, 2009). It is important to recognise that IT identity as a person identity is part of an individual's multiple identities. An individual's person identity of deep attachment to IT use affects her/his internalised expectations about competent performance in her/his work role (McCall & Simmons, 1966; Stryker & Burke, 2000). Previous research supported the impact of individuals' person identities on their role identities. For example, Mishra and colleagues (2012) found that employees' reliance and dependence on the implemented IT enabled them to retain and strengthen their autonomy and dominant role identity among physicians. Findings from previous studies in the scientific community revealed that the professional role identities of research scientists were shaped by their personal attachment to IT through technology usage (Lamb & Davidson, 2005).

Accordingly, employees' person and role identities together constitute their identities, which is a reflection of their personal characteristics and enactment of their roles as employees (Burke & Stets, 2009). IT identity and IS infusion role identity as person and role identities define a person as a unique individual who is tied to a role in an organisation. Drawing on a theoretical point of view and through linkage between identities and IS use behaviours, employees' person and role identities in relation to IS use phenomena first need to be investigated before integrating the social aspects of identities. This is because the self-reference of person and role identities is initially related to "me" as an individual not "we" of a social group (Burke & Stets, 2009). Individuals' behaviours (i.e., IS use) need to be examined through person and role identities with the self-reference of "me" to understand individuals' self-concept through their interactions with IS and their perceived expectations from others, before examining these behaviours through social groups with the self-reference

of "we". In addition, social bases of identity are attached with other social factors such as social/group culture and norms that need to be examined at the same time/model, which are beyond the scope of this study.

Overall, based on the literature review, there are three key reasons that support why there is a need to investigate the influence of identity related factors on IS infusion behaviours. First, although much research effort has focused on identifying the influencing factors of IS infusion behaviours, most of these factors are based on rational behavioural argument, which are more appropriate to explain IS use in the early stages of IS implementation (such as adoption stage). In order to examine political and proactive behaviours like IS infusion behaviours, psychological factors, particularly those related to identities, need to be examined (H. W. Kim, Chan, & Gupta, 2016; H. W. Kim & Gupta, 2014; Mishra et al., 2012). IS infusion should not be viewed as mandatory or basic use, but a voluntary, exploratory and exploitative use of IS features that enhances organisations' productivity (Hsieh & Wang, 2007). End users' unique characteristics and factors (such as commitment, intrinsic motivation empowerment, and identities) are more important to examine these kind of behaviours. In addition, individuals' psychological interaction and experience with an IS also encourages them to explore new features of an IS (Thatcher et al., 2011). When individuals mentally depend on a system, they are more likely to invest time and effort in engaging in extra-role behaviours, such as exploring new ways to use the system and making linkage among job tasks (Wang & Hsieh, 2006).

Second, psychological factors such as identities have been investigated in other stages of IS implementation such as the assimilation stage. For example, Mishra and colleagues investigated the impact of physicians' role identity on their IS assimilation behaviour in healthcare; and suggest that identity factors should play a role in explaining IS infusion behaviour as well (Mishra et al., 2012). Third, studies find strong evidence that individuals' identities are central to understanding people's continuous behaviours in different contexts such as continuance exercise behaviour, green consuming behaviour, continuous blood donation, voting, among others (Mishra et al., 2012; Real, Bramson, & Poole, 2009). Therefore, this study is motivated to provide a comprehensive understanding of individual IS infusion behaviour by investigating the impact of employees' IT identity and IS infusion

role identity on their IS infusion behaviour, extended use, integrative use and emergent use of IS in the workplace based on the application of identity theories.

1.3 Research Objective and Research Questions

The aim of this research is to examine the influence of employees' identities on their IS infusion behaviours within an organisation by drawing on identity theories (Burke & Stets, 2009; McCall & Simmons, 1978; Stryker, 1980). Drawing on role identity theory (McCall & Simmons, 1978), this research depicts the relationships in which role identity determinants shape role identity prominence which in turn influences behaviours. In addition, based on Burke's (2004) person identity theory, an individual's identity and behaviour are interconnected through a common system of meaning that is important for understanding an individual's behaviour. These identity-behaviour processes are employed as overarching theories to investigate the impact of employees' identities in relation to IS on IS infusion behaviours within an organisation. The objective of this study can be listed as follows:

- To investigate factors that explain IS infusion behaviour and its three sub-dimensions: extended use, integrative use and emergent use behaviours. A comprehensive understanding of IS infusion behaviour and its sub-dimensions is important to direct the course of this research and other studies that are interested in the IS infusion topic;

- To examine the effect of an individual's IT identity and IS infusion role identity on her/his employee-related IS infusion behaviour as well as its three sub-dimensions within an organisational context. Understanding the effect of IT identity and IS infusion role identity on IS infusion behaviour is important, as these psychological factors are crucial to develop the behavioural model to explain an individual's continuance behaviour, beyond beliefs and attitude; and

- To investigate the relationship between an individual's IT identity and her/his IS infusion role identity to find out if her/his IT identity as person identity will influence her/his IS infusion role identity in the workplace.

The following are the research questions related to the research aims mentioned above.

Research Question 1: What is the influence of employees' IT identity on their IS infusion behaviour within an organisation?

Sub research question 1.1: What is the influence of employees' IT identity on their IS extended use behaviour within an organisation?

Sub research question 1.2: What is the influence of employees' IT identity on their IS integrative use behaviour within an organisation?

Sub research question 1.3: What is the influence of employees' IT identity on their IS emergent use behaviours within organisation?

Research Question 2: What is the influence of employees' IS infusion role identity on their IS infusion behaviour within an organisation?

Sub research question 2.1: What is the influence of employees' IS infusion role identity on their IS extended use behaviour within an organisation?

Sub research question 2.2: What is the influence of employees' IS infusion role identity on their IS integrative use behaviour within an organisation?

Sub research question 2.3: What is the influence of employees' IS infusion role identity on their IS emergent use behaviour within an organisation?

Research Question 3: What is the influence of employees' IT identity on their IS infusion role identity within an organisation?

1.4 Research Design

To answer the proposed research questions, this study adopts a positivist philosophical approach. Drawing on identity theories, two integrated research models are proposed to empirically evaluate the influence of individuals' IT identity and IS infusion role identity on IS infusion behaviour, as well as the influence of individuals' IT identity and IS infusion role identity on extended use, integrative use and emergent use behaviours within an organisation. Based on Stryker (1980), Burke (2004), Burke and Stets' (2009) identity theories, IT identity and its three reflective factors are included in the research models, including relatedness, emotional attachment and dependency. Based on McCall and Simmons (1978) role identity theory, IS infusion role identity and its six determinant factors are incorporated into the research models, including self-support, social support, commitment, resource investment, and external and internal gratifications. This study takes a deductive approach, which is reasoning from the general to the particular. In a deductive approach, data are used to evaluate hypotheses related to an existing theory of study. This research proposes a quantitative methodology that relies on a hypothetical test of theory.

This research empirically investigates the IS infusion behaviours of professionals who use enterprise systems in organisations. In particular, the enterprise system under study is a cloud CRM system used by sales and marketing professionals. Cloud CRM systems such as Salesforce.com and Microsoft Dynamic are used for sales force and service centres. Customer data are stored, analysed and used for the management of customer service and sales opportunities and for the development of new products and marketing plans. Cloud computing and the Software as a Service (e.g., cloud CRM) deployment model are considered as a new commercial platform (Cusumano, 2010). Firms chosen to participate in this study were those that had used CRM systems for more than two years. A minimum two-year period provides an organisation an appropriate amount of time to address updates and changes in the technology (H. W. Kim, Chan, & Lee, 2012). Furthermore, end-users needed to have used the system for more than one year.

Data were collected to empirically assess hypothesised relationships. The online survey was hosted on the Qualtrics website at AUT University. Participants were the end-users of cloud CRM systems in New Zealand. The survey instrument was a self-administrated questionnaire

which contained questions regarding each construct in the research models, measured using validated items from related literature. The survey instrument was examined and refined based on feedback from a group of experts, then the pre-test and pilot study were processed.

The data were analysed using partial least squares, structural equation modelling (PLS-SEM) techniques following the procedures suggested by Hair and colleagues (2011). Specifically, SPSS Version 19 and PLS Version 3.0 were used to assess the reliability and validity of the measurement models and the hypothesised relationships in the structural models. The results of testing the research models showed that the hypothesised relationships were supported. Findings from this study are discussed in the light of current literature, leading to discussions on the contributions that this study makes to research and practice alike.

1.5 Contributions

This research offers both theoretical and practical contributions. From a theoretical perspective, by drawing on identity theories, this study provides an integrated theoretical model for understanding individual IS infusion behaviour and its three sub-dimensions (extended use, integrative use and emergent use) in organisations. By linking IT identity and IS infusion role identity to IS infusion, this study extends IS infusion research, which has not closely examined the effects of identity on IS use behaviours.

This study improves the existing theorisation of individual-level IS infusion by adding the identity concepts to current IS use models. In addition, this research builds on the work of Zmud and his colleagues (Cooper & Zmud, 1990; Saga & Zmud, 1994) by operationalising and testing the concept of IS infusion. This study extends the current identity theories, by making a linkage between individuals' person identity and role identity. In particular, it is one of the first studies to incorporate six determining factors of role identity and to establish user role identity as a driver of IS infusion behaviour based on the application of identity theory.

The study's findings have practical implications for leaders and managers in organisations. The results provide managers with insights into factors that explain the influencing factors

of IS infusion behaviour. Organisations encounter the ongoing issue of how to instruct employees toward behaviours that are organisationally desired; therefore, based on the findings, managers may find it useful to provide ongoing socialisation programs, customised training interventions, effective communication campaigns, specific management strategies and a motivational atmosphere to reinforce and reward the desired identity-related behaviours of employees. The findings also provide managers with an understanding of users' psychological factors that influence the full use of primary information systems for professionals in organisations. This study provides practical guidelines for managers on how to encourage employees' full IS use behaviour. Results from this study can be used to help organisations assess actual benefits from IS investments through system use. Findings may be used to provide guidelines for designing interventions to promote individuals' infusion behaviours and foster higher levels of infusion among users, ultimately helping organisations to secure full benefits from their technology investments.

1.6 Outline of the Thesis

This thesis is organised into seven chapters (as shown in Figure 1.1 below). The following provides a brief explanation of each chapter.

Chapter One elaborates the significance and motivation of the study along with its theoretical underpinnings. The research objective and research questions of this study are then presented, followed by an overview of the research methodology. Then, the theoretical and practical contributions of the study are discussed.

Chapter Two presents a discussion of relevant literature to facilitate understanding of individuals' IS use behaviours within an organisation. It discusses the conceptualisation of IS infusion behaviours and identity theories, which form the foundation of this research. In particular, the roles individuals' identities (person and role bases) play in the IS infusion process are discussed. Based on the literature analysis, the literature gaps are also identified.

Chapter Three discusses how identity theories help to explain the influence of individuals' person and role identities in relation to IS on their IS infusion behaviours in the workplace.

Based on the discussions and research questions, two integrated research models are then proposed together with the development of a set of research hypotheses.

Chapter Four explains the methodology employed in this study. The criteria for selecting data collection methods and data analysis techniques are reported. The measurement issues are identified and PLS-SEM is introduced as the structural equation modelling technique used to analyse the data. The details of the instrument development process, survey procedures and the preliminary details of the final survey are described in this chapter.

Chapter Five reports the data analysis procedures and results. SmartPLS 3.0 is used to assess the measurement models and the structural models of this study. The research hypotheses are also tested based on the results of testing the structural models.

Chapter Six discusses the findings from the data analysis results (Chapter five). The research questions are answered and the research hypotheses are discussed. A discussion is provided on the contributions of this research in light of the theories and prior studies.

Chapter Seven concludes the thesis by presenting a summary of the main findings from this study. The main theoretical and practical implications of this research are presented. This chapter also highlights the limitations of this research, and then discusses and provides guidelines for future research.

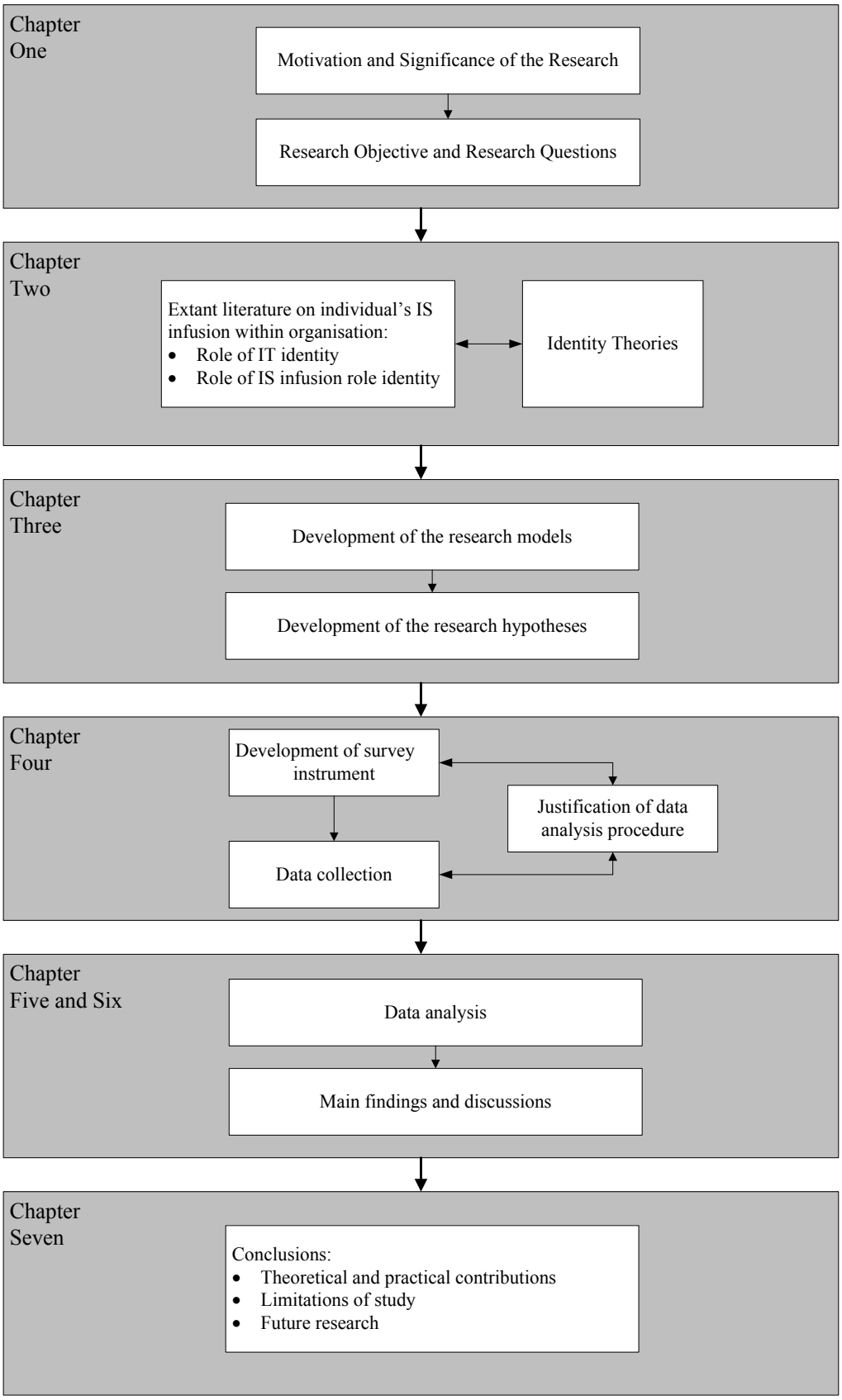

Figure 1.1. Outline of the thesis

1.7 Summary of Chapter One

This chapter laid the foundations for this study. First, it introduced the significance and motivation of the study. The objective and the research questions of the research were then presented, and the research methodology was described briefly. The potential contributions to the literature and implications for practice were outlined, and then the organisation of the thesis was described. The following chapter reviews the existing literature in order to develop a clear understanding of the impact of individuals' identities on their IS infusion behaviours in the workplace context.

CHAPTER Two: Literature Review

2.1 Overview of Chapter Two

Drawing on identity theories in sociology and psychology, this study examines the influence of person identity and role identity on IS infusion behaviours within an organisation. Person identity and role identity are instantiated as IT identity and IS infusion role identity respectively. In this chapter, IS infusion literature and identity theories are discussed to provide foundational knowledge to inform this study.

The chapter is organised as follows: Extant literature on IS use is discussed, followed by a definition of the IS infusion concept and a discussion of its origins in the IS literature. Next, the bases of identity and symbolic interactionism are presented. Then, the identity theories as the theoretical lenses for this study, are discussed. IS infusion role identity and IT identity constructs are elaborated upon and their plausible explanatory impact on IS infusion behaviours is presented. Then, the chapter concludes with a summary of the relevant themes identified in the literature.

2.2 IS Use and IS Infusion Behaviours

The following sections elaborate on IS use, IS infusion and the sub-dimensions of IS infusion behaviour namely extended use, integrative use and emergent use and the theoretical and empirical studies of IS infusion from the literature. IS infusion is the last stage of IS implementation, which is one of the research domains of IS use.

2.2.1 IS Use

IS use is one of the most focal and frequently studied constructs in the IS research (e.g., Ahuja & Thatcher, 2005; Burton-Jones & Straub, 2006; Hsieh & Wang, 2007; Karahanna, Straub, & Chervany, 1999). IS use has been implicitly conceptualised in four IS research domains: IS acceptance, IS implementation, IS success and IS for decision making (Burton-Jones & Straub, 2006). In the IS implementation research, the efforts are primarily on identifying the characteristics of IS implementation that leads to greater use of IS (Burton-

Jones & Straub, 2006). IS implementation is portrayed as an organisational endeavour described as a six-sage model which includes initiation, adoption, adaptation, acceptance, routinisation and finally the infusion stage. Cooper and Zmud (1990) presented the IS implementation model as shown in Figure 2.1.

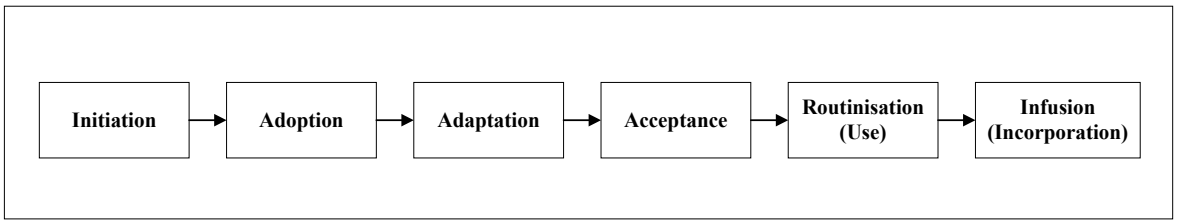

Figure 2.1. IS implementation model. Adapted from Cooper and Zmud (1990) and Lewin (1947)

According to Cooper and Zmud (1990), the *Initiation* stage refers to a scanning of organisational problems/opportunities and finding a match between an IS solution and its application. The *Adoption* stage refers to the rational and political negotiations to gain organisational backing for IS implementation and to make a decision to invest necessary resources. *Adaptation* refers to the development, installation, maintenance and organisational procedures for the IS application; users are trained to use the system in the organisation. *Acceptance* refers to the users commitment to use the employed IS application. *Routinisation* refers to the usage of the IS application as a normal activity. An organisation's governance systems are adjusted to account for the IS application. *Infusion,* which is the focus of this study*,* is obtained through using the IS application in a more comprehensive and integrated manner to support organisational work in order to achieve organisational effectiveness. IS infusion behaviour is also defined as when "the IT application is used to its fullest potential" within the organisation (Cooper & Zmud, 1990, p. 125). The process and product of each stage of IS implementation is presented in Table 2.1.

Table 2.1. IS Implementation Stages. Adapted from Cooper and Zmud (1990)

Stage	**Definition as a Process**	**Definition as a Product**
Initiation	Active and/or passive scanning of organisational problems/opportunities and IS solutions is undertaken.	A match is found between an IS solution and its application in the organisation.
Adoption	Rational and political negotiations ensue to gain organisational backing for the implementation of the IS application.	A decision is reached to invest resources necessary to accommodate the implementation effort.
Adaptation	The IS application is developed, installed and maintained. Organisational procedures are revised and developed. Organisational members are trained both in the new procedures and in the IS application.	The IS application is available for use in the organisation.
Acceptance	Organisational members are induced to commit to IS application usage.	The IS application is employed in organisational work.
Routinisation	Usage of the IS application is encouraged as a normal activity.	The organisation's governance systems are adjusted to account for the IS application.
Infusion (focus of this study)	Increased organisational effectiveness is obtained by using the IS application in a more comprehensive and integrated manner to support higher level aspects of organisational work.	The IS application is used within the organisation to its fullest potential

Despite its significance in the IS literature, the IS use construct has not been well theorised (Boffo & Barki, 2003; Burton-Jones & Straub, 2006; Chin & Marcolin, 2001; Fadel, 2012). The extant research has mostly evaluated IS use by operationalising the construct as the intensity, frequency or duration of IS use behaviours (e.g., Adams, Nelson, & Todd, 1992; Igbaria & Iivari, 1995; Parthasarathy & Bhattacherjee, 1998; Taylor & Todd, 1995; Venkatesh & Morris, 2000). Increased quantity of use does not always convey the increased individual/organisational benefit of IS investment (Fadel, 2012).

Even though quantitative measures of IS use may be useful as high-level proxies for IS acceptance, researchers are now looking for a richer understanding of "what constitutes IT usage and the pattern of IT infusion itself" (Chin & Marcolin, 2001, p. 10). The increasing complexity of today's organisational IS has caused the shift in perspective, which has increased user discretion over *how*, compared to *whether* or *how often*, an IS is used (Fadel, 2012). For example, an organisation may adopt and mandate the use of a feature-rich enterprise system such as a CRM system to integrate business functions and support transactions with customers. Despite organisational mandate, users may still refuse to use the wide range of IS features to complete their tasks (Boudreau & Seligman, 2006; Fadel, 2012; Jasperson et al., 2005). In addition, Cooper and Zmud (1990) stated that factors associated with rational explanations of IS implementation are more significant for earlier stages of IS implementation. The early stages of IS implementation reflect very rational behaviours, whereas IS infusion reflects social learning, depth of use and political behaviours (Cooper & Zmud, 1990; Zmud & Apple, 1992). Moreover, IS infusion behaviour represents a form of proactive behaviour that requires the individual to be psychologically motivated to use the system (H. W. Kim & Gupta, 2014). Therefore, increased research attention should be devoted to better understanding of psychological factors that shape quality or depth of use, especially with regard to complex organisational IS (Barki & Pinsonneault, 2005; Cooper & Zmud, 1990; Fadel, 2012; Saga & Zmud, 1994).

2.2.2 IS Infusion Behaviour: Definitions, Origin and Sub-dimensions

A successful IS implementation does not automatically entail the organisation having an enhanced performance (Mishra, 2009). When users do not use and commit to the IS to its fullest potential to perform work activities, the desired benefits cannot be met and hence the increase in performance will not follow (Murphy, Chang, & Unsworth, 2012). Utilisation of the applications is the crucial link between technology investments and improved performance through IS (Devaraj & Kohli, 2003). The sophisticated level of usage, referred to as infusion, enables an organisation to gain higher benefits from its IS investment (Fadel, 2012; Moore, 2002; Saga & Zmud, 1994).

Infusion came to light in a research study conducted in the late 1980s (Kwon & Zmud, 1987; Sullivan, 1985) and became recognised as the last stage of a technology implementation

model. IS infusion behaviour has been defined in the literature in different ways. Cooper and Zmud (1990, p. 125) defined infusion as the degree to which "the IT application is used within the organisation to its fullest potential". Saga and Zmud (1994, p. 110) defined it as "the extent to which an innovation's features are used in a complete and sophisticated way" by individuals. Jasperson and colleagues (2005, p. 531) defined infusion as occurring "after an IT application has been installed, made accessible to the user, and applied by the user in accomplishing his/her work activities". Some authors argue that IS infusion behaviour represents the degree to which an individual proactively interacts with a wide range of specific features to conclude a certain task or in a specific setting (Burton-Jones & Straub, 2006; Carter, 2012). The gist of these definitions implies that IS infusion can be studied at organisational, group and individual levels and the extent of infusion is associated with technological benefits. This study applies the definition of infusion from a user's perspective, which represents the degree to which an individual proactively interacts with a wide range of specific features to accomplish a certain task in a specific setting (Burton-Jones & Straub, 2006; Carter, 2012).

The focus of this study is at the individual level, and the measure of IS infusion behaviour focuses on individual IS use behaviours. Individual level IS infusion behaviour has been conceptualised as a single-dimensional construct that reflects IS usage at its fullest potential (Cooper & Zmud, 1990; Jones, Sundaram, & Chin, 2002; Maas, Fenema, & Soeters, 2014; Sundaram, Schwarz, Jones, & Chin, 2007), as well as in its three sub-dimensions: extended use, integrative use and emergent use behaviours (Fadel, 2012; H. W. Kim & Gupta, 2014; Saga & Zmud, 1994). These three sub-dimensions of IS infusion behaviour are well established in the literature and seem appropriate for measuring individual level IS infusion behaviour. According to Saga and Zmud (1994), each or any of these behaviours presents a specific detailed pathway to the infusion behaviour at an individual level.

According to prior studies, extended use of IS refers to the use of more features of a system to perform job tasks without considering the interconnectedness of these tasks with others, or of new ways of applying the system to accomplish job tasks (Hsieh, Rai, & Xu, 2011; Hsieh & Wang, 2007; Saeed & Abdinnour-Helm, 2008; Saga & Zmud, 1994). Extended use as an aspect of IS infusion behaviour requires an IS user to be proactive in using more IS

features to perform a wider range of job tasks, beyond the prescribed or formal guidelines (Hsieh et al., 2011; H. W. Kim & Gupta, 2014).

Integrative use involves "using the technology to establish or enhance flow linkages among a set of work tasks" (Saga & Zmud, 1994, p. 80). Workflow issues have been recognised as an IS use issue, which is related to integrative use of IS (Deng & Chi, 2012). Workflow related issues appear when process/data integration fails to work as expected within the collaborative environment. Employees sometimes tend to collaborate with each other in performing job tasks to create linkage among their tasks and establish a smooth workflow, which is significant for efficiency and effectiveness. By applying an IS in an integrative manner, an employee can establish or improve the connections among related job tasks (H. W. Kim & Gupta, 2014).

Emergent use refers to "using the technology in order to accomplish tasks that were not feasible or recognized prior to the application of the technology to the work system" (Saga & Zmud, 1994, p. 80). Emergent use means using an IS in an innovative and new way to support job tasks. Prior studies noted different types of emergent use such as trying to innovate (Ahuja & Thatcher, 2005) and exploratory usage (Ke, Tan, Sia, & Wei, 2012; Saeed & Abdinnour-Helm, 2008; Thatcher et al., 2011). The uniqueness of emergent use compared to extended use and integrative use is in finding new ways to use the system even with those frequently used IS features to perform job tasks (H. W. Kim & Gupta, 2014).

IS infusion behaviour as well as its three sub-dimensions demonstrate a form of proactive behaviour because IS infusion behaviours require individuals to perform extra-role behaviours which are beyond employees' job descriptions and management expectations. An individual's proactive behaviour refers to "an individual's actions effecting environmental change through his or her scanning for opportunities, showing initiative, taking action on and solving problems, and persevering until changes are made" (Kirkman & Rosen, 1999, p. 62). Employees who are proactive can accomplish their job tasks by going beyond formal job guidelines, then fulfilling or exceeding what is expected in their job roles at work (H. W. Kim & Gupta, 2014).

IS infusion behaviour has been operationalised in the literature in different ways. Previous studies used different definitions and measurements to study IS infusion behaviour in organisations (Hassandoust, Techataassnasoontorn, & Tan, 2016). Some studies used the variable *infusion* at an individual level (Fadel, 2012; Hsieh & Wang, 2007; H. W. Kim & Gupta, 2014; Maas et al., 2014; McKnight, Carter, Thatcher, & Clay, 2011; Sundaram et al., 2007) and the organisational level (Cooper & Zmud, 1990; Eder, Arinze, Darter, & Wise, 2000; Eder & Igbaria, 2001; S. Lee, Han, & Park, 2000; Ramamurthy, Sen, & Sinha, 2008; Winston & Dologite, 1999). Other studies examined distinct types of infusion behaviours including deep structure use, exploratory use, trying to innovate, innovating with IT, innovative use, adaptive system use, intention to explore and the embeddedness of IS.

In this study, the single-dimensional IS infusion construct is conceptualised at an individual level, which is adopted from previous studies (Cooper & Zmud, 1990; Donaldson & Yakel, 2013; Fadel, 2012; Gallivan, 2001; Jones et al., 2002; Kishore & McLean, 2007; Pao-Long & Lung, 2002; Zmud & Apple, 1992). For extended use behaviour, the definitions of extended use and deep structure use are combined as the meanings of IS deep structure use convey similar meanings to extended use behaviour (Burton-Jones & Straub, 2006; Hsieh & Wang, 2007; H. W. Kim & Gupta, 2014). For integrative use behaviour, the definition from Kim and Gupta (2014) is adopted as it is one of the studies that examined integrative use behaviour as a separate construct. For emergent use behaviour, this study combined the definitions for emergent use, exploratory use and innovative IS use from previous studies (Ahuja & Thatcher, 2005; Jasperson et al., 2005; Ke et al., 2012; H. W. Kim & Gupta, 2014; Saeed & Abdinnour-Helm, 2008), because all of these constructs convey similar meanings toward the emergent use of IS. The summary of different terminologies and definitions of IS infusion behaviour is presented in Table 2.2.

Table 2.2. Summary of Different Definitions of IS Infusion Behaviour. Adopted from (Hassandoust et al., 2016)

Concept/ Construct	Definition(s)
Infusion-individual	The infusion stage is the last stage in the IS implementation process. Infusion means that individuals use the system to its fullest potential. The system is applied by the users in order to accomplish their work activities (Cooper & Zmud, 1990; Donaldson & Yakel, 2013; Fadel, 2012; Gallivan, 2001; Jones et al., 2002; Kishore & McLean, 2007; Pao-Long & Lung, 2002; Zmud & Apple, 1992).
Infusion-organisational	The extent to which the full potential of the innovation has been embedded within an organisation's operational or managerial work systems (Cooper & Zmud, 1990; Zmud & Apple, 1992).
Extended use	Defined as using more of the IS features to complete/support an individual's tasks/performances (Hsieh & Wang, 2007; H. W. Kim & Gupta, 2014).
Integrative use	Defined as "using the system to reinforce linkages among tasks" (H. W. Kim & Gupta, 2014, p. 2).
Emergent use	Defined as "using a system in an innovative and new manner to support tasks" (H. W. Kim & Gupta, 2014, p. 2).
Deep Structure use	Defined as "the use of features in the IS that support the underlying structure of the task" (Burton-Jones & Straub, 2006, p. 18).
Exploratory use	Defined as the extent to which a user discovers the active examination and innovative uses of the system features to support job tasks (Ke et al., 2012; Saeed & Abdinnour-Helm, 2008).
Trying to innovate	Refers to "a user's goal of finding new uses of existing workplace information technologies" (Ahuja & Thatcher, 2005, p. 430).
Innovative use	Defined as "a form of innovation at the individual level [and] describes employees' application of IS in novel ways to support their work" (Li, Hsieh, & Rai, 2013, p. 662). Users explore and use system features that were not known to them before (Jasperson et al., 2005).
Innovate with IT	Defined as "new uses of existing workplace information technologies by an individual to support his/her task performance" (Wang, Hsieh, Butler, & Hsu, 2008, p. 28).
Adaptive system use	Includes four distinct behaviours: trying new features, feature substituting, feature combining and feature repurposing (Sun, 2012).
Intention to explore (Emergent use)	Defined as "a user's purpose and motivation to innovate based on the perceived business related benefits she will derive from IT deployment" (Nambisan et al., 1999, p. 373). Intention to Explore "reflects a user's willingness and purpose to explore a new technology and find potential use" (Nambisan et al., 1999, p. 373).
Embeddedness of IS	Defined as "the extent to which the use of BIS is an integral part of organisational activity" (Grublješič & Jaklič, 2015, p. 6).

2.2.3 Infusion Research: Conceptual and Empirical Studies

Previous research studied infusion from both conceptual and empirical perspectives. Early works in the IS implementation literature proposed that infusion transpires via standardisation of IS use in the workplace and re-conceptualisation of business processes (Saga & Zmud, 1994). Conceptual studies have stated that infusion occurs as IS use becomes routinised and frequent, and as IS-enabled work procedures are re-conceptualised and adapted in response to it (Saga & Zmud, 1994). The empirical studies generally have two distinct approaches toward the concept of infusion: (1) Infusion via organisational technology configuration and (2) infusion via individual technology use. The former investigates infusion in the form of a group of subsets of IS features, implemented by an organisation as a whole (Cooper & Zmud, 1990; Eder & Igbaria, 2001; Lassila & Brancheau, 1999; Winston & Dologite, 1999; Zmud & Apple, 1992). These studies examined the influence of factors such as organisational structure, top management support, earliness of adoption and IS characteristics on organisational level infusion. For instance, Winston and Dologite (1999) conducted a comprehensive review of IS implementation literature and presented a series of 11 determinants of IS infusion behaviour in small business contexts. These determinants are organisational factors (structure, IS experience), end-user factors (experience, training, involvement, incentives), and extra-organisational circumstances (strategic alliances, IS consultants).

The other stream of research, including this study, focuses on understanding infusion through technology use at an individual level. These studies conceptualise and measure infusion by the degree to which IS users engage with the full range of features that the technology has to offer, or the degree to which they employ the technology to its fullest extent (Hsieh & Wang, 2007; H. W. Kim & Gupta, 2014; Ng & Kim, 2009; Oakley & Palvia, 2012; Pongpattrachai et al., 2014). These studies view that organisational IS infusion can only be achieved if individuals infuse the technology into their own work practices (Fadel, 2012). These studies evaluated the influence of technological factors (e.g., perceived ease of use and usefulness), management and organisational factors (e.g., top management support), task characteristics (e.g., task complexity, mobility, interdependence), firm environment factors (e.g., complexity of client, partner support, competitiveness of the environment) and end-user

related factors (e.g., attitude, satisfaction, intrinsic motivation, commitment) on IS infusion behaviour within an organisation (Hassandoust et al., 2016).

According to Hassandoust and colleagues (2016), findings from previous studies reported positive, negative, not significant and conflicting results between the influencing factors and IS infusion behaviours. For example, studies reported that factors such as top management support and facilitating conditions had *positive and significant* impact on IS infusion behaviour. Some other factors such as staff turnover and partner support showed *negative and significant* influence on IS infusion behaviour. *No statistically significant* relationships were reported between factors such as prior attitude toward IT, trust in IT support and IS infusion behaviour. In addition, there were several *conflicting results* between factors such as relative advantage, autonomy, satisfaction and IS infusion behaviour, which reported positive or negative significant or non-significant relationships within different studies. The comprehensive literature review on the influencing factors of IS infusion behaviour demonstrates the lack of research on the influence of psychological factors (e.g., identities) on IS infusion behaviours. Moreover, theoretical foundations used in these previous individual-level IS infusion studies are technology organisation and environment framework, expectation-confirmation theory, unified theory of acceptance and use of technology, technology acceptance model, IS continuance model, diffusion of innovation theory, theory of reasoned action, the DeLone and McLean IS success model, coping theory, theory of trying and job characteristic model, among others. Most of these theories are related to rational behaviours which can better explain the early stages of IS implementation, such as the adoption and acceptance stages. In order to examine political behaviours like IS infusion behaviours, motivational and psychological theories are recommended (Cooper & Zmud, 1990). Different types of technologies that have been investigated include enterprise resource planning, CRM, knowledge management systems, sales force automation, Microsoft Access and Excel, software process innovation and electronic medical system, among others. Based on the literature review of individual level IS infusion studies, there are a number of variables that have received an adequate amount of attention with clear results from previous studies, which can facilitate further theory development and reveals areas (i.e., psychological factors) where future research is required. A summary of selected individual level infusion studies is presented in Table 2.3.

Table 2.3. Summary of Individual Level Infusion Studies. Adapted from (Hassandoust et al., 2016)

Authors/ Year	**Theoretical Foundation**	**Target System**	**Influencing Factors (Independent Variable)**	**Dependent Variable (DV)**	**Findings**
Kim, Chan & Gupta, 2016	Socio-technical system theory	Enterprise system	User commitment	Infusion	Positively significant relationship between user commitment and IS infusion.
Afonso, Schwarz, Roldán & Sánchez-Franco, 2015	-	Electronic Document Management System (EDMS)	Routinisation, Extent of use	Infusion	Positively significant relationship between routinisation and IS infusion. Significant relationship between extent of use and IS infusion.
Grublješič & Jaklič, 2015	TOE, ECT, UTAUT, TAM, DeLone and McLean IS success model	Business Intelligence Systems (BIS)	Personal innovativeness, Readiness for change, Facilitating conditions, System quality, Relevance of information, Management support, Information culture, Focus on customer satisfaction, Relative advantage, Job relevance, Perceived usefulness, Voluntariness, Visibility of use, Image, Competitiveness of the environment	Deep use, Embeddedness of IS	Positively significant relationships between all these influencing factors and IS infusion (deep use/embeddedness of IS).
Koo, Chung & Kim, 2015	Theory of exploration and exploitation innovation	Smartphones	User competence, User satisfaction, Perceived usefulness, Exploitative use	Explorative use	Positively significant relationships between user competence, perceived usefulness, exploitative use, and explorative use. Insignificant relationship

					between user satisfaction and explorative use.
Kim & Gupta, 2014	Psychological empowerment theory	Customer Relationship Management (CRM)	User empowerment	Extended use, Integrative use, Emergent use	Positively significant relationship between user empowerment and extended use, integrative use, emergent use.
Maas, Fenema & Soeters, 2014	-	Enterprise Resource Planning (ERP)	Organisational control, Empowerment	Infusion	Marginally positively significant relationship between organisational control and IS infusion. Positively significant relationship between empowerment and IS infusion.
Pongpattrachai, Cragg & Fisher, 2014	-	Spreadsheet	IT competence, IT champion, Complexity of client, External support, Relative advantage, Observability, Staff turnover, Partner support	Infusion	Positively significant relationships between IT competence, IT champion, Complexity of client, External support, Relative advantage, Observability and IS infusion.
Donaldson & Yakel, 2013	DOI	Preservation metadata: implementation strategies (PREMIS)	Managerial interventions, Subjective norms, Facilitating conditions	Infusion	Positively significant relationships between facilitating conditions and IS infusion. Insignificant relationships between managerial interventions, subjective norms and IS infusion.
Li, Hsieh & Rai, 2013	Motivation theory	Business intelligence system	Intrinsic motivation to experience stimulation, Intrinsic motivation to know, Intrinsic motivation toward	Innovative use	Positively significant relationships between all these influencing factors and innovative use of IS.

			accomplishment, Perceived usefulness		
Kim, Chan & Lee (2012)	Commitment theory	Enterprise systems	User commitment	Infusion	Positively significant relationship between user commitment and IS infusion.
Fadel, 2012	Coping theory	Electronic Medical System (EMS)	Problem-focused adaptation, Approach oriented emotion-focused adaptation, Avoidance oriented emotion-focused adaptation	Infusion	Positively significant relationship between problem-focused adaptation and IS infusion. Insignificant relationship between approach oriented emotion-focused adaptation and IS infusion. Negatively significant relationship between avoidance oriented emotion-focused adaptation and IS infusion.
Ke, Tan, Sia & Wei, 2012	Motivation theory	ES (Enterprise system)	Intrinsic hedonic motivation, Intrinsic normative motivation	Exploratory use	Positively significant relationship between intrinsic hedonic motivation and IS infusion. Insignificant relationship between intrinsic normative motivation and exploratory use of IS.
Sun, 2012	-	Microsoft Office users, Microsoft Access database	Novel situations, Discrepancies	Adaptive system use	Positively significant relationships between novel situation discrepancies and adaptive system use.
Hester, 2011	DOI, TAM	Wiki technology-based knowledge management systems (KMS)	Perceived reciprocity expectation, Perceived voluntariness, Perceived visibility, Perceived image, Perceived ease of use, Trialability, Perceived relative advantage, Perceived result demonstrability, Usage	Infusion	Positively significant relationships between perceived voluntariness, ease of use, trialability, usage and IS infusion. Insignificant relationship between perceived reciprocity expectation and IS infusion. Negatively significant relationships between perceived visibility, image, relative advantage, result demonstrability and IS infusion.

McKnight, Carter, Thatcher & Clay, 2011	-	MS Access or MS Excel	Trusting beliefs in specific technology	Deep structure use	Positively significant relationship between trusting beliefs in specific technology and IS deep structure use.
Hsieh, Rai & Xu, 2011	Sense-making theory	Operational customer relationship management (OCRM)	Technology quality, Service quality	Extended use	Positively significant relationships between technology quality, service quality and IS extended use.
Thatcher, McKnight, Baker, Arsal & Roberts, 2011	TAM	Knowledge management systems (KMS).	Perceived usefulness, Perceived ease of use, Trust in IT, Trust in IT support	Intention to explore (Emergent use)	Positively significant relationships between perceived usefulness, ease of use and IS infusion. Insignificant relationships between trust in IT, trust in IT support and IS emergent use.
Saeed & Abdinnour-Helm, 2008	TAM	A web-based Student Information System	System integration, Perceived usefulness, Information quality	Extended use, Exploratory use	Positively significant relationships between perceived usefulness, information quality, system integration and extended use, exploratory use.
Wang, Hsieh, Butler, & Hsu, 2008	ISC	ERP	Perceived usefulness, Management support, Computer self-efficacy, Personal innovativeness with IT, Satisfaction	Innovate with IT	Positively significant relationships between perceived usefulness, management support, personal innovativeness with IT, satisfaction and IS infusion. Insignificant relationship between computer self-efficacy and innovate with IT.
Hsieh & Wang, 2007	ISC, TAM and Synthesised model	ERP	Perceived ease of use, Perceived usefulness, Satisfaction	Extended use	Marginally positively significant relationships between perceived ease of use, usefulness and IS infusion. Insignificant relationship between satisfaction and IS extended use.

Kishore & McLean, 2007	Structuration and Sense-making theories	Software process innovation (SPI)	Organisational alignment, Compatibility, Voluntariness, Relative advantage	Infusion	Positively significant relationship between organisational alignment and IS infusion. Negatively significant relationship between voluntariness and IS infusion. Insignificant relationships between compatibility, relative advantage and IS infusion.
Sundaram, Schwarz, Jones & Chin, 2007	TPB/TRA and performance concept	Sales force Automation (SFA)/CRM systems	Reutilisation	Infusion	Positively significant relationship between reutilisation and IS infusion.
Wang & Hsieh (2006)	Symbolic adoption theory, ISC	ERP system	Perceived usefulness, Satisfaction, Symbolic adoption	Extended use, Emergent use	Positively significant relationships between perceived usefulness, symbolic adoption and IS extended use, emergent use. Marginally positively significant relationship between satisfaction and infusion of IS emergent use.
Ahuja & Thatcher, 2005	Theory of trying	-	Autonomy, Qualitative overload for men, Qualitative overload for women, Quantitative overload for men, Quantitative overload for women	Trying to innovate	Positively significant relationships between autonomy, qualitative overload for men and trying to innovate. Negatively significant relationship between quantitative overload for women and trying to innovate. Insignificant relationships between qualitative overload for women, quantitative overload for men and trying to innovate.
Pao-Long & Lung, 2002	Organisational change model and Job	Advanced manufacturing technology (AMT)	Centralisation of structures, Complexity of structure, Formalisation of structure, Skill variety, task identity,	Infusion	Positively significant relationships between skill variety, task identity, feedback of task, individual's attitude,

	characteristic model (JCM)		Feedback of task, Task significance, Autonomy, Individual's attitude, Sufficiency of education and training		sufficiency of education and training and IS infusion. Negatively significant relationship between centralisation of structures and IS infusion. Insignificant relationships between complexity of structure, formalisation of structure, task significance, autonomy and IS infusion.
Jones, Sundaram &Chin, 2002	TRA and TAM	SFA	Personal innovativeness, Perceived usefulness, Attitude toward new system, Compatibility, Facilitating conditions, Subjective norms	Infusion	Insignificant relationships between perceived usefulness, compatibility, subjective norms and IS infusion. Positively significant relationships between personal innovativeness, attitude, facilitating condition and IS infusion.
Nambisan, Agarwal &Tanniru, 1999	Delphi study	-	Knowledge acquisition	Intention to explore (Emergent use)	Positively significant relationship between knowledge acquisition and IS emergent use.

Notes: TOE: Technology Organisation and Environment framework, ECT: Expectation-Confirmation Theory, UTAUT: Unified Theory of Acceptance and Use of Technology, TAM: Technology Acceptance Model, ISC: IS Continuance model, DOI: Diffusion of Innovation Theory, TRA: Theory of Reasoned Action, TPB; Theory of Planned Behaviour and "-" means that the authors did not explicitly describe the underlying theory.

In addition, Hassandoust et al. (2016) identified 85 influencing factors and organised the factors by the similarities of the underlying concepts and grouped them into 5 main categories including organisational, environmental, technological, task-job and individual. Within the individual factors, there are 5 subcategories namely perceptional, behavioural, user characteristics, affective-evaluation and cognitive beliefs, as shown in Figure 2.2. The influencing factors of the previous studies may fall under these themes. For example, IS complexity fall under the technological category, top management support fall under organisation category, Competitiveness and partner support factors fall under environmental category. In recent years, researchers have focus on end-users related factors such as empowerment, commitment, intrinsic motivations and other psychological factors, which shows the importance of psychological factors in explaining IS infusion.

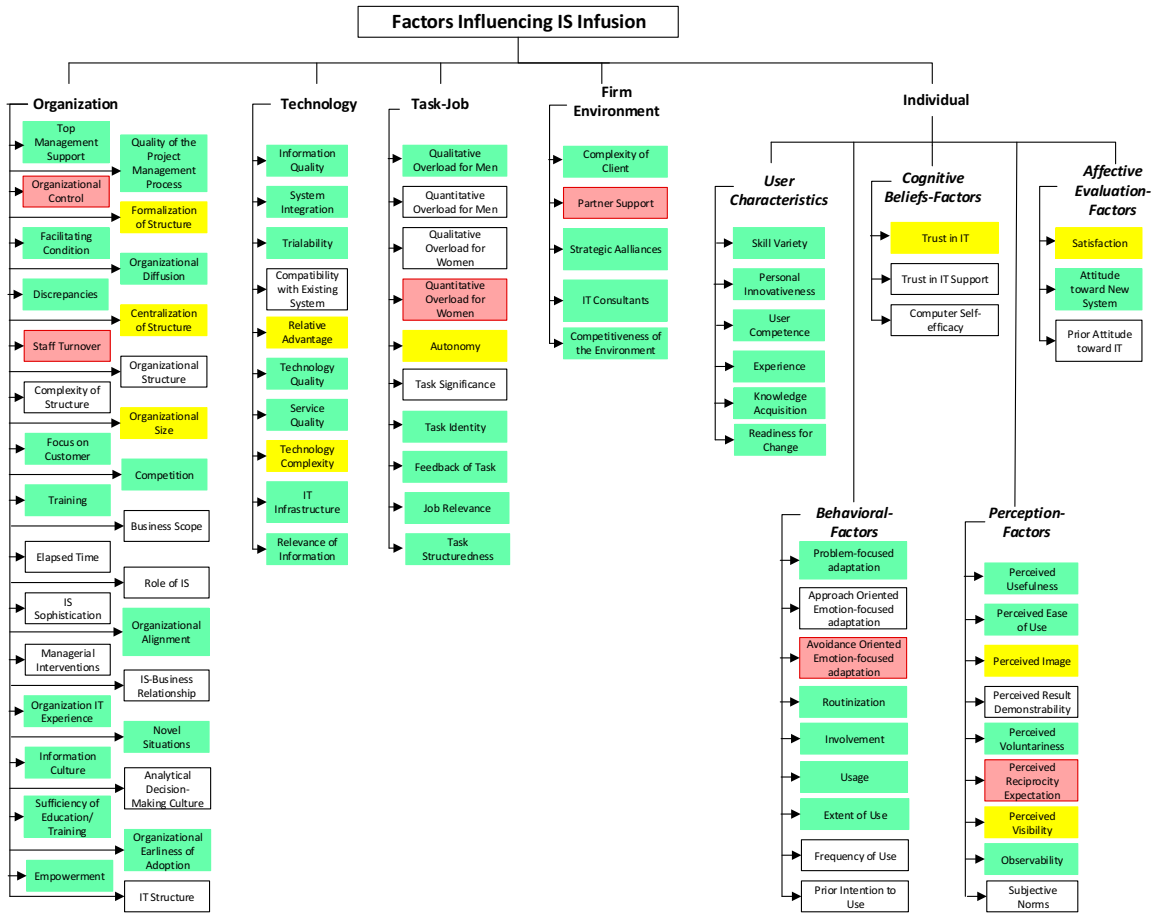

Figure 2.2. Classification of independent variables from previous IS infusion studies (Hassandoust et al., 2016)

2.3 Identity and Behaviours

This study examines the impact of individual's identities on the IS infusion behaviours within an organisation. First, it is important to articulate the underlying arguments that explain the relationship between individuals' identity and behaviour. In the past few years, concepts of self and identity have received scholarly attention in social psychology due to their importance in behavioural sciences (Burke & Stets, 2009; Carter & Grover, 2015; Leary & Tangney, 2012; Owen, 2003). Identity governs behaviour through a set of meanings associated with the self that serves as a standard of reference (Burke, 2004; Burke & Cast, 1997; Tsushima & Burke, 1999). Research in sociology originally embarked upon explaining the complex networks of roles and relationships among individuals that reflect their views of themselves and eventually, their behaviours toward others (Burke & Reitzes, 1981; McCall & Simmons, 1966, 1978; Stryker, 1980). Psychology research has complemented studies from sociology by looking at how individuals' traits and personalities influence their views of themselves and their behaviours (e.g., Hogg, 2006; Tajfel & Turner, 2004). Studies have found that identity is a primary motivator of various types of behaviours (Carter, 2012; Stets & Biga, 2003; Theodorakis, Bagiatis, & Goudas, 1995).

Research argues that in the case of long-term behaviours, identity, rather than attitude, is the primary motivator of an individual's behaviours. Identities relate to the concepts of self that have implications for individuals' behaviour through the internalisation of identity (Riley & Burke, 1995; Stets & Biga, 2003). The relationships between identities and long-term behaviours have received empirical support across a number of studies. These include college students' participation in campus social activities (Burke & Reitzes, 1981), continuing in college (Biddle et al., 1987), blood donation behaviour (Charng et al., 1988), voting (Granberg & Holmberg, 1990), exercise behaviour (Theodorakis, 1994), food choice (Armitage & Conner, 1999; Cook et al., 2002; Dennison & Shepherd, 1995; Sparks & Guthrie, 1998; Sparks, Shepherd, Wieringa, & Zimmermanns, 1995), household recycling (Terry et al., 1999), green consumer (Sparks, 2000) and environmental behaviour (Stets & Biga, 2003), among others. Furthermore, previous studies in the IS domain supported the relationships between identities and long-term behaviours such as technology usage (Carter

& Grover, 2015; Y. Lee et al., 2006), IS assimilation (Mishra et al., 2012), and mobile phones' deep usage (Carter, 2012; Carter & Grover, 2015).

Thus far, research has not paid attention to individuals' identities in relation to IS and professional roles that may shape IS infusion behaviours within an organisation. Several researchers have supported the inclusion of identity within the behavioural models that can explain IS use behaviour, but it has not been well studied in the literature (e.g., Armitage & Conner, 1999; Carter & Grover, 2015; Y. Lee et al., 2006; Ortiz De Guinea & Markus, 2009). Based on Carter and colleagues' findings, it can be concluded that individuals' identities in relation to IS can shape their continuing IS use behaviours (Carter, 2012, 2013; Carter & Grover, 2015; Carter, Grover, & Thatcher, 2012). As a consequence of employees' close association with a professional community in organisations, they have developed powerful identities that are suggested to be central for understanding employees' behaviours within an organisation (Mishra et al., 2012; Weick, 1995). Therefore, this study is motivated to investigate the impact of individuals' identities in relation to IS and professional roles on their IS infusion behaviours in the workplace.

2.3.1 Identity: Definition and Bases

Identity outlines "a way of organising information about the self" that specifies the characteristics which define a person (Clayton, 2003, p. 45). In other words, identity is a set of meanings that individuals apply to the self in the form of answers to the question, "Who am I?", that is how they interact as part of a group, the roles they perform, and in the standards and values they regard as separating them from other people (Carter, 2012; Freese & Burke, 1994). These answers are explained in terms of the positions in the structures of people's social relationships and the roles that attach to these positions (Stryker & Serpe, 1982). Individuals may have as many identities as the number of discrete groups of structured relationships in which they are engaged. For example, an individual may hold the identities of mother, doctor, friend and hard worker all of which make up herself (Stryker & Serpe, 1982).

2.3.1.1 Bases of Identities: Role, Social and Person Identities

In general, identities constitute role identity, social identity and person identity. Identities from each of these bases have identity standards that present as the reference and guide behaviour in specific situations (Burke & Stets, 2009).

Role Identity

Roles provide organisation, structure and meaning to selves and to situations. For better understanding of role identities, social positions and roles need to be reviewed. A social position refers to a category in society or an organisation that an individual occupies, such as individuals' occupation (e.g., academic lecturer, marketing manager). A role refers to the set of expectations tied to a social position that instructs an individual's attitudes and behaviours (Burke & Stets, 2009). For example, if a role identity of "student" entails academic responsibilities, the behaviour of a student should match this identity by attending classes, doing assignments, taking lecture notes and passing exams (Burke & Reitzes, 1981). Role identity concentrates on roles and interpersonal relationships. Role and identity are strongly related, which is highlighted in the term "role-identity", used by McCall and Simmons (1978) in their role identity theory. Role identity indicates the individual's internal expectancies and self-satisfactions about what it means to be competent in a role (Burke & Stets, 2009; McCall & Simmons, 1978; Stryker & Burke, 2000). Individuals show a strong sense of self-efficacy through verifying role identities related to their behaviour that are consistent with the meanings and expectations associated with those role identities (Burke & Stets, 2009).

Social Identity

Social or collective identity indicates mutual self-meanings that are common with others in a social category or group (Tajfel, 1981; Tajfel & Turner, 2004). Membership into particular social groups implies an in-group and an out-group and correspondingly a sense of us versus them. From this perspective, individuals raise worth-based self-esteem through acting like in-group members, and seeing things from the in-group's perspective (Burke & Stets, 2009; Stets & Burke, 2000). There is uniformity in thought and behaviour in being a group member, which is enough to activate and encourage similarity in perceptions and behaviours among members (Burke & Stets, 2009). For example, when people categorise themselves as the member of the environmental activist group, Greenpeace, rather than seeing themselves as

having specific personal characteristics such as being smart, kind, hard worker, they behave and see themselves in terms of being environmentally aware and protective of the earth's resources (Burke & Stets, 2009).

Person Identity

A person's identity as an identity that is independent of others has received less attention compared to social and role identities. Person identity or personal identity focuses on the set of self-interpretations that defines a person/self as a unique, identifiable and distinct entity (Brewer & Gardner, 1996; Burke & Stets, 2009). Person identity refers to the personal attributes, characteristics, values and norms that individuals claim as part of their self-concepts, which are not shared with others and shape their behaviours (Burke & Stets, 2009; Meijers, 1998). In other words, what guides individuals' behaviour is their own self-interest, goals and values rather than the expectation or goals of the group or role. Person identities are set up in the same way as role and social identities. However, where role identities describe individuals in terms of what they perform, social identities describe individuals with regards to the social categories they belong to and person identities include a set of meanings that define individuals as distinct entities (Burke & Stets, 2009; McCall & Simmons, 1966, 1978). In current research, both sociological and psychological researchers have begun to identify the person as a basis for identity, because person identities are constantly activated and are very high in identity salience (Burke, 2004). Person identities operate like master identities (Burke, 2004); thus, if the person, role and social identities were arranged in an identity hierarchy, person identities would be ranked higher than role and social identities (Burke & Stets, 2009). Table 2.4 presents the perspectives, definitions, features and examples of person, role and social identities.

Table 2.4. Perspectives, Definitions, Features and Examples of Role, Social and Person Identities (Burke & Stets, 2009; Carter, 2012)

Features	Role Identity	Social Identity	Person Identity
Perspectives	Sociology	Psychology	Psychology and Sociology
Bases	Expectations tied to social positions	Social group	Individual self-concept
Identity Orientation	Role	Group	Person
Definition	Meanings tied to a role	Meanings tied to a social group	Meanings that define a person as a unique individual
Behaviour	Complementary to others	Similar to others	Independent of others
Self-reference	Me as role	We	Me
Social Motivation	Self-interest, as well as other's interest	Collective welfare	Self-interest
Illustrative example	Student identity: the set of expectations tied to being a student that guides a person's attitudes and behaviour as a student (e.g., the extent to which they study, strive to pass tests, complete their courses, etc.) (Burke & Stets, 2009).	Organisation identity: "perceived oneness with an organization and the experience of the organization's successes and failures as one's own" (Mael & Ashforth, 1992, p. 103).	Environment identity: defined as "the set of meanings attached to the self as the person interacts with the natural environment" (Stets & Biga, 2003, p. 409). People's perception that environment is important to us as an important part of who we are (Clayton, 2003).

2.3.2 Symbolic Interactionism: Roots of Identity Theory

Identity theories grow out of symbolic interactionism. The term symbolic interaction is articulated by Herbert Blumer from his interpretation of Mead (1934) argument that society shapes self and self shapes behaviour, to explain a perspective that concentrates on the unique

character of human interactions that focus on the shared use of symbols (Burke & Stets, 2009). Society is viewed as a network of interpersonal communication and human nature is the outcome of that communication (Stryker & Serpe, 1982). In a broad sense, symbolic interactionism looks at both self and society as created, maintained and altered through the process of symbolic communication. Symbols can be used to denote objects and events in the situations. Shared meaningful symbols are the keys to the development of self or identity behaviours (Biddle et al., 1987; Burke, 1991; Charng et al., 1988; Granberg & Holmberg, 1990; Sparks & Shepherd, 1992; Stets & Biga, 2003).

Symbolic interaction has two versions: *traditional symbolic interaction* and *structural symbolic interaction*. Both of these versions have the same intellectual heritage, drawing on the work of Mead (1934), Blumer (1986) coined the term symbolic interaction and it was his ideas that led to the development of traditional symbolic interaction. One significant commonality between these two versions is about gaining the best understanding of social behaviour by focusing on individuals' definitions and interpretations of themselves, others, and their situations. We can understand why people do what they do by identifying the meanings the actors attribute to their surroundings by getting "inside their head" and seeing the world from their perspective (Burke & Stets, 2009).

Traditional symbolic interaction has a tendency to neglect the relatively "fixed" nature of social structure and its analysis of social behaviours that predictions about the self and behaviours cannot be made. Social structure in the traditional version of symbolic interactionism is considered in a state of flux, or in the process of being created and recreated through definitions, interpretations and actions of people in situations (Burke & Stets, 2009).

In contrast, the structural version of symbolic interactionism focuses on the role of social structure in social life. Society is not continuously in a state of flux; rather, it is viewed as stable and durable in the patterned behaviour within and between people. We are born into a social world that is organised and ongoing and we learn about this organisation procedure through socialisation. People learn that within society, there are various groups, communities, networks and institutions. Depending on people's taste, they navigate in and around these various groupings, which leads to who they become (Burke & Stets, 2009).

Stryker and Vryan (2006, p. 22) state that "social structures in general define boundaries, making it likely that those located within them will or will not have relations with particular kinds of others and interact with those others over particular kinds of issues with particular kinds of resources." Structures will also influence the likelihood that individuals will or will not develop specific kinds of selves, learn specific kinds of motivations. According to structural symbolic interactionism, priori theories can be used, predictions about the self and behaviours can be tested, theories can emerge from this testing, hypotheses can be generated and tested, and in addition, further development of theories are possible (Burke & Stets, 2009).

2.3.3 Theoretical Lenses: Identity Theories

The majority of previous studies that examined individuals' identities and related behaviours used Stryker's identity theory (1968, 1980), McCall and Simmons' role identity theory (1966, 1978) and Burke's identity theory (1991, 2009). These three identity theories discuss the three bases of identity (person, role and social) with different focuses. For instance, Stryker emphasises the hierarchal arrangement of identities that are tied to the social structure, McCall and Simmons mainly focus on individuals' role identity and Burke concentrates on person identity and the internal dynamics that operate for each identity. They all acknowledged the other two bases of identities as well. These theories are explained in the following sections.

2.3.3.1 Stryker's Identity Theory

Stryker's emphasis in identity theory is based on viewing society as patterned and organised. Stryker focuses on the hierarchal arrangement of identities and how identities are tied to the social structure. He also acknowledges the other two bases of identity (person and role). Merging these views with Mead's (1934) ideas of the self and action presents the foundation of the structural version of identity theory (Burke & Stets, 2009). Stryker's identity theory (1968, 1980) defines the social base of identity as "reflexively applied cognitions in the form of answers to the questions: Who am I?" (Stryker & Serpe, 1982, p. 206). Identity responds to the positions in an organised structure of a network of relationships, in which there are sets of engaged behavioural anticipations or roles. Stryker is interested in how individuals select

one role behaviour over another in a particular situation. The person identity encompasses the view of self as a unique and distinct individual, separate from others (Stryker, 1980). It is the "idiosyncratic personality attributes that are not shared with other people" (Hogg, 2006, p. 115). Thus a person may hold the identities of doctor, mother, churchgoer, friend, hard worker, and so on, all of which collectively make up herself. This general concept of identity subsequently involves both the individual's social roles as well as the socio-demographic characteristics that the individual claims as part of their self-concept (Hogg, 2006). These roles and characteristics shape individuals' behaviours in different circumstances.

Building on Mead's (1934) argument, Stryker's identity theory implies that individuals make choices and these choices are impressed by social structures and interactions. Individuals usually claim more than one identity and these identities (i.e., internalised expectations) can be organised into a hierarchy within the self that are structured in what Stryker (1980, 1982, 2000) calls "identity salience". Salience refers to an individual's keenness to enact an identity "across a variety of situations, or alternatively across persons in a given situation" (Stryker & Burke, 2000, p. 286).

Stryker (1968, 1982) instigated identity theory to theorise the structure of identity commitment, salience and behavioural choice. Identity commitment is operationalised as a number of social ties (quantitative) and/or the strength of social ties (affective dimensions of the social ties) upon which an identity is based (Stryker & Serpe, 1982). Identities that are established on more complex relationships or intense, emotionally positive relationships will be ranked higher in the identity commitment hierarchy. Identity commitment hierarchies demonstrate that social structure and identity commitment considerably affect identity salience (Stryker & Serpe, 1982). In other words, identity commitment through social ties shapes identity salience or an individual's willingness to practice that identity (Stryker, 1980; Stryker & Burke, 2000; Stryker & Serpe, 1994). To support the relationship between identity commitment and identity salience, this study borrowed an example from Stryker and Serpe (1982, p. 207): that "a man is committed to the role of husband in the degree that the number of persons and the importance to him of those persons requires his being in the position of husband and playing that role". Thus, the man's commitment to the husband identity impacts his identity salience, which means that the husband identity would sit higher in his salience

hierarchy. In addition, identity salience is predictive of an individual's long-term behaviours (Stryker, 1980; Stryker & Burke, 2000). For example, P. L. Callero (1985) found that blood donor identity salience has a positive influence on blood donors' behaviour. Similarly, Stryker and Serpe (1982) found that the salience of religious identity has a positive effect on an individual's religious continuance behaviour. In the IS context, Carter (2012) found that the salience of IT identity has a positive effect on an individual's IS deep usage behaviour. The relationships between identity commitment, identity salience and behavioural choice are given in Figure 2.2.

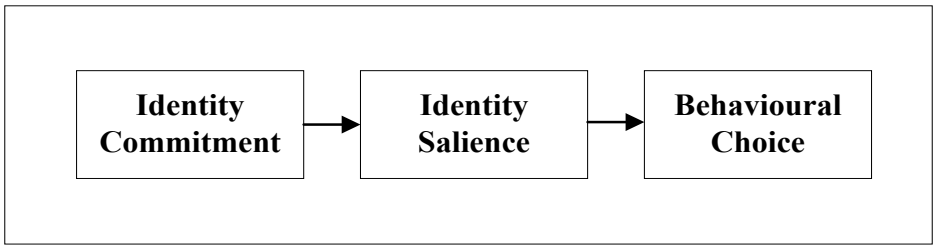

Figure 2.2. Stryker's identity theory

2.3.3.2 McCall and Simmons' Role Identity Theory

McCall and Simmons identity theory mainly focuses on the role base of identity. A role identity is an individual's imaginative view of her/himself as she/he tends to think of her/himself being and acting as an occupant of that position. The imagination of self indirectly depends on the performance of that role and an integral part of the imagination is the reactions of other people to an individual's hypothetical performance (McCall & Simmons, 1978). Individuals accomplish the social positions or the role part of role identity but do so with improvisations and creativities that make role performances expressive of personal character and idiosyncrasies, which reflects the identity part of the role identity. Individuals are capable of improvisation and beautifying their identity because most roles or social positions only loosely determine appropriate behaviour, allowing considerable breadth for creative and individualised performance (Thoits & Virshup, 1997). Role identity concentrates on the individual as complementary to others (Burke & Stets, 2009). From this perspective, verification is based on what an individual does (Stets & Burke, 2000). An individual's role identity is confirmed when that person accomplishes a role in ways that affirm her/his internalised expectations about what it means to be competent and empowered

in that role (Burke, 2004). For example, the verification of a manager identity rests on the performance of this manager's subordinates (Sluss & Ashforth, 2007). Successfully verifying a role identity helps increase efficacy-based feelings concerning an individual's "beliefs about her/his capabilities to produce designated levels of performance" (Bandura, 1986; Compeau, Higgins, & Huff, 1999, p. 146).

People assemble multiple role identities such as father, hard worker, IS infuser and manager in a "prominence" hierarchy that displays their "ideal self". Role identity prominence refers to "what is desirable or preferable to a person from his or her point of view" (Stryker & Serpe, 1994, p. 19). The relative prominence of role identity is influenced by several factors including *self-support, social support, commitment, investment* and *external and internal gratifications* (McCall & Simmons, 1978). When there is a choice among alternative lines of action in specific circumstances, individuals automatically put the more prominent or valued role identities into practice. Hence, according to role identity theory, the more positive an individual's affective response to an identity, the greater its importance, and the more likely an individual is to act in accordance with the identity when situational factors make it advantageous to do so. McCall and Simmons' (1978) conceptualisation of role identity and behaviour is presented in Figure 2.3.

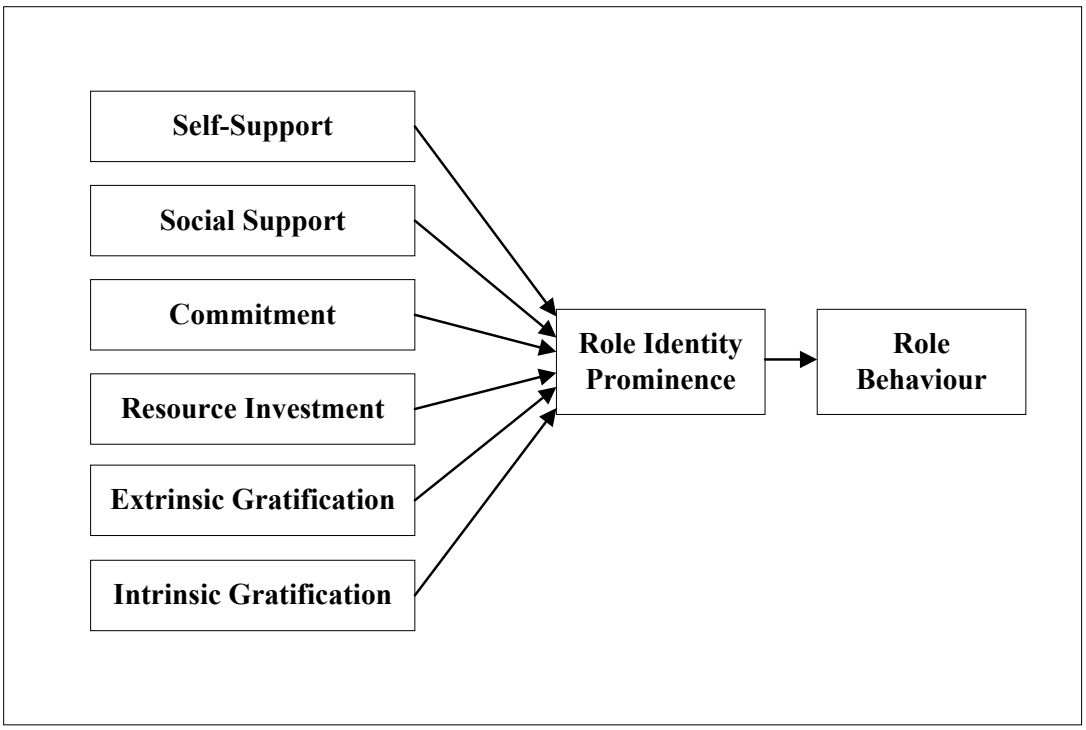

Figure 2.3. McCall and Simmons' role identity theory

It is worth noting the similarity and difference between the concepts of identity salient hierarchy and prominence hierarchy. Stryker's salience hierarchy exerts a similar influence on behaviour to McCall and Simmons' prominence hierarchy (Carter, 2012). Identity salience focuses more on identities that are tied to situational interpersonal relationships (Burke & Reitzes, 1981). In particular, identity prominence emphasises what is preferable to an individual from her/his point of view (Stryker & Serpe, 1994). As these two concepts carry similar influence on an individual's behaviour, this study will apply both concepts to examine the influence of identity-related factors on IS infusion behaviours in the conceptual models. Chapter Three provides a further discussion by demonstrating how these concepts shape an individual's role in relation to IS use, which in turn influences her/his IS use behaviour.

2.3.3.2.1 Role Identity Prominence Determinants

An individual's main concern as the creator of self-ideals is to maintain her/his idealised perceptions to legitimise her/his role identities. Viewing self as a social product, role identity theory argues that individuals' successful role identity performances are critical (McCall & Simmons, 1978). When the outcome of individuals' identity claims are not successful, they

are right back to where they started, with no identity but in need of one. In other words, individuals need to acquire, legitimise and maintain role identities both for themselves as the reflective audience as well as for the external audience of interactive participants.

Six factors have been proposed to shape role prominence hierarchy: self-support, social support, commitment, resource investment, external gratifications and internal gratifications (McCall & Simmons, 1978). A role identity's importance in relation to the ideal self is the outcome of the subjective weighting of each of these six determining factors. The weighting of these factors varies from individual to individual due to the subjective importance of each factor (Reid, 1999). When a role sits at the highest level in the prominence hierarchy compared to other roles, that specific role is accepted as the salient role in the hierarchy. Thus, there is no need to call it role identity prominence, as it is the only role that matters in the whole hierarchy. Hence, in the context of this study, employees' role identity in relation to IS use is assumed to sit at the highest level of employees' role identity hierarchy, which is the only role that matters among all other roles that employees hold. So for the rest of this thesis, the term role identity will be used instead of role identity prominence.

Self-Support: Self-support is defined as "the degree to which the person [herself] himself supports [her] his own imaginative view of his [her] qualities and performances as an occupant of the given position" (McCall & Simmons, 1978, p. 74). This factor takes into account individuals' self-perceptions about their role identities. Therefore, the role identities through which an individual defines her/himself as accomplishing well will be positioned higher in the prominence hierarchy as an outcome of the self-support factor.

Social Support: Social support is defined as the "degree to which one's view of self has been supported by relevant others" (McCall & Simmons, 1978, p. 75). The judgments and expectations of relevant others (e.g., colleagues, bosses) do not carry the same weight on an individual's role identity. From this perspective, a role identity weight can be estimated by considering the degrees of support from all these relevant others (McCall & Simmons, 1978).

Commitment: Commitment is defined as the "degree to which an individual has committed [herself] himself to the particular contents of [the] role identity" (McCall & Simmons, 1978,

p. 75). The commitment factor as a subjective dimension of the prominence hierarchy is about the individual's devotions to a role identity, in order to meet her/his self-expectations created in a subjective imaginative process.

Resource Investment: An individual's investment of resources is another influencing factor that shapes role identity prominence hierarchy based on the individual's attempts to create a specific role identity. McCall and Simmons (1978) argue that "if one stakes [her] his entire fortune or life's work on fulfilling a particular view of [herself] himself that identity will be more prominent in the hierarchy, for one does not live by imagination alone" (p. 75). These resources include the individual's efforts in performing a given role identity such as time, energy, and so on.

External Gratifications: External gratifications include the material benefits obtained from performing a particular role. They refer to the individual's material benefits by gaining extrinsic rewards such as a bonus, promotion, goods, and favour from performing a specific role identity (McCall & Simmons, 1978).

Internal Gratifications: Internal gratifications include self-pleasures gained by the enactment of a specific role identity. Internal gratifications refer to "the sheer sense of efficacy in having done something with reasonable competence" (McCall & Simmons, 1978, p. 76). Internal gratifications may consist of subjective occurrences such as feelings of accomplishment, pride, pleasure and satisfaction upon the act of a given role identity (Reid, 1999).

In the context of this study, if employees' IS infusion role identity sits at a higher priority than other work-related role identities, the employee will perform this role more competently. IS infusion role identity refers to the extent to which employees personally view that using the most features of a system or coordinating multiple job tasks or exploring the new features in innovative ways is an important part of their sense of self as an employee. According to McCall and Simmons's role identity theory, employees' IS infusion role identity is likely to form through their self-support, social support, commitment, resource investment, external

gratifications and internal gratifications. Thus, IS infusion role identity is the outcome of the subjective weighting of each of these six determining factors.

Previous studies applied role identity theory to argue that employee's role identity is a predictor of employees' volunteerism and organisational citizenship behaviour (OCB) (Dávila & Finkelstein, 2010; Finkelstein & Penner, 2004). Since IS infusion behaviour can be considered as a form of OCB, individuals' role identities would likely be a predictor of IS infusion behaviour within an organisation. In addition, previous studies reported the significant relationships between individuals' role identities and their IS continuance use (Y. Lee et al., 2006; Mishra et al., 2012). A summary of the six determining factors of role identity is presented in Table 2.5.

Table 2.5. Determinants of Role Identity Prominence

Determinants	**Definition/Explanation**
Self-support	The "degree to which the person himself supports his [her] own imaginative view of his qualities and performances as an occupant of the given position" (McCall & Simmons, 1978, p. 74).
Social support	The "degree to which one's view of self has been supported by relevant others" (McCall & Simmons, 1978, p. 75).
Commitment	The "degree to which an individual has committed himself [herself] to the particular contents of [the] role-identity" (McCall & Simmons, 1978, p. 75).
Resource investment	If an individual stakes her/his entire work time and energy on fulfilling a particular view of her/himself, that specific identity will be more prominent in the hierarchy (McCall & Simmons, 1978).
External gratifications	Those role identities that materially benefit the individual by gaining her/him extrinsic rewards like money, favour, prestige (McCall & Simmons, 1978).
Internal gratifications	Self-pleasures gained by the enactment of a specific role identity (McCall & Simmons, 1978).

2.3.3.3 Burke's Identity Theory

Whilst Stryker emphasises the hierarchal arrangement of identities and how identities are tied to the social structure, Burke's work concentrates on person identity and internal dynamics that operate for each person identity (Burke, 2004). An individual's identity and behaviour are interconnected through a common system of meaning. According to Burke, meaning is critical for understanding an identity (Burke, 1991; Burke & Reitzes, 1981; Burke & Stets, 2009). To understand an individual's behaviour, the evoked meaning of that behaviour should correspond to the meaning that is held in the individual's identity (Burke & Stets, 2009).

A set of meanings are tied to each identity that individuals ascribe to themselves when they are claiming or playing out an identity. The associated meanings of the identity will be known to an individual through interactions with others in the situation and how others respond to her/him. For example, if an individual holds a student identity which entails the meaning of being academic, it is expected from that person to attend class, pass exams and finish courses. On the other hand if an individual holds a student identity associated with the meaning of being social rather than academic, it is expected from that person to spend her/his time socialising, attend parties and events (Burke & Stets, 2009). Fundamentally, the meaning of a person's identity has implications for how that person behaves, and the person's behaviour, in turn, confirms the meanings of the specific identity. In the context of IS use, an employee with IS infusion role identity that entails the meaning of being an IS deep user, is expected to infuse the system and use the system to its fullest potential to do their daily job tasks in organisations. Thus, when we identify the meanings of an identity for an individual, we can anticipate the meanings of the individual's behaviour as well (Burke & Stets, 2009).

"Since an identity is a set of meanings attached to the self, this set of meanings serves as a standard or reference for a person" (Burke & Stets, 2009, p. 50). If an identity is activated in a situation, an identity process loop that has four components is established: (1) the identity standard which refers to the self-meanings of an identity; and (2) perceptual input of meanings from the situation. The perceptual input refers to how a person sees her/himself and the meaningful feedback that the person receives from others. (3) The comparator, which refers to the process of comparison between the perceptual input and the identity standard; and (4) meaningful behaviour that is a function of the comparison of the perceptions of the

situation with actual self-meanings held in the identity standard (Burke & Stets, 2009). In the identity process, the process traces the flow of meanings from the environment where meanings are perceived by the comparator. The comparator compares the identity with the identity standards. From this comparison, the behaviour in response to the meanings occurs as the cycle continues. Thus, in the context of this study, the following process is likely to occur if an employee claims to be an IS infuser in the role she/he performs. First the person would see her/his perceptions about her/his current situation, then she/he would set the goal of being an IS infuser which is an identity standard. After a comparison between her/his perceptions about her/his situation and this identity standard, she/he may find out that there is a discrepancy between her/his perceptions and goals. Then the output or the behaviour generated from this process would lead this person to use more features of the system, or coordinate multiple job tasks or explore the new features of the system. These processes are shown in Figure 2.4.

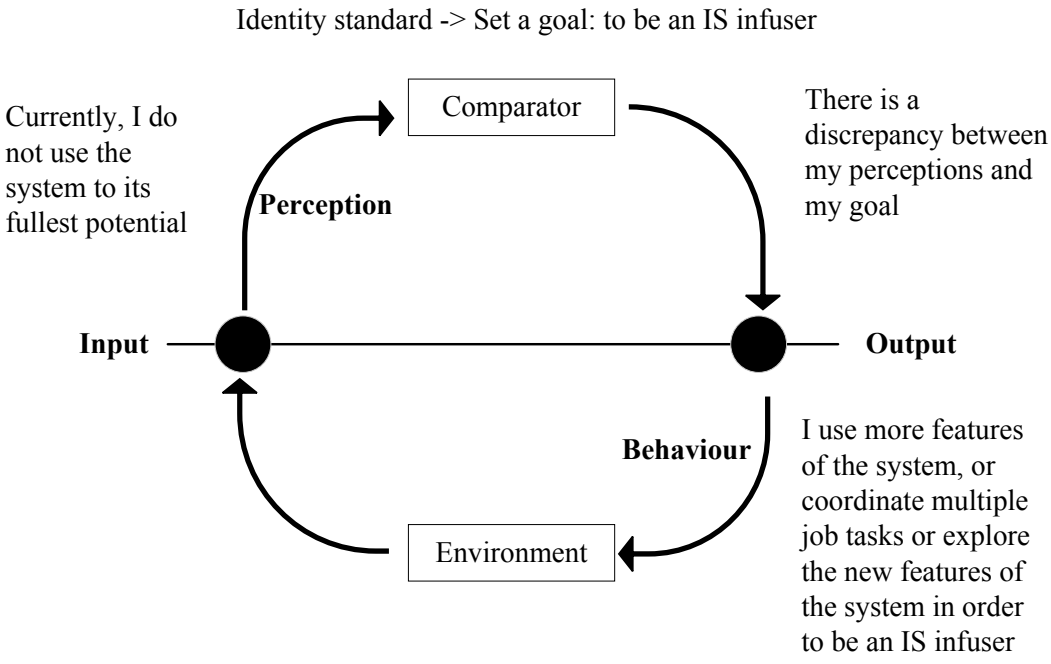

Figure 2.4. Identity process based on Burke's theory

Figure 2.5 presents a summary of identity theories and highlights key concepts that are applicable to this study.

Roots of Identity Theory
Structural Symbolic Interaction
Focuses on individual's meaning
Social structure is stable, patterned and organised
Ability to use a priori theory and develop theory

Current Emphases in Identity Theory		
Interactional Emphasis	Structural Emphasis	Perceptual Emphasis
McCall and Simmons	Stryker	Burke
The idiosyncratic dimension of identities	The conventional dimension of identities	The meaning dimension of identities
• Prominence • Support (self, social) • Rewards (internal, external) • Commitment • Perceived opportunity structure	• Commitment • Quantitative (number of social ties) • Qualitative (strength of social ties)	• Identity standard • Perceptual input • Comparator • Behaviour

Figure 2.5. Key concepts of identity theory. Adapted from Burke and Stets (2009)

2.3.4 Implication of Identity Theories for this Study

According to Stets and Serpe (2016), identity theory has three distinct emphases: the structural emphasis (Stryker, 1980), the interactional emphasis (McCall & Simmons, 1978), and the perceptual control emphasis (Burke, 2004). Each of these theoretical perspectives focuses on one aspect of identity (either person, role or social identity) but they acknowledge the other two aspects of identities as well.

For example, Stryker and colleagues' identity theory focuses on how social structures influence the meanings (i.e., person identities – IT identity) and expectations (i.e., role identities – IS infusion role identity) individuals assign to themselves and how these identities subsequently affect their behaviour. By drawing on Stryker's theory, this study recognises social structures as an underlying factor that shapes IT identity and IS infusion role identity, which subsequently influence individuals' IS infusion behaviours.

McCall and Simmons' role identity theory puts an emphasis on the interactional aspect of role identity. Role identity theory assumes that identity enactment rests on an individual's interactions with others, whose expectations may differ from his/her own expectations. In this study, role identity or infusion role identity is theorised to shape IS infusion behaviours through six determinants of IS infusion role identity construct.

Burke's theory emphasises how individuals' behaviour is influenced by the process of perceptional self-verification (i.e., seeking self-confirmatory feedback/loop). This study uses this self-confirmatory process to develop the relationships between IT identity and IS infusion behaviour and IS infusion identity and IS infusion behaviour. In particular, the self-confirmatory process occurs if an employee claims to be an IS infuser in the role she performs. First, the person would evaluate her perceptions about her current situation, then she would set the goal of being an IS infuser which is an identity standard. After a comparison between her perceptions about her situation and this identity standard, she finds out that there is a discrepancy between her perceptions and goals. Then, the output or the behaviour generated from this comparison process would lead this person to use more features of the system, or coordinate multiple job tasks or explore the new features of the system. This perception-goal-behaviour identity process also suggests that there is a feedback loop from behaviour to identity as well. In other words, it is likely that identity and behaviour have a reciprocal relationship.

2.3.5 Workplace Role Identity

This study examines employees' role identity in relation to their interaction with a specific technology in workplaces. In this study, employees' role identity in relation with IS infusion is considered as a predictor of employees' IS infusion behaviour. Identity theories (McCall & Simmons, 1966, 1978; Stryker, 1968, 1980) are used to examine how employees define their workplace roles and the sense of self within the roles that they occupy within an organisation (Reid, 1999). Workplace role identities are defined as individuals' "self-definitions [in relation to a role] based on occupying particular roles" (Farmer & Van Dyne, 2010, p. 503). The more other people identify an individual with a specific role, the more the individual internalises the role and synthesises it into the self-concept. According to role

identity prominence and identity salience (McCall & Simmons, 1966, 1978; Stryker, 1968, 1980), if employee' role identity sits at a higher priority than other work-related role identities across a variety of situations, the employee will perform this role more competently in the workplace. According to Burke (2004), employee' identity can entail multiple meanings, including needing to be organisationally responsible, sociable, competent, intellectually goal-oriented and personally confident.

Workplace role identities are important in organisations because they can influence employees' work-related behaviours, such as organisational citizenship behaviours (Finkelstein & Penner, 2004), and IS assimilation behaviours (Mishra et al., 2012). Furthermore, organisations can signal and encourage workplace role identities by encouraging certain desirable behaviours (Farmer & Aguinis, 2005; Lord & Brown, 2004).

2.3.5.1 IS Infusion Role Identity

As mentioned earlier, IS infusion role identity refers to the extent to which an employee personally views that using the most features of a system or coordinating multiple job tasks or exploring the new features of a system in innovative ways is an important part of their sense of self as an employee. According to the workplace role identity definition, which refers to employees' self-definitions based on occupying particular roles, if an employee defines her/himself as an IS infuser who uses the organisational system to its fullest potential to perform her/his job tasks competently, then she/he is likely to claim IS infusion role identity as her/his role identity in the organisation. The findings of Stein (2013) show that some employees' workplace role identities are related to the specific patterns of IS use behaviours within an organisation. In addition, an employee's identity that is prompted by a new technology positively affects IS adoption and IS use behaviours (Mishra et al., 2012).

Although previous studies reported empirical support for the relationship between an employee's role identity and IS use (e.g., Barki, Paré, & Sicotte, 2008; Lamb & Davidson, 2005; Stein et al., 2013; Walsham, 1998), Mishra and colleagues (2012) found that a physician's role identity positively impacts her/his IS assimilation behaviour in the workplace; however, not enough attention has been paid to IS-related role identity to investigate further IS use behaviours (Barki et al., 2008). Therefore, this study employs the

findings from previous studies of role identities and then extends the efforts further by assessing the relationship between employees' IS infusion identity and behaviours.

2.3.6 The Interrelationship of IT and Identity

Drawing on identity theories, this study examines employees' person identity in relation to their interaction with a specific technology in workplaces. An IS can be embedded in an individual's daily life if the system becomes involved with who an individual is through her/his personality, roles, groups and situations in organisations (Carter & Grover, 2015). An individual is likely to develop multiple identities in her/his interactions with IS across different situations, in the roles she/he performs and through her/his personal characteristics. An individual's relationship with the system is significant to her/him because this relationship is a salient part of her/his self-concept that is not shared with other people (Carter, 2012). To develop an understanding of long-term IS use behaviours within an organisation, it is important to consider an individual's interactions and perceived relationships with a particular IS that will provide answers to the question of, "Who am I, as an employee, through my use of this technology?".

Previous studies applied identity theories to examine IS implementation and illuminated the role of identity as a core construct in explaining an individual's IS use behaviour (Carter & Grover, 2015; Y. Lee et al., 2006; Stein et al., 2013). In addition, previous studies on identity in the IS domain found that there are significant relationships between an individual's person identity and her/his IS use behaviour (Carter & Grover, 2015; Mishra et al., 2012; Stein, 2013; Stein et al., 2013).

In recent years, the relationship between and IS use and identity has attracted attention from IS researchers (Carter & Grover, 2015; Whitley, Gal, & Kjaergaard, 2014). A number of research studies have explored the manner in which identity is involved in the process of successful IS implementation. For example, several previous studies investigated individuals' identities in relation to their interactions with the IS in the IS implementation processes, where the IS assists to build and present employees' identities across workplaces (Alvarez, 2008; Barrett & Scott, 2004; Barrett & Walsham, 1999; Dobson, Jackson, &

Gengatharen, 2013; Gal & Kjærgaard, 2009; Lamb & Davidson, 2005; Y. Lee et al., 2006; Mishra et al., 2012). Some researchers argued that a user's identity can both enable and inhibit IS assimilation among users (Van Akkeren & Rowlands, 2007). The summary of previous studies about the impact of individuals' identities on their IS use behaviour is presented in Table 2.6. According to these studies, identity plays an important role in IS use behaviours. In addition, the analysis of previous studies (see Table 2.6) suggests that previous research examined the indirect relations between technology and an individual's identity through other factors such as emotional factors (Stein, 2013).

Despite a broad range of studies on identity, not much attention has been paid to IT and identity in the literature on person identity (Alvesson et al., 2008). Moreover, much of the research on the topic of IT and identity has examined the indirect relations between technology and an individual's identity through emotional factors (Stein et al., 2013). An individual's interaction with IT can help in identity construction procedures – for example, by being part of an individual's self-definition (Stein et al., 2013). Consistent with the findings of previous studies, the relationship between IT and identity, which is conceptualised as IT identity in this study, has become an important person identity as people integrate IT into many aspects of their lives and works that influences people's IS use behaviours.

Table 2.6. Identity Studies in the IS Domain

Author(s)	**Description**	**Theoretical Background**
Adam et al. (2006)	Investigates the factors influencing professional identity by using action research to align health information systems with users' requirements.	Feminist approach
Alvarez (2008)	Studies the co-construction of identity and IS and suggests that IS, structure and identity are mutually constitutive.	Critical discourse
Akah and Bardzell (2010)	Explores the relationship between personal identity and digital artefacts as creative resources in the home.	Design theory
Barrett and Scott (2004)	Evaluates how self-identity is influenced by increased globalisation and IS use during the adoption of an e-trading system.	Social theory on 'global time'.
Barrett and Walsham (1999)	Examines the implementation of an e-trading system in the insurance market to examine its influence on users' self-identity.	Giddens' social theory
Carter (2013)	Studies the influence of IT identity on an individual's ongoing IT use behaviour.	Identity theory
Da Cunha and Orlikowski (2008)	Studies how employees' use of an online forum helps them deal with perceived threats to their identity.	Practice perspective
Dobson et al. (2013)	Studies broadband adoption and suggests that IS adoption needs to be considered as a means of understanding individuals' social identities.	Critical realism
Forman, Ghose, and Wiesenfeld (2008)	Studies how the presentation of reviewers' identities affects other shoppers' behaviours.	Social identity, information processing theory
Gal and Kjærgaard (2009)	Examines IS implementation in the architecture industry and suggests that the IS assists to shape employees' identities.	-
Lamb and Davidson (2005)	Studies how scientists use IS to construct and present a professional scientist identity.	Interactionism network theory
Lamb and Kling (2003)	Views how in ICT the user as a social actor is characterised by dimensions such as user identities.	Labelling theory, Institutional theory
Y. Lee et al. (2006)	Studies the impact of self-identity/role identity on technology acceptance.	TAM and social identity theory
Mishra et al. (2012)	Examines how physician identity, operated by electronic health record systems, impacts IS assimilation.	Social identity theory
Ma and Agarwal (2007)	Studies an individual's identity presentation in relation to IS, that leads to knowledge sharing in online communities.	Self-presentation theory
G. M. Schwarz and Watson (2005)	Studies employee perceptions of group membership, which lead to the outcome changes of implementing a new IS within an organisation.	Social identity theory
Vaast and Walsham (2005)	Examines how agents adapt work practices to create harmony between IS use and representations of their identities.	Cognitive dissonance
Van Akkeren and Rowlands (2007)	Studies the assimilation of new ICT in a radiologist practice.	Social actor theory

2.3.6.1 IT Identity

Most previous identity studies in the IS domain were related to users' identities in relation to IS implementation. Not enough studies have examined the direct interaction of individuals and technology as a person identity. As individuals interact with a specific IT through a variety of attributes, roles and situations in an organisation, their interactions with the system become essential to the sense of who they are as individuals (Carter, 2012; Carter & Grover, 2015). IT identity is conceptualised as "the extent to which a person views the use of an IT as integral to his or her sense of self" (Carter & Grover, 2015, p. 938). It is also conceptualised as the set of meanings a person attaches to the self in relation to a particular IT, and the interactions with that specific IT that shape her/his ongoing IT use behaviours (Carter, 2012). A strong IT identity demonstrates identification, where the use of the target IT is integral to a sense of self (who I am) (Carter & Grover, 2015).

IT identity is drawn from the person identity concept that is motivated by individuals' self-interest to enhance their self-concepts through self-expansion. People "seek to enhance their potential efficacy by increasing physical and social resources, perspectives, and identities that facilitate achievement of any [personal] goal that might arise" (Aron, Aron, & Norman, 2003, p. 478). When an individual identifies that IT demonstrates an opportunity to expand the self and available opportunities exist to achieve this goal (Aron et al., 2003), the individual's building period of IT identity is characterised through enhanced use of IT, where IT becomes embedded within the individual's personal and professional network (Carter & Grover, 2015). Similarly, "individuals actively create opportunity structures, where their views of themselves (and their needs) are routinely supported" (Swarm, 1983, p. 36). Thus, IT identity starts to stabilise behaviour as individuals routinely interact with the feature set of IT (Carter & Grover, 2015). While the particular self-meanings that individuals attach to their interactions with IT vary based on a personal history of interactions, research suggests that individuals' affective/emotional responses in relation to IT reflect the strength of IT identity (e.g., Burke & Cast, 1997; Carter & Grover, 2015; Heise, 1979; Stets & Biga, 2003).

In this study, drawing on Carter and Grover (2015) conceptualisation of IT identity, three interconnected components are identified that express an individual's affective reaction to her/himself in relation to a specific IT. These dimensions are *dependency*, *emotional attachment* and *relatedness,* which can vary among individuals, based on the strength of an individual's IT identity.

Dependency reflects "a person's sense of reliance upon an IT" (Carter & Grover, 2015, p. 945) as a source of competent role performance in the workplace. Individuals relate their personal well-being to their reliance on IT (Carter, 2012). Feelings of reliance occur when an individual sees IT as part of her/his identity and thinks of her/himself in relation to IT. For example, in the workplace, employees rely on IT to do their job tasks and to demonstrate who they are to others (Lamb & Kling, 2003). In daily life, individuals increasingly depend on the Internet to maintain relationships with family, friends and colleagues (McMillan & Morrison, 2006). Table 2.7 summarises the concept of IT identity, its dimensions and other similar concepts from previous studies.

Emotional attachment refers to "a person's enduring feelings of emotional attachment and enthusiasm in relation to an IT" (Carter & Grover, 2015, p. 945). Individuals attach positive emotions to themselves and synthesise their energy and enthusiasm in relation to IT (Carter, 2012). Through a long-term series of interactions with IT, emotional attachment demonstrates individuals' feelings of enthusiasm, confidence, and energy when thinking of themselves in relation to IT (Carter & Grover, 2015). For instance, Hackbarth and colleagues (2003) reported that the confidence and knowledge individuals obtained as an outcome of successfully using electronic spreadsheets over time positively impacted their levels of computer joyfulness and emotional tendency to interact spontaneously with spreadsheets. On the other hand, individuals whose experiences with IT have ended with low emotional energy are likely to feel little emotional attachment in their interaction with IT (Carter & Grover, 2015).

Relatedness refers to "the blurring of boundaries between the self and an IT, and manifests as feelings of connectedness with the IT" (Carter & Grover, 2015, p. 945). The notion of connectedness refers to how individuals incorporate resources and characteristics of IT into

their self-concepts (Carter, 2012). For example, Lamb and Davidson (2005) discovered that what scientists do is progressively influenced by advances in IT – to the extent that, for many, "the 'who I am' of professional identity is interwoven with 'what I do' with IT" (p. 10). Individuals who develop a strong sense of connection with IT are likely to depict their IT identity through a variety of situations (Carter & Grover, 2015).

Table 2.7. IT Identity and its Dimensions

Concept	**Definition**	**Related concepts from IS domains**
IT Identity	"The extent to which an individual views use of an IT as integral to his or her sense of self" (Carter & Grover, 2015, p. 946). Reflected in three dimensions: relatedness, emotional attachment, and dependence.	IT identity: "Essentially, mobile phones are now a part of us as individuals" (Carter, 2012, p. 24).
Dependency	An end users feelings of reliance when thinking about themselves in relation to the specific IT (Carter & Grover, 2015).	"The truth is our lives have become dependent on the mobile phone because of the convenience." (Carter, 2012, p. 24).
Emotional attachment	The extent to which end users express feelings of confidence, enthusiasm and energy in relation to an IT (Carter & Grover, 2015).	"I felt a little more alive and like I had something in my possession that could occupy every spare moment of my life" (Carter, 2012, p. 24).
Relatedness	A blurring of boundaries between notions of the self and an IT experienced as feelings of connectedness when thinking about themselves in relation to the specific IT (Carter & Grover, 2015).	"When I got it back, I felt like I had gained a part of myself back and I was back in business." (Carter, 2012, p. 24).

2.4 Summary of Chapter Two

This chapter began by introducing the research background of this study, including the significance of IS infusion behaviour and its three sub-dimensions within an organisation. This was followed by discussions on individuals' identities and behaviours, elaborating the importance of symbolic interactionism as a root for identity theories. Next, identity theories were introduced to describe multiple types of individuals' identities. The literature was reviewed regarding individuals' IT identity as person identity and their workplace role identity, referring to their IS infusion role identity.

The next chapter outlines the development of a theoretical framework to provide a conceptual model underlying the impact of individuals' identities on their IS infusion behaviours within an organisation.

CHAPTER Three: Theoretical Framework and Hypotheses

3.1 Overview of Chapter Three

The objective of this chapter is to develop the conceptual models in order to examine the influence of IT identity as person identity and IS infusion role identity on employees' IS infusion behaviour as well as its three sub dimensions – extended use, integrative use and emergent use behaviours within an organisation. In the following section, the identity theories discussed in the previous chapter are synthesised to conceptualise the research models and explain the interrelationships between constructs that are build up the research models. Then, the research hypotheses for this study are presented. This chapter concludes with a summary.

3.2 Identity Theories and IS Infusion Behaviours

This study draws on three strands of identity theories from McCall and Simmons' (1966, 1978), Stryker's (1968, 1980, 1982, 1987, 1994, 2000) and Burke's (1980, 1991, 2004) identity theories. All of these theories emphasise the social structural versions rather than the traditional version of symbolic interactionism. In the work of McCall and Simmons (1978), the central focus is about an individual's role identity. The work of Stryker and his colleagues (Serpe, 1987; Serpe & Stryker, 1987; Stryker, 1968, 1980; Stryker & Serpe, 1982, 1994), emphasises how the social structure influences individual's identity and behaviour. The work of Burke and his associates (Burke, 1991, 2004; Burke & Reitzes, 1981; Burke & Stets, 1999) focuses on the impact of person identity on behaviour through the internal dynamics within the self.

People develop multiple identities through their interaction with others and technologies, and each identity is tied to an aspect of the social structure (Stets & Burke, 2000). Identities can be categorised into three major bases: role, group and person (Burke & Stets, 2009). Literature on identity differs between identities originated from membership in a group or social category that focus on roles and interpersonal relationships (role and social identities) and those concentrated on the self as a unique and distinguishable entity (person identity) (Brewer & Gardner, 1996; Burke & Stets, 2009; Carter, 2012). Individuals' self-concepts

emerge when they observe and categorise themselves in order to shape their identities to align with their goals, perceive others' response to themselves and make self-evaluations (Stets & Burke, 2003). Through identities, they internalise these shared meanings and expectations with regard to their own behaviour (Carter, 2012). Therefore, the content of identities is the meanings people apply to the self about who they are, and how they should act, in the roles they perform (e.g., as an employee), the groups they belong to (e.g., as a member of an organisation), and in the norms, values and characteristics they claim as defining them as distinct from other people (e.g., as an innovative person). An individual's multiple identities are arranged hierarchically, with identities that are more important and salient across situations having greater potential to impact the individual's behaviour than less important and less salient identities (Stets & Biga, 2003). Accordingly, an employee's work-related identities are arranged hierarchically, with identities that are more salient with greater potential to influence the employee's behaviour within an organisation. Thus, if employees' identities related to their interactions with IS are important and salient to them, the identities will have greater impact on their long-term IS use behaviours in organisations. This study outlines how employees' IS use behaviours are guided by person identity and role identity in workplaces.

Evaluating one person's behaviour over time makes it possible to know that person. Looking for similarities in individuals' patterns of behaviour can help to develop understanding of larger patterns of behaviour across social structures (Lopez & Scott, 2000). Stryker and Vryan (2006, p. 22) stated that "social structures in general define boundaries, making it likely that those located within them will or will not have relations with particular kinds of others and interact with those others over particular kinds of issues with particular kinds of resources". In today's societies, social structures are becoming inseparable from patterns of individuals' interactions with IT (Carter, 2012; Castells, 1997; Orlikowski, 2010). People's professional roles and relationships, as well as the cultural and normative expectations that define them, are ever more intertwined with their interactions with ITs (Carter, 2012). In organisations, technologies create new expectations about how, when and where employees perform their various roles. An individual's history of interactions with ITs will bring up questions such as – What do I mean to others through my use of this technology? Who am I, through my use of this technology as an employee? (Carter, 2013). For example, employees

make daily use of a CRM system as part of their job activities in order to follow up with customers and to support related tasks with colleagues. An employee can be viewed as a CRM deep user, if she/he relies on the CRM as an integral part of her/his daily work-life to perform her/his role. In the absence of this system, an employee's meaning to her/himself and others would change and the employee would feel a loss of an important resource for thinking and communicating to do her/his daily job tasks within an organisation. Consistent with previous studies, which assume that nonhuman objects may come to be considered as an extension of the self (Belk, 1988), this research proposes that individuals interact with specific technologies as nonhuman objects within an organisation through different self-concepts and professional roles. Individuals' relationships with these technologies become significant to them, and an important part of their person identities and self-concepts that are not shared with other people.

Despite significant theorising efforts about an individual's identity, it is understudied in extant literature (Tripsas, 2009), and empirical work investigating the impact of identity on behaviour in the workplace is limited (Foreman & Whetten, 2002). Although identity theories have been applied in previous studies, they have yet to be well-utilised in the study of IS use in organisations (Mishra et al., 2012). In this study, IT identity and IS infusion role identity are conceptualised to examine IS infusion behaviour as well as extended use, integrative use and emergent use behaviours in workplace. According to the definition and bases of person and role identities (Burke & Stets, 2009), IT identity is considered as person identity because the bases of IT identity is about individual self-concept, whereas the bases of IS infusion role identity as role identity refers to the expectations tied to professional roles in the workplace. IT identity refers to the set of meanings a person attaches to the self in relation to a particular IT, and the interactions with that specific IT shapes her/his IT use behaviours (Carter & Grover, 2015). IS infusion role identity refers to the extent to which employees personally view that using the most features of a system or reinforcing linkages among related job tasks or exploring the new features in innovative ways is an important part of their sense of self as employees. Both IT identity and IS infusion role identity not only shape how an individual views her/himself through interactions with ITs, but also drive future IT use behaviours as the individual strives to behave consistently with the long-term, planned and discretionary behaviours (Finkelstein & Penner, 2004), including IS infusion behaviours within an

organisation.

3.2.1 IT Identity and Identity Theories

Based on identity theories, individuals engage in the identity construction process through their interaction with IT, where IT becomes part of an individual's self-definition (Stein et al., 2013). The relationship between IT and identity, which is conceptualised as IT identity in this study, has become an important person identity as people integrate IT into many aspects of their lives through psychological dependency with IT and ownership feelings that satisfy their needs for control and self-definition.

IT identity as a person identity guides the individual's IS use behaviour as an IT user in the workplace. Based on identity theories, person identities possess a set of meanings (e.g., creativity, innovative) that define individuals as distinct entities (Burke & Stets, 2009; McCall & Simmons, 1966, 1978). Thus, individuals are considered as distinct entities whose IS use behaviour in the workplace is motivated by their self-interest in relation to the IS based on the fact that when an employee's behaviour is independent of others within an organisation, it is motivated by her/his self-interest (i.e., personal characteristics, merit), rather than by serving the mutual interests of a role.

Carter and Grover (2015) used identity theories to develop a construct, IT identity, which represents the extent to which individuals view their use of IT as an integral part of the self and to explain IT use that is embedded everywhere in the environment. IT identity is reflected by individuals' feeling of dependency on the system, emotional attachment to the system and relatedness to the system. Employees' *dependency* on the system in relation to IT identity within an organisation occurs when employees feel dependent and reliant on the specific system to do their job tasks. Employees' *emotional attachment* to the system in relation to IT identity within an organisation occurs when employees feel enthusiastic and confident while they use the specific system to do their job tasks. Employees' *relatedness* to the system in relation to IT identity within an organisation occurs when employees feel connected and in coordination with the specific system to do their job tasks within an organisation.

Identity theories are able to contribute to the examination of employees' IT identity as a

predictor of employees' IS infusion behaviours in organisations. Previous studies applied identity theories to examine the relationships between individuals' identity in relation to IS and their IS use behaviours. For example, Carter (2012) revealed IT identity as a significant predictor of IT infusion behaviour in organisations. Stein and colleagues (2013) applied the person identity theory of Burke (2004), and their findings revealed that IT use across individuals is not only influenced by their intentions, but also by their preferred professional identity around IT in the workplace. They also argued that IT becomes part of employees' identity performances, as manifested in specific patterns of IT use. IT aligned with personal preferences and normative expectations can influence how IT becomes a landmark in employees' self-narratives (Stein et al., 2013).

3.2.2 IS Infusion Role Identity and Identity Theories

Role identities describe individuals in terms of what they do (McCall & Simmons, 1966). An individual's role identity is verified when that individual performs a role in a way that confirms her/his internalised expectations about what it means to be competent in the role (Burke, 2004). For example, employee role identity refers to the set of expectations tied to being an employee that guides a person's behaviour as an employee in the workplace, where employees strive to fulfill their responsibilities and complete their job-tasks (Burke & Stets, 2009). In this study, employees' IS infusion role identity guides their behaviour in an organisation in the extent to which they deeply use the system, try the new features of the system, reinforce linkages among related job tasks or use the system in an innovative way.

Based on identity theories, role identity prominence refers to the extent to which an identity reflects a person's priorities (McCall & Simmons, 1966, 1978). If employees' IS infusion role identity sits at a higher priority than other work-related role identities, then the employees will perform this role more competently. According to McCall and Simmons' (1978), role identity theory, employees' IS infusion role identity is likely to form through employees' self-support, social support, commitment, resource investment, external gratifications and interinsic gratifications within an organisation.

Employees' *self-support* regarding IS infusion role identity within an organisation refers to how they regard their important characteristics/skills as IS infusers and how they perform as

the sort of IS infusers that they perceive themselves to be. Employees' *social support* regarding IS infusion role identity within an organisation refers to their belief regarding colleagues' perceptions of how they perform at being IS infusers and how colleagues regard their important characteristics as IS infusers. Employees' *commitment* regarding IS infusion role identity within an organisation refers to how devoted they perceive themselves to be and how committed they are for being the kind of IS infusers that they perceive themselves to be. Employees' *resource investment* regarding IS infusion role identity within an organisation refers to how much of their working time and energy is devoted to being IS infusers. Employees' *external gratifications* regarding IS infusion role identity within an organisation refers to their work improvement in performance, speed, productivity and effectiveness by being IS infusers. Employees' *internal gratifications* regarding IS infusion role identity within an organisation refers to their positive feeling and enjoyment from being IS infusers.

Previous studies argued that identity shapes IS use behaviours (Y. Lee et al., 2006; Mishra et al., 2012; Stein et al., 2013). IS infusion behaviour is viewed as voluntary as well as OCB that is long-term, planned and discretionary. Researchers have applied role identity theory and found that an employee's role identity is a significant predictor of the employee's volunteerism and OCB (Dávila & Finkelstein, 2010; Finkelstein & Penner, 2004). Lee and colleagues (2006) also investigated the individual's self-identity as a predictor of the individual's IS usage in voluntary vs. mandatory conditions. Their findings reported the there is a greater impact of an individual's self-identity on IS usage in a voluntary condition (Y. Lee et al., 2006). In another study, Mishra and colleagues (2012) applied identity theories to suggest that role identity directly influences the assimilation of technology among physicians. By extending the line of argument from identity theories and empirical evidence from IS research, it is plausible that employees' role identity in relation to IS use to perform their job tasks shapes their IS infusion behaviours in organisations.

3.3 The Theoretical Models and Hypotheses

Drawing on identity theories, this section presents the proposed research models and discusses the hypothesised relationships between employees' IT identity, IS infusion role identity and their IS infusion, extended use, integrative use and emergent use behaviours within an organisation.

3.3.1 Research Models

Based on the earlier theoretical discussion, this study proposes two research models in which IT identity and IS infusion role identity are hypothesised as the antecedents of IS infusion behaviours. One research model uses a single-dimensional construct of IS infusion behaviour as a dependent variable and the other research model uses sub-dimensions of IS infusion behaviour, namely extended use, integrative use and emergent use behaviours as dependent variables. The sub-dimensions of the IT identity construct include dependency, emotional attachment and relatedness. According to role identity theory, the factors that form an individual's IS infusion role identity are self-support, social support, commitment, resource investment, external gratifications and internal gratifications. In addition, this study tests the moderation effect of perceived organisational valuing of IS infusion on the relationships between IS infusion role identity and IS infusion behaviour. Six control variables (i.e., gender, age, education, position in organisation, tenure and former IT experience) identified from the literature are also included in the research models as shown in Figure 3.1.

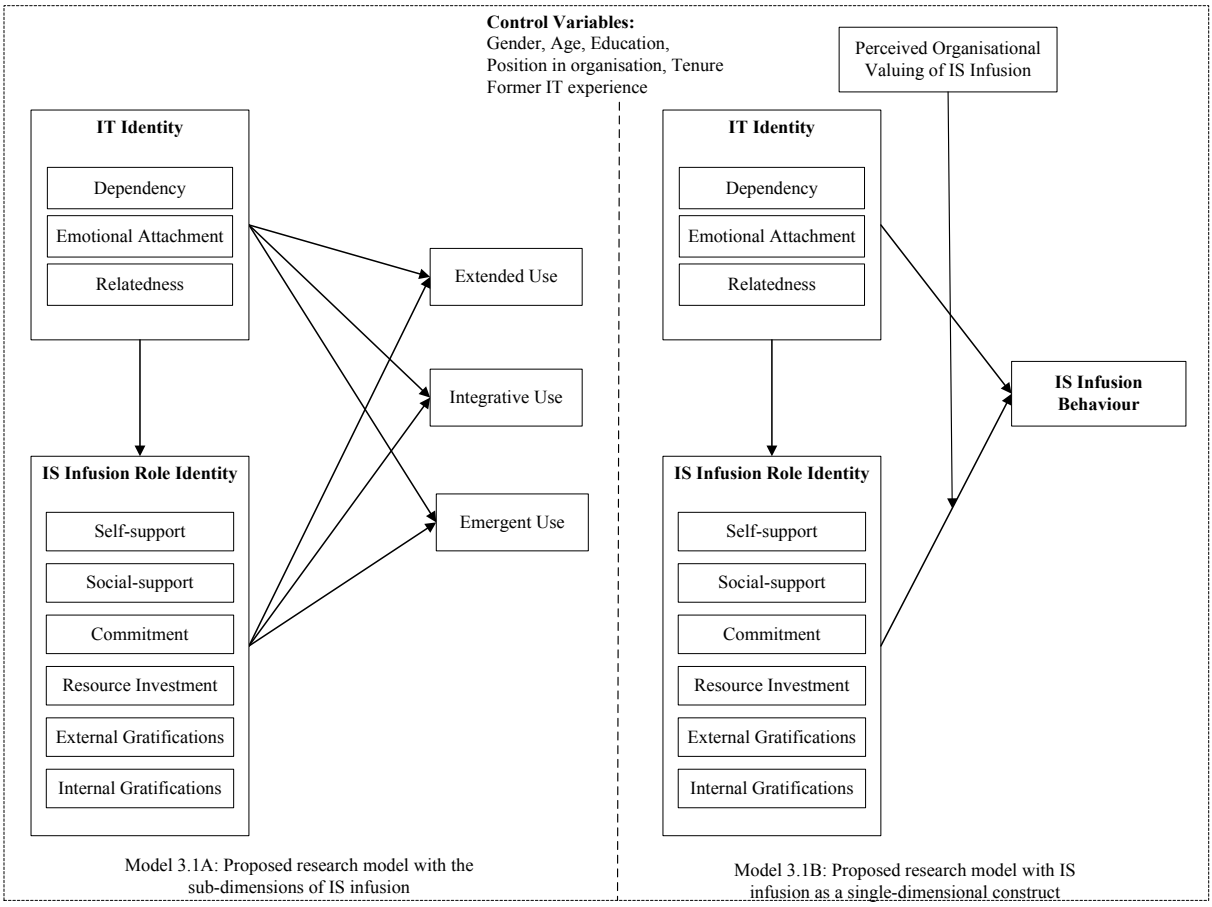

Figure 3.1. Proposed research models

3.3.2 IT Identity and IS Infusion Behaviours

Psychological theories complement studies from sociology by looking at how individuals' traits and personalities influence their views of themselves and their behaviours (e.g., Hogg, 2006; Tajfel & Turner, 2004). Individuals' identity around an IT shapes their views of themselves and subsequently influences their IS use behaviours in the workplace. The relationship between individuals' identity in relation to IT and their IT use behaviours has received strong empirical support across a number of previous studies that reported identity around IT is a primary motivator of IS use behaviours such as IS acceptance (Y. Lee et al., 2006), IS assimilation (Mishra et al., 2012) and IS deep use (Carter & Grover, 2015).

Previous empirical studies also supported the relationships between individuals' person identity around IT and their IT use behaviours (Barki et al., 2008; Lamb & Davidson, 2005; Walsham, 1998). For example, McMillan and Morrison (2006) investigated Internet use and

found that people perceive that their dependency on the Internet shapes their Internet use for personal well-being as its use pervades more aspects of their daily lives. In addition, they reported that people's dependency and reliance on the Internet as part of their IT identity shape their technology use behaviours. Carter (2012) also found a strong relationship between the meanings individuals attach to the self in relation to mobile phones and their continuous mobile use behaviour. The empirical evidence offers support that for many individuals, mobile phone identity as IT identity is a salient part of their individual self-concept that shapes their mobile phone use behaviour (Carter, 2012; Carter et al., 2012). In another study, Stein and colleagues (2013) suggested that IT has become part of employees' identity performances, manifesting itself in specific patterns of IT use. Employees' personal preferences and normative expectations aligned with IT impact on how an IT becomes a landmark in employees' self-narratives (Stein et al., 2013). Based on the findings from previous empirical studies, in the context of this study, employees' IT identity, which is developed through their dependency and reliance on a specific system, impacts their self-concept and personal preferences that consequently shape their IS use behaviours. The reason for this is that when individuals integrate an IS into their personal and professional activities, they realise that the IS allows them to enhance both the self and available opportunities, and consequently their IT identity likely shapes their IS infusion behaviour in workplace.

Drawing on identity theories, an employee's IT identity as person identity is about her/his own personal preference and attributes that she/he claims as part of her/his self-concept in relation to IS use. This person identity, which is not shared with other employees, can shape her/his IS use behaviours in an organisation (Burke, 2004; McCall & Simmons, 1966; Stryker, 1980). In particular, employees' IT identity is formed by their own personal goals, self-interests and values in relation to IS rather than the expectations or goals of the group or their roles in the workplace (Burke & Stets, 2009; Meijers, 1998).

IT identity is reflected in three interrelated dimensions: *dependency, emotional attachment* and *relatedness* (Carter et al., 2012). Previous studies stated that individuals' emotional attachment when thinking about themselves in relation to IT reflects the strength of the individuals' IT identity (e.g., Burke & Cast, 1997; Carter & Grover, 2015; Heise, 1979; Stets & Biga, 2003).

A person sees an IT as part of her/his identity, indicated through feelings of reliance (*dependency*), while thinking of her/himself in relation to the IT (Carter & Grover, 2015). Hackbarth and colleagues (2003) found that the feelings of confidence and dependency people achieved as an outcome of effectively applying electronic spreadsheets, over time positively impacted their levels of computer usage.

Emotional attachment, as an outcome of a series of individuals' interactions with IT, indicates their feelings of enthusiasm and energy when thinking of themselves in relation to IT. Identity studies argue that individuals' interactions with nonhuman objects (e.g., technologies) are emotionally significant and valued, where these interactions influence individuals' identity and an identity shapes individuals' thinking and behaviour (Carter, 2013; Clayton, 2003). So, for employees to engage in IS infusion behaviours, they should have confidence and enthusiasm while thinking of themselves in relation to IS interactions to do their daily job tasks. Previous studies also found that emotional attachment with technology arises during IS use as this use arouses individuals' internal motivations towards engaging in IS use that consequently influence their IS use behaviours (Carter, 2012; Nah, Tan, & Teh, 2004; Stein, 2013).

In addition, Clayton (2003) defined *relatedness* as the extent to which an individual feels connected to a nonhuman object as a part of an operational system or a "desired part of everyone's identity" (p. 50). In the context of this study, employees' feeling of connectedness to a specific IS can shape their IS use behaviours in the workplace. If employees feel connected to a specific IS to perform their daily job tasks, their IT identity toward that IS is stronger and they are more likely to use the system to its fullest potential in order to perform their job tasks in the workplace.

This study extends previous research by assessing individuals' identity as predictors of technology infusion in the workplace. Based on person identity theory (Burke & Stets, 2009), functions of a technology, if aligned with personal psychological characteristics and identity preferences of employees, can shape employees' self-meanings in relation to IT use. The associated meanings of the employees' identity in relation to IT is known to them through

their interactions with colleagues in the workplace and how colleagues respond to them. For example, if an employee claims an IT identity, which entails being dependent and enthusiastic towards that specific IT, it is expected that the employee will heavily rely on and use that IT to do her/his job tasks within an organisation. Fundamentally, the meaning of an employee's IT identity has implications for how that employee behaves in the workplace.

Applying Burke's (2004) identity theory in the context of this study, if an employee's IT identity is activated in the workplace, a process loop that has four components is established: (1) the *identity standard* as the self-meanings of IT identity; for example, setting a goal in order to heavily rely on a specific system as an IS infuser; (2) *perceptual input* of meanings from the workplace; for example, an employee may perceive that she/he does not use the targeted system to its fullest potential; (3) *comparator* refers to the process of comparison between the perceptual input and the identity standard; for example, the illustrated employee compares her/his perceptual input and IT identity standard and discovers that there is a discrepancy between her/his perception and goal; (4) *meaningful behaviour* is a function of the comparison of the perceptions of the situation with actual self-meanings held in the identity standard. In this case, the employee generates a meaningful behaviour from a comparison between her/his goal (to rely on the system as an IS infuser) and her/his perception that she/he is not using the system to its fullest potential. Since there is a gap between the employee's goal to rely on the system as an IS infuser and her/his perception that she/he has not been using the system to its fullest potential, this employee is likely to change her/his behaviours to use more features of the system, or coordinate multiple job tasks or explore the new features of the system in order to be an IS infuser and use the system to its fullest potential.

Accordingly, it is expected that employees with strong IT identity will engage more in using the most features of the system or exploring the new features of the system in an innovative fashion or reinforcing the linkages among multiple job tasks within an organisation. Previous studies also supported this argument. Stein and colleagues (2013) found that employees develop their identity in relation to the systems, which influence their use of these technologies to accomplish job tasks. In another study, Carter (2012) argued that IT identity is motivated by individuals' desire for self-expansion, and IT identity enactment includes

exploring features of a technology and using it in novel ways to improve self-efficacy. These previous studies reveal a pattern that employees' IT identity motivates and energises them to expend effort on a specific IS which thus has a positive effect on their IS use behaviour. On this basis, it is expected that there are positive relationships between employees' IT identity and their use of an IS to its fullest potential within an organisation. Thus, I hypothesise:

Hypothesis 1: An individual's IT identity is positively associated with her/his IS infusion behaviour within an organisation.

IT identity and extended use, integrative use and emergent use behaviours: Extended use as a sub-dimension of IS infusion behaviour requires an IS user to be proactive in using more IS features to perform a wider range of job tasks, beyond the prescribed or formal guidelines (Hsieh et al., 2011; H. W. Kim & Gupta, 2014). Previous studies reported positive relationships between individuals' IT identity and their IS deep use, where employees use as many features as possible of an IS (extended use) to do their daily job tasks (Carter, 2012; Carter & Grover, 2015). Wang and Hsieh (2006) also stated that if employees have positive feelings toward an IS through their interaction with the system, they are more likely to embrace the IS and try out more features of the IS. When employees mentally and psychologically depend on a system, they are more likely to invest time and effort engaging in extra-role behaviours in relation to that specific IS, such as a deeper level use of the system which is beyond their job descriptions (Burton-Jones & Straub, 2006; A. Schwarz & Chin, 2007). In another study, Stein and colleagues (2013) argued that employees' IT identity motivates them to be more proactive, which influences their work practices and IS extended use behaviours within an organisation.

Employees with a strong personal preference and an attachment towards a system may be more motivated to pursue efficient performance (H. W. Kim & Gupta, 2014). Then, based on their persistence and hard work in pursuing an effective performance, they may use the system in an extended way to perform a diverse range of job tasks in the workplace. Through perceiving the benefit and impact of the target system, employees with strong IT identity are therefore more likely to employ their high levels of skills and capabilities to determine for themselves how to extend the usage of the targeted system. In addition, employees with

strong reliance, dependency and enthusiasm towards a system are likely to act on problems and improve the quality of their work by initiating changes in the way work is done, which may include using most of the IS features to improve work tasks. In order to achieve a better result from IS usage, employees with more passion, reliance and enthusiasm toward using the targeted system have a positive belief that the system can help them to reach a better outcome, which in turn influences their way of using the system in a broader range. For example, sales employees who have developed strong reliance on and connectedness with the CRM system in order to create a forecast activity are generally more proactive in improving their quality of work by using the wider range of system features such as quota, expected closed amount, pipeline, stage, probability, forecast category for each case, and so on.

In addition, personal characteristics such as curiosity and confidence in working with an IS, which constitute an individual's IT identity, are very important determinants of deep system use within an organisation (Grublješič & Jaklič, 2015). Based on the findings of previous studies (Carter, 2012; Carter & Grover, 2015), employees personal attributes and characteristics regarding working with an IS (i.e., IT identity) are very important and have a significant effect on how users find ways to use more features of a system to do their job tasks in the workplace. Accordingly, this study expects to see a positive relationship between employees' IT identity and their use of most features of the system. Therefore, I hypothesise:

Hypothesis 1a: An individual's IT identity is positively associated with her/his IS extended use behaviour within an organisation.

Integrative use as the second sub-dimension of IS infusion behaviour also requires an individual to be proactive in using an IS to accomplish or enhance workflow linkages among a set of job tasks. Structuring job processes only by following formal rules and guidelines becomes challenging as the level of workflow complexities grows. Performing or enhancing workflow linkages among job tasks is necessary for better performance in the workplace (H. W. Kim & Gupta, 2014). Because employees with strong personal preference and motivation to use a targeted system tend to pursue better achievement and performance from that specific system, employees with strong reliance, dependence and attachment to the system may use

the target system in an integrative manner and then reinforce the interconnectedness and linkage among related job tasks to improve their task accomplishment. In other words, employees' perception of the impact of the targeted system can lead these employees to utilise a high level of skills and capabilities to discover how to integrate different features of the system to do their job tasks. For example, an employee with strong reliance on a CRM system is likely to be more proactive in using her/his skills to integrate the tasks and information from opportunities, leads and campaigns to create a dashboard for her/his sales activities. When an employee has a feeling of connectedness and reliance on an IS as a means of accomplishing job tasks in the workplace, she/he will be motivated to benefit from the system in order to better organise related tasks and reinforce linkages among multiple job tasks (integrative use) in the workplace. Hence, employees are likely to make connections among a wide range of IS features and evaluate how linkage among tasks can allow them to do their daily job tasks more efficiently. Based on the findings of previous studies, if a proactive employee is interested in extra-role behaviours, she/he is likely to engage more in behaviours that are endorsed by their own personal values such as using a system in a more integrated manner (Deci & Ryan, 2000; H. W. Kim & Gupta, 2014; Wang et al., 2008). Employees' internal feelings and motivations positively impact their integrative use of IS, where employees use the IS to reinforce the linkage among job tasks (H. W. Kim & Gupta, 2014). Employees' IT identity helps us to further understand the mechanism that forms their perceptions and proactive behaviours as well as the role disposition plays in their IS usage. Employees with strong IT identity are more likely to embrace IS features in order to better coordinate multiple job tasks than those who are have weak IT identity. I therefore hypothesise:

Hypothesis 1b: An individual's IT identity is positively associated with her/his IS integrative use behaviour within an organisation.

Emergent use as the third sub-dimension of IS infusion behaviour requires an IS user to be proactive in using the target IS in an innovative and exploratory manner to support job tasks within an organisation. Due to the uncertainties of job tasks in workplaces, employees should be ready to handle unexpected issues and requests raised from the internal and external work environment. Employees with strong personal and psychological characteristics are more

likely to pursue high goals and performance even in an uncertain work environment (H. W. Kim & Gupta, 2014). In order to handle such unexpected issues, employees with a strong IT identity may explore and find innovative uses of a target IS. Through strong IT identity, users' personal interest in learning IS features can drive them to engage in exploring new features of the IS, and make them open to challenges and curiosity and the willingness to take risks. Employees with strong IT identity may exert intensive effort in thinking systematically to consolidate and align different perspectives and may expend intensive effort in acquiring information and trying out innovative features of IS, which would subsequently lead to a greater extent and scope of exploratory IS usage. With the aroused IT identity, employees' desire to explore their interests and engage their curiosity can make them psychologically absorbed in the process of performing IS feature exploration.

Users with strong IT identity may explore a wide range of new IS features and evaluate how different features can benefit them and the organisation (Agarwal & Karahanna, 2000; Ke et al., 2012). In addition, previous studies investigated the relationship between individuals' personal values and their IS exploratory behaviours and argued that strong psychological engagement with a specific system (e.g., IT identity) allows employees to integrate new IS feature exploration with their personal values. For example, a previous study found that employees persistently engage in behaviours that are endorsed by their own personal values system (Deci & Ryan, 2000). Employees with strong IT identity and attributes toward IS use may have the tendency to explore more new ways of using IS, rather than relying on standardised routines to enhance their IS infusion behaviours (Stein, 2013). Thatcher and colleagues also found that individuals' subjective experiences influence their emergent use of IS in that they explore new features of IS in novel manners (Thatcher et al., 2011). Based on the theoretical arguments from identity theories and support from previous empirical studies, I expect that a strong IT identity will lead employees to exert intensive and persistent efforts on IS feature exploration, thus creating a positive effect on emergent IS usage behaviour. Thus, I hypothesise:

Hypothesis 1c: An individual's IT identity is positively associated with her/his IS emergent use behaviour within an organisation.

3.3.3 IS Infusion Role Identity and IS Infusion Behaviours

Psychologically prominent identities are related to relevant role performances; identity-related behaviours are most likely to happen in the workplace when identities are psychologically fundamental, which makes these identities prominent. Individuals may be motivated to use an IS to support an important role identity if that system can support them to improve their role identity performance (Armitage & Conner, 1999). Psychological importance within the individual's overall self-concept is a significant aspect of role identities, and an individual's role identity can range from low to high prominence (Stryker, 1980). A prominent role identity can influence employees' behaviour in situations where they have free choice and can perform extra-role behaviours. In the case of this study, if employees view IS infusion role identity as the prominent aspect of their role identity in relation to an IS, it will positively influence their IS use behaviours in the workplace. Individual' IS infusion role identity refers to the extent to which employee personally views that using the most features of a system or reinforcing linkages among related job tasks or exploring the new features in innovative ways is an important part of her/his sense of self as an employee.

Previous studies supported the relationship between individuals' role identity and their long-term behaviours. For example some studies have argued that the role identity theory can further explain the determinants of OCB (Dávila & Finkelstein, 2010; Finkelstein & Penner, 2004), extra-role behaviours such as employees' creativity behaviours (Farmer et al., 2003), and sales employees' behaviour (Steward, Hutt, Walker, & Kumar, 2009), as well as individuals' IS infusion behaviour within an organisation. Based on identity theory, role identities are validated and sustained through role-consistent behaviour (McCall & Simmons, 1978).

According to Stets and Biga (2003), identity prominence influences behaviour, which shows that performing an identity may simply reflect the importance of that identity. Pope and Hall (2014) examined the psychometric antecedents of coach identity prominence from a role identity perspective. They found positive relationships between McCall and Simmons's (1978) antecedents and identity prominence. These antecedents are s*elf-support, social support, commitment, resource investment, external gratifications* and *internal*

gratifications. Drawing on McCall and Simmons' role identity theory, this study examines employees' role identity through the six determining factors of IS infusion role identity and their influence on IS infusion behaviours.

Individuals' *self-support* influences the formation of role identity (Stryker & Serpe, 1982) and reflects individuals' self-expectations or an internal identity standard (Farmer et al., 2003). Reid's (1999) study results indicated self-support as a determinant of role identity prominence and role identity prominence as a determinant of continuance behaviour. For example, employees' self-support about creative activities affects creative role identity, which leads to the continuance of creative behaviours (Farmer et al., 2003). By extending this line of argument, employees' self-support about IS infusion (i.e., using the system in a deep and innovative manner) can affect their IS infusion role identity, which leads to the continuance of IS infusion behaviours within an organisation.

Principal expectations of important social others are a main source of seeing oneself through others' expectations (Farmer et al., 2003). Previous studies provided strong support for the effects of social expectations (*social support*) on role identity prominence (e.g., P. L. Callero, 1985; Farmer et al., 2003), which in turn influences continuance behaviour (Reid, 1999). Colleagues' and supervisors' expectations affect a person's behaviours and if these others see an identity as an important part of that person's role identity, they will expect and support the identity-related behaviour. For example, drawing on role identity theory, Farmer et al. (2003) suggested that employees who perceive that their co-workers expect them to be creative will define themselves as creative. Similarly, if a person in the workplace receives support from others on her/his IS use in a deep and innovative manner for performing her/his role, it will impact on her/his role identity prominence in relation to that specific IS and is likely to influence her/his IS infusion behaviour.

The prominence of an identity is influenced by the degree of *commitment* that an individual may have to that identity (McCall & Simmons, 1978). From a theoretical point of view, commitment as one of the determining factors of role identity prominence refers to individuals' attempts to meet their self-expectations (McCall & Simmons, 1966, 1978). Commitment to a specific role identity positively influences a person's identity-related

behaviours (Reid, 1999). Accordingly, if an employee is committed to an IS infusion role identity, it will influence her/his role identity prominence and is likely to impact on her/his IS infusion behaviour. Due to the person's commitment to using an IS, she/he will be more devoted to the role that is related to this IS and therefore this role will sit in a higher position in the identity prominence hierarchy, leading to the deeper level of IS use behaviours in workplace. This argument is in line with previous research that stated there is a relationship between identity commitment and behaviour consistent with the identity (P. L. Callero, 1985; Carter, 2012; Stryker & Serpe, 1982). According to Wang and Hsieh (2006), when an employee is committed to the use of the technology, she/he is more likely to engage in extra-role behaviours, such as using more system features (extended use), being better organised and reinforcing linkages among related job tasks (integrative use), and exploring new ways to use the system (emergent use).

Resource investment (such as time and energy) as an antecedent of role identity prominence has an impact on individuals' continuance behaviour (Reid, 1999). If an employee invests significant effort, time and energy in IS infusion role identity, this role will sit in a higher position in the identity prominence hierarchy and consequently influence her/his IS infusion behaviour. Previous studies (e.g., Limayem & Cheung, 2008; Venkatesh & Morris, 2000) supported this argument and suggested that an individual's time and energy investment in IS use influences her/his IS use behaviour. A self-reported measure of the time spent using a target IS for work-related tasks impacts on employees' IS use behaviours (Igbaria & Iivari, 1995; Venkatesh & Davis, 2000). When employees invest time and energy to engage in IS infusion behaviour as an extra-role behaviour, they are more likely to use more system features, reinforce linkages among related job tasks, and explore new ways to use the system (Wang & Hsieh, 2006).

According to McCall and Simmons (1978), *external gratifications* (such as bonus, promotion, favour) are one of the determining factors of role identity prominence, which in turn influences behaviour (Reid, 1999). If a person receives extrinsic rewards for a behaviour, it can strengthen her/his role identity prominence and then her/his behaviour (Reid, 1999). In the IS context, if an employee receives extrinsic rewards for IS use behaviour, it is likely to support and strengthen the prominence of her/his IS use identity. Subsequently, this

prominent role identity, which is termed IS infusion role identity in this study, is likely to affect her/his IS infusion behaviour. *Internal gratifications* such as satisfaction, pride and pleasure are viewed as the key to building and keeping a loyal base of individuals' long-term behaviours. Internal gratifications in the context of an individual's job performance refer to a pleasurable or positive emotional state resulting from the assessment of one's job (Bhattacherjee, 2001). There is a positive relationship between an individual's internal gratifications and continuance behaviour (Reid, 1999). Several empirical studies have provided evidence to support this association. For instance, Oliver (1980) cited that individuals' internal gratifications such as satisfaction as an experience based affect can motivate them toward better IS use. Similarly, Delone and McLean (2003) suggested that there is a strong relationship between user satisfaction and IS use in their IS implementation success models. In addition, Bhattacherjee (2001) suggested that there is a behavioural impact of internal gratifications (e.g., satisfaction) on IS use at the post-adoption stage in the IS use model. Based on the findings of these previous studies, it can be concluded that individuals' internal gratifications generate the feelings of satisfaction and motivation that affect individuals' intention and behaviour through influencing their attitude. If employees feel satisfied and experience pleasure through their interaction with an IS, they are more likely to embrace the IS, try out more functions and explore new ways of applying the IS (Wang & Hsieh, 2006). In addition, previous studies used motivation theory, which argues that an individual is driven by intrinsic and extrinsic motivations/gratifications to engage in proactive long-term behaviours such as IS infusion behaviour within an organisation (Ke et al., 2012; Li et al., 2013). These gratifications can generate enjoyment, cognitive flexibility and satisfaction during an activity and positively influence long-term behaviours.

As mentioned above, this study uses McCall and Simmons' role identity theory to examine employees' role identity through six determining factors of IS infusion role identity and in turn their influence on IS infusion behaviours. In order to investigate the relationship between individuals' IS infusion role identity and IS infusion behaviours, this study employs theoretical and empirical arguments. For instance, from a theoretical point of view, employees' role identity related to IS usage is a set of expectations tied to their social position related to IS usage in the workplace, which can directly instruct their IS use behaviours. Drawing on role identity theory, employees' IS infusion role identity indicates their internal

expectancies and self-satisfactions regarding using the IS in order to be competent in their role, which leads them to perform the related IS use behaviours more efficiently in the workplace (Burke & Stets, 2009; McCall & Simmons, 1978; Stryker & Burke, 2000). Employees present a sense of self-efficacy through acting out their IS infusion role identity that is related to their IS infusion behaviours in the workplace. Their IS infusion behaviours are consistent with the meanings and expectations associated with their role identity in relation to the IS (Burke & Stets, 2009). From an empirical point of view, Mishra and colleagues (2012) reported that employees' role identity positively influences their IS use behaviour in organisations. An IS becomes part of their professional role identity by acting as a landmark in employees' self-narratives around which the self and others are positioned. Employees' IS-related role identity positively impacts on their IS use behaviour in organisations (Stein et al., 2013). Because an individual's role identity is shaped by the six determinants that can influence the individual's IS use behaviour, I therefore hypothesise:

Hypothesis 2: An individual's IS infusion role identity is positively associated with her/his IS infusion behaviour within an organisation.

IS infusion role identity and extended use, integrative use, emergent use behaviours: If an employee in the workplace uses an IS in a deep and innovative manner for performing her/his role (self-support), receives support from others (social support), commits to the use of the IS, invests significant effort, time and energy (resource investment) in using the IS, receives extrinsic rewards such as bonus or promotion, and receives intrinsic rewards such as satisfaction and enjoyment from using the IS, then it will impact on her/his role identity prominence and influence her/his IS deep use behaviour. According to Saga and Zmud (1994), each or any of the extended use, integrative use and emergent use behaviours represents a specific detailed pathway to the higher level of IS infusion behaviour. Hence, IS infusion role identity that impacts on role identity prominence, is likely to influence IS infusion behaviour through its sub-dimensions. According to Wang and Hsieh (2006), when an employee is committed to the use of the technology, she/he is more likely to engage in proactive behaviours, such as using more features of the system (extended use). Based on employees' endeavour and hard work in showing their IS infusion role identity, they tend to use the system in an extended way to accommodate various job tasks beyond the prescribed

or formal guidelines for the use of these features, and to perform a wider range of tasks within an organisation. Employees' perception of the value and influence of role identity can lead them to perform an IS infusion role identity and thus apply their high levels of skills to determine for themselves how to extend the usage of the IS. Accordingly, this study expects to see a positive relationship between employees' IS infusion role identity and their use of most features of the system. Therefore, I hypothesise:

Hypothesis 2a: An individual's IS infusion role identity is positively associated with her/his IS extended use behaviour within an organisation.

Employees' confidence in their ability to perform their IS infusion role identity competently may be critical in their IS usage to better organise related job tasks and make interconnections among multiple job tasks to perform their role more efficiently in the workplace. Previous studies argued that employees with strong role identity in relation to IS are more capable of appreciating the benefits of IS usage and to embrace IS features in order to better interconnect multiple job tasks, than those who have weak role identity in relation to IS (Agarwal & Prasad, 1998; Wang et al., 2008). Integrative use also requires an employee to be proactive in using a target IS to perform or enhance workflow linkages among a set of job tasks, and an individual's psychological factors positively influence their IS integrative use behaviour (H. W. Kim & Gupta, 2014). Employees' IS infusion role identity helps to further understand the mechanism that forms their professional roles and behaviours in relation with their IS usage. Enhancing workflow linkages among job tasks is essential to create better performance at work. This is because an employee with strong IS infusion role identity tends to pursue proactive behaviours in order to create better performance, which leads her/him to perform better by using a target IS in an integrative manner and then consolidating connections among related job tasks. Employees' perception of the value and influence of role identity can lead IS infusers to use their high levels of skills, resources and commitment to coordinate among job tasks. For example, Mishra and colleagues (2012) found that the role identity amongst physicians positively impacted their IS use behaviour and ensured that information and job tasks were integrated and linked. Accordingly, an employee with strong IS infusion role identity is expected to use the IS in a way that ensure the job tasks are

integrated in the workplace, in order to reinforce the connection among job tasks. Thus, I hypothesise:

Hypothesis 2b: An individual's IS infusion role identity is positively associated with her/his IS integrative use behaviour within an organisation.

IS infusion role identity can drive employees to engage in exploring new features of an IS to perform their roles competently. Employees with strong IS infusion role identity are likely to show more competency in the related role and expend intensive effort in acquiring information and trying out innovative features of IS, which subsequently can lead to greater role performance in the workplace. Thus, these users are likely to explore a wide range of new IS features and evaluate how different features can benefit them to perform their job more competently in the organisation. Previous empirical studies (Farmer & Dyne, 2010; Ke et al., 2012) argued that individuals with strong role identity toward IS use may have the tendency to explore more new ways of using IS, rather than relying on standardised routines to enhance their role and job performance. Therefore, a person with strong IS infusion role identity will exert intensive efforts on IS feature exploration to do her/his job tasks, thus creating a positive effect on the emergent IS usage behaviour in the workplace.

Emergent use requires an employee to use a target IS in a new way that was not recognised or feasible previously (H. W. Kim & Gupta, 2014). According to Wang and Hsieh (2006), when an employee is committed to the use of the technology, she/he will try to perform the IS use identity and be more likely to engage in extra-role behaviours, such as exploring new ways to use the system. Employees with strong IS infusion role identity pursue IS infusion behaviours. In order to demonstrate a strong IS infusion role identity, an employee may explore and find innovative uses of a target IS. Thus, I hypothesise:

Hypothesis 2c: An individual's IS infusion role identity is positively associated with her/his IS emergent use behaviour within an organisation.

3.3.4 IT Identity and IS Infusion Role Identity

Frequently, individuals' social, role and person identities emerge simultaneously in a situation. Within groups and societies, there are roles, and persons play out these roles. Whereas person identities are likely to be master identities operating through roles, groups and situations, it is expected that person identities impact the selection of role and group identities. When individuals have a choice in roles to perform, the meanings of individuals' person identities are likely to influence the meanings of their role identities (Burke & Stets, 2009). In other words, individuals perform role and group/social identities that are more consistent with the meanings of their person identities (Burke, 2004). For example, the moral person identity may engender caring and helpful role identities for individuals.

It is important to recognise that IT identity as a person identity is part of an individual's multiple identities. Each of these identities is related to an aspect of the social structures in which that individual lives. Drawing on identity theories (McCall & Simmons, 1966; Stryker & Burke, 2000), individuals' person identity of deep attachment with an object like IS, affects their internalised expectations about competent performance in their work roles that are related to that targeted system usage. Individuals may choose those roles that are consistent with their person identity meanings, attributes and characteristics and they may be involved in groups that comprise these roles (Burke & Stets, 2009). Individuals' personal characteristics and attachment to IT is related to the meaning of "who they are" and this meaning influences the meanings of individuals' role identities in the workplace. In turn, individuals with the person identity of attachment with a specific IS may claim those role identities that have a better match with their IS use person identity. This is because the meanings of individuals' person identity in relation to an IS can impact the meanings of their role identity related to IS use in the workplace.

The relationship between employees' person identity and their role identity is supported by previous research. According to a study by Mishra and colleagues (2012) on the care-provision process among physicians, employees' reliance and dependency on the implemented IT enabled them to retain and strengthen their autonomy and dominant role identity. Carter and colleagues (2012) suggested that an individual's identity that is related to a specific IS becomes related to who they are in the roles they perform and the groups they

associate with. Lamb and Davidson (2005) revealed that professional role identities among research scientists were shaped by personal attachment to IT through technology usage (Lamb & Davidson, 2005). Therefore, it is expected that employees' IS use role identity is influenced by their personal attachment with an IS in the workplace. This leads to the following hypothesis:

Hypothesis 3: An individual's IT identity is positively associated with her/his IS infusion role identity within an organisation.

3.3.5 The Moderating Role of Perceived Organisational Valuing of IS Infusion

Role identity develops, in part, through social supports from others such as colleagues, supervisors, and top management in organisations. Further, maintenance of desired and valued identities is important in almost any workplace (Farmer et al., 2003). For example, Amabile (1988) argued that perceived valuing of creativity is a key component of an organisational environment that supports employees' innovative behaviours and it has been found to moderate the relationship between an employee's role identity and performance in relation to creativity (Farmer et al., 2003).

When a behaviour associated with a specific identity is valued in an organisation, employees are likely to be motivated to validate that identity. Perceived organisational valuing of IS infusion is a measure of a general perception about organisational support regarding IS infusion behaviour in a workplace. Thus, this perception is modelled as a moderating variable in this study. If IS infusion behaviour is valued in an organisation, employees with IS infusion identity are likely to be motivated to enforce IS infusion behaviour in order to validate their identity in the workplaces. Satisfying the identity expectations from relevant others is an important enabler of behaviour (Yang, 1981). This shows that employees with strong role identities are sensitive to situations that have the potential for either enhancing or threatening a valued identity within an organisation (Farmer et al., 2003). If an individual feels threatened to deeply use the system, she/he is likely to actively avoid such behaviours. This claim is in line with a previous study that shows that perceived organisational valuing of a specific behaviour positively moderates the relationship between an employee's role identity and that

behaviour, in a way that the relationship is positively higher when organisational valuing is positive, and lower when organisational valuing is negative (Farmer et al., 2003).

The significant impact of organisational support on employees' identity construction and IS use behaviours are also supported by previous studies. Previous research argued that organisational support has a direct positive effect on employees' IS infusion behaviour within an organisation (Eder et al., 2000; Eder & Igbaria, 2001; Grublješič & Jaklič, 2015; Hassandoust et al., 2016; Ramamurthy et al., 2008). Wang and colleagues (2008) reported the positive influence of top management and organisational support on employees' IS infusion behaviour.

Accordingly, this study argues that employees' perceptions about organisational valuing of IS infusion to validate their IS infusion role identity can facilitate role consistent IS infusion behaviours in the workplace. In contrast, when employees with a strong IS infusion role identity find themselves working under conditions where infusion behaviour is irrelevant or devalued, they are likely to opt out of IS infusion engagement. As such, if employees who have an IS infusion role identity perceive that their organisation's norms and culture appreciate the IS infusion behaviour, this perception may strengthen employees' behaviour toward a greater willingness to use the features of IS more extensively. When they perceive organisational appreciation of IS infusion behaviour, they may try to perform better by using a target IS in an integrative manner and then reinforce linkages among related job tasks and use the new features of the IS in an innovative way to perform better within an organisation. In this manner, perceived organisational valuing of IS infusion strengthens the extent to which IS infusion role identity results in IS infusion behaviour. This leads to the following hypothesis:

Hypothesis 4: Perceived organisational valuing of IS infusion positively moderates the relationship between an individual's IS infusion role identity and IS infusion behaviour within an organisation.

The list of the proposed hypotheses for this study is presented in Table 3.1.

Table 3.4. Research Hypotheses of this Study

#	Hypotheses
H1	An individual's IT identity is positively associated with her/his IS infusion behaviour within an organisation.
H1a	An individual's IT identity is positively associated with her/his IS extended use behaviour within an organisation.
H1b	An individual's IT identity is positively associated with her/his IS integrative use behaviour within an organisation.
H1c	An individual's IT identity is positively associated with her/his IS emergent use behaviour within an organisation.
H2	An individual's IS infusion role identity is positively associated with her/his IS infusion behaviour within an organisation.
H2a	An individual's IS infusion role identity is positively associated with her/his IS extended use behaviour within an organisation.
H2b	An individual's IS infusion role identity is positively associated with her/his IS integrative use behaviour within an organisation.
H2c	An individual's IS infusion role identity is positively associated with her/his IS emergent use behaviour within an organisation.
H3	An individual's IT identity is positively associated with her/his IS infusion role identity within an organisation.
H4	Perceived organisational valuing of IS infusion positively moderates the relationship between an individual's IS infusion role identity and IS infusion behaviour within an organisation.

3.3.6 Control Variables

Previous literature suggested that age (Maas et al., 2014; Ng & Kim, 2009; Wang et al., 2008), gender (Maas et al., 2014; Ng & Kim, 2009; Wang et al., 2008), education (Wang et al., 2008), position in an organisation (Maas et al., 2014; Ng & Kim, 2009), tenure (Maas et al., 2014; Ng & Kim, 2009), and former IT experience (Ifinedo, 2011; Maas et al., 2014) may affect employees' IS infusion behaviour as well as extended use, integrative use and emergent use behaviours in an organisation. This study controls for the aforesaid six factors because of their potential impact on employees' IS infusion behaviour in organisations. Figure 3.2 presents the hypothesised relationships and control variables in the research models.

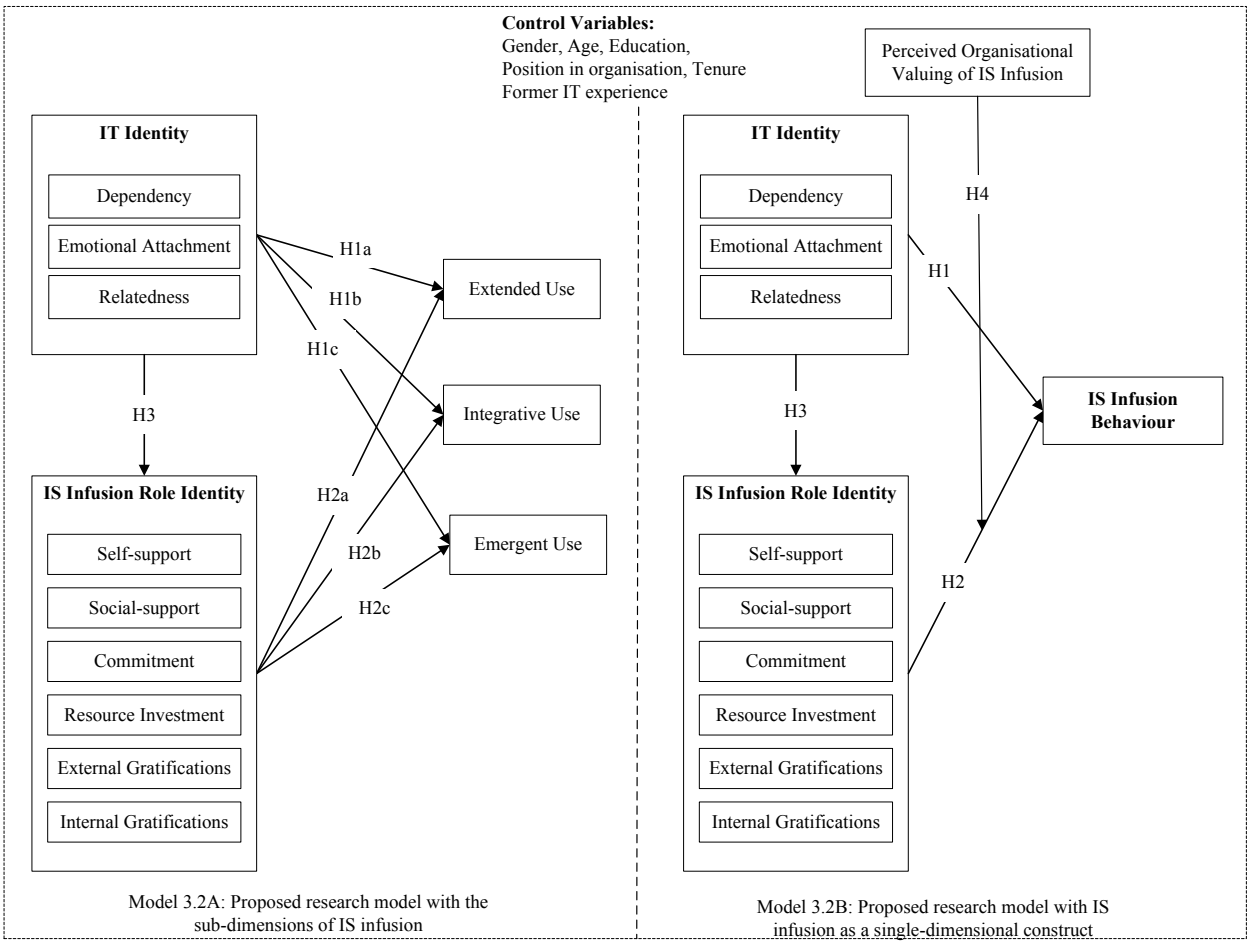

Figure 3.2. Research models and the hypothesised relationships

3.4 Summary of Chapter Three

In this chapter, three identity theories were synthesised. Based on the theoretical foundations, two research models that specify the hypothesised relationships were generated. The research models incorporate identity constructs (IT identity and IS infusion role identity), IS infusion behaviour, extended use, integrative use, emergent use constructs and perceived organisational valuing of the IS infusion construct. The following chapter discusses the research design and methodology to address the research questions put forth in Chapter One through evaluating the hypotheses proposed in Chapter Three.

CHAPTER Four: Research Design and Methodology

4.1 Overview of Chapter Four

In the previous chapter, two research models were developed to examine the impact of employees' IT identity and IS infusion role identity on IS infusion behaviour as well as extended use, integrative use and emergent use behaviours within an organisation. Burke's identity theory, Stryker's identity theory and the role identity theory of McCall and Simmons were used to develop the theoretical/research models. A set of four hypotheses were also developed in relation to the research questions.

The current chapter provides a detailed presentation of the research design and methodology that was utilised to test the theory-based research models formulated in Chapter Three. This chapter discusses the research design, the data collection approach, survey instrument development, data analysis techniques, and the evaluation of the measurement models and structural models through PLS-SEM as shown in Figure 4.1.

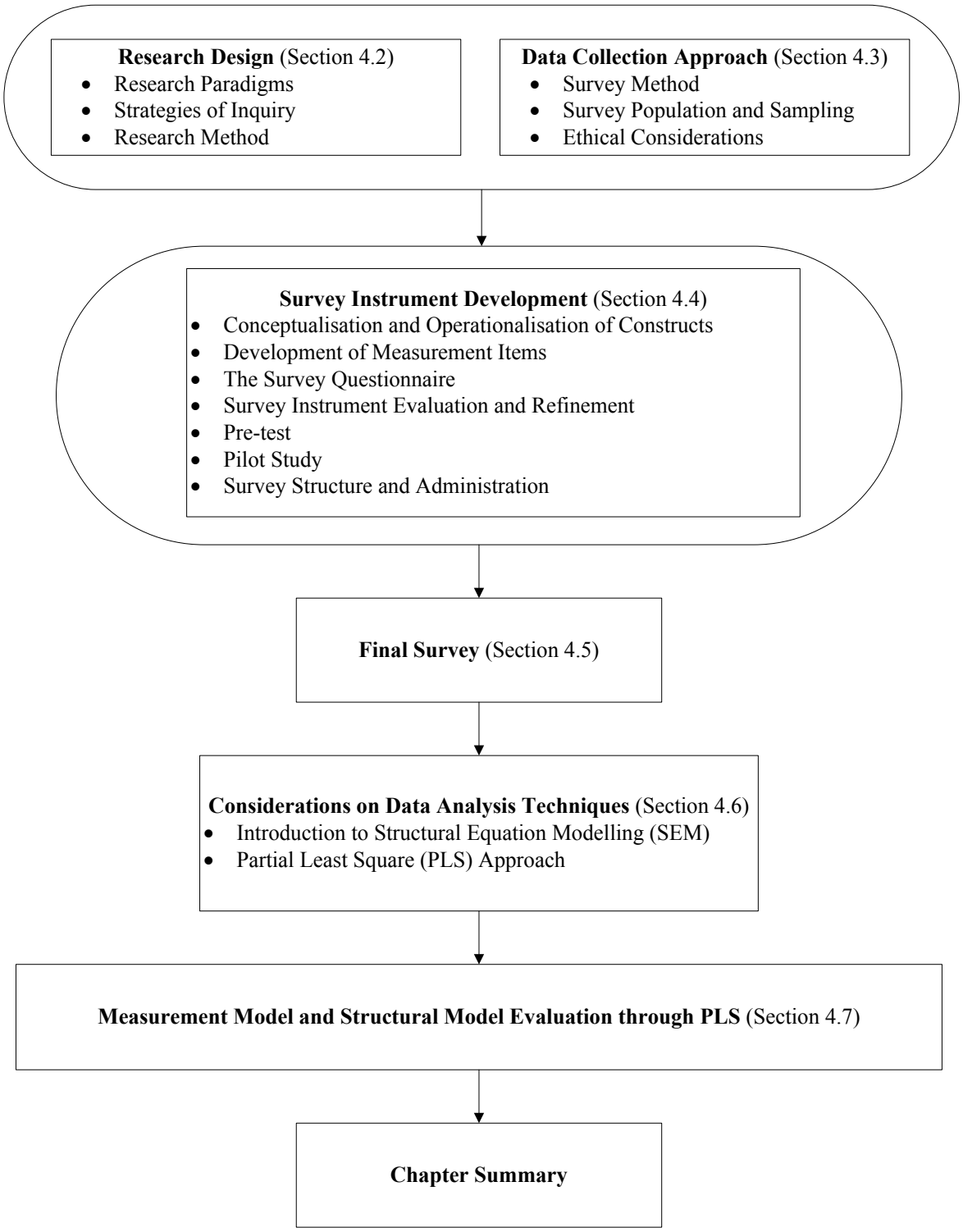

Figure 4.1. An overview of Chapter Four

4.2 Research Design

According to Crotty (1998) and Creswell (2009), four points need to be considered in designing a research study. The first point is epistemology that refers to the theory of knowledge in the theoretical discipline that relates to the phenomena being studied. The second point is the theoretical perspective that stands behind the chosen methodology in question. The third point is methodology that refers to the strategy of action that connects methods to outcomes (e.g., experimental research, survey research). The fourth point is methods that refer to the techniques and procedures to be used (e.g., questionnaire, interview).

Philosophically, researchers make claims about what is knowledge, called ontology, and how we know it, called epistemology (Creswell, 2009). Ontology (i.e., the nature of reality) refers to philosophical assumptions and questions relevant to the nature of social reality (Bryman & Bell, 2007; Creswell & Clark, 2011). Epistemology refers to how we know what we know (Bryman & Bell, 2007). Three major positions have been established: objectivism, constructivism and subjectivism. Objectivism as an ontological position that assumes that social entities are external and posits that social phenomena have an existence separate from social actors (Bryman & Bell, 2007). Constructivism, however, disapproves of objectivism's point of view regarding human knowledge and claims that truth does not exist in the external world; that is, individuals create knowledge and ideas from their interaction with the external world and their experiences (Gray, 2013). In contrast to constructivism, subjectivism refers to social phenomena, their meanings and the social constructions that are regularly being created by the perceptions and actions of social actors (Bryman & Bell, 2007). This research adopts objectivism; that is, social phenomena and their meanings are independent from social actors. In addition, it holds that there is an objective reality which is not created by the thoughts one has and the researcher's goals are to discover that reality.

A combination of the three principal elements of inquiry (i.e., research paradigms, strategies and methods) form different approaches to research. These approaches are then translated into the processes of research design, as shown in Figure 4.2.

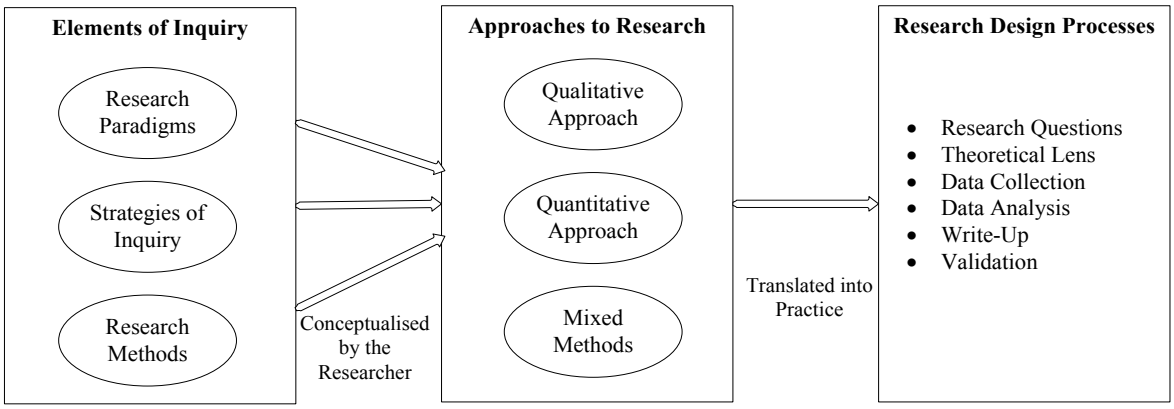

Figure 4.2. Elements of inquiry leading to research approaches and methods: Creswell (2009)

4.2.1 Research Paradigms (Knowledge Claims)

The first element that has to be considered when developing a research plan is identification of the specific research paradigm that underpins the research (Creswell, 2009). A paradigm is defined as "the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways" (Guba & Lincoln, 1994, p. 105). Paradigms are also called knowledge claims and philosophical worldviews (Creswell, 2009; Guba & Lincoln, 2000). A research paradigm means that researchers begin a research with determined assumptions about how they will learn and what they will learn during their inquiry. Four paradigms organised by Creswell (2009) are constructivist, advocacy/participatory, pragmatist and postpositivist.

Assumptions identified in the constructivist paradigm reveal that individuals explore understanding of the world in which they live and work. Individuals construct subjective meanings through social interactions. This paradigm relies on the participants' views of the situation being studied (Creswell, 2009). Participants create multiple subjective meanings through interactions with others and through historical and social norms (Creswell & Clark, 2011). The more open-ended the questions, the more likely the researcher is able to listen intently to what participants say or do in their social setting. This paradigm is typically seen as an approach to qualitative research. Constructivism generates or develops a theory rather than starting with a theory (Creswell, 2009).

The advocacy/participatory paradigm posits that inquiry needs to be intertwined with a political agenda and it is often used in the qualitative approach rather than the quantitative approach (Creswell, 2009). In this paradigm, specific problems need to be covered that relate to important social issues, such as inequality, empowerment, domination, oppression, suppression and alienation. The advocacy/participatory researcher often starts with one of these problems as the principal point of research (Creswell, 2009). This advocacy may provide a voice for the research participants, upraise their consciousness or boost an agenda for change to improve the lives of the participants. In this paradigm, theoretical perspectives integrate with the philosophical assumptions being studied, the participants and the changes that are required (Creswell & Clark, 2011).

In the pragmatist paradigm, researchers do not focus on methods; they apply all approaches to understand the problem (Rossman & Wilson, 1985). This paradigm, as a philosophical underpinning for mixed methods research, conveys the importance of emphasising the research problem in social science research and then employs pluralistic approaches to infer knowledge about the problem (Creswell, 2009). Pragmatism is oriented toward what works and real-world practice (Creswell & Clark, 2011). Pragmatism is open to multiple methods, different worldviews and assumptions, as well as to different types of data collection and analysis in mixed methods research.

Postpositivism represents a philosophy in which causes are likely to determine the effects or outcomes. Thus, the problems studied by postpositivists reflect a need to assess causes that impact outcomes. Postpositivism also reduces ideas into a small, distinct set of ideas. In addition, developing numeric measures of observations and studying the behaviour of individuals are very important for a postpositivist (Creswell, 2009; Creswell & Clark, 2011). In postpositivism, a researcher starts with a theory, collects data that either support or reject the theory, and then tests the proposed hypotheses (Creswell & Clark, 2011). This is considered as an approach for quantitative research rather than qualitative research (Creswell, 2009). This study aligns with the postpositivist paradigm since it starts with theory to generate hypotheses, and then collects data that either support or reject the theory. The summary of the four paradigms by Creswell (2009) are shown in Table 4.1.

Table 4.1. Alternative Research Paradigm Positions. Source: Creswell (2009)

Postpositivist • Determination • Reductionism • Empirical observation and measurement • Theory verification	Constructivist • Understanding • Multiple participant meanings • Social and historical construction • Theory generation
Advocacy/Participatory • Political • Empowerment issue-oriented • Collaborative • Change-oriented	Pragmatist • Consequences of actions • Problem-centred • Pluralistic • Real-world practice oriented

4.2.2 Strategies of Inquiry

The second element that has to be considered during a research plan is the specific strategy of inquiry (Creswell, 2009). Researchers select research design assumptions about a research paradigm, referred to as strategies of inquiry or research methodologies (Creswell, 2009; Mertens, 2003). Strategies of inquiry provide researchers with a specific direction in research design processes. There are three major strategies in the social sciences: quantitative strategy, qualitative strategy and mixed methods strategy (Creswell, 2009).

A quantitative strategy is often applied when researchers use postpositivist claims for developing knowledge, theory testing, reduction to specific variables, research questions and hypotheses, and cause and effect thinking (Bryman & Bell, 2007; Creswell, 2009). The quantitative approach employs strategies of inquiry such as surveys and experiments (Creswell, 2009).

A qualitative strategy is often applied when researchers use constructive or advocacy/participatory claims for developing a theory or pattern, constructing historical and social meanings, studying the context or setting of participants, and interpreting the data (Creswell, 2009). A qualitative strategy employs strategies of inquiry such as narratives, phenomenology, ethnographies, grounded theory and case studies to collect open-ended data

(Creswell, 2009). This qualitative strategy as an inductive approach focuses on words rather than quantification in the data collection and data analysis.

A mixed methods strategy is often applied when researchers use pragmatic claims for developing a rationale for mixing methods and integrating the data at different stages of inquiry. This strategy combines both quantitative and qualitative approaches into a single study (Bryman & Bell, 2007). Mixed methods strategy integrates the most fitting techniques from qualitative and quantitative strategies to investigate a phenomenon of interest (Teddlie & Tashakkori, 2010). Mixed methods help to develop rich insights into various phenomena of interest that would not be fully understood using only a qualitative or a quantitative method (Venkatesh, Brown, & Bala, 2013).

According to Creswell (2009), if the research problem calls for the identification of factors that influence an outcome, then a quantitative approach is more appropriate. This study adopts the quantitative strategy as it mainly involves a deductive approach (i.e., theory testing), and investigates the relationship among variables using statistical methods. This research will identify and assess the psychological factors that impact employees' IS infusion behaviours.

4.2.3 Research Method

The third element that has to be considered for a research plan is the specific research methods of collecting data and analysis. It is necessary to reflect on the full range of possibilities for data collection in any research and to organise these methods according to their predetermined nature, their emphasise on numeric versus non-numeric data analysis and their use of closed-ended versus open-ended questioning (Creswell, 2009). Researchers decide which type of research method will be used based on their intent regarding the type of information that needs to be collected. In addition, the type of collected data may be numeric data gathered on scales of instruments (i.e., quantitative) or text information, recording and reporting the voice of the participants (i.e., qualitative) (Creswell, 2009).

The quantitative approach collects numeric data through predetermined instruments based on usually closed-ended questions to yield data that can be analysed using statistical procedures

(Creswell, 2009). On the other hand, the qualitative approach uses methods such as interviews with open-ended questions to provide the actual words of participants and to determine the many different themes on the investigated phenomena, offering a complex form of the situation by interpreting the meaning of the collected data (Creswell, 2007). The mixed methods approach contains specifications from both the quantitative and qualitative methods (Creswell, 2009). The overview of these three methods is presented in Table 4.2.

Table 4.2. Philosophical Assumptions and Employment of Quantitative Methods. Adapted from Creswell (2009)

Quantitative Approach
• Postpositivist research paradigms • Surveys and experiments • Closed-ended questions • Predetermined approaches • Numeric data • Testing theories • Verification of theories • Identifying variables • Relating variables in questions and hypotheses • Validity and reliability • Measuring information numerically • Using unbiased approaches • Employing statistical procedures

The elements of inquiries (i.e., research paradigm, method and strategies of inquiry) and approaches to research (i.e., qualitative, quantitative and mixed methods) show the interrelated decisions that go into the process of designing a research (Creswell, 2009). This research applies the postpositivist paradigm and quantitative method to test a model and answer the research questions, relating variables in hypotheses, specifying the type of data to be collected, using an instrument with predetermined questions, and using statistical procedures to analyse the data.

4.3 Data Collection Approach

In this section, the survey method, survey population, sampling and survey ethical considerations are discussed in detail.

4.3.1 Survey Method

According to Creswell (2009) there are two quantitative method of inquiry: surveys and experiments. Surveys provide numeric descriptions of ideas of a population by studying a sample of that population, whilst experiments determine if a specific treatment impacts an outcome (Creswell, 2009). Experiments include true experiments by randomly assigning the participants to treatment conditions (Creswell, 2009). The survey method is a quantitative method that needs information to explain variables and relationships between variables (Malhotra & Grover, 1998).

The survey method was chosen over experimental research for this study for a number of reasons. First, survey research allows the researcher to test the hypotheses without manipulating variables (Newsted, Huff, & Munro, 1998). By collecting data from participants in a natural situation without manipulating the study environment, findings from survey research generate statistical evidence to assist the researcher to evaluate the relationships between employees' IT identity, IS infusion role identity and their IS infusion behaviour in this study. Second, survey research provides numeric descriptions of opinions of a population by studying a sample of that population, whilst experiments are applied to determine if a specific treatment influences an outcome (Creswell, 2009). Using the survey method, inferences can be made about the specific characteristics and behaviour of the studied population (Newsted et al., 1998). This research includes empirical testing of variables and their relationships. In this study, the quantitative survey method provided a more generalisable picture of IS infusion behaviour, and identified the potential psychological factors influencing employees' IS infusion behaviour within an organisation. The study context is about employees infusing cloud CRM systems (i.e., Salesforce, Microsoft Dynamics) to do their job tasks.

Depending on the goal of the study, the survey approach can be either exploratory or explanatory (Kerlinger, 1986). The objective of an exploratory (descriptive) survey is to become familiar with a topic that is more appropriate in the early stages of the research with no adopted model by identifying the concepts and foundation of measurement (Malhotra & Grover, 1998).

The explanatory (causal) survey approach is reported as the most common kind of survey research, and is usually used to evaluate causal relationships between variables (Malhotra & Grover, 1998). Hypotheses are tested and the results are interpreted in order to contribute to theory development (Malhotra & Grover, 1998). This research uses an explanatory survey approach since its main objectives are to hypothesise and test the influence of employees' IT identity on their IS infusion role identity, and in turn the influence of IT identity and IS infusion role identity on their IS infusion behaviour as well as extended use, integrative use and emergent use behaviours.

Surveys can also be categorised as cross-sectional or longitudinal studies using questionnaires or structured interviews for data collection and for generalising from a sample to a population (Babbie, 1990). In the cross-sectional design, information is collected at one point of time from a selected sample. The intention of cross-sectional design is to collect a set of quantitative data related to two or more variables that are then investigated to detect patterns of association (Bryman & Bell, 2007; Malhotra & Grover, 1998). Longitudinal design, on the other hand, is used for studying phenomena that change over time. In longitudinal design, data is collected from the same sample at two or more points of time (Malhotra & Grover, 1998). This research used cross-sectional design. This means data were only gathered at one point of time. Data were collected at a certain period of time from the chosen sample to explain the larger population of interest.

4.3.2 Survey Population and Sampling

In a survey approach, data are collected from a sample of the population with the intention of generalising the findings from the sample to the population (Malhotra & Grover, 1998). The population of interest to this study refers to the professionals who have had the experience of using an enterprise system for more than one year to complete job tasks in

organisations. In particular, the enterprise system under study is a cloud-based (CRM) application. Cloud CRM systems such as Salesforce.com and Microsoft Dynamic collect customer data through their online business and their calls, sales force and service centers. Employees use this system for collecting, storing and accessing customer information, as well as for marketing and communicating with customers to help businesses gain insight into customers and to modify their business operations and capitalise on improved customer relations (Tian, 2011). This research targeted employees of organisations in New Zealand that were currently using a cloud CRM systems for more than two years to ensure sufficient time for IS infusion to take place (H. W. Kim et al., 2012). A minimum two-year period provides an organisation an appropriate amount of time to address updates and changes toward the technology. Furthermore, end-users needed to have used the system for more than one year. Data was collected from the employees working in the marketing and sales teams. However, employees were not obliged to use all features of the system to support their work activities.

Cloud computing is an emerging technology. Cloud computing is expanding globally and demonstrates essential characteristics such as services and resource sharing, external information storing, scalability and most significantly pay-as-you-go as the services renting concept (Abdollahzadegan, Hussin, Moshfegh Gohary, & Amini, 2013). Cloud computing is creating a shift in which organisations move from a fixed infrastructure capacity to a more flexible one and enables organisations to gain access to massive computational and other resources in pay-per-use fashion (Lin, Chuang, & Wang, 2014). Cloud computing and the Software as a Service (SaaS) deployment model have clearly been considered as a new commercial platform (Cusumano, 2010). SaaS is one of three main categories of cloud computing, alongside infrastructure as a service (IaaS) and platform as a service (PaaS). SaaS applications (e.g., cloud CRM) equip organisations to efficiently test and adopt new software applications (Lin et al., 2014). Some renowned cloud CRM vendors include Salesforce.com and Microsoft Dynamics CRM. Some available features of cloud CRM are lead, opportunity, reports, accounts, contacts, files, forecasts, chatter, data analytics (e.g., dashboard, pipeline), campaign, ideas, products, and so on. Generally, employees from the frontline team, customer relations, account management, marketing and sales/support heavily rely on CRM usage to do their tasks.

The participants in this study were selected based on convenience and accessibility sampling (Cavana, Delahaye, & Sekaran, 2001). This is because the number of organisations that have adopted cloud CRM systems for more than two years in New Zealand is limited. For this research, five organisations that had adopted cloud CRM were approached to participate in this study. Top management from sales/marketing and human resource departments were approached to share the survey link among the CRM users in their organisation or share it on their organisation's internal social media page.

4.3.3 Ethical Considerations

The ethical considerations of the data collection procedure mostly aim to protect all involved parties in the research from adverse consequences (Sekaran, 2006). The ethical guidelines set by the Auckland University of Technology Ethics Committee (AUTEC) were strictly adhered to throughout the data collection process of this study. Ethical approval for collecting data from participants was granted by AUTEC prior to conducting the actual survey on 27/02/2015 for a period of three years (reference no 15/44). The ethics application approval letter and the participants' information sheet are available in Appendices A and B.

According to AUTEC, a research study needs to adhere to the principles of partnership, participation and protection. In particular, the participant information sheet for this study provided the research title and an introduction to the researcher and the research goal. It specified that this study was part of a PhD programme with the objective of investigating the factors that influence employees when using cloud CRM systems such as Salesforce.com and Microsoft Dynamics to their fullest potential. The contact details of the researcher and AUTEC were disclosed to participants so that they could follow up with any concerns/questions.

It was also stated on the participant information sheet that there was a partnership between the researcher and employees who completed the survey. While employee participation in the survey contributed to the completion of this research, employees were also provided with the opportunity to receive a summary report of the research findings which could be beneficial to them.

Participants were made aware through the participant information sheet that their participation in the survey was entirely voluntary and could be withdrawn at any stage during the completion of the survey.

In addition, participants were made aware that their participation in this study was completely anonymous. There were no sensitive questions. Although, the survey included some demographic questions, the anonymity of the survey meant that participants could not be identified. In terms of participants' privacy, all the collected information is kept strictly confidential and stored in a secured place that only the researchers who are engaged in this research have access to. Participants were informed that the collected information would be used for a PhD thesis and for related academic publications and no information on specific individuals would be identified in any of these publications.

4.4 Survey Instrument Development

The survey instrument development entails a systematic process that involves three steps: 1) conceptualisation and operationalisation of constructs, 2) development of measurement items and survey questionnaire design, 3) survey instrument validation, evaluation and refinement (MacKenzie, Podsakoff, & Podsakoff, 2011). Figure 4.3 presents the survey instrument development steps, which are further explained in the following sections.

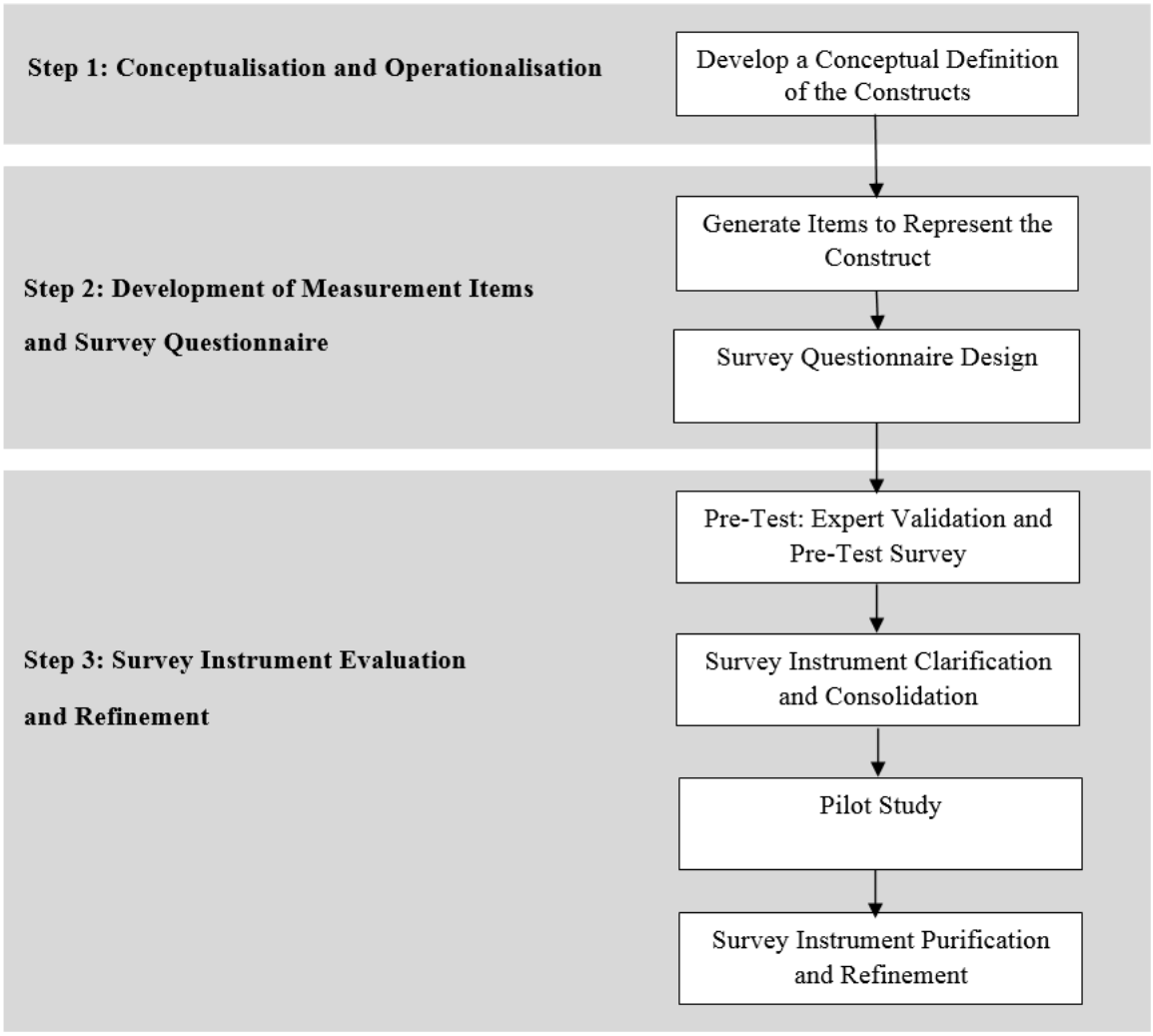

Figure 4.3. Survey instrument development. Adapted from Mackenzie et al. (2011)

4.4.1 Conceptualisation and Operationalisation of Constructs

According to Nunnally and Bernstein (1994), a construct is an abstract concept that is not observable, and does not exist as an observable dimension of behaviour. The constructs need to be translated into measurable items to develop a set of quantifiable measurements for each construct (MacKenzie et al., 2011).

In order to conceptualise and operationalise the constructs, a literature review on the meaning of related constructs needs to be done. The focal construct in prior research needs to be examined through consultation with practitioners and/or subject matter experts. Next,

researchers should specify the nature of each construct including the entity to which it applies as well as the general type of property to which the construct refers to. Then, the conceptual theme of each construct needs to be specified in unambiguous terms and in a manner that is consistent with prior research (MacKenzie, 2003). Table 4.3 provides a summary of necessary considerations for the construct conceptualisation process. In this study, the entity to which each construct applies is an individual user of a cloud CRM system. In this research, there are three key constructs in the research models: IT identity, IS infusion role identity and IS infusion behaviours. The general property of the IT identity construct refers to the set of meanings/thoughts attached to individuals in relation to the cloud CRM system. The IS infusion role identity construct refers to the expectancies, thoughts and beliefs of a user regarding her/his role as an employee who uses the cloud CRM system. The IS infusion behaviour construct refers to the user's IS deep use behaviour in the workplace.

Next, the researcher should clarify the intention of the constructs by describing the conceptual theme of each construct. The conceptual theme of a construct includes a set of essential characteristics, dimensionality and stability that are necessary and sufficient for the constructs. Each specified attribute/characteristic for the conceptual theme should be common to all exemplars of the construct (MacKenzie et al., 2011). However, identifying the conceptual theme for constructs often seems to be difficult, because it needs a clarification of thought that may be lacking in the early stages of the development of a construct (MacKenzie et al., 2011). It is also important to evaluate whether there are multiple sub-dimensions of the focal construct and how they relate to the focal construct and to each other (MacKenzie et al., 2011). In this study, two constructs are multidimensional, including IT identity is a higher-order construct, reflected in three interrelated dimensions (dependency, emotional attachment and relatedness) and IS infusion role identity is shaped by six determinants (self-support, social support, commitment, resource investment, and external and internal gratifications). The rest of the constructs, including IS infusion behaviour, extended use, integrative use and emergent use behaviours and perceived organisational valuing of IS infusion, are unidimensional.

In addition, it is also important to specify how stable each construct is expected to be over time, across situations, and across cases (Chaplin, John, & Goldberg, 1988). According to

structural symbolic interactionist theories, identities are relatively stable over time and across cases (Serpe & Stryker, 2011). In this study, all the constructs were expected to be relatively stable over time, across situations and across cases.

Table 4.3. Factors to Consider in Construct Conceptualisation. Adapted from Mackenzie et al. (2011)

Factor	Considerations
Investigate how the focal constructs have been used in prior studies	• Literature review on the focal constructs from prior theoretical and empirical research • Literature review on the meaning of related constructs • Conduct preliminary research with subject matter experts

Identify the nature of the construct's conceptual aspect	Specify the type of *entity* and *property* the construct represents
	• *IT identity*:
	  o Entity = person
	  o General property = set of meanings/thoughts attaches to individuals in relation to IT
	• *IS infusion role identity*:
	  o Entity = person
	  o General property = internal expectancies/thoughts about what it means to be competent in IS infusion
	• *IS infusion behaviour*:
	  o Entity = person
	  o General property = using an IS to its fullest potential

Identify the conceptual theme of the construct	Specify the necessary and sufficient attributes/characteristics of the constructs: • Common attributes/characteristics • Unique attributes/characteristics • Breadth/Inclusiveness Specify the *dimensionality* of the constructs • Unidimensional • Multidimensional Specify the *stability* of the constructs • Over time • Across situations • Across cases
Define the construct in unambiguous terms	• Provide a concise and clear conceptual definition of the constructs • Should not be subject to multiple interpretations • Should not be overly technical • Should define construct positively, not by the denial of other things • Should not be circular or self-referential

According to the explanations above, it is important for researchers to be as clear and concise as possible in the defining of the conceptual domain of the construct (MacKenzie et al., 2011). A summary of the 16 constructs of this research is presented in Table 4.4, with their operational definitions and related literature.

Table 4.4 (Cont.) Definitions of Constructs

Construct	Conceptual Definition	Operational Definition	Related Literature
IT identity	The set of meanings an individual attaches to the self in relation to information technology (IT), as a product of individuals' history of interactions with an IT that shapes their ongoing IT use behaviours.	Reflected in three interrelated dimensions: relatedness, emotional attachment and dependency.	Adapted from Carter and Grover (2015)
Relatedness	A blurring of boundaries between notions of the self and an IT experienced as feelings of connectedness with an IT or class of ITs.	The extent to which an employee expresses feelings of connectedness when thinking about her/ himself in relation to the CRM system.	Adapted from Carter and Grover (2015)
Emotional attachment	An individual's enduring feelings of emotional attachment and enthusiasm in relation to an IT or class of IT.	The extent to which an employee expresses feelings of confidence and enthusiasm, when thinking about her/himself in relation to the CRM system.	Adapted from Carter and Grover (2015)
Dependency	A person's reliance on an IT or class of ITs.	The extent to which an employee expresses feelings of reliance when thinking about her/himself in relation to the CRM system.	Adapted from Carter and Grover (2015)
IS infusion role identity	A person personally views that using the most features of a system or exploring the new features in innovative ways to accomplish multiple job tasks is an important part of their sense of self as an individual.	Formed by six determinants: self-support, social support, commitment, resource investment, and external and internal gratifications.	Adapted from Farmer and Van Dyne (2010)
Self-support	A person her/himself supports her/his own imaginative view of her/his qualities and performances as an occupant of the given position.	The degree to which the employee her/himself supports her/his own imaginative view of her/his qualities and performances in relation to CRM use as an occupant of the given position.	Adapted from McCall and Simmons (1978)
Social support	A person's view of self has been supported by relevant others.	The degree to which an employee's view of self in relation to CRM use has been	Adapted from McCall and

Construct	Conceptual Definition	Operational Definition	Related Literature
		supported by relevant others in the organisation.	Simmons (1978)
Commitment	An individual has committed her/himself to the particular contents of (the) role-identity.	The degree to which an employee has committed her/himself to the CRM use role-identity in the organisation.	Adapted from McCall and Simmons (1978)
Resource investment	If one stakes most of her/his time/energy or life's work on fulfilling a particular view of her/himself, that identity will be more prominent in the hierarchy, for one does not live by imagination alone.	If an employee stakes most of her/his time/energy on fulfilling a particular view of her/himself in relation to the CRM use in the workplace, that identity will be more prominent in the hierarchy.	Adapted from McCall and Simmons (1978)
External gratifications	Those identities and roles that materially benefit the individual by gaining her/him extrinsic rewards like money, labour, goods, favour, prestige.	Those identities and roles in relation to the CRM use in the workplace that materially benefit the employee by gaining her/him extrinsic rewards like money, bonus, prestige.	Adapted from McCall and Simmons (1978)
Internal gratifications	To begin with, the sheer sense of efficacy in having done something with reasonable competence.	An employee's sheer sense of efficacy in having done something in relation to the CRM use with reasonable competence in the workplace.	Adapted from McCall and Simmons (1978)
IS infusion behaviour	The degree to which an IS application is used by end-users to its fullest potential within an organisation.	Refers to using the CRM system to its fullest potential in the workplace.	Adapted from Cooper and Zmud (1990)
Extended use	Using more features of the IS to complete/support the individual's tasks/performances.	Refers to using more features of the CRM to complete/support the employee's tasks/performances in the workplace.	Adapted from (H. W. Kim & Gupta, 2014)
Integrative use	Using the system to reinforce linkages among tasks.	Refers to using the CRM to reinforce linkages among tasks in the workplace.	Adapted from (H. W. Kim & Gupta, 2014)
Emergent use	Using a system in an innovative and new manner to support tasks.	Refers to using the CRM in an innovative and new manner to support tasks in the workplace.	Adapted from (H. W. Kim & Gupta, 2014)
Perceived organisational valuing of IS infusion	An individual perceives that her/his environment values a specific behaviour to validate the-related role identities.	The extent to which employees perceive that their organisation values IS infusion behaviour to validate their IS infusion role identities.	Adapted from Farmer et al. (2003)

4.4.2 Development of Measurement Items

Once each focal construct has been conceptually defined, the next step is to produce a set of measurement items that completely demonstrates the conceptual domain and clarifies attributes of the construct (MacKenzie et al., 2011). These measurement items may be derived from various sources including reviews of prior studies, previous theoretical and empirical research on the focal construct, deduction from the theoretical definition of the construct, comments/feedbacks from experts in the discipline, interviews with the population(s) to which the focal construct is expected to distribute, and an investigation of other measurement items of the construct that already exist (MacKenzie et al., 2011; Nunnally & Bernstein, 1994). In this study, the measurement items used to measure each construct were adapted from previously validated items of prior studies by carefully modifying them to fit into the context of this study.

There are advantages in using previously validated measurement items in survey research. The quality of the adapted items regarding their reliability and validity has already been examined in prior studies (Bryman & Bell, 2007). Frequently testing the construct using the same set of measurement items across various research contexts contributes to establishing the nomological validity of the construct (Straub, Boudreau, & Gefen, 2004). Therefore, it gives the researchers confidence that these items are likely to produce satisfactory reliability and validity as well as increasing the likelihood of expanding the use of the construct to a larger context.

The items used to measure each sub-dimension of IT identity including relatedness, emotional attachment and dependency were adapted from Carter and Grover (2015). The items used to measure each determinant of IS infusion role identity including self-support, social support, commitment, resource investment and internal gratifications were adapted from Reid (1999). The items measuring external gratifications of the IS infusion role identity construct were adapted from Li et al. (2013). Items measuring IS infusion behaviour were adapted from Fadel (2012). The measurement items used to measure each sub-dimension of IS infusion behaviour including extended use, integrative use and emergent use were adapted from Ng and Kim (2009). The measurement items from Farmer and colleagues (2003) were

adapted to measure perceived organisational valuing of IS infusion construct. The survey questions statements are listed in Table 4.5.

In this study, all the constructs were measured using multiple items. Self-support, social-support, commitment, resource investment and internal gratifications had three items while perceived organisational valuing of IS infusion had six items. All the remaining constructs were measured using four items. A Likert scale is used for its simplicity and ease of use in social sciences and IS studies to measure the constructs. A Likert scale requires the participant to make a decision on the degree of her/his agreement with a statement (Neuman, 2011). In this study, a seven-point Likert scale (strongly disagree, disagree, slightly disagree, neutral, slightly agree, agree and strongly agree) was used to measure all of the mentioned constructs, ranging from 1 (strongly disagree) to 7 (strongly agree).

Table 4.5 (Cont.). Measurement Items

Construct	Item Names	Item Description	Reference
Self-support	SEL1	On average, as an employee, I think I do well at being the sort of IS infuser that I perceive myself to be.	Reid (1999)
	SEL2	On average, I think that I have the important characteristics/skills to be an IS infuser.	Reid (1999)
	SEL3	On average, I feel I do well at being an IS infuser.	Reid (1999)
Social support	SOC1	On average, I believe my colleagues think I do well at being an IS infuser.	Reid (1999)
	SOC2	On average, I believe my colleagues think that I have the important characteristics to be an IS infuser.	Reid (1999)
	SOC3	On average, my colleagues think I am a good example of an IS infuser.	Reid (1999)
Commitment	COM1	As an employee, I feel that I have devoted myself to being the kind of IS infuser that I perceive myself to be.	Reid (1999)
	COM2	I feel that I have strongly committed myself to being recognised as an IS infuser.	Reid (1999)
	COM3	I feel that I have devoted a lot of myself to view myself as an IS infuser.	Reid (1999)
Resource investment	RES1	As an employee, I have given most of my working time to being the kind of IS infuser that I perceive myself to be.	Reid (1999)
	RES2	As an employee, I have given most of my working available resources to being the kind of IS infuser that I perceive myself to be.	Reid (1999)
	RES3	As an employee, I have given most of my energy to being the kind of IS infuser that I perceive myself to be.	Reid (1999)
External gratifications	EXT1	Aside from pure enjoyment, on average, I get rewards (e.g., bonus, promotion, praise) from being an IS infuser.	Reid (1999)
	EXT2	I increase my productivity by being an IS infuser.	Li et al. (2013)
	EXT3	I accomplish tasks more quickly by being an IS infuser.	Li et al. (2013)

Construct	Item Names	Item Description	Reference
	EXT4	I improve my job performance by being an IS infuser.	Li et al. (2013)
	EXT5	I enhance my effectiveness in my job by being an IS infuser.	Li et al. (2013)
Internal gratifications	INT1	On average, I enjoy being an IS infuser.	Reid (1999)
	INT2	On average, I get a good feeling from being an IS infuser.	Reid (1999)
	INT3	On average, I feel good about myself from being an IS infuser.	Reid (1999)
Dependency	DEP1	Thinking about myself in relation to the CRM use, I feel dependent on this system to do my job tasks.	Carter and Grover (2015)
	DEP2	Thinking about myself in relation to the CRM, I am counting on this system to do my job tasks.	Carter and Grover (2015)
	DEP3	Thinking about myself in relation to the CRM, I am reliant on this system to do my job tasks.	Carter and Grover (2015)
	DEP4	Thinking about myself in relation to the CRM, I feel that I need this system to do my job tasks.	Carter and Grover (2015)
Emotional attachment	EMA1	Thinking about myself in relation to the CRM to do my job tasks, I feel energised.	Carter and Grover (2015)
	EMA2	Thinking about myself in relation to the CRM to do my job tasks, I feel confident.	Carter and Grover (2015)
	EMA3	Thinking about myself in relation to the CRM to do my job tasks, I feel pumped up.	Carter and Grover (2015)
	EMA4	Thinking about myself in relation to the CRM to do my job tasks, I feel enthusiastic.	Carter and Grover (2015)
Relatedness	REL1	Thinking about myself in relation to the CRM to do my job tasks, I feel close to this system.	Carter and Grover (2015)
	REL2	Thinking about myself in relation to the CRM to do my job tasks, I feel connected with this system.	Carter and Grover (2015)
	REL3	Thinking about myself in relation to the CRM to do my job tasks, I am in coordination with this system.	Carter and Grover (2015)
	REL4	Thinking about myself in relation to the CRM to do my job tasks, I feel linked with this system.	Carter and Grover (2015)
Infusion	INF1	I am using the CRM system to its fullest potential to support my own work.	Fadel (2012)
	INF2	I am using all capabilities of the CRM system in the best fashion to help me on the job.	Fadel (2012)
	INF3	I doubt that there are any better ways for me to use the CRM system to support my work.	Fadel (2012)
	INF4	My use of the CRM system has been integrated and incorporated into my work at the highest level.	Fadel (2012)

Construct	Item Names	Item Description	Reference
Extended use	EXTU1	I fully use the available CRM system features to complete my tasks.	Ng and Kim (2009)
	EXTU2	I use most of the available CRM system features in performing my tasks.	Ng and Kim (2009)
	EXTU3	I make use of the available CRM system features thoroughly to accommodate my tasks.	Ng and Kim (2009)
	EXTU4	I use all available CRM system features to help me in my tasks.	Ng and Kim (2009)
Integrative use	INTU1	I use the CRM system for better connections among tasks.	Ng and Kim (2009)
	INTU2	I use the CRM system to organise various tasks in an integrative manner.	Ng and Kim (2009)
	INTU3	I use the CRM system to coordinate multiple tasks.	Ng and Kim (2009)
	INTU4	I use the CRM system to handle related tasks.	Ng and Kim (2009)
Emergent use	EMEU1	I explore new uses of the CRM system to support my tasks.	Ng and Kim (2009)
	EMEU2	I often experiment with new ways of using the CRM system to accomplish my tasks.	Ng and Kim (2009)
	EMEU3	I often find new uses of the CRM system in performing my tasks.	Ng and Kim (2009)
	EMEU4	I use the CRM system in novel ways to complete my tasks.	Ng and Kim (2009)
Perceived organisational valuing of IS infusion	ORG1	Top management is very supportive of IS infusion behaviours in my organisation.	Farmer et al. (2003)
	ORG2	I feel being an IS infuser is supported and encouraged in my organisation.	Farmer et al. (2003)
	ORG3	Top management values IS infusion behaviours in my organisation.	Farmer et al. (2003)
	ORG4	I can be an IS infuser without feeling threatened by others in my organisation.	Farmer et al. (2003)
	ORG5	Being an IS infuser is encouraged in my organisation.	Farmer et al. (2003)
	ORG6	Being an IS infuser is fostered in my organisation.	Farmer et al. (2003)

4.4.3 The Survey Questionnaire

Once a valid set of measurement items has been generated, the next step is to officially specify a measurement model, which in this study was a survey questionnaire. A survey captures the expected relationships between the indicators, sub-dimensions of constructs and the focal constructs (MacKenzie et al., 2011). The adapted and revised measurement items were then rendered in a self-administrated questionnaire statement. According to Sekaran (2006), a self-administrated questionnaire has the advantages of high efficiency in time, energy and costs over other types of data collection processes (e.g., interview and observation). The questionnaire was presented in English and organised in the following sequence:

An invitation email included a participant information sheet approved by AUTEC and the survey link. The online survey was hosted on the Qualtrics website at AUT University. At the beginning of the questionnaire, the purpose of the study was explained and a brief introduction about the number of questions was provided. The draw for a NZ$100 gift card was also stated followed by demographic questions including gender, age, position, tenure, former IT experience, education level, type of CRM systems used and the extent of participants' IT use. The first page included a filter question asking participants whether they had worked with CRM systems or not. The filter question asked how many years they had used the CRM system – if the answer was "less than 1 year", a "Thank You" message was displayed in appreciation of their participation, indicating the end of their participation. The following pages of the questionnaire began with clarification of two points pertaining to the similarity of some questions to establish statistical reliability/validity and the definition of an IS infuser at the top of each page. The remaining pages of the questionnaire asked the key questions corresponding to the constructs of the study.

4.4.4 Survey Instrument Evaluation and Refinement

In order to fine-tune the survey, the full questionnaire with adapted measurement items was examined and refined in two steps: pre-test and pilot study (Straub et al., 2004).

- ***Pre-test***: This was conducted in two steps. First, a number of experts were approached for their opinions on questionnaire design and CRM usage. Second, a pre-test survey was carried out with practitioners to critique matters relevant for initial instrument design.
- ***Pilot study***: This was conducted with employees who used the cloud CRM system with the purpose of collecting initial data, refining the questionnaire and assessing the reliability and validity of the measurement model.

4.4.4.1 Pre-test

For this research, the pre-test was done in two steps. First, a number of experts were approached for their opinions to check and comment on the face validity of the measurement items, the clarity of the questions and the questionnaire design. These experts had sufficient experience of using the CRM system and/or experience with a quantitative-survey tool and questionnaire design. Second, a pre-test survey was conducted with practitioners to check on questionnaire format, clarity of the instructions and statements of items, content representation, ease of understandability, length and speed of completion.

The pre-test process is necessary because invalid items may threaten the reliability of findings and unclear instructions and statements could cause frustration for the respondents, resulting in them dropping the survey without completing the entire questionnaire (Ray & Tabor, 2003). In March 2015, five experts – two academics who had experience with survey studies and individuals' behavioural research, and three experts who had experience using CRM systems – were approached for their expertise on questionnaire design and the CRM system. Experts were provided with a printed version of the survey questionnaire. They were asked to provide feedback on the clarity of content, the overall design of the questionnaire and the sequence of presenting the statements to avoid respondents' bias (Ray & Tabor, 2003). They commented on wording, flow of questions and clarification for having similar questions. Several refinements were then made to improve the flow and structure of the questions according to the experts' feedbacks. In addition, pages with main questions began with a clarification statement regarding repetitive questions to explain the reason for having similar questions to ensure statistical reliability and validity.

After modifying the questionnaire based on the experts' comments, the pre-test survey was carried out in April 2015 with 10 practitioners from AUT University who had prior experience with CRM systems. Practitioners were provided with the online version of the survey questionnaire, which was hosted by Qualtrics equipped by AUT University. A pre-test is a trial of the survey that tries to detect issues in instrument design that may cause exhaustion in participants and stop them from completing the survey (Boudreau, Gefen, & Straub, 2001). During the pre-test survey, practitioners were asked to complete the survey to evaluate its administration on an online platform using different devices (e.g., desktop, laptop, tablet and mobile) and provide feedback on the instrument design (e.g., format, layout, vision presentation, terminology and length) (Lewis, Templeton, & Byrd, 2005). The practitioners filled in the survey and spent, on average, 11 minutes to complete it. The practitioners suggested a few changes in wording and the inclusion of a progress bar so that participants are able to determine how many more items are remaining. Based on their comments, a progress bar was added on top of each page and minor changes to the wording of the instrument were made as well.

4.4.4.2 Pilot Study

A pilot study is a rehearsal of the instrument with a small sample size, in which participants are similar to the population of the final survey (Lewis et al., 2005). The purpose of a pilot study is to collect initial data for fine tuning the instrument and assessing the measurement model prior to the actual data collection (Churchill, 1979).

In this research, a pilot study was conducted in May 2015, after the pre-test process and prior to administering the actual survey. The pilot test was conducted at a company that had adopted cloud CRM for more than three years, in Hamilton, New Zealand. The sales director of this company was approached and asked to share the pilot study survey link with the employees who use CRM in the organisation. The pilot study aimed to identify any problems in understanding the questions. A comment box was provided for participants to give comments on the questionnaire at the end of the survey. Findings of the pilot study from 42 respondents indicated that there were no major difficulties in understanding the questionnaire items and instructions. The measurement model validation based on pilot study data is presented in Section
Pilot Study Findings.

4.4.5 Survey Structure and Administration

For the administration of the survey, the researcher sent an invitation email along with the online questionnaire link and the participant information sheet approved by AUTEC to Sales/Human Resource Directors to share it with CRM users in their organisations. The final design of the online survey is presented in Figure 4.4 in the sequence each section appeared in the questionnaire. The data collection process was conducted for four months starting from August 2015 to November 2015. After two months, a gentle reminder email was sent to the CRM users. The survey was closed on 30 November 2015. In total, out of 510 responses, 413 completed responses were gathered. The completion time for the survey ranged from 8 to 12 minutes. The following sections provide an introduction to the analysis of the collected data. The actual data analysis and reporting procedures are reported in Chapter Five.

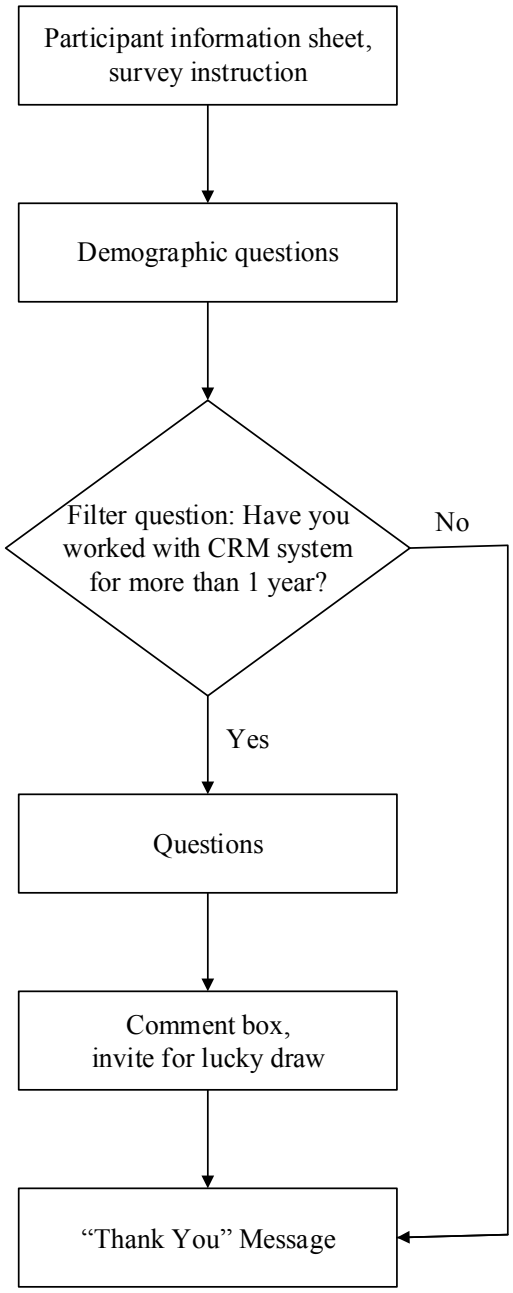

Figure 4.4. The online survey questionnaire logic flow

4.5 Data Preparation

The data preparation procedure requires coding and data entry into a database, finding any missing responses and data filtering. Using the Qualtrics web survey, the data is entered automatically into a database (e.g., SPSS). A total of 510 participants accepted the survey invitation. Any incomplete or invalid data were excluded. Out of the 510 responses, 95 responses were found to be incomplete and invalid. Although the survey was set to "force

responses to all questions" before advancing to the next stage and submission, there were some cases in which participants stopped answering the questions and left the survey halfway through. These responses were regarded as incomplete responses. In addition, responses completed in less than three minutes showed that the participants were not paying enough attention while answering the questionnaire and this caused the responses to be invalid. According to the feedbacks from experts and participants of the pilot study, the survey needed at least eight minutes to be read and answered due to the length of the questions in the survey.

After the initial scrutiny, all 413 acceptable cases were entered into the SPSS software, for producing descriptive statistical reports and generating exploratory analyses, response bias and common method bias.

Verifying the collected data is important to make sure the data is valid and complete for analysis. A number of analyses are executed to make sure data does not include any missing values, and to verify any potential of common method bias.

Missing values were not the concern of this research, as it used an online survey authoring package. Answering all of the questions was required and incomplete answers were not allowed to be submitted. Through the Qualtrics online survey service, there is an option to download the completed responses and exclude all the incomplete answers. Therefore, all the exported data were complete without any missing data.

4.5.1 Common Method Bias and Marker Variable

Common method bias (CMB), also known as common method variance, is an issue for behavioural research (Jarvis, MacKenzie, & Podsakoff, 2003). If correlations between constructs are relatively accounted for by shared methods, then common method bias occurs (Bagozzi & Yi, 1991; Jarvis et al., 2003). Common method bias demonstrates an origin of systematic error, which may cause a threat to the research's validity. In this study, several procedural and statistical remedies were implemented to reduce the potential of common method bias.

For this study, procedural and statistical remedies for CMB were conducted, including Podsakoff and colleagues' (2012) procedural remedies, the Harman one-factor test and the marker variable test. *Procedural remedies* refer to the efforts taken during data collection. First, multiple procedural remedies were used in this study, including obtaining measures from different sources and ensuring anonymity (Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003). The anonymity of participants was guaranteed before they took part in the survey, as preserving participants' anonymity is one method of controlling common method bias (Podsakoff et al., 2003).

Second, the *Harman one-factor test* (Harman, 1976; Podsakoff & Organ, 1986) was performed; all the items will be loaded into an exploratory factor analysis to examine the unrotated solution. CMB will identified if a single factor emerges from the factor analysis, and one general factor will account for a majority of the co-variance in the independent and dependent variables (Chin, Thatcher, & Wright, 2012; Jarvis et al., 2003). Generally, the amount of variance considered for CMB differs based on the field of research (Jarvis et al., 2003).

Third, *Lindell and Whitney's (2001) marker variable* test was applied. This test uses a theoretically unrelated construct as a control on dependent variables. The questionnaire needs to be designed in a way to support a discriminant validity test by intentionally including at least one marker variable. The marker variable should have high reliability and the variable should be measured by a multi-item scale. The marker variable should also be theoretically unrelated to at least one of the other variables (Lindell & Whitney, 2001). In this study, a theoretically unrelated construct was selected as the marker variable and measured by a seven-point Likert scale (strongly disagree, disagree, slightly disagree, neutral, slightly agree, agree and strongly agree). A brand image construct from the marketing field was selected regarding participants' attitudes towards Air New Zealand's marketing and advertising campaigns from all media such as TV, Internet, magazines, radio and sponsorship activities.

4.6 Data Analysis Techniques

Upon the completion of data collection, Structural Equation Modelling (SEM) was used to analyse the dataset. In this study SEM was chosen to analyse the quantitative data due to its ability to investigate the multiple relationships between a variable and its multiple indicators, and also to evaluate the hypothesised relationships among variables in the structural model (Hair, Hult, Ringle, & Sarstedt, 2013).

4.6.1 Introduction to Structural Equation Modelling (SEM)

SEM is a flexible modelling tool for conducting many multivariate statistical analyses, including regression analysis, factor analysis, path analysis, growth curve modelling and canonical correlation analysis (Gefen, Straub, & Boudreau, 2000). According to Chin (1998a), SEM empowers researchers to model relationships among multiple predictors and criterion variables, create unobservable latent variables, model measurement errors for observed variables, and statistically test a priori theoretical and measurement assumptions. SEM techniques and programs use a covariance-based approach (CB-SEM) (e.g., LISREL, AMOS) and component-based (e.g., PLS-SEM, PLS-GRAPH) analysis. Researchers are then able to investigate measurement and structural models simultaneously (Gefen et al., 2000; Petter, Straub, & Rai, 2007).

Partial least squares approach SEM (PLS-SEM) is an alternative method when CB-SEM assumptions cannot be met (Hair et al., 2011). According to Wold (1982), the informational and distributional demand required by CB-SEM is seen as unrealistic for many fields of inquiry, particularly in the social sciences. These two statistical methods should not be seen as competing statistical methods; rather, they should be considered as complementary methods (Joreskog & Wold, 1979). This study follows the rules of thumb proposed by Hair and colleagues (2011) to select a suitable statistical method between CB-SEM and PLS-SEM.

4.6.1.1 Rules of Thumb for Selecting CB-SEM or PLS-SEM

There are two approaches to estimating the relationships in a structural equation model: CB-SEM and PLS-SEM (Hair et al., 2013). There are a few rules of thumb used as guidance when selecting between CB-SEM and PLS-SEM based on the underlying assumptions, characteristics and objectives that distinguish these methods (Hair et al., 2013).

First, the researcher needs to identify the objective of conducting the study. If the research objective is to confirm a theory(s), then CB-SEM is an appropriate method to use as testing a theory requires confirmation of how well a theoretical model fits the observed data (Barclay, Higgins, & Thompson, 1995). The strength of CB-SEM is acknowledged in situations in which error terms require additional specification, such as the covariation. On the other hand, in situations where the research objective is for the prediction and explanation of target constructs, researchers should consider using PLS-SEM as an alternative approach to CB-SEM (Hair et al., 2013). In path model relationships, the focus is to maximise the R^2 values of the target constructs in order to increase the explanatory power of the model of the dependent constructs. Therefore, PLS-SEM is the preferred method when the theory development and explanation of variance is the main objective of the research.

Second, for the formative constructs, the explanation of the covariance of all indicators is not possible with the CB-SEM approach (Chin, 1998b), unless when performing construct specification modifications, the construct has both formative and reflective indicators to meet identification requirements (Hair et al., 2013). Meanwhile, PLS-SEM can evaluate the constructs with only formative indicators in the structural models. PLS-SEM can be applied to the research models that include either formative, reflective or the combination of both reflective and formative constructs (Chin, 1998b). Modelling of formative indicators is less problematic, because PLS-SEM can explicitly calculate the outer weights to shape construct scores (Chin, 2010b). Reflective and formative constructs used in this study are elaborated on in section Reflective and Formative Constructs.

Third, there is a set of requirements for using CB-SEM that involves the assessment of data normal distribution and large sample size, variable metric uniformity, observation

independence and global goodness-of-fit criterion (Hair et al., 2013; Sosik, Kahai, & Piovoso, 2009). If one of the assumptions fails CB-SEM results will be highly inaccurate (Hair et al., 2013). On the other hand, PLS-SEM can be used to analyse data with a small sample size. Normal distribution of data is not a requirement in PLS-SEM because PLS-SEM uses calibration procedures that convert any non-normal distributed data into data that cohere to the central limit proposition (Beebe, Pell, & Seasholtz, 1998).

According to the points mentioned earlier regarding structural model evaluation, the main objective of CB-SEM is theory testing, comparison of alternative theories and theory confirmation to test which alternate model fits the data better. In contrast, the goal of PLS-SEM is to predict the key target constructs or to identify key driver constructs that have been suggested based on the literature (Hair et al., 2013; Sosik et al., 2009).

In summary, this research adopts PLS-SEM as the statistical method to evaluate the measurement and structural models and to analyse the data based on the following reasons:

- The focus of this study is predicting the psychological factors related to employees' IS infusion behaviour within an organisation. Therefore, the plan is to use the latent variable (LV) scores to assess the underlying relationship between the LVs.
- This study uses 14 latent variables in the structural models. PLS-SEM is an appropriate approach for large complex models with many latent variables (Henseler et al., 2009).
- A 2nd order formative construct (IS infusion role identity) is part of the structural model of this study. According to Chin (2010b), PLS-SEM as an estimation technique is suggested to examine the research models with formative constructs, as CB-SEM requires formative construct specification modifications.

4.6.1.2 Partial Least Squares (PLS) Approach

PLS-SEM was created by an econometrician named Herman Wold in the 1960s and 1970s (Chin, 1998b). PLS-SEM path modelling usually uses two sets of models known as the measurement model and the structural model (Henseler, Ringle, & Sinkovics, 2009). In PLS-SEM, the structural model is assessed by R^2 values, which represent the amount of variance in the constructs that is explained by the model (Barclay et al., 1995; Chin, 1998b). The path

coefficient of the structural model is also tested in PLS-SEM (Meso, Musa, Straub, & Mbarika, 2009). A path coefficient indicates the relationship between dependent and independent constructs. In PLS-SEM, a bootstrapping method is used to evaluate the significance of path coefficients.

The PLS algorithm, in nature, is a continuity of regressions in terms of weight vectors (Henseler et al., 2009). The PLS algorithm allows indicators to differ based on how much they can contribute to the composite score of the latent variable; hence, indicators with weaker relationships to related indicators and latent construct are given lower weightings (Chin, Marcolin, & Newsted, 2003)

4.6.1.3 Reflective and Formative Constructs

In PLS-SEM, latent variables can be modelled as either reflective or formative constructs. Indicators of a reflective construct are impacted by the same underlying construct, which uses measures that co-vary in their extent and measure the same underlying construct (Jarvis et al., 2003; Ravichandran & Rai, 2000). In a reflective construct, the direction of causality is from the construct to the indicators, and changes in the underlying construct are hypothesised to entail changes in the indicators (Jarvis et al., 2003). As a result, indicators of a reflective construct should be consistent internally, as all of the measures are presumed to be equally valid indicators of the underlying latent variable (Petter et al., 2007).

Meanwhile, formative indicators cause the latent construct, thus representing different dimensions (Gefen et al., 2000). Formative indicators form the creation of a latent variable (Chin, 1998a). Formative indicators combine to approximate the underlying construct and are weighted according to their relative importance in forming the construct (Ravichandran & Rai, 2000). The formative indicators are not assumed to be correlated with each other or to represent the same underlying dimension. Preferably, formative indicators may occur independently (Chin, 1998a), are not correlated and do not have high internal consistency as shown in Cronbach's alpha (Bollen & Lennox, 1991).

Therefore, the main difference between reflective and formative measurement is that whereas the construct causes variance in reflective indicators, formative indicators cause the variance

in the construct (Cenfetelli & Bassellier, 2009). From a modelling point of view, arrows of formative indicators point to the latent construct, while arrows of reflective indicators lead away from the latent construct (Gefen et al., 2000). Figure 4.5 shows the diagram of reflective and formative constructs.

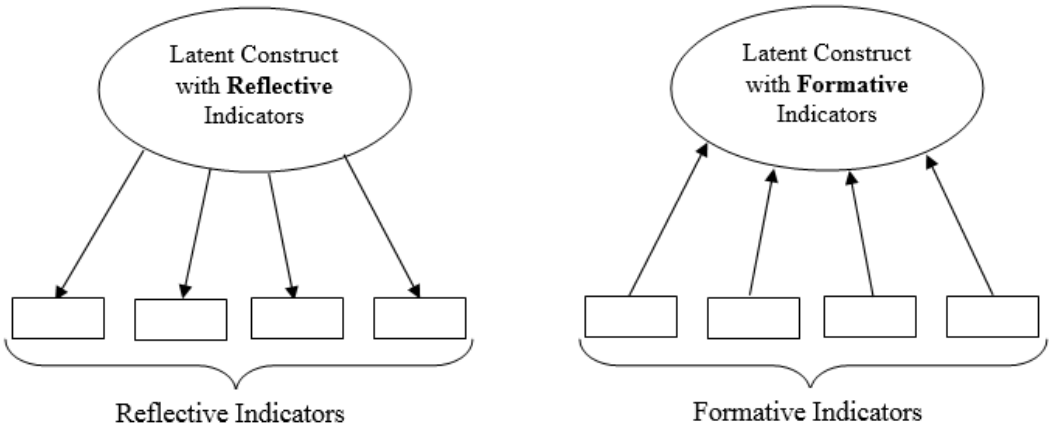

Figure 4.5. Diagrams of reflective and formative constructs and their relationships with indicators

Another significant characteristic of formative indicators is that they are not interchangeable, as are reflective indicators (Hair et al., 2013). Therefore, each indicator of formative constructs captures a particular aspect of the construct's scope. Figure 4.6 illustrates the coverage of the indicators of reflective and formative constructs. The black bold circle shows the domain of content the construct is going to measure. The scope of each indicator is shown by grey circles. While the formative measurement approach tries to fully cover the construct domain (black circle) through various formative indicators (grey circles), the reflective measurement approach aims to maximise the overlap between interchangeable indicators.

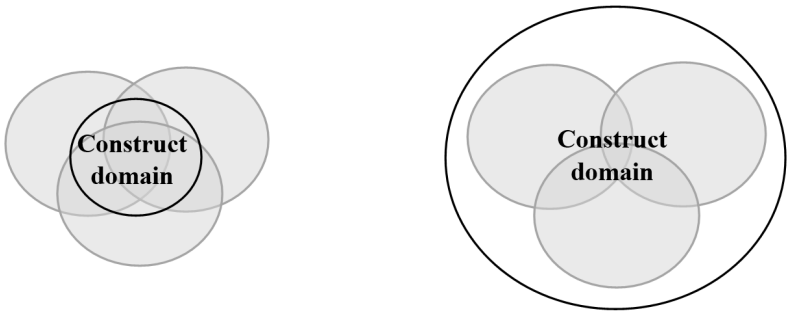

Figure 4.6. Reflective and formative measurement models. Adopted from Hair et al. (2013)

During an assessment of a particular construct, the type of measurement item specifies whether the loadings or the weights should be considered (Mathieson, Peacock, & Chin, 2001). The loadings will be examined for constructs with reflective measures, as loadings demonstrate the correlation between the indicators and the component score (Gefen et al., 2000). Meanwhile, the interpretation of constructs with formative indicators should be based on weights, as it represents the importance of each measure in the formation of the component (Chin, 1998a). In this study, all latent constructs are modelled as reflective measures except the IS infusion role identity construct, which is modelled as a formative construct. In order to avoid measurement model misspecification, it is crucial to use existing literature and knowledge congregated during the literature review stage for specification of the causality flows (Henseler et al., 2009). In this study, the causality flows of the IT identity construct is based on prior studies from Carter and colleagues (Carter, 2012, 2013; Carter & Grover, 2015). The causality flows of the IS infusion role identity is derived from McCall and Simmons (1978) and Reid (1999). The causality flows of IS infusion behaviour, extended use, integrative use and emergent use constructs are from Fadel (2012), H. W. Kim and Gupta (2014) and Ng and Kim (2009). The causality flows of perceived organisational valuing of the IS infusion construct is from (Farmer et al., 2003).

There are different types of second order reflective and formative constructs. Jarvis and colleagues (2003) provided a model for multidimensional formative and reflective indicator constructs (see Figure 4.7). According to Jarvis and colleagues (2003), it is important to consider that the conceptual definitions of constructs are usually determined at a more

abstract level. Sometimes constructs consist of multiple formative and/or reflective first-order dimensions. A single multidimensional construct consists of the measurement model related to its first-order components (Jarvis et al., 2003). The four different possible combinations in second-order factor models are depicted in Figure 4.7 (Types I-IV). Type (I) assumes a series of first-order latent variables with reflective indicators and also that these first-order variables are themselves reflective indicators of an underlying second-order construct. Type (II) is where the second-order variable has first-order variables as formative indicators and the first-order variables have reflective indicators. A type (III) second-order variable has first-order variables as reflective indicators like Type I models, but the first-order variables themselves have formative indicators. Type (IV) has formative indicators for both the first- and second-order variables (Jarvis et al., 2003). In this study, there are two types of constructs: IT identity as reflective first- and second-order constructs (Type I) and IS infusion role identity as reflective first-order and formative second-order constructs (Type II).

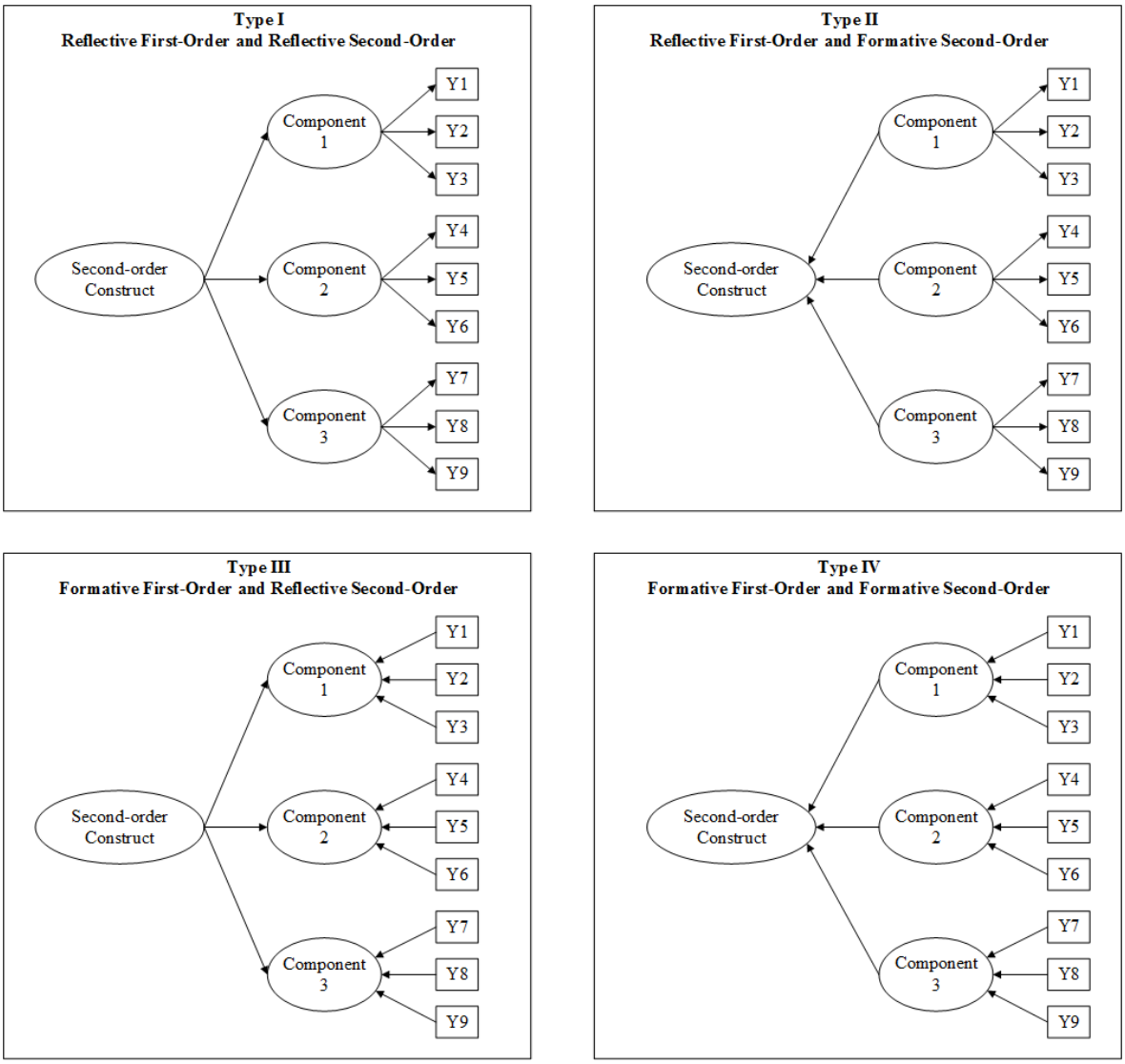

Figure 4.7. Alternative second-order constructs. Adapted from Jarvis et al. (2003)

4.7 Evaluating the Measurement and Structural Models through PLS-SEM

In this research, the conceptual model is evaluated through two steps: 1) the evaluation of the measurement model and 2) the evaluation of the structural model, through the PLS-SEM technique. Generally, the aim of model validation is to assess both measurement and structural models for fulfilling the quality criteria of an empirical study (Urbach & Ahlemann, 2010). The applied guidelines in this study to assess measurement and structural models are discussed in the following subsections.

4.7.1 Evaluating the Measurement Model

The measurement model defines how each indicator relates to its latent variable (Chin, 1998b). The measurement model describes the constructs and allocates observed variables to each (Gefen et al., 2000). Therefore, the measurement model is evaluated to specify how well the constructs (latent variables) are measured, and how observed variables are used to explain the measurement properties (validity and reliability). For measurement model evaluation, PLS-SEM estimates item loadings and weights, and residual covariance (Gefen et al., 2000). Validation of a measurement model can be acknowledged by testing its internal consistency, indicator reliability, convergent validity and discriminant validity (Lewis et al., 2005; Straub et al., 2004).

4.7.1.1 Internal Consistency

In PLS-SEM, internal consistency is measured by composite reliability (CR) (Chin, 1998b). CR takes into account that indicators have different loadings and assumes that items measuring the same latent variable possibly have different amounts of error, and all the indicators are equally weighted (Werts, Linn, & Jöreskog, 1974). An internal consistency reliability is presumed satisfactory when the value is more than 0.7, while a value below 0.6 demonstrates a lack of reliability (Nunnally & Bernstein, 1994). Therefore, according to the rule of thumb, internal consistency can be considered as satisfactory when CR is greater than 0.7.

4.7.1.2 Indicator Reliability

Indicator reliability evaluates the extent to which a variable or a set of variables is consistent with what it intends to measure (Urbach & Ahlemann, 2010). The construct reliability is independent and calculated separately from other constructs. An indicator's loading should be significant at more than the 0.05 level and the loading should be greater than 0.7 (Chin, 1998b). It means a latent variable is able to explain at least 50% of its indicator's variance at the loading value of 0.7. The significance of indicator loadings can be assessed using a resampling approach such as bootstrapping. Researchers should be careful of eliminating an indicator due to the PLS-SEM characteristics of consistency at large (Henseler et al., 2009).

An indicator can be eliminated only when the indicator's reliability is low and the elimination of that indicator causes a remarkable increment of CR.

4.7.1.3 Convergent Validity

Convergent validity refers to the degree to which all the items reflecting a specific construct are in agreement in measuring the same construct (Urbach & Ahlemann, 2010). Convergent validity can be assessed through the value of average variance extracted (AVE) in PLS-SEM. Significant convergent validity is attained when the AVE value of a construct is greater than 0.5 (Fornell & Larcker, 1981). The AVE among a set of items measuring the same construct is a summary indicator of convergence among these items. The AVE for a construct more than 0.50 is desirable because it shows that the construct accounts for a majority of the variance in its indicators on average (MacKenzie et al., 2011). Therefore, according to this rule of thumb, convergent validity is acceptable when the AVE value for each construct is larger than 0.50 and is considered very good when the AVE value is more than 0.7.

4.7.1.4 Discriminant Validity

Discriminant validity is applied to differentiate measurement items of a construct from one another. Discriminant validity assesses whether or not the items incidentally measure something else (Chin, 1998b; Urbach & Ahlemann, 2010). Two approaches of discriminant validity are regularly used in PLS-SEM: Fornell-Larcker's criterion (Fornell & Larcker, 1981) and cross loading (Chin, 1998b).

According to Fornell-Larcker's criterion, a latent variable (construct) should share more variance with its allocated indicators than with any other latent variables (constructs). It means that the AVE of each latent variable should be more than the latent variable's highest squares correlation with any other latent variables.

Cross loading is captured by correlating each latent variable's scores with all of the other items (Chin, 1998b). It can be claimed that the different indicators of constructs are not interchangeable if each indicator's loading is higher for its determined construct compared to any other constructs. Loading of each indicator is highest for its determined construct.

Table 4.6 shows the summary of validation guidelines to evaluate a reflective measurement model.

Table 4.6. Summary of the Reflective Measurement Model Evaluation

Validation Type	Guidelines
Internal Consistency - Composite Reliability (CR)	CR > 0.7 - significant CR < 0.6 - lack of reliability
Indicator Reliability - Loadings	Loading > 0.7 - significant at least at the 0.05 level
Convergent Validity - Average Variance Extracted (AVE)	AVE > 0.5
Discriminant Validity - Fornell and Larcker, Cross Loading	The AVE of each LV should be more than the LV's highest squares correlation with any other LVs. Each indicator's loading is higher for its determined construct.

4.7.1.5 Pilot Study Findings

Findings from the pilot study indicated that there were no major difficulties in the understandability of the questionnaire items and instructions. Out of a 54 total sample, 12 of the respondents (22%) were dropped because of the filter question in the first page of the survey. The filter question asked how many years they had been using the CRM system. If the answer was "less than 1 year", the respondent was excluded from the sample. From the total samples, 42 responses (78%) were used for the pilot study reliability and validity test. Among these respondents, 14 were female and 28 male. Most of the respondents were aged between 30 and 39 years old; 10 of them were between 40 and 49; and 9 were between 20 and 29. Most of the respondents held customer service manager positions; 9 were sales managers; 7 were account managers; 5 were sales specialists; 4 were marketing managers; 3 were customer service representatives; 1 was a sales representative and the remainder were from other positions within the organisation. Most of the respondents (43%) had 2-4 years tenure; 10 had 4-6 years tenure; 10 had less than 2 years tenure; 3 had 6-8 years tenure and the rest 8-10 years tenure. Most of the participants (83%) had more than 3 years' experience with CRM systems; 7 of them had 1-3 years of experience with CRM. In total 20 respondents had more than 5 years former IT experience; 15 had 3-5 years; 5 had 1-3 years and the rest

had less than one year former IT experience. Finally, most of the respondents had at least a bachelor's degree. The summary of respondents' demographic information in the pilot study is represented in Table 4.7.

Table 4.7. Summary of Respondent's Demographic Information - Pilot Study

Demographic Questions	Frequency (n=42)	Percentage
Gender		
Female	14	33%
Male	28	67%
Age		
20-29 years old	9	21%
30-39 years old	21	50%
40-49 years old	10	24%
>50 years old	2	5%
Position in Organisation		
Sales Representative	1	2%
Sales Manager	9	21%
Marketing Manager	4	10%
Account Manager	7	17%
Sales Specialist	5	12%
Customer Service Representative	3	7%
Customer Service Manager	12	29%
Others (Please specify)	1	2%
Tenure		
<2 years	10	24%
2-4 years	18	43%
4-6 years	10	24%
6-8 years	3	7%
8-10 years	1	2%
Experience Using CRM		
1-3 years	7	17%
>3 years	35	83%
Former IT Use Experience		
<1 year	2	5%
1-3 years	5	12%
3-5 years	15	36%
>5 years	20	47%
Education		
High school	1	2%
Bachelor's Degree	27	64%
Master's Degree	12	29%
Doctorate Degree	2	5%

In these models, the influence of IT identity and IS infusion role identity on IS infusion behaviour, extended use, integrative use and emergent use behaviours was assessed. In the 1st measurement model, the influence of IT identity and IS infusion role identity on extended use, integrative use and emergent use was tested. All items except for one item (EXT_1: 0.691) exhibited high loadings (>0.70), ranging from 0.79 to 0.96 on their respective constructs. The composite reliability (CR) of all constructs was 0.91 or higher, which indicates that the constructs were within accepted limits and therefore reliable (Gefen et al., 2000). Indicator reliability is the square of outer loading. Indicator reliability 0.70 or higher is preferred. For this study, indicator reliability 0.70 or higher was accepted. Constructs had AVE values ranging from 0.69 to 0.87, which is considered adequate (>0.5) (Fornell & Larcker, 1981). Reliability of all the indicators was acceptable except for the first indicator of External Gratification (EXT_1: 0.48), which was removed from the questionnaire for the main study. An indicator can be eliminated only when the indicator's reliability is low and the elimination of that indicator causes a remarkable increment of CR. The summary of the first measurement model for the pilot study is presented at Table 4.8.

Table 4.8. Summary of First Measurement Model Analysis - Pilot Study

Latent Variable	Indicators	Loadings	Indicator Reliability	R Square	R Square adjusted	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Discriminant Validity?
Emotional Attachment	EMA1	0.93	0.86	0.86	0.85	0.92	0.94	0.80	Yes
	EMA2	0.85	0.72						
	EMA3	0.88	0.77						
	EMA4	0.92	0.85						
Relatedness	REL1	0.91	0.83	0.92	0.92	0.93	0.95	0.82	Yes
	REL2	0.92	0.85						
	REL3	0.88	0.77						
	REL4	0.92	0.85						
Dependency	DEP1	0.88	0.77	0.74	0.73	0.94	0.96	0.86	Yes
	DEP2	0.95	0.90						
	DEP3	0.95	0.90						
	DEP4	0.92	0.85						
Self-Support	SEL1	0.79	0.62			0.87	0.92	0.79	Yes
	SEL2	0.93	0.86						
	SEL3	0.93	0.86						
Social Support	SOC1	0.95	0.90			0.90	0.93	0.82	Yes
	SOC2	0.79	0.62						
	SOC3	0.96	0.92						
Commitment	COM1	0.93	0.86			0.94	0.96	0.86	Yes
	COM2	0.93	0.86						
	COM3	0.96	0.92						
Resource Investment	RES1	0.91	0.83			0.93	0.95	0.87	Yes
	RES2	0.95	0.90						
	RES3	0.94	0.88						
External Gratifications	EXT1	0.70	0.48			0.77	0.87	0.69	Yes
	EXT2	0.94	0.88						
	EXT3	0.90	0.81						
	EXT4	0.93	0.86						
	EXT5	0.64	0.41						
Internal Gratifications	INT1	0.91	0.83			0.91	0.94	0.85	Yes
	INT2	0.96	0.92						
	INT3	0.89	0.79						
Extended Use	EXTU1	0.86	0.74	0.72	0.70	0.92	0.95	0.82	Yes
	EXTU2	0.94	0.88						
	EXTU3	0.83	0.69						
	EXTU4	0.80	0.64						
Integrative Use	INTU1	0.90	0.81	0.71	0.69	0.95	0.96	0.87	Yes
	INTU2	0.91	0.83						
	INTU3	0.96	0.92						
	INTU4	0.96	0.92						
Emergent Use	EMEU1	0.87	0.76	0.42	0.39	0.91	0.93	0.79	Yes
	EMEU2	0.95	0.90						
	EMEU3	0.87	0.76						
	EMEU4	0.84	0.71						

To specify the 1st measurement model's discriminant validity of the pilot study, the AVE value of each construct was extracted. According to findings, all square roots of AVE exceeded the off-diagonal elements in their corresponding row and column as shown in Table 4.9. Accordingly, the findings showed that Fornell and Larker's criterion was met.

Table 4.9. Factor Loadings of First-Order Factors – Pilot Study, First Measurement Model

Latent Variable Correlation	SEL	SOC	COM	RES	EXT	INT	DEP	EMA	REL	EXTU	INTU	EMEU
SEL	**0.89**											
SOC	0.75	**0.91**										
COM	0.79	0.83	**0.94**									
RES	0.72	0.64	0.72	**0.94**								
EXT	0.71	0.58	0.76	0.66	**0.83**							
INT	0.70	0.63	0.70	0.66	0.73	**0.92**						
DEP	0.37	0.30	0.44	0.29	0.47	0.66	**0.93**					
EMA	0.48	0.36	0.48	0.56	0.67	0.73	0.65	**0.90**				
REL	0.52	0.37	0.55	0.50	0.71	0.75	0.73	0.84	**0.91**			
EXTU	0.46	0.30	0.38	0.61	0.54	0.63	0.43	0.76	0.71	**0.90**		
INTU	0.61	0.51	0.51	0.64	0.61	0.70	0.50	0.75	0.69	0.84	**0.93**	
EMEU	0.46	0.38	0.43	0.60	0.47	0.53	0.35	0.59	0.41	0.70	0.74	**0.88**

Note: The bolded values demonstrate the square roots of the AVE and non-bolded values show the inter-correlation value between constructs.

In addition, the pilot study for the 2nd measurement model was assessed. In the 2nd model, the influence of IT identity and IS infusion role identity on IS infusion behaviour as a single-dimensional construct was tested. Internal consistency reliability, indicator reliability and convergent validity were tested and reported a satisfactory level, as shown in Table 4.10. All items except for one item (EXT_1: 0.691) exhibited high loadings (>0.70), ranging from 0.783 to 0.978 on their respective constructs. The composite reliability (CR) of all constructs was 0.91 or higher, which indicates that the constructs were within accepted limits and therefore reliable (Gefen et al., 2000). Constructs had AVE values ranging from 0.717 to 0.942, which is considered adequate (>0.5) (Fornell & Larcker, 1981). Reliability of all the indicators was acceptable except for the first indicator of External Gratification (EXT_1: 0.691), which was removed from the questionnaire for the main study. An indicator can be eliminated only when the indicator's reliability is low and the elimination of that indicator causes a remarkable increment of CR.

Table 4.10. Summary of Second Measurement Model Analysis - Pilot Study

Latent Variable	Indicators	Loadings	Indicator Reliability	R Square	R Square adjusted	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Discriminant Validity?
Emotional Attachment	EMA1	0.97	0.93	0.70	0.66	0.96	0.97	0.90	Yes
	EMA2	0.94	0.88						
	EMA3	0.94	0.88						
	EMA4	0.96	0.92						
Relatedness	REL1	0.80	0.64	0.66	0.65	0.88	0.92	0.73	Yes
	REL2	0.91	0.82						
	REL3	0.84	0.70						
	REL4	0.88	0.77						
Dependency	DEP1	0.88	0.77	0.47	0.46	0.91	0.94	0.79	Yes
	DEP2	0.95	0.90						
	DEP3	0.95	0.90						
	DEP4	0.91	0.82						
Self-Support	SEL1	0.92	0.85			0.90	0.94	0.83	Yes
	SEL2	0.89	0.78						
	SEL3	0.93	0.87						
Social Support	SOC1	0.93	0.86			0.86	0.91	0.78	Yes
	SOC2	0.85	0.72						
	SOC3	0.87	0.76						
Commitment	COM1	0.94	0.87			0.86	0.91	0.78	Yes
	COM2	0.88	0.78						
	COM3	0.95	0.90						
Resource Investment	RES1	0.98	0.96			0.97	0.98	0.94	Yes
	RES2	0.97	0.94						
	RES3	0.96	0.93						
External Gratifications	EXT1	0.69	0.47			0.89	0.91	0.74	Yes
	EXT2	0.94	0.88						
	EXT3	0.83	0.69						
	EXT4	0.82	0.68						
	EXT5	0.83	0.69						
Internal Gratifications	INT1	0.93	0.87			0.89	0.93	0.82	Yes
	INT2	0.96	0.92						
	INT3	0.82	0.68						
IS Infusion behaviour	INF1	0.82	0.67	0.291	0.254	0.87	0.91	0.72	Yes
	INF2	0.91	0.83						
	INF3	0.87	0.76						
	INF4	0.78	0.61						

To specify the measurement model's discriminant validity of the pilot study, the AVE value of each construct was extracted. According to findings, all square roots of AVE exceeded the off-diagonal elements in their corresponding row and column. The bolded elements in Table 4.11 demonstrate the square roots of the AVE and non-bolded values show the inter-correlation value between constructs. Based on Table 4.10, values of the off-diagonal

elements were lower than the square roots of AVE (bolded on the diagonal). Accordingly, the findings showed that Fornell and Larker's criterion was met.

Table 4.11. Factor Loadings of First-Order Factors – Pilot Study, Second Model

Latent Variable Correlation	SEL	SOC	COM	RES	EXT	INT	DEP	EMA	REL	INF
SEL	**0.89**									
SOC	0.76	**0.90**								
COM	0.77	0.82	**0.94**							
RES	0.56	0.65	0.72	**0.94**						
EXT	0.68	0.59	0.77	0.68	**0.83**					
INT	0.70	0.65	0.70	0.67	0.71	**0.92**				
DEP	0.38	0.31	0.44	0.29	0.45	0.66	**0.93**			
EMA	0.48	0.37	0.48	0.57	0.66	0.73	0.65	**0.90**		
REL	0.52	0.38	0.56	0.50	0.70	0.75	0.73	0.84	**0.91**	
INF	0.41	0.24	0.34	0.55	0.47	0.46	0.28	0.65	0.58	**0.89**

4.7.2 Evaluating Structural Model and Hypothesised Relationships

The structural model evaluates the direction and strength of the relationship among theoretical constructs (Gefen et al., 2000). Validating the structural model assists the researcher to assess systematically if the hypotheses conveyed by the structural model are supported or rejected (Urbach & Ahlemann, 2010). After the measurement model has been validated successfully, the structural model and hypotheses can be assessed.

Using PLS-SEM, a structural model can be evaluated through path coefficients and correlations among the constructs, together with the individual R^2 and AVE (Average Variance Extracted) for each of the constructs (Gefen et al., 2000). The first criterion for evaluating the PLS-SEM structural model and hypotheses is to assess each endogenous construct coefficient of determination (R^2). R^2 measures the relationship of a construct's illustrated variance to its total variance. A value of R^2 around 0.19 and lower is considered weak, values around 0.33 are assumed average and values around 0.67 are considered substantial (Chin, 1998b).

The second criterion for evaluating the PLS-SEM structural model and hypotheses is to examine path coefficient. To account for a certain impact in the structural model, the path coefficients should exceed 0.10 and be significant at least at the 0.05 level of significance

(Huber, Herrmann, Meyer, Vogel, & Vollhardt, 2008). T-values of both loadings and paths should be assessed using a bootstrap approach. Good model fit is established with significant path coefficients, acceptably high R^2 and internal consistency being greater than 0.70 for each construct (Barclay et al., 1995). Therefore, PLS-SEM can determine the relationships between the constructs and their underlying items, specify if the hypothesised relationships at the theoretical level are empirically acceptable, and assess how well the measures relate to each construct (Chin, 1998b).

4.7.2.1 Mediating Relationship

A mediating variable refers to a third factor which accounts for the relationship between the predictor (independent) and outcome (dependent) variables (Baron & Kenny, 1986), as shown in Figure 4.8. A mediator is the mechanism by which an independent variable influences a dependent variable. In this study, IS infusion role identity was evaluated as a mediator variable between IT identity and IS infusion behaviour, and extended use, integrative use and emergent use behaviours.

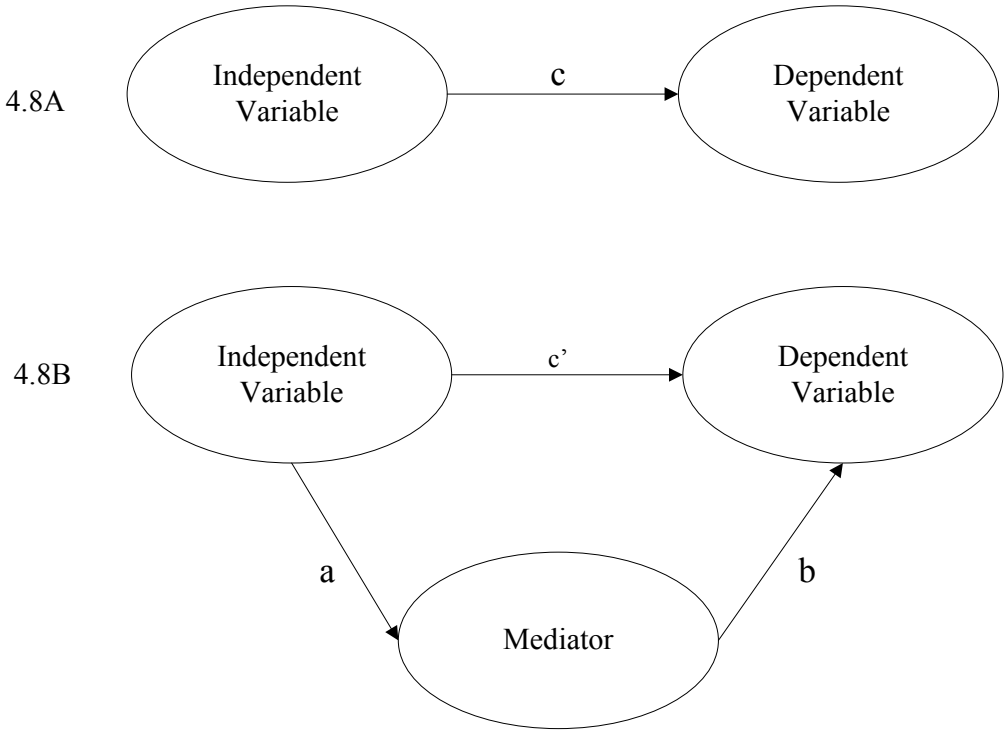

Figure 4.8. Mediating relationship. Adopted from Kenny (2014)

Baron and Kenny's (1986) analytical considerations were used for analysing the mediating relationship in this study. These authors used four conditions to consider the mediating relationship between an independent and a dependent variable:

- Path *c* in Figure 4.8A to show the significant relationship between the independent and the dependent variables.
- Path *a* in Figure 4.8B to show the relationship between the independent and mediator variables.
- Path *b* in Figure 4.8B to show the relationship between the mediator and the dependent variable.
- Path c' in Figure 4.8B to show the strength of the relationship between the independent and dependent variables when the mediator is added to the model. If it is a complete mediation, the c' value will be zero. If the path c' value is significantly smaller than the path *c*, then it is a partial mediation.

If all the four conditions are met, then the relationship between the independent and dependent variables is fully mediated by a mediator variable. If only the first three guidelines are met, the relationship between the independent and the dependent variables is partially mediated by a mediator variable. After the relationships between mediator, independent and dependent variables are examined, the statistical significance of the mediation reduction needs to be assessed through the following formula:

$$Z = ab/(\sqrt{(a^2\ s_b^2\ + b^2\ s_a^2\ )}$$

In this formula, *a* and *b* are the path coefficient values from the independent variable (IV) to the mediator, and from the mediator to the dependent variable (DV), s_a and s_b are the standard error values for the path coefficients. These values can be captured from bootstrapping results. The significant indirect influence between two variables is decided based on the Z value. If the Z value is more than 1.96, then the null hypothesis (there is no indirect effect between independent and dependent variables) will be rejected.

4.7.2.2 Moderating Relationship (Interaction Effect)

Generally, a moderator (also referred to as interaction effect) is a variable that influences the direction and/or strength of the relationship between a predictor (independent or exogenous) variable and a criterion (dependent or endogenous) variable (Baron & Kenny, 1986; Henseler & Chin, 2010). In this study, the organisational valuing of the IS infusion construct was examined as a moderator for the relationship between IS infusion role identity and IS infusion behaviour.

As shown in Figure 4.9, the impact of the predictor is represented by path "a", the impact of the moderator is represented by path "b" and the interaction of these two is represented by path "c". If the interaction of the predictor and moderator (path "c") is significant, then the moderator hypothesis is supported. There may also be significant effects for the predictor and the moderator (paths "a" and "b"), but these are not conceptually related for assessing the moderator hypothesis (Baron & Kenny, 1986).

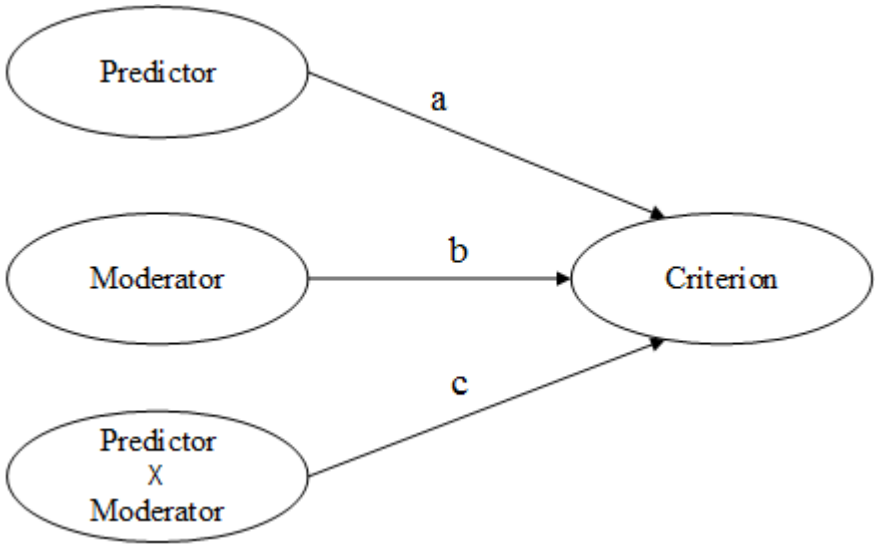

Figure 4.9. Moderator relationship. Adopted from Baron and Kenny (1986)

4.7.2.3 Control Variables

It is important to test the influence of control variables on the dependent variable in order to prevent other possible influences that are unrelated to the hypothesised relationships (Kock, Chatelain-Jardon, & Carmona, 2008). Demographic factors are normally appropriate candidates that can be used as a control variable (Kock et al., 2008).

This study controlled for the effects of gender, age, tenure, job level and former IT experience on IS infusion behaviours. Previous IS studies have also controlled for the gender, age, tenure, job level and former IT experience. Particularly, former IT experience is a significant control variable (Maas et al., 2014). Employees with former IS knowledge work better with the systems and are better at comprehension of the semantic technical qualities of such IS (Ifinedo, 2011; Maas et al., 2014).

4.8 Summary of Chapter Four

This chapter presented the methodologies applied in this research. This study follows a postpositivist paradigm to meet the research objectives and to answer the research questions. A survey method was chosen as a proper research technique for this study. The approaches used in developing a survey instrument were explained. This was followed by an explanation on the processes of using a web-based survey, the sampling method and ethical considerations for collecting empirical data.

The measurement issues were identified and PLS-SEM was introduced as a data analysis tool. Evaluation of the measurement model and the structural model were included. Survey instrument evaluation and refinement were described through the pre-test and pilot study. How the Web survey was formatted and administered was discussed. The introductory details of the actual survey were also reported. The following chapter describes the findings in terms of both the measurement and structural model.

CHAPTER Five: Data Analysis and Findings

5.1 Overview of Chapter Five

This chapter reports findings from the analysis of data collected through the online survey. The findings are derived from the data analysis steps discussed in Chapter Four, using the PLS-SEM analysis. The coding of measurement scales used in the survey, is presented. Then, descriptive statistics of respondents and instruments are reported. The measurement models are assessed in terms of their reliability and validity including internal consistency, and the convergent and discriminant validity of the instrument items of two models – the first model with extended use, integrative use and emergent use (sub-dimensions of IS infusion behaviour) as dependent variables and the second model with IS infusion behaviour (as a single-dimensional construct) as the dependent variable. The structural models are validated to test the hypothesised relationships, mediation, moderation effects, control variables and common method bias. Figure 5.1 demonstrates the flow and overview of this chapter.

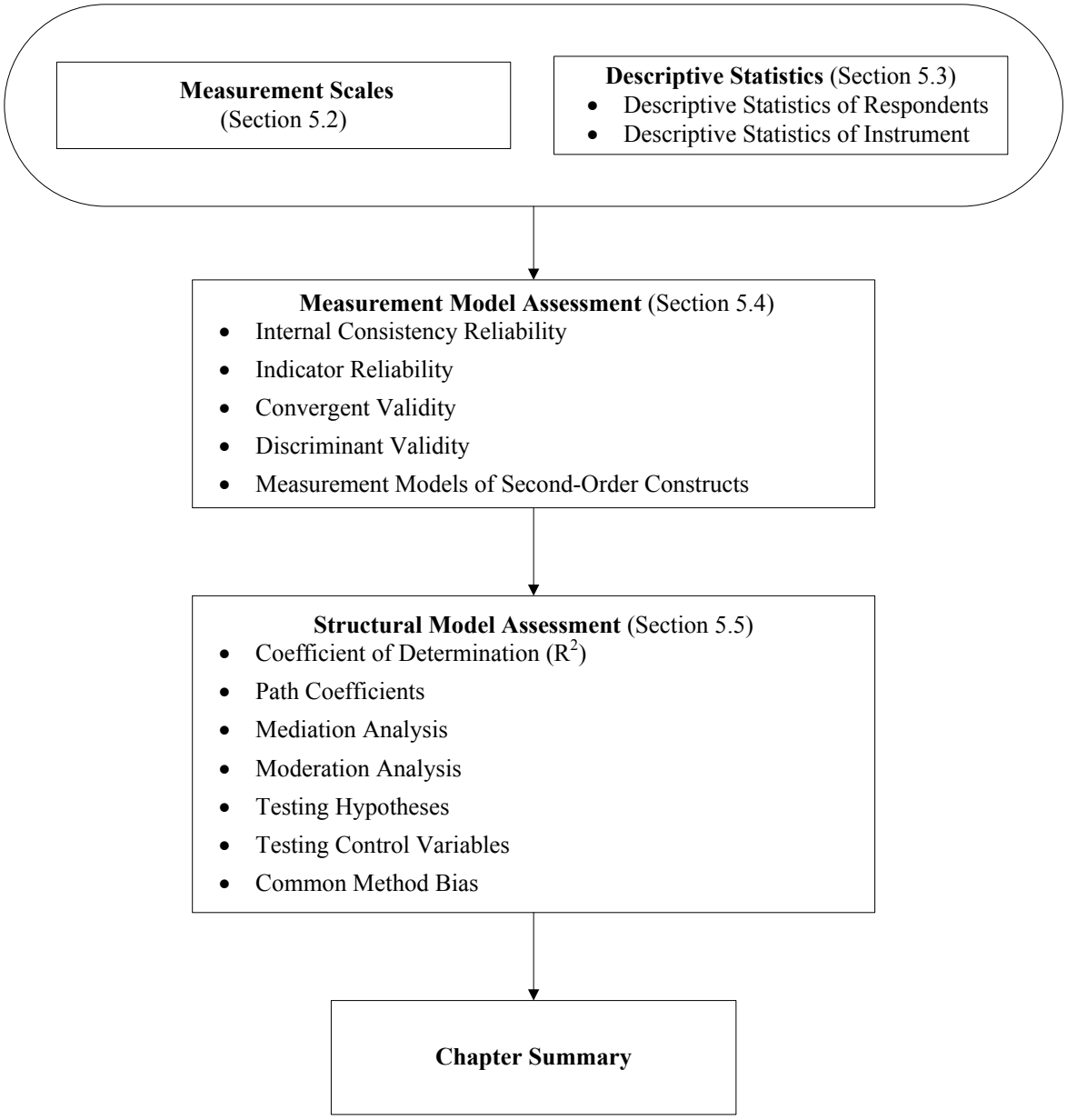

Figure 5.1. An overview of Chapter Five

5.2 Measurement Scales

This section shows how the measurement scales models were named in this study. Fifty-three items were incorporated in the survey as follows: self-support (3 items), social support (3 items), commitment (3 items), resource investment (3 items), external gratifications (4 items), internal gratifications (3 items), dependency (4 items), emotional attachment (4 items), relatedness (4 items), IS infusion behaviour (4 items), extended use (4 items), integrative use (4 items), emergent use (4 items), and perceived organisational valuing of IS infusion (6 items).

5.3 Descriptive Statistics

Participants' general demographic information was collected along with their responses to the measurement items of each construct in the research model. This section presents participants' general demographic information as well as descriptive statistics of the measurement items.

5.3.1 Demographic Profile of Respondents

The demographic profile of respondents included information about their gender, age, education, position in organisation (role), tenure, experience using CRM and former IT use experience. A summary of the descriptive statistic of respondents' demographic information is presented in Table 5.1.

Out of 413 respondents, there were 277 (67.1%) male and 136 (32.9%) female respondents. Most of the respondents were aged between 30-39 (40.9%), followed by those aged between 40-49 (26.2%); 19.1% were aged between 20-29; 13.8% were aged more than 50. In terms of organisational positions, 34.6% of respondents held customer service manager positions; 14.5% were sales managers; 14% were account managers; 9% were sales specialists; 8.7% were customer service representatives; 7% were marketing managers; 6.5% were sales specialists; 1.7% were marketing representatives and the remaining were from other positions within the organisation such as head of sales, digital marketer and CRM implementer. Over 33% of the respondents had 2 years or less tenure; 11.9% had more than 10 years tenure; 23.2% had 2-4 years tenure; 16% had 4-6 years tenure; 8.2% had 6-8 years tenure and the rest 8-10 years tenure. Over 80% of participants had between 3 to 6 years of experience using a CRM system; 19.4% had more than 3 years of experience using a CRM system. Most of the respondents had more than 5 years former IT use experience; 17.4% had 3-5 years of experience; 11.4% had 1-3 years of experience and the remaining had less than one year of former IT use experience. Regarding the participants' education background, nearly 54.2% held a minimum of a Bachelor's Degree; 22% had a Master's Degree; 14.5% had a high school/diploma and 2.7% had a Doctorate Degree. Finally, 68.3% of respondents were using

the Salesforce CRM system; 15.7% were using Microsoft Dynamics; 10.9% were using Oracle Sales Cloud and the rest used other types of cloud CRM including Sugar, NetSuite, Zoho.

Table 5.1 (Cont.). Participants' Demographic Information

Demographic Information		Frequency	Percentage
Gender	Female	136	32.9%
	Male	277	67.1%
Age	20-29 years old	79	19.1%
	30-39 years old	169	40.9%
	40-49 years old	108	26.2%
	>50 years old	57	13.8%
Role (Organisational Position)	Customer Service Manager	143	34.6%
	Sales Manager	60	14.5%
	Account Manager	58	14.0%
	Sales Representative	37	9.0%
	Customer Service Representative	36	8.7%
	Marketing Manager	29	7.0%
	Sales Specialist	27	6.5%
	Marketing Representative	7	1.7%
	Others (e.g., CEO)	16	3.9%
Tenure with the Role	<2 years	140	33.9%
	2-4 years	96	23.2%
	4-6 years	66	16.0%
	6-8 years	34	8.2%
	8-10 years	28	6.8%
	>10 years	49	11.9%
CRM Experience	1-3 years	333	80.6%
	>3 years	80	19.4%
Former IT Experience	No experience with other business applications	28	6.8%
	<1 year	19	4.6%

Demographic Information		Frequency	Percentage
	1-3 years	47	11.4%
	3-5 years	72	17.4%
	>5 years	247	59.8%
Education	High school/Diploma	60	14.5%
	Bachelor's Degree	224	54.2%
	Master's Degree	91	22.0%
	Doctorate Degree	11	2.7%
	Others	27	6.5%
Type of CRM	Salesforce CRM	282	68.3%
	Microsoft Dynamics	65	15.7%
	Oracle Sales Cloud	45	10.9%
	Sugar CRM	10	2.4%
	NetSuite CRM	3	0.7%
	Zoho CRM	2	0.5%
	Others	6	1.5%

5.3.2 Descriptive Statistics of Measurement Items

The descriptive statistics of the measurement items including the mean and standard deviation of each indicator are reported, using the statistical software SPSS version 19.0. Table 5.2 presents the descriptive statistics for all indicators.

Table 5.2 (Cont.). Descriptive Statistics for the Measurement Items

Constructs	Indicator	Mean	Std. Dev
Dependency	DEP1	5.76	1.24
	DEP2	5.63	1.41
	DEP3	5.62	1.38
	DEP4	5.65	1.32
Emotional attachment	EMA1	5.24	1.26
	EMA2	5.64	1.11
	EMA3	5.12	1.39
	EMA4	5.30	1.26
Relatedness	REL1	5.43	1.18
	REL2	5.49	1.18
	REL3	5.45	1.15
	REL4	5.38	1.19
Self-support	SEL1	5.92	0.93
	SEL2	6.02	0.87
	SEL3	5.90	0.98
Social support	SOC1	5.86	0.96
	SOC2	5.87	0.92
	SOC3	5.81	0.97
Commitment	COM1	5.39	0.99
	COM2	5.42	2.94
	COM3	5.18	1.14
Resource investment	RES1	4.91	1.29
	RES2	4.95	1.35
	RES3	4.91	1.31
External gratifications	EXT1	5.94	1.10
	EXT2	5.95	1.14
	EXT3	6.00	1.03
	EXT4	6.02	1.03
Internal gratifications	INT1	5.87	1.08
	INT2	5.94	2.71
	INT3	5.82	1.11
IS infusion behaviour	INF1	5.42	1.40
	INF2	5.48	1.33
	INF3	4.95	1.80
	INF4	5.36	1.45
Extended use	EXTU1	5.46	1.42
	EXTU2	5.56	1.28
	EXTU3	5.61	1.23
	EXTU4	5.37	1.44
Integrative use	INTU1	5.70	1.20
	INTU2	5.65	1.21
	INTU3	5.72	1.23
	INTU4	5.64	1.22
Emergent use	EMEU1	5.52	1.32
	EMEU2	5.43	1.38
	EMEU3	5.42	1.35
	EMEU4	5.34	1.38

Constructs	Indicator	Mean	Std. Dev
Perceived organisational valuing of IS infusion	ORG1	5.82	1.05
	ORG2	5.83	0.94
	ORG3	5.80	1.03
	ORG4	5.95	0.95
	ORG5	5.82	1.02
	ORG6	5.70	1.06

5.4 Measurement Model Assessment

In this study, SmartPLS 3.0 professional (Ringle, Wende, & Will, 2005) was used to test the measurement and structural models of this study. This program was used to evaluate the psychometric attributes of the measurement models and test the parameters of the structural models.

As explained in Chapter Four, the validity and reliability of the measurement model was assessed through internal consistency reliability, indicator reliability, convergent validity and discriminant validity of the instrument items (Chin, 2010a).

In the first-order model, all the constructs were modeled as reflective. In the second-order model, IT identity was modeled as a second-order reflective construct and IS infusion role identity was modeled as a second-order formative construct. Therefore, IT identity and IS infusion behaviour were specified as reflective of first- and second-order constructs, whereas the IS infusion role identity was specified as a reflective first- and formative second-order construct.

5.4.1 Internal Consistency Reliability

A measurement model has satisfactory internal consistency reliability if the composite reliability (CR) of each construct of the research model exceeds the threshold value of 0.7 (Chin, 2010a). Descriptive and reliability statistics for all the first-order reflective constructs in the research models are presented in Table 5.3. The CR of each construct for this study ranged from 0.87 to 0.97 and this was above the accepted threshold value of 0.7, showing that all constructs were within accepted limits and reliable (Gefen et al., 2000). Therefore, the measurement items had satisfactory internal consistency reliability.

In the first model, the influence of IT identity and IS infusion role identity on extended use, integrative use and emergent use as the sub-dimensions of IS infusion behaviour was assessed. In the second model, the influence of IT identity and IS infusion role identity on IS infusion behaviour as a single-dimensional construct as dependent variable with the four measurement items was tested. Internal consistency reliability, indicator reliability and convergent validity were tested and reported a satisfactory level. The discriminant validity of the measurement model with the IS infusion behaviour as dependent variable was also evaluated. According to findings, the measurement model's discriminant validity was met.

Table 5.3 (Cont.). Descriptive and Reliability Statistics for Reflective Constructs

Constructs	Indicators	Factor Loadings	Std. Dev	T-statistics
Dependency CR = 0.95	DEP1	0.88***	0.02	53.63
	DEP2	0.93***	0.01	65.59
	DEP3	0.95***	0.01	130.23
	DEP4	0.90***	0.02	54.09
Emotional attachment CR = 0.96	EMA1	0.94***	0.01	132.29
	EMA2	0.85***	0.02	44.00
	EMA3	0.93***	0.01	103.37
	EMA4	0.94***	0.01	105.38
Relatedness CR = 0.96	REL1	0.91***	0.02	59.12
	REL2	0.94***	0.01	103.81
	REL3	0.92***	0.01	72.51
	REL4	0.90***	0.01	63.23
Self-support CR = 0.94	SEL1	0.92***	0.01	84.41
	SEL2	0.89***	0.02	43.67
	SEL3	0.93***	0.01	104.68
Social support CR = 0.96	SOC1	0.95***	0.01	117.89
	SOC2	0.92***	0.01	70.47
	SOC3	0.94***	0.01	107.88
Commitment CR = 0.87	COM1	0.92***	0.02	55.44
	COM2	0.64*	0.25	1.87
	COM3	0.93***	0.01	90.95
Resource investment CR = 0.97	RES1	0.97***	0.01	174.16
	RES2	0.96***	0.01	168.48
	RES3	0.96***	0.01	148.38
External gratifications CR = 0.96	EXT1	0.89***	0.02	46.00
	EXT2	0.94***	0.01	91.47
	EXT3	0.95***	0.01	103.75
	EXT4	0.93***	0.01	81.78
Internal gratifications	INT1	0.94***	0.01	102.01

Constructs	Indicators	Factor Loadings	Std. Dev	T-statistics
CR = 0.90	INT2	0.67*	0.24	2.31
	INT3	0.94***	0.01	95.39
Extended use CR = 0.96	EXTU1	0.92***	0.01	84.33
	EXTU2	0.93***	0.01	95.23
	EXTU3	0.92***	0.01	80.69
	EXTU4	0.90***	0.01	70.21
Integrative use CR = 0.96	INTU1	0.91***	0.02	54.63
	INTU2	0.94***	0.01	104.93
	INTU3	0.95***	0.01	115.11
	INTU4	0.93***	0.01	82.13
Emergent use CR = 0.96	EMEU1	0.92***	0.01	91.92
	EMEU2	0.94***	0.01	116.06
	EMEU3	0.91***	0.02	52.40
	EMEU4	0.93***	0.01	93.47
IS infusion behaviour CR = 0.95	INF1	0.93***	0.01	101.51
	INF2	0.93***	0.01	99.49
	INF3	0.89***	0.01	69.27
	INF4	0.88***	0.02	43.93
Perceived organisational valuing of IS infusion CR = 0.95	ORG1	0.87***	0.02	40.86
	ORG2	0.90***	0.02	61.07
	ORG3	0.91***	0.01	64.78
	ORG4	0.78***	0.03	26.42
	ORG5	0.89***	0.03	34.98
	ORG6	0.88***	0.02	50.83

Note: * p <0.5, ** p < 0.1, *** p <0.001

5.4.2 Indicator Reliability

Factor loadings assess the indicator reliability of constructs. A measurement model has satisfactory indicator reliability when loadings are greater than 0.7 and significant at the 0.05 level (Chin, 1998b). All items had loadings exceeding 0.7, ranging from a lower bound of 0.78 to an upper bound of 0.97 on their respective constructs except for two items (COM2 and INT2) of commitment and internal gratifications constructs that showed indicator loadings of 0.64 and 0.67 respectively and were below the accepted threshold value. For factor loadings between 0.4 and 0.7, the Average Variance Extracted (AVE) needs to be checked (Hair et al., 2011). If AVE improves by deleting the item, then it is recommended to delete the item, otherwise, the item can remain in the model (Hair et al., 2011). These items were kept as they had acceptable AVE of 0.71 and 0.76, which are more than 0.5. Table 5.4 presents that all item loadings on their respective constructs were significant as indicated by

the t-statistics for the outer model loadings. According to the results, all items used for this research had satisfactory indicator reliability.

5.4.3 Convergent Validity

The measurement model's convergent validity was assessed by examining its average variance extracted (AVE) value. Convergent validity is sufficient when constructs have an average variance extracted (AVE) value of at least 0.5 or more, and with loadings in excess of 0.7 for reflective items (Fornell & Larcker, 1981). Table 5.4 presents that all constructs had AVE ranging from 0.71 to 0.92, which exceeded the recommended threshold value of 0.5. The results indicated that this research's constructs had an adequate convergent validity.

Table 5.4. AVE Value for First-Order Constructs

Constructs	Average Variance Extracted (AVE)
Self-support	0.83
Social support	0.88
Commitment	0.71
Resource investment	0.92
External gratifications	0.86
Internal gratifications	0.76
Dependency	0.84
Emotional attachment	0.84
Relatedness	0.84
Extended use	0.85
Integrative use	0.87
Emergent use	0.86
IS Infusion behaviour	0.83

5.4.4 Discriminant Validity

Discriminant validity is evaluated by using two measures: 1) Fornell and Larcker's (1981) criterion, and 2) cross loading. As explained in Chapter 4, for adequate discriminant validity, first the square root of the AVE should exceed the correlations between the construct and all other constructs. Second, each group of indicators should have higher loadings for its respective construct than indicators for any of the other constructs (Chin, 1998b).

To evaluate the discriminant validity of constructs in measurement models, the AVE value of each construct was extracted. In the first model of this study, the influence of IT identity

and IS infusion role identity on IS infusion behaviour as a single-dimensional construct was assessed. In the second model, the influence of IT identity and IS infusion role identity on extended use, integrative use and emergent use behaviours as the sub-dimensions of IS infusion behaviour was tested. According to the findings, all square roots of AVE exceeded the off-diagonal elements in their corresponding row and column. The bolded elements in Table 5.5A and 5.5B demonstrate the square roots of the AVE and non-bolded values show the correlation value between the constructs of both the measurement models. Values of the off-diagonal elements were lower than the square roots of AVE (bolded on the diagonal). The findings showed that Fornell and Larker's criterion was met.

Table 5.5A. Factor Loadings of First-Order Factors of the First Measurement Model (sub-dimensions of IS infusion as DV)

Latent Variable Correlation	Self-support	Social support	Commitment	Resource investment	External gratifications	Internal gratifications	Dependency	Emotional attachment	Relatedness	Extended use	Integrative use	Emergent use
Self-support	**0.91**											
Social support	0.75	**0.94**										
Commitment	0.58	0.64	**0.84**									
Resource investment	0.50	0.52	0.68	**0.96**								
External gratifications	0.64	0.55	0.47	0.43	**0.93**							
Internal gratifications	0.68	0.62	0.57	0.52	0.72	**0.87**						
Dependency	0.49	0.40	0.37	0.47	0.52	0.51	**0.92**					
Emotional attachment	0.49	0.44	0.40	0.55	0.58	0.65	0.56	**0.92**				
Relatedness	0.54	0.49	0.48	0.53	0.56	0.62	0.56	0.77	**0.92**			
Extended use	0.53	0.50	0.44	0.56	0.55	0.57	0.55	0.65	0.71	**0.92**		
Integrative use	0.59	0.51	0.41	0.50	0.65	0.64	0.54	0.66	0.67	0.79	**0.93**	
Emergent use	0.54	0.52	0.44	0.54	0.55	0.63	0.44	0.64	0.57	0.70	0.75	**0.93**

Table 5.5B. Factor Loadings of First-Order Factors of the Second Measurement Model (IS infusion as a single-dimensional construct as DV)

Latent Variable Correlation	Self-support	Social support	Commitment	Resource investment	External gratifications	Internal gratifications	Dependency	Emotional attachment	Relatedness	IS Infusion behaviour
Self-support	**0.91**									
Social support	0.75	**0.94**								
Commitment	0.58	0.64	**0.84**							
Resource investment	0.50	0.52	0.69	**0.96**						
External gratifications	0.64	0.55	0.47	0.42	**0.93**					
Internal gratifications	0.67	0.61	0.56	0.52	0.72	**0.87**				
Dependency	0.49	0.40	0.37	0.47	0.53	0.51	**0.92**			
Emotional attachment	0.49	0.44	0.40	0.55	0.57	0.65	0.56	**0.92**		
Relatedness	0.54	0.49	0.48	0.53	0.56	0.62	0.56	0.74	**0.92**	
IS Infusion behaviour	0.54	0.48	0.42	0.56	0.55	0.54	0.54	0.64	0.65	**0.91**

To specify the discriminant validity of the constructs for the second measurement model, it is expected that each group of indicators will load greater for its respective construct than indicators for any of the other constructs (Chin, 1998b). The indicators' loadings with respect to all construct correlations were examined. The cross loading output was generated by the SmartPLS algorithm function. The factor loadings (bolded) and cross loadings are presented in Tables 5.6A and 5.6B. All items loaded higher against their respective intended construct compared to other constructs. The cross loading output supported that the second assessments of the measurement model's discriminant validity were met. Hence, this research infers that the measurement models had discriminant validity.

Table 5.6A. Cross Loadings Output for the First Measurement Model (sub-dimensions of IS infusion behaviour as DV)

	COM	DEP	EMA	EMEU	EXT	EXTU	INTEU	INT	RES	REL	SEL	SOC
COM1	**0.93**	0.35	0.37	0.39	0.46	0.36	0.38	0.54	0.58	0.44	0.57	0.61
COM2	**0.65**	0.13	0.14	0.18	0.15	0.18	0.15	0.20	0.25	0.18	0.19	0.22
COM3	**0.93**	0.36	0.40	0.44	0.44	0.45	0.39	0.54	0.71	0.45	0.53	0.60
DEP1	0.39	**0.88**	0.52	0.41	0.51	0.49	0.49	0.52	0.43	0.53	0.49	0.38
DEP2	0.33	**0.93**	0.53	0.43	0.48	0.52	0.51	0.46	0.44	0.50	0.45	0.36
DEP3	0.34	**0.95**	0.52	0.44	0.47	0.51	0.50	0.48	0.44	0.48	0.42	0.37
DEP4	0.31	**0.90**	0.49	0.35	0.45	0.48	0.49	0.42	0.41	0.52	0.42	0.35
EMA1	0.40	0.52	**0.94**	0.61	0.55	0.60	0.61	0.62	0.53	0.72	0.48	0.42
EMA2	0.32	0.50	**0.86**	0.52	0.54	0.59	0.60	0.55	0.43	0.68	0.45	0.39
EMA3	0.40	0.50	**0.93**	0.62	0.52	0.62	0.60	0.59	0.55	0.71	0.44	0.41
EMA4	0.36	0.55	**0.94**	0.59	0.53	0.58	0.62	0.63	0.52	0.71	0.43	0.39
EMEU1	0.42	0.39	0.58	**0.92**	0.52	0.61	0.68	0.59	0.48	0.51	0.52	0.48
EMEU2	0.42	0.39	0.56	**0.94**	0.50	0.63	0.67	0.58	0.51	0.49	0.49	0.48
EMEU3	0.37	0.44	0.60	**0.91**	0.51	0.68	0.72	0.57	0.49	0.55	0.48	0.47
EMEU4	0.43	0.42	0.61	**0.93**	0.52	0.65	0.70	0.58	0.54	0.57	0.51	0.50
EXT1	0.41	0.42	0.52	0.48	**0.89**	0.50	0.58	0.64	0.37	0.53	0.60	0.50
EXT2	0.45	0.50	0.58	0.54	**0.95**	0.52	0.63	0.68	0.43	0.54	0.59	0.50
EXT3	0.44	0.50	0.54	0.52	**0.95**	0.52	0.60	0.68	0.39	0.52	0.59	0.52
EXT4	0.46	0.51	0.52	0.51	**0.93**	0.50	0.59	0.66	0.41	0.49	0.59	0.52
EXTU1	0.44	0.49	0.62	0.67	0.53	**0.92**	0.72	0.54	0.54	0.68	0.54	0.52
EXTU2	0.40	0.49	0.59	0.63	0.53	**0.93**	0.76	0.54	0.49	0.66	0.49	0.46
EXTU3	0.37	0.54	0.59	0.61	0.48	**0.92**	0.76	0.51	0.48	0.65	0.49	0.43
EXTU4	0.38	0.50	0.60	0.66	0.47	**0.91**	0.70	0.49	0.56	0.62	0.42	0.42
INTU1	0.40	0.53	0.65	0.70	0.60	0.75	**0.90**	0.62	0.47	0.67	0.56	0.49
INTU2	0.35	0.50	0.63	0.68	0.58	0.76	**0.94**	0.57	0.47	0.63	0.52	0.44
INTU3	0.38	0.51	0.59	0.71	0.62	0.72	**0.95**	0.59	0.46	0.59	0.56	0.47
INTU4	0.38	0.48	0.60	0.71	0.61	0.74	**0.93**	0.61	0.47	0.60	0.54	0.48
INT1	0.56	0.48	0.61	0.59	0.71	0.52	0.60	**0.94**	0.49	0.58	0.68	0.62
INT2	0.20	0.20	0.27	0.26	0.26	0.25	0.27	**0.69**	0.19	0.26	0.26	0.23
INT3	0.56	0.52	0.65	0.63	0.69	0.57	0.64	**0.94**	0.52	0.62	0.64	0.59
RES1	0.64	0.45	0.53	0.52	0.42	0.54	0.49	0.50	**0.97**	0.51	0.49	0.49
RES2	0.64	0.46	0.53	0.52	0.41	0.54	0.49	0.50	**0.96**	0.51	0.49	0.51
RES3	0.62	0.45	0.54	0.53	0.41	0.53	0.47	0.50	**0.96**	0.50	0.47	0.51
REL1	0.41	0.49	0.69	0.51	0.46	0.61	0.59	0.53	0.45	**0.91**	0.46	0.43
REL2	0.43	0.53	0.73	0.53	0.56	0.66	0.62	0.59	0.48	**0.94**	0.50	0.43
REL3	0.46	0.51	0.71	0.57	0.54	0.70	0.65	0.61	0.51	**0.92**	0.54	0.50
REL4	0.45	0.51	0.69	0.50	0.51	0.63	0.57	0.53	0.49	**0.91**	0.49	0.43
SEL1	0.52	0.49	0.50	0.50	0.60	0.53	0.58	0.65	0.47	0.56	**0.92**	0.64
SEL2	0.49	0.37	0.40	0.47	0.57	0.42	0.49	0.58	0.42	0.43	**0.89**	0.69
SEL3	0.57	0.47	0.46	0.52	0.58	0.50	0.54	0.63	0.49	0.50	**0.93**	0.71
SOC1	0.60	0.40	0.42	0.50	0.53	0.48	0.50	0.60	0.48	0.45	0.72	**0.95**
SOC2	0.56	0.32	0.36	0.45	0.47	0.42	0.42	0.54	0.45	0.42	0.66	**0.92**
SOC3	0.63	0.41	0.45	0.51	0.54	0.50	0.49	0.59	0.54	0.49	0.72	**0.94**

Table 5.6B. Cross Loadings for the Second Measurement Model (IS infusion behaviour as a single-dimensional construct as DV)

	COM	DEP	EMA	EXT	INF	INT	RES	REL	SEL	SOC
COM1	**0.93**	0.35	0.37	0.46	0.35	0.54	0.58	0.44	0.57	0.61
COM2	**0.67**	0.13	0.14	0.15	0.18	0.19	0.25	0.18	0.19	0.22
COM3	**0.93**	0.36	0.40	0.44	0.43	0.53	0.71	0.45	0.53	0.60
DEP1	0.39	**0.88**	0.52	0.51	0.47	0.51	0.43	0.53	0.49	0.38
DEP2	0.33	**0.93**	0.53	0.48	0.51	0.45	0.44	0.50	0.45	0.36
DEP3	0.34	**0.95**	0.52	0.47	0.50	0.47	0.45	0.48	0.42	0.37
DEP4	0.31	**0.90**	0.49	0.45	0.49	0.41	0.41	0.52	0.42	0.35
EMA1	0.40	0.52	**0.94**	0.55	0.59	0.62	0.53	0.72	0.48	0.42
EMA2	0.32	0.50	**0.86**	0.54	0.53	0.55	0.43	0.68	0.45	0.39
EMA3	0.40	0.50	**0.93**	0.52	0.64	0.59	0.55	0.71	0.44	0.41
EMA4	0.36	0.55	**0.94**	0.53	0.58	0.64	0.52	0.71	0.43	0.39
EXT1	0.41	0.42	0.52	**0.89**	0.49	0.64	0.37	0.53	0.60	0.50
EXT2	0.45	0.50	0.58	**0.95**	0.51	0.68	0.43	0.54	0.59	0.50
EXT3	0.44	0.50	0.54	**0.95**	0.51	0.68	0.39	0.52	0.59	0.52
EXT4	0.46	0.51	0.52	**0.93**	0.50	0.66	0.41	0.49	0.59	0.52
INF1	0.44	0.49	0.61	0.54	**0.93**	0.53	0.52	0.62	0.56	0.48
INF2	0.42	0.50	0.56	0.52	**0.93**	0.51	0.51	0.57	0.52	0.46
INF3	0.33	0.48	0.56	0.44	**0.89**	0.42	0.54	0.56	0.43	0.40
INF4	0.33	0.49	0.58	0.47	**0.88**	0.46	0.45	0.61	0.45	0.38
INTG1	0.56	0.48	0.61	0.71	0.49	**0.94**	0.49	0.58	0.68	0.62
INTG2	0.20	0.20	0.27	0.26	0.24	**0.55**	0.19	0.26	0.26	0.23
INTG3	0.55	0.51	0.66	0.69	0.53	**0.94**	0.50	0.63	0.64	0.58
RES1	0.61	0.45	0.53	0.42	0.54	0.49	**0.97**	0.51	0.49	0.49
RES2	0.60	0.46	0.53	0.41	0.54	0.49	**0.96**	0.51	0.49	0.51
RES3	0.57	0.45	0.54	0.41	0.53	0.49	**0.96**	0.50	0.47	0.51
REL1	0.41	0.49	0.69	0.46	0.56	0.54	0.45	**0.91**	0.46	0.43
REL2	0.43	0.53	0.73	0.56	0.62	0.60	0.48	**0.94**	0.50	0.43
REL3	0.46	0.51	0.71	0.54	0.63	0.61	0.51	**0.92**	0.54	0.50
REL4	0.45	0.51	0.69	0.51	0.57	0.54	0.49	**0.91**	0.50	0.43
SEL1	0.52	0.49	0.50	0.60	0.55	0.64	0.47	0.56	**0.92**	0.65
SEL2	0.49	0.37	0.39	0.56	0.43	0.57	0.42	0.43	**0.89**	0.69
SEL3	0.57	0.47	0.45	0.58	0.50	0.63	0.49	0.50	**0.93**	0.71
SOC1	0.60	0.40	0.42	0.53	0.45	0.60	0.48	0.45	0.72	**0.95**
SOC2	0.56	0.32	0.36	0.47	0.41	0.53	0.45	0.42	0.66	**0.92**
SOC3	0.61	0.41	0.45	0.54	0.47	0.59	0.54	0.49	0.72	**0.94**

5.4.5 Collinearity

According to Hair and colleagues (2014), collinearity occurs when two indicators are highly correlated. It is called multicollinearity when more than two indicators are involved. Multicollinearity is defined as the extent to which a variable can be explained through the other variables in the analysis. "As multicollinearity increases, it complicates the interpretation of the variate in a dependent variable because it is more difficult to ascertain the effect of any single variable, owing to their interrelationships" (Hair et al., 2011, p. 2).

To detect multicollinearity, the examination of the Variance Inflation Factor (VIF) of each set of predictor constructs is suggested (Hair et al., 2014). A VIF above 5 in the predictor constructs is considered as indicative of collinearity (Hair et al., 2014).

Multicollinearity poses a greater problem for formative indicators than for reflective indicators. This study also used the approach suggested by Petter et al. (2007) to assess formative validity, which involves testing the multicollinearity among the indicators of formative construct. The results showed that all the VIFs were below the recommended threshold of 5, with the highest value of 2.97. Hence, no collinearity was detected in the dataset, as is shown in Table 5.7.

Table 5.7. Collinearity for Predictor Constructs

Constructs	VIF
Self-support -> IS infusion role identity	2.91
Social support -> IS infusion role identity	2.67
Commitment -> IS infusion role identity	2.46
Resource investment -> IS infusion role identity	2.29
External gratifications -> IS infusion role identity	2.42
Internal gratifications -> IS infusion role identity	2.97
IT identity -> Extended use	2.14
IT identity -> Integrative use	2.14
IT identity -> Emergent use	2.14
IT identity -> IS infusion behaviour	2.30
IS infusion role identity -> Extended use	2.14
IS infusion role identity -> Integrative use	2.14
IS infusion role identity -> Emergent use	2.14
IS infusion role identity -> IS infusion behaviour	2.40

5.4.6 Measurement Models of Second-Order Constructs

The main constructs of this study were modelled as second-order constructs. IT identity and IS infusion behaviour were modelled as reflective constructs and IS infusion role identity was modelled as a formative construct.

IT Identity as a Reflective Second-Order Construct

This study proposed a second-order reflective measurement model for employees' IT identity within an organisation with three reflective first-order factors: dependency, emotional

attachment and relatedness. The IT identity second-order reflective measurement model and its loadings are demonstrated in Figure 5.2.

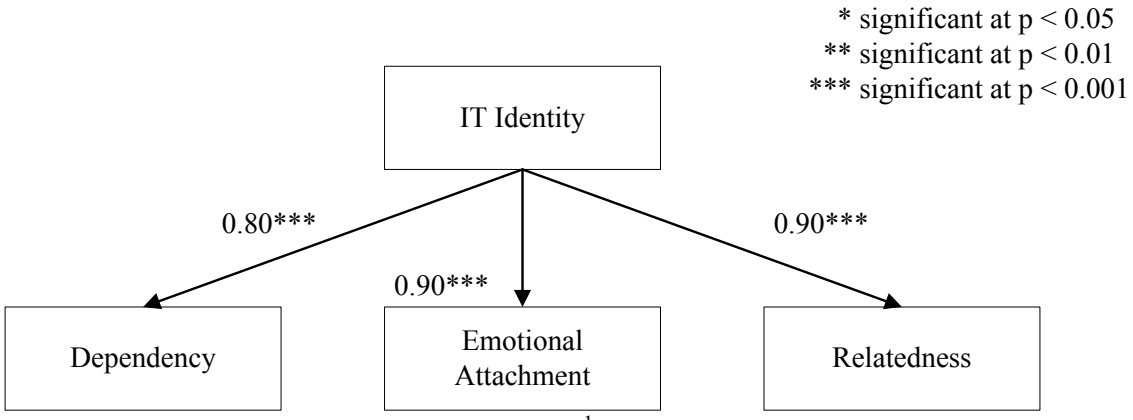

Figure 5.2. Second-order factor of IT identity[1]

The construct of IT identity had the following loadings; dependency (0.80), emotional attachment (0.90), and relatedness (0.90). All item loadings were highly significant (p <0.001), as indicated by the t-statistics. A second-order reflective structure for IT identity was consistent with the IS literature (Carter & Grover, 2015), where IT identity was measured as a second-order reflective construct with three first-order reflective factors: dependency, emotional attachment and relatedness. The composite reliability of IT identity was 0.95, which clearly exceeded the threshold of 0.70, suggesting acceptable reliability (Gefen et al., 2000).

IS Infusion Role Identity as a Formative Second-Order Construct

This study proposed a second-order formative measurement model of employees' IS infusion role identity within an organisation with six reflective first-order factors: self-support, social-support, commitment, resource investment, external gratifications and internal gratifications. McCall and Simmons' role identity theories (1978; 1966) conceptually linked the six dimensions of role identity (i.e., self-support, social support, commitment, resource investment, external gratifications and internal gratifications), which were treated as higher-

[1] *** p <0.001. IT identity had the following t-statistics for Dependency (25.95); for Emotional attachment (50.67) and for Relatedness (71.76).

order constructs. The IS infusion role identity second-order formative measurement model and its weights are depicted in Figure 5.3.

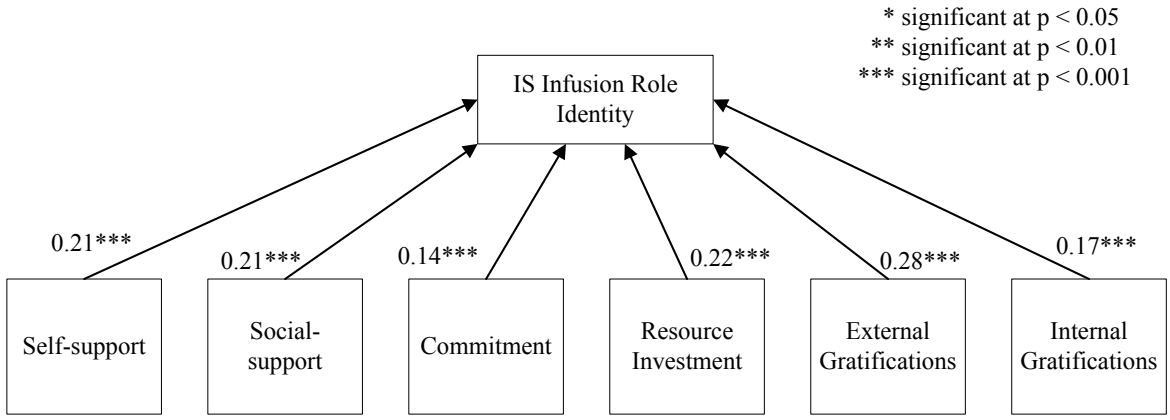

Figure 5.3. Second-order factor of IS infusion role identity

For measuring formative constructs, the item weights are examined. Generally, formative constructs have lower absolute values in item loadings compared to reflective constructs (Karimi, Somers, & Bhattacherjee, 2007). Weights examine the role of each formative indicator to measure the constructs in the research model, whereas loadings represent the correlation between the indicators and component scores of reflective constructs (Chin, 1998b). In PLS-SEM, indicator weights represent the contribution of each formative indicator to the variance of the construct (Petter et al., 2007).

In a formative higher-order model, the first-order construct does not reflect the second-order construct. Alternatively, each first-order construct demonstrates a unique form that provides a new aspect to the higher-order construct (Chin, 1998a). Therefore, reliability and validity assessment of reflective models are not used in formative measurement models (Bagozzi, 1994; Bollen, 1989), since indicators are not expected to be internally consistent (Bollen, 1984). Furthermore, AVE is not assessed because convergent validity evaluation is not desired for assessing formative constructs (Jarvis et al., 2003).

In PLS-SEM, Henseler and colleagues (2009) suggested the validity assessment of formative constructs on two levels: the indicator and the construct levels. This study followed the procedure applied in Roberts and Thatcher (2009), which evaluates the indicator and the

construct levels in formative models. Urbach and Ahlemann (2010) stated that indicator weights of measurement items for a formative construct are required to be at 0.05 significance level, which means an indicator is relevant for the construction of the formative construct and represents a sufficient level of validity.

Examining the significance of the construct weights is the first approach to validate formative measurement models (Roberts & Thatcher, 2009). The weights of formative constructs can be perceived as validity coefficients (Bollen, 1989). The significance of the construct weights by means of bootstrapping needs to be examined (Efron & Tibshirani, 1993). A significance level of at least 0.05 represents that a construct is relevant for the formative measurement model, and shows an acceptable level of validity (Urbach & Ahlemann, 2010). Using PLS-SEM, the weights of formative constructs are considered as PLS-SEM coefficients (Chin et al., 2003). Path coefficients higher than 0.20 are recommended by Chin (1998b). Table 5.10 illustrates the weights, VIF and respective t-statistics for the IS infusion role identity construct in this study.

The approach is to ensure the indicator weights for formative constructs are roughly equal and all have significant t-values (Ringle, Sarstedt, & Straub, 2012). The formative constructs of IS infusion role identity have roughly equal weights from 0.15 to 0.27. In this study, VIF ranged from 2.30 to 2.96, which is lower than 5, and all had significant t-values from 6.03 to 21.83, as is shown in Table 5.8.

Table 5.8. Indicator Reliability for Formative Construct (IS Infusion Role Identity)

Paths	**Indicator Weights**	**VIF**	**Std. Dev**	**T-statistics**
Self-support	0.21***	2.92	0.01	20.89
Social support	0.20***	2.69	0.01	20.75
Commitment	0.15***	2.46	0.02	6.03
Resource investment	0.21***	2.30	0.01	21.10
External gratifications	0.27***	2.42	0.01	19.83
Internal gratifications	0.18***	2.96	0.03	6.51

Note: *** $p < 0.001$

The results showed that the IS infusion role identity construct had the following weights: self-support (0.21), social support (0.20), commitment (0.15), resource investment (0.21), external gratifications (0.27) and internal gratifications (0.18). All the six constructs contributed significantly to the IS infusion role identity construct ($p < 0.001$).

Overall, the reliability and validity analyses executed on the measurement models were satisfactory. All reliability and validity analyses were confirmed and this indicated that the measurement models of this study were valid and fit to be used to evaluate parameters in the structural models.

5.5 Structural Models Assessment

The following subsections explains the validity assessment of the structural models and the results of the hypothesised relationships for this research. In the first structural model of this study, the influence of IT identity and IS infusion role identity on extended use, integrative use and emergent use behaviours as the sub-dimensions of IS infusion behaviour, was assessed. In the second model, the influence of IT identity and IS infusion role identity on IS infusion behaviour as a single-dimensional construct was tested.

5.5.1 First Structural Model Assessment

Sub-dimensions of IS infusion behaviour as dependent variables: As explained in Chapter Four, the validity of the structural model was tested through the coefficient of determination (R^2) and path coefficients. Moreover, this research also evaluated the mediation and moderation relationships that were proposed in the research models followed by testing for control variables and common method bias.

5.5.1.1 Coefficient of Determination (R^2)

The coefficient of determination (R^2) value represents the amount of variance in dependent variables that is explained by the independent variables. Therefore, a higher R^2 value increases the predictive ability of the structural model. The R^2 values should be adequately high for the structural model to have a minimum level of explanatory power (Urbach &

Ahlemann, 2010). According to Chin (1998a), R^2 values of roughly 0.67 are substantial, values around 0.33 are average, and values of 0.19 are considered weak. In this research, the SmartPLS algorithm function was applied to produce the R^2 values, whilst the SmartPLS bootstrapping function was used to generate the t-statistics values. For this study, the bootstrapping generated 2000 samples from 413 cases. IT identity and IS infusion role identity explain 59.3% of the variance in extended use, 60.2% of the variance in integrative use and 50.5% of the variance in emergent use behaviours. Meanwhile, IT identity explains 52.9% of the variance in IS infusion role identity.

5.5.1.2 Path Coefficients

Each path connecting two latent variables in a structural model presents a hypothesis. According to structural model analysis, a researcher can accept or reject each hypothesis in order to determine the relationship strength between dependent and independent variables. In a structural model, the values for path coefficients should be tested in terms of signs, magnitude, and significance (Henseler et al., 2009; Urbach & Ahlemann, 2010). If path signs are reverse to the theoretically proposed relationship, then the hypotheses are not supported (Urbach & Ahlemann, 2010). A path coefficient magnitude represents the strength of the relationships between two latent variables (Urbach & Ahlemann, 2010). The lower limit for significance path coefficients is considered as 0.05 (Urbach & Ahlemann, 2010).

Using SmartPLS algorithm output, the relationships between independent and dependent variables were assessed. However, in order to test the significance level in SmartPLS, t-statistics for all paths were produced using the SmartPLS bootstrapping function. The significance level of each relationship was specified based on the t-statistics output. Table 5.9 details the path coefficients, observed t-statistics, and significance level for all hypothesised paths. In addition, the bootstrapping confidence interval of standardised regression coefficients (upper bound and lower bound) is given. According to Henseler and colleagues (2009, p. 306) "if a confidence interval for an estimated path coefficient does not include zero, the hypothesis that equals zero is rejected". According to the manually calculated confidence interval, the range of lower bound to upper bound for each path did not include zero. Using the findings from the path assessment, the acceptance or rejection of

the proposed hypotheses was specified. The proposed hypotheses assessment is discussed in the next section.

Table 5.9. Path Coefficients, T-statistics, Significance Level for Hypothesised Paths

Paths	Path Coefficient	T-statistics	Std. Dev	Lower Bound	Upper Bound
IT identity -> Extended use	0.54***	9.92	0.06	0.42	0.66
IT identity -> Integrative use	0.40***	9.30	0.05	0.30	0.50
IT identity -> Emergent use	0.29***	4.59	0.07	0.15	0.43
IT identity -> IS infusion role identity	0.73***	20.36	0.04	0.65	0.81
IS infusion role identity -> Extended use	0.24***	4.24	0.06	0.12	0.36
IS infusion role identity -> Integrative use	0.30***	6.12	0.06	0.18	0.42
IS infusion role identity -> Emergent use	0.40***	6.09	0.07	0.26	0.54

Note: * p <0.5, ** p < 0.1, *** p <0.001

Formulas to calculate upper and lower bounds are: Upper bound = Path coefficient + 1.96 ✕ Standard Deviation, Lower bound = Path coefficient - 1.96 ✕Standard Deviation

5.5.1.3 Mediation Analysis

It is important to evaluate the direct and indirect relationships between predictor (exogenous) and outcome (endogenous) latent variables of a structural model (Henseler et al., 2009). These direct and indirect relationships can be investigated through mediating and moderating analyses. In this section, the significance of the mediating relationship is presented. This assessment was based on the theoretical reasoning that suggests IS infusion role identity is a mediating factor that can influence individuals' IS infusion behaviour in organisations (Farmer et al., 2003; Reid, 1999).

Figures 5.5 and 5.6 present the results of the post-hoc analysis conducted to examine the mediating effect of IS infusion role identity on extended use, integrative use and emergent use behaviours. The first step of post-hoc analysis was started by examining the influence of

IT identity on extended use, integrative use and emergent use. From the analysis, it can be seen that extended use, integrative use and emergent use were influenced positively by IT identity (see Figure 5.4).

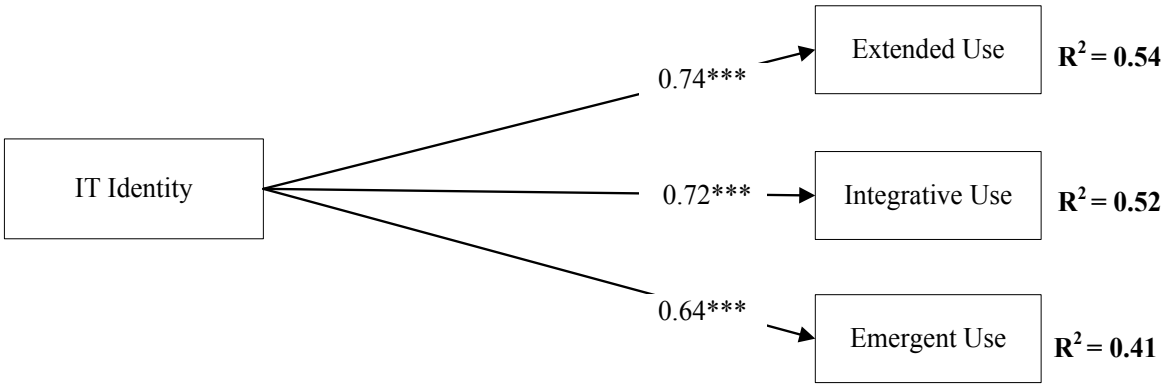

Figure 5.4. The Results of mediation post-hoc analysis[2]

The second step was to test the mediating effect of IS infusion role identity. The mediating variable was introduced into the relationship between IT identity and extended use, integrative use and emergent use behaviours (see Figure 5.5). From the analysis, IS infusion role identity was found to influence extended use, integrative use and emergent use positively, and also IS infusion role identity was positively influenced by IT identity (β=0.73, t=20.40). The introduction of IS infusion role identity as the mediating variable reduced the coefficient values between IT identity and extended use from 0.74 to 0.56, IT identity and integrative use from 0.72 to 0.47, and IT identity and emergent use from 0.64 to 0.33.

[2] *** p <0.001. The following t-statistics for IT identity -> Extended use (23.41); for IT identity -> Integrative use (25.39) and for IT identity -> Emergent use (16.60).

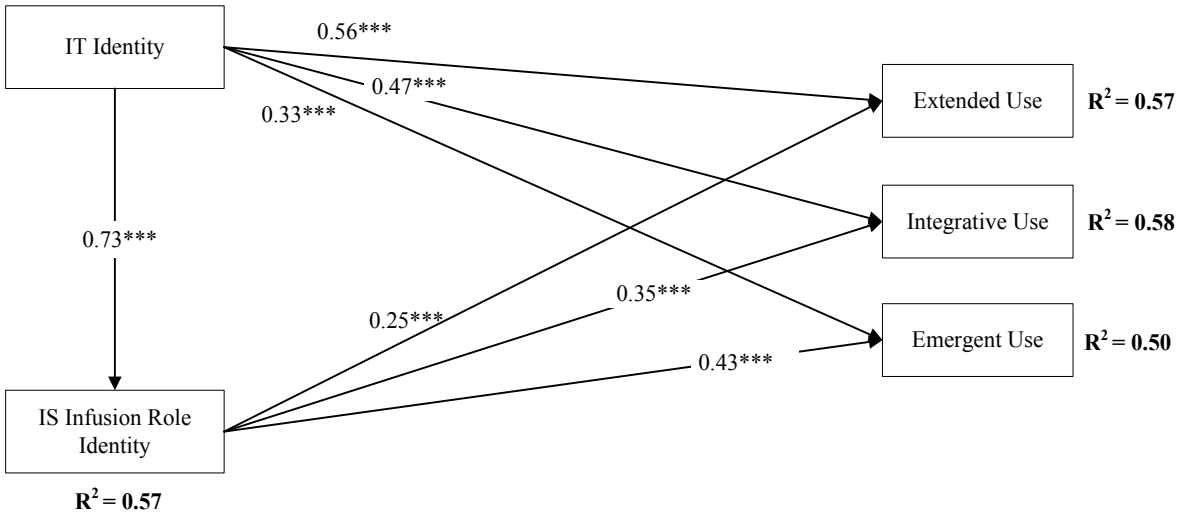

Figure 5.5. The Results of mediation post-hoc analysis

Based on Baron and Kenny's (1986) guidelines, this study found that IS infusion role identity partially mediated the relationship between IT identity and extended use, integrative use and emergent use behaviours. It also found that the introduction of IS infusion role identity as a mediator increased the R^2 values for extended use from 54.2% to 57%, for integrative use from 51.9% to 57.7%, and for emergent use from 40.9% to 49.6%. The results are presented at Table 5.10.

Table 5.10. Second-step Results for the Mediation Relationships

Paths	Path Coefficient	Std. Dev	T-statistics
IT identity -> Extended use	0.56***	0.06	10.14
IT identity -> Integrative use	0.47***	0.05	9.04
IT identity -> Emergent use	0.33***	0.07	4.54
IT identity -> IS infusion role identity	0.73***	0.04	20.40
IS infusion role identity -> Extended use	0.25***	0.06	4.45
IS infusion role identity -> Integrative use	0.35***	0.06	6.17
IS infusion role identity -> Emergent use	0.43***	0.07	5.86

Note: *** p <0.001

Subsequently, Sobel's test was used to assess the significance of the mediating relationship proposed in this study. Table 5.11 presents a summary of the direct and indirect relationships based on the structural model, which indicates that the relationships between IT identity and extended use, integrative use and emergent use were mediated significantly by IS infusion

role identity. The statistical significance of the mediation reduction was assessed through the following formula. The Z value was greater than 1.96 which showed that IS infusion role identity (Z_1= 5.56, Z_2 = 7.10, Z_3 = 7.49, $p < 0.001$) was a significant mediator.

$$Z = ab/(\sqrt{(a^2\ s_b{}^2\ + b^2\ s_a{}^2\ )}$$

Table 5.11. Sobel's Z Value Test Results

Paths		Path Coefficient	Std. Dev	Type of Mediation	Z	Results
Path c_1	ITI -> EXTU	0.74***	0.03	Partial	5.56	The relationship between IT identity and IS extended use was partially mediated by IS infusion role identity ($p < 0.001$).
Path a_1	ITI -> ROL	0.73***	0.04			
Path b_1	ROL -> EXTU	0.25***	0.06			
Path c'_1	ITI -> EXTU	0.56***	0.06			
Path c_2	ITI -> INTU	0.72***	0.03	Partial	7.10	The relationship between IT identity and IS integrative use was partially mediated by IS infusion role identity ($p < 0.001$).
Path a_2	ITI -> ROL	0.73***	0.04			
Path b_2	ROL -> INTU	0.35***	0.06			
Path c'_2	ITI -> INTU	0.47***	0.05			
Path c_3	ITI -> EMEU	0.64***	0.03	Partial	7.49	The relationship between IT identity and IS emergent use was partially mediated by IS infusion role identity ($p < 0.001$).
Path a_3	ITI -> ROL	0.73***	0.04			
Path b_3	ROL -> EMEU	0.43***	0.07			
Path c'_3	ITI -> EMEU	0.33***	0.07			

Note: *** $p < 0.001$. Path c_1, c_2, c_3 are the relationships between IV and DV without a mediator (IS infusion role identity). ITI refers to the IT identity, ROL refers to the IS infusion role identity, EXTU refers to extended use, INTU refers to integrative use and EMEU refers to emergent use.

5.5.1.4 Testing Hypotheses

To test the first structural model and the proposed hypotheses, the path coefficient between two latent variables was assessed. In PLS studies, reporting R^2 values for all the dependent variables incorporated in the structural model is recommended (Hulland, 1999). The four dependent variables in the research model were IS infusion role identity and IS extended use, integrative use and emergent use behaviours, and their R^2 values were 0.53, 0.59, 0.60 and 0.51 respectively.

Based on the path coefficient assessment, all the proposed hypotheses were supported. Hypotheses were statistically significant at the level of 0.001. All path coefficients had the expected sign directions (i.e., positive) and the statistically significant path coefficient value (β) ranged from 0.24 to 0.73. A summary of hypotheses testing is presented in Table 5.12.

Table 5.12. Summary of Hypothesis Testing

#	Hypothesis Statement	Result
H1a	An individual's IT identity is positively associated with her/his IS extended use behaviour within an organisation.	Supported
H1b	An individual's IT identity is positively associated with her/his IS integrative use behaviour within an organisation.	Supported
H1c	An individual's IT identity is positively associated with her/his IS emergent use behaviour within an organisation.	Supported
H2a	An individual's IS infusion role identity is positively associated with her/his IS extended use behaviour within an organisation.	Supported
H2b	An individual's IS infusion role identity is positively associated with her/his IS integrative use behaviour within an organisation.	Supported
H2c	An individual's IS infusion role identity is positively associated with her/his IS emergent use behaviour within an organisation.	Supported

The analysis showed that IS extended use was influenced directly by IT identity (β=0.51, t=7.96, p <0.001). Thus, hypothesis H1a that employees' IT identity positively influences their IS extended use behaviour in an organisation was supported. IS integrative use was also found to be influenced directly by IT identity (β=0.40, t=8.09, p <0.001). Thus, hypothesis H1b that employees' IT identity positively influences their IS integrative use behaviour in an organisation was supported. In addition, IS emergent use was found to be influenced directly by IT identity (β=0.29, t=3.84, p <0.001). Thus, hypothesis H1c that employees' IT identity positively influences their IS emergent use behaviour in organisation was also supported (see Table 5.16).

The analysis showed that IS infusion role identity was influenced directly by IT identity (β=0.73, t=20.77, p <0.001). Thus, hypothesis H2 that employees' IT identity positively influences their IS infusion role identity was supported (see Table 5.16).

Similarly, IS infusion role identity had a significant path coefficient to IS extended use (β=0.24, t=4.05, p < 0.001). Hence, hypothesis H3a that employees' IS infusion role identity positively influences their IS extended use behaviour in organisations was supported. IS infusion role identity had a significant path coefficient to IS integrative use (β=0.30, t=5.16, p < 0.001). Hence, hypothesis H3b that employees' IS infusion role identity positively

influences their IS integrative use behaviour in organisations was supported. In addition, IS infusion role identity had a significant path coefficient to IS emergent use (β=0.40, t=5.30, p < 0.001). Hence, hypothesis H3c that employees' IS infusion role identity positively influences their IS emergent use behaviour in organisations was supported (see Table 5.13).

Table 5.13. Results for Hypotheses for the First Model

#	Hypothesis	Path Coefficient	Std. Dev	T-statistics	Lower Bound	Upper Bound
H1a	IT identity -> Extended use	0.51***	0.07	7.96	0.37	0.65
H1b	IT identity -> Integrative use	0.40***	0.05	8.09	0.30	0.50
H1c	IT identity -> Emergent use	0.29***	0.08	3.84	0.13	0.45
H2	IT identity -> IS infusion role identity	0.73***	0.04	20.87	0.65	0.81
H3a	IS infusion role identity -> Extended use	0.24***	0.06	4.05	0.12	0.36
H3b	IS infusion role identity -> Integrative use	0.30***	0.06	5.16	0.18	0.42
H3c	IS infusion role identity -> Emergent use	0.40***	0.08	5.30	0.24	0.56

Note: *** p < 0.001

5.5.1.5 Testing Control Variables

The results of testing the specified structural model with the control variables (gender, age, education, position in organisation, tenure and former IT experience) are presented in Table 5.15 and Figure 5.8. As shown in Table 5.14, age had a significant negative relationship with IS extended and emergent use, indicating that younger participants showed a higher level of IS extended use and IS emergent use behaviours. In addition, role also had a significant positive relationship with IS emergent use, indicating that respondents' organisational position affected their IS emergent use behaviour. Customer related positions were coded from 1, with the highest number referring to less customer related positions, such as CEO. More customer related and front-line team positions (such as customer service representative/manager) showed higher scores for emergent use. The remaining four control variables (i.e., gender, education, tenure and former IT experience) had no significant relationships with extended use, integrative use and emergent use behaviours. Moreover,

none of the hypothesised paths changed their signs or the significance levels of any of the paths.

Table 5.14. Results for Control Variables for the First Model

	Path Coefficient	**Std. Dev**	**T-statistics**
Age -> Extended use	-0.17***	0.04	3.95
Age -> Integrative use	-0.08	0.04	1.73
Age -> Emergent use	-0.11*	0.04	2.53
Education -> Extended use	0.04	0.03	1.41
Education -> Integrative use	0.05	0.03	1.40
Education -> Emergent use	0.06	0.03	1.91
Former IT experience -> Extended use	-0.001	0.03	0.21
Former IT experience -> Integrative use	0.03	0.03	0.92
Former IT experience -> Emergent use	0.02	0.04	0.55
Role -> Extended use	0.01	0.03	0.36
Role -> Integrative use	0.01	0.03	0.27
Role -> Emergent use	0.14***	0.04	3.82
Tenure -> Extended use	0.05	0.04	1.14
Tenure -> Integrative use	-0.01	0.04	0.27
Tenure -> Emergent use	0.02	0.04	0.52
Gender -> Extended use	-0.01	0.03	0.32
Gender -> Integrative use	-0.03	0.03	0.76
Gender -> Emergent use	-0.03	0.03	0.77

Note: * $p < 0.5$, ** $p < 0.01$, *** $p < 0.001$

A comparison of Figure 5.5 (in hypothesis section) and Figure 5.6 shows that after the control variables were introduced to the structural model, the variance in extended use increased from 0.59 to 0.63. In IS integrative use, variance increased from 0.60 to 0.62, and in IS emergent use, variance increased from 0.51 to 0.56. These findings demonstrated that most of the variance in dependent variables (i.e., extended use, integrative use and emergent use) were captured by the theoretical constructs and only a small portion (i.e., 2.2%) was due to the control variables. The small difference in the variances in dependent variables between the two models suggested that the control variables had only a minor influence on the hypothesised structural model. Accordingly, the inclusion of the control variables ensured that these variables did not significantly change the impact of the theoretical constructs. Figure 5.6 illustrates the discussion in detail.

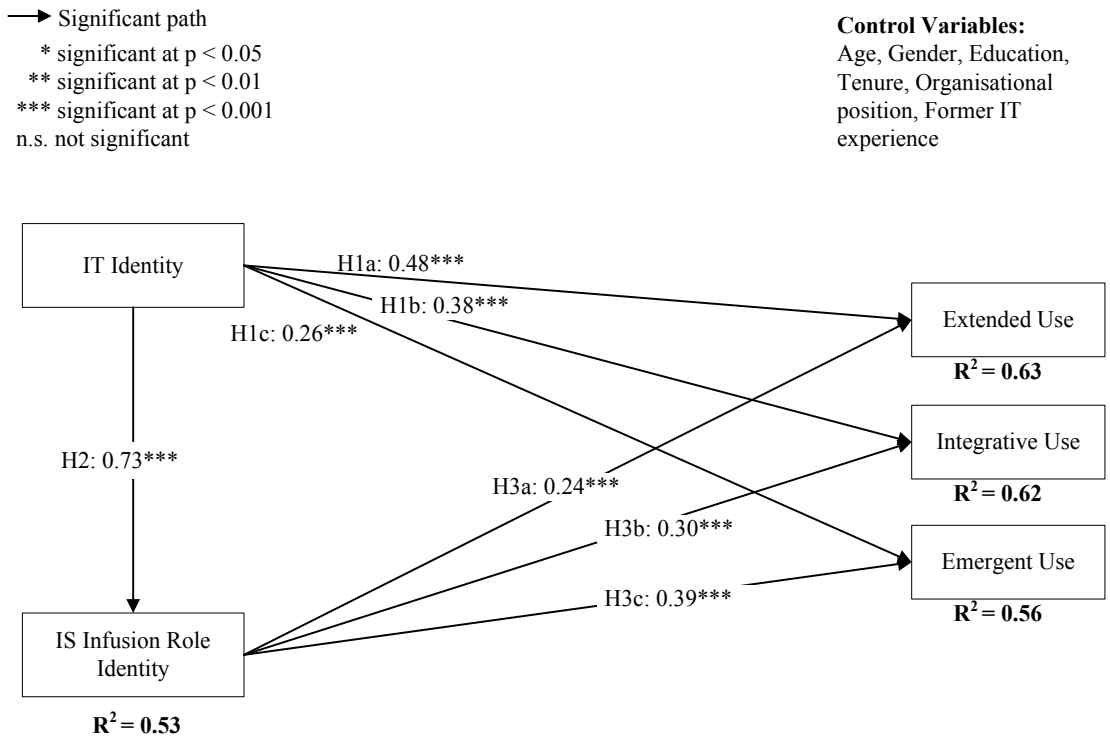

Figure 5.6. First structural model with control variables

5.5.1.6 Common Method Bias

This study followed the procedural and statistical remedies recommended by Podsakoff and colleagues (2012) to control any possible common method bias. Procedural remedies refer to the efforts which were taken during the data collection. Questions were placed in proper sequence in the questionnaire. Respondents were assured of the anonymity of their participation before they took part in the survey because protecting respondents' anonymity is one method of controlling common method bias (Jarvis et al., 2003; Podsakoff et al., 2003).

In addition to procedural remedies, multiple statistical tests were applied to identify the presence of common method bias (CMB). First, Harman's single factor test, an unrotated principal component factor analysis using SPSS, was done to evaluate the variance explained by a single factor (Podsakoff et al., 2003). According to Podsakoff and colleagues (2003), CMB exists in the dataset if a single factor emerges from the factor analysis or one general factor accounting for a majority (no less than 50%) of the variance in all of the variables is posited in the analysis. In other words, there is strong evidence of CMB, if the majority of the data load onto a single factor. For the first structural model of this study, the result of Harman's single factor test revealed 41 factors emerging from the dataset with the first factor

extracted accounting for 41.98% of the variance, and no single factor accounted for the majority of the variance. This suggests that CMB may not be an important issue for this research.

Second, Lindell and Whitney's (2001) marker variable test was conducted. This test applies a theoretically unrelated construct as a control on dependent variables (see Figure 5.7). If the theoretically unrelated construct significantly increases explained variance, there is evidence of CMB. A marker variable was included in the design of the survey instrument from the marketing domain of study. The marker variable measured the brand image construct regarding participants' attitudes towards Air New Zealand's marketing and advertising campaigns from all media such as TV, Internet, magazines, radio and sponsorship activities. The questions were measured by seven Likert scales from strongly disagree to strongly agree.

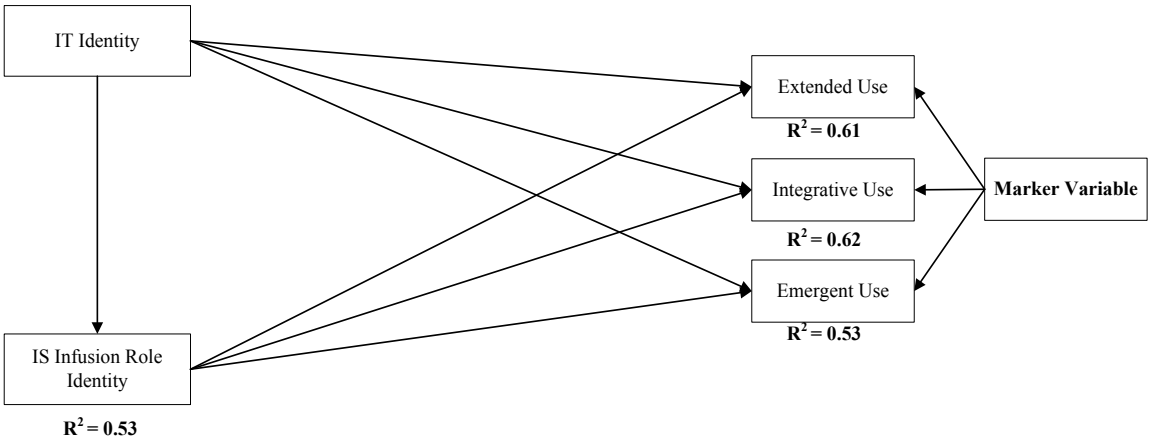

Figure 5.7. Marker variable for first model - CMB

If there was a presence of CMB, the inclusion of this variable as a control on the dependent variables should have significantly increased variance explained across all the variables. The analysis results showed that the change in variance explained was marginal. Table 5.15 shows that the variance in extended use increased from 0.59 to 0.61 after the marker variable was included into the structural model. This finding demonstrated that the variance difference in extended use was very marginal (i.e., 2.3%). The variance difference in integrative use and emergent use was marginal 1.8% and 2.1% respectively. This result further supports that CMB is not a significant issue for this study.

Table 5.15. Marker Variable Test for the First Model

Path	R^2	R^2 with Marker Variable	ΔR^2
Marker variable -> Extended use	59.3%	61.2%	1.9%
Marker variable -> Integrative use	60.2%	62.0%	1.8%
Marker variable -> Emergent use	50.5%	52.6%	2.1%

5.5.2 Second Structural Model Assessment

IS infusion as a single-dimensional construct as dependent variable: In addition, the structural model with IS infusion behaviour was assessed with a single-dimensional construct as dependent variable instead of three dependent variables (extended use, integrative use and emergent use).

In the second structural model, the mediation and moderation relationships were also tested. IT identity and IS infusion role identity were able to explain 54.4% of the variance in IS infusion behaviour, while, IT identity explained 52.9% of the variance in IS infusion role identity. Table 5.16 presents the path coefficients, observed T-statistics, and significance level for all hypothesised paths in the second structural model.

Table 5.16. Path Coefficients, Observed T-statistics, Significance Level for all Hypothesised Paths

Paths	Path Coefficient	T-statistics	Std. Dev
IT identity -> IS Infusion behaviour	0.51***	9.20	0.06
IT identity -> IS infusion role identity	0.73***	20.63	0.04
IS infusion role identity -> IS Infusion behaviour	0.27***	4.66	0.06

The mediation role of IS infusion role identity was also tested and results are reported in Table 5.17. According to the findings, the relationship between IT identity and IS infusion behaviour was partially significantly mediated by IS infusion role identity.

Table 5.17. Sobel's Z Value Test Results for the First Model

Path		Path Coefficient	Std. Dev	Type of Mediation	Z	Result
Path c	ITI -> INF	0.70***	0.03	Partial	4.61	The relationship between IT identity and IS infusion behaviour was significantly mediated by IS infusion role identity (P < 0.001).
Path a	ITI -> ROL	0.73***	0.04			
Path b	ROL -> INF	0.27***	0.06			
Path c'	ITI ->INF	0.51***	0.06			

Note: *** p <0.001

5.5.2.1 Moderation Effect Analysis

The effects of an interaction between IS infusion role identity and perceived organisational valuing of IS infusion on IS infusion behaviour as a single-dimensional construct was tested. To assess moderation relationship, the two-stage approach suggested by Henseler and Chin (2010) was applied. First, a model was run with the predictor (exogenous) and moderating variables used to predict the outcome (endogenous) variable. In the second stage, a model was run with the predictor variable, moderating variable and the interaction term predicting the outcome variable.

It is important to test more than just the significance of the interaction term for interpreting the findings of a test of interaction effects (Carte & Russell, 2003; Chin et al., 2003). The strength of the interaction term is assessed via Cohen's (1988) f^2 effect size, after identifying significant interaction terms. Effect sizes of 0.02 are considered small, 0.15 are considered medium and 0.35 are considered large (Cohen, 1988). We analyzed the f^2 to appraise effect size for all significant interaction terms.

The effect of an interaction between IS infusion role identity and perceived organisational valuing of IS infusion on IS infusion behaviour was tested. Results showed that perceived organisational valuing of IS infusion (β=0.062, p <0.05) significantly interacted with IS infusion role identity in its influence on IS infusion behaviour (see Table 5.18). In other words, the effect of IS infusion role identity on IS infusion behaviour was greater under conditions of high perceived organisational valuing of IS infusion.

Table 5.18. IS Infusion Role Identity Interaction Effects

	Path Coefficient	Std. Dev	T-statistics	Lower Bound	Upper Bound
Moderating effect -> IS infusion behaviour	0.06*	0.02	2.39	0.02	0.11

Note: * p <0.5

Based on the path coefficient assessment, all the proposed hypotheses for the second structural model were supported. Moreover, supported hypotheses were statistically significant at least at the level of 0.05. All beta path coefficients had expected sign directions (i.e., positive) and the statistically significant path coefficient value (β) ranged from 0.27 to 0.73. Table 5.19 presents the results of the testing hypotheses.

Table 5.19. Summary of Hypothesis Testing for the Second Model

#	Hypothesis Statements	Result
H1	An individual's IT identity is positively associated with her/his IS infusion behaviour within an organisation.	Supported
H2	An individual's IT identity is positively associated with her/his IS infusion role identity.	Supported
H3	An individual's IS infusion role identity is positively associated with her/his IS infusion behaviour within an organisation.	Supported
H4	Perceived organisational valuing of IS infusion positively moderates the relationship between an individual's IS infusion role identity and IS infusion behaviour within an organisation.	Supported

The analysis showed that IS infusion behaviour was influenced directly by IT identity (β=0.47, t=8.1, p <0.001). Thus, hypothesis H1 that employees' IT identity positively influences their IS infusion behaviour in organisation was supported. The analysis also showed that IS infusion role identity was influenced directly by IT identity (β=0.73, t=20.45, p <0.001). Thus, hypothesis H2 that employees' IT identity positively influences their IS infusion role identity was supported. Similarly, IS infusion role identity had a significant path coefficient to IS infusion behaviour (β=0.26, t=4.33, p < 0.001). Hence, hypothesis H3 that employees' IS infusion role identity positively influences their IS infusion behaviour in organisations was supported. In similar fashion, perceived organisational valuing of IS infusion significantly influenced the relationship between employees' IS infusion role identity and their IS infusion behaviour in organisations (β=0.07, t=2.39, p < 0.5). Thus, hypothesis H4 that perceived organisational valuing of IS infusion positively influences the

relationship between employees' IS infusion role identity and their IS infusion behaviour in organisations was supported (see Figure 5.8).

5.5.2.2 Testing Control Variables

The results of testing the second structural model with the control variables (gender, age, education, position in organisation, tenure and former IT experience) are presented in Table 5.20. As shown in Table 5.20, age had a significant negative relationship with IS infusion behaviour, indicating that younger participants showed higher level of IS infusion behaviour. In addition, role also had a significant positive relationship with IS infusion behaviour, indicating that respondents' organisational position affected their IS infusion behaviour. The customer related positions were coded from 1, with the highest number referring to less customer related positions, such as CEO. More customer related and front-line team positions (such as customer service representative/manager) showed higher scores for IS infusion behaviour. The remaining four control variables (i.e., gender, education, tenure and former IT experience) had no significant relationships with IS infusion behaviour. Moreover, none of the hypothesised paths changed their algebraic signs or the significance levels of any of the paths.

Table 5.20. Results for Control Variables

	Path Coefficient	**Std. Dev**	**T-statistics**
Age -> Infusion	-0.14**	0.04	3.30
Education -> IS Infusion behaviour	0.06	0.04	1.63
Former IT experience -> IS Infusion behaviour	0.03	0.03	1.07
Role -> IS Infusion behaviour	0.07*	0.03	1.98
Tenure -> IS Infusion behaviour	0.06	0.04	1.43
Gender -> IS Infusion behaviour	0.01	0.04	0.21

Note: * $p < 0.5$, ** $p < 0.01$, *** $p < 0.001$

After the control variables were introduced to the structural model, the variance in IS infusion increased from 0.54 to 0.57. These findings demonstrated that most of the variance in IS infusion was captured by the theoretical constructs and only a small portion (i.e., 2.3%) was due to the control variables. The small difference in the variances in IS infusion between the two models suggested that the control variables had only a minor influence on the hypothesised structural model. Accordingly, the inclusion of the control variables ensured

that these variables did not significantly change the impact of the theoretical constructs. Figure 5.8 illustrates the discussion in detail.

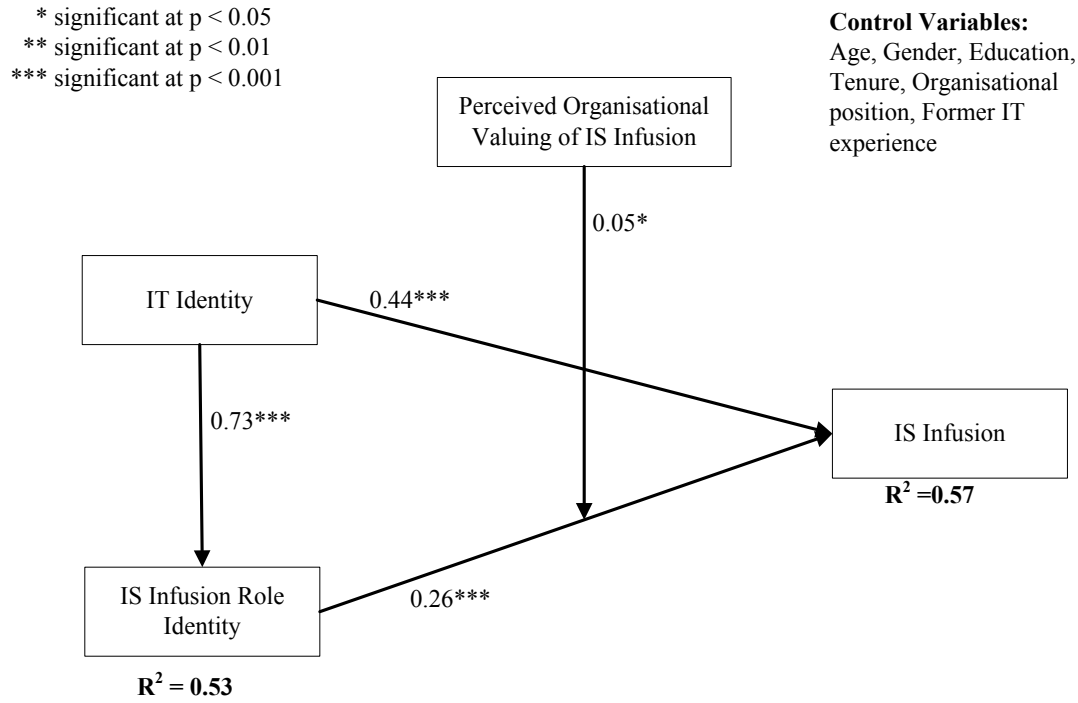

Figure 5.8. Second structural model with control variables

5.5.2.3 Common Method Bias

For the second structural model of this study, the result of Harman's single factor test revealed 38 factors emerging from the dataset with the first factor extracted accounting for 39.57% of the variance, and no single factor accounting for the majority of the variance. This suggests that CMB may not be an important issue for this research. Moreover, Lindell and Whitney's (2001) marker variable test was conducted. This test applies a theoretically unrelated construct as a control on dependent variables (see Figure 5.9).

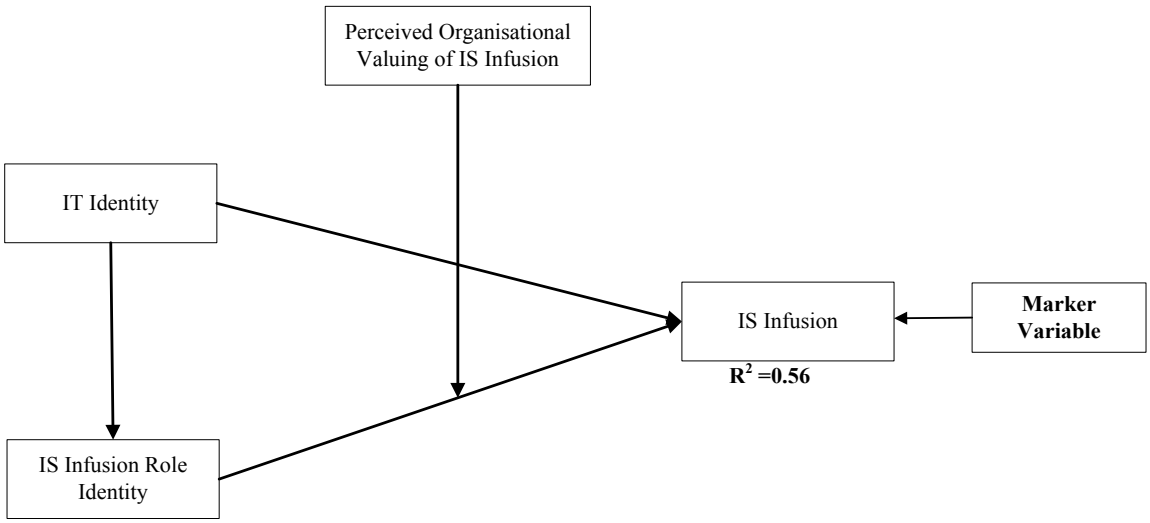

Figure 5.9. Marker variable for second model - CMB

If there was a presence of CMB, the inclusion of this variable as a control on the dependent variables should have significantly increased variance explained across all the variables. The analysis results suggested that the change in variance explained was marginal. Table 5.21 shows that the variance in IS infusion increased from 0.54 to 0.56 after the marker variable was included into the structural model. This finding demonstrated that the variance difference in IS infusion was very marginal (i.e., 2%). This result further supports that CMB is not a significant issue for this study.

Table 5.21. Marker Variable Test

Path	R^2	R^2 with Marker Variable	ΔR^2
Marker variable -> IS infusion	54%	56%	2%

5.6 Chapter Summary

This chapter reported the procedure and the results of analysing the data collected from the online survey. SmartPLS was used to analyse the determinants influencing employees IS infusion as well as its sub-dimensions of extended use, integrative use and emergent use behaviours. A number of observations could be made from the analysis conducted on the measurement and structural models. The first section presented the coding for the measurement items followed by the descriptive analysis of the respondents' demographic information and statistics on the instrument.

The second section included the examination of the measurement models – the first model with extended use, integrative use and emergent use behaviours as dependent variables and the second model with IS infusion behaviour (as a single-dimensional construct) as the dependent variable. The measurement models demonstrated satisfactory reliability and validity measures. In terms of internal consistency, all constructs demonstrated significant composite reliability values and significant indicator reliability. In addition, the measurement models represented satisfactory convergent and discriminant validity, all manifest constructs loaded on their respective latent variables and the square roots of AVE for each construct were higher than its inter-correlations.

The third section explained the validation of the structural models – the first model with extended use, integrative use and emergent use behaviours as dependent variables and the second model with IS infusion behaviour (as a single-dimensional construct) as the dependent variable. The R^2 was substantial with the high values representing strong explanatory power. In addition, all of the proposed paths within the structural models were supported. The structural models exhibited a significant mediating relationship that showed partial mediation effects on the relationship between IT identity and IS infusion behaviour. The structural models also depicted a significant moderation relationship. The next chapter provides a summary of the main findings and a discussion on the theoretical constructs applied in this study in relation to the captured results.

CHAPTER Six: Discussion of Results

6.1 Overview of Chapter Six

This chapter presents the key findings of this study. A detailed discussion on the hypotheses in relation to the key research findings based on the results reported in the previous chapter is presented. The second section presents an overview of the hypotheses based on the research questions outlined in Chapter One. The third section discusses the relationship between employees' identities and their IS infusion behaviours within an organisation in the light of IS infusion literature and identity theories. The fourth section presents discussions on the relationships between employees' IT identity and their IS infusion role identity. The following section presents the moderating role of perceived organisational valuing of IS infusion on the relationship between employees' IS infusion role identity and their IS infusion behaviour. In addition, these sections compare the consistency or inconsistency of the research findings with identity theories and previous studies in the literature. The last section is a brief summary of this chapter.

6.2 Summary of Key Findings

Organisations invest considerably in enterprise systems such as CRM systems with the expectations that employees will utilise these systems to enhance their job tasks and organisational performance. Unfortunately, organisations often do not gain the full expected benefits from their IS investments, due to the underutilisation of IS resources by employees. Several reasons may contribute to why IS investments do not bring about the expected outcome; a recurrent theme is the fact that these systems are rarely infused into individuals' work practices. This phenomenon invokes the need for a better understanding of the antecedents of IS infusion behaviours.

It has been argued that psychological factors (e.g., an individual's identity) directly influence continued IS use; however, these factors have not been extensively studied in the literature (Ortiz De Guinea & Markus, 2009). As a result of employees' close affiliation with a professional community in the workplace, employees have developed powerful identities that

guide their IS-related behaviours and performance (Mishra et al., 2012; Weick, 1995). Identities are regarded as central to an understanding of employees' decision making and behaviours within professional communities and organisations (Mishra et al., 2012). To this end, it is important to understand employees' identities in relation to their IS use in organisations. In this study, employees' IT identity and IS infusion role identity are examined to explain their influence on IS infusion behaviours in organisations.

This study has attempted to contribute to the IS use research area by developing and validating theoretical models to understand the underlying influence of employees' identities on IS infusion behaviours. The research models apply identity theories to explain the influence of person identity and role identity on employees' IS infusion behaviours within an organisation.

Overall, the findings suggest that the theoretical models are helpful to better understand the effect of employees' identities on IS infusion behaviour within an organisation and its three sub-dimensions – extended use, integrative use and emergent use behaviours. The first model with sub-dimensions of IS infusion as dependent variables has strong explanatory power; employees' IT identity and IS infusion role identity explain 63%, 63% and 56% of the variance in employees' IS extended use, integrative use and emergent use behaviours respectively. In addition, the second model with IS infusion as a single-dimensional construct as the dependent variable has strong explanatory power; employees' IT identity and IS infusion role identity explain 57% of the variance in IS infusion behaviour. All the hypothesised relationships in both models are supported, with the majority of them at the significance level of $p < 0.001$.

Based on the research findings, employees' IS infusion behaviour as well as extended use, integrative use and emergent use behaviours are positively influenced by employees' IT identity and IS infusion role identity. IS infusion role identity is found to have significant partial mediation effect on the relationship between employees' IT identity and their IS infusion behaviour as well as extended use, integrative use and emergent use within an organisation. Finally, the relationship between employees' IS infusion role identity and their IS infusion behaviour are positively moderated by employees' perceived organisational

valuing of IS infusion in the workplace. Table 6.1 provides a summary of the research findings under each research question.

Table 6.1. Summary of Key Findings

Research Questions	**Findings**
Research Question 1: What is the influence of employees' IT identity on their IS infusion behaviour within an organisation?	Employees' IT identity positively impacts their IS infusion behaviour within an organisation.
Sub research question 1.1: What is the influence of employees' IT identity on their IS extended use behaviour within an organisation?	Employees' IT identity positively impacts their IS extended use behaviour within an organisation.
Sub research question 1.2: What is the influence of employees' IT identity on their IS integrative use behaviour within an organisation?	Employees' IT identity positively impacts their IS integrative use behaviour within an organisation.
Sub research question 1.3: What is the influence of employees' IT identity on their IS emergent use behaviour within an organisation?	Employees' IT identity positively impacts their IS emergent use behaviour within an organisation.
Research Question 2: What is the influence of employees' IS infusion role identity on their IS infusion behaviour within an organisation?	Employees' IS infusion role identity positively impacts their IS infusion behaviour within an organisation.
Sub research question 2.1: What is the influence of employees' IS infusion role identity on their IS extended use behaviour within an organisation?	Employees' IS infusion role identity positively impacts their IS extended use behaviour within an organisation.
Sub research question 2.2: What is the influence of employees' IS infusion role identity on their IS integrative use behaviour within an organisation?	Employees' IS infusion role identity positively impacts their IS integrative use behaviour within an organisation.
Sub research question 2.3: What is the influence of employees' IS infusion role identity on their IS emergent use behaviour within an organisation?	Employees' IS infusion role identity positively impacts their IS emergent use behaviour within an organisation.
Research Question 3: What is the influence of employees' IT identity on their IS infusion role identity within an organisation?	Employees' IT identity positively impacts their IS infusion role identity within an organisation.

6.3 Discussion of the Findings

In this section, the findings are presented in accordance with the underlying research questions. The results are discussed and compared with related previous studies and identity theories. Previous studies demonstrated that identity is the core essence of people, directing and restricting their behaviours in the workplace (Mishra et al., 2012; Tripsas, 2009). It is therefore understandable that employees actively endeavor to manage their identities, which in turn impacts their behaviours within an organisation.

This study posited that there are direct relationships between the two identity constructs – IT identity and IS infusion role identity – and IS infusion behaviour and its constitutive elements of extended use, integrative use and emergent use. All relationships were found to be significant, supporting our arguments that employees' IT identity and IS infusion role identity in the workplace are associated with their IS infusion behaviours. In terms of IT identity, the findings suggest that employees openly embrace IS infusion behaviours when they have strong reliance, emotional attachment and dependency on the IS. In IS infusion role identity relationships, when IS infusion role identity is supported by employees' self-view, support from others, commitment, resource investment, external and internal gratifications, employees are likely to engage in IS infusion behaviours in the workplace.

6.3.1 The Role of IT Identity in Explaining IS Infusion Behaviour and its Sub-dimensions

This section presents the role of employees' IT identity in explaining IS infusion behaviour as well as extended use, integrative use and emergent use behaviours within an organisation.

6.3.1.1 The Role of IT Identity in Explaining IS Infusion Behaviour (as a single-dimensional construct)

Research Question 1: What is the influence of employees' IT identity on their IS infusion behaviour within an organisation?

IT identity refers to the extent to which employees view the use of IT as an integral part of the self. In this study, employees' IT identity was found to have a positive influence on employees' IS infusion behaviour within an organisation ($\beta = 0.51$, $t = 9.20$, $p < 0.001$). Employees' IT identity as person identity is about their own personal preference and attributes that they claim as part of their self-concept in relation to IS use. Employees' IT identity is guided by their own personal goals, self-interests and values in relation to IS use rather than the expectations or goals of the group or role in workplace. Employees' IT identity shapes their IS use behaviours in an organisation. In particular, employees with strong IT identity tend to engage more in using the most features of the system or exploring the new features of the system in an innovative fashion or reinforcing the linkages among multiple job tasks within an organisation. When an IS becomes infused within employees' personal and social networks, they realise that IS provides an opportunity to enhance the self. Consequently, employees' IS use intertwines with their personal preference as part of the self-concept that shapes their person identity in relation to IS use. In turn, employees' IT identity shapes their IS infusion behaviour in the workplace. The influence of individuals' person identity on their behaviours has received theoretical support from identity theories which argue that the meaning of an individual's identity has implications for how the individual behaves (Burke, 2004; McCall & Simmons, 1978; Stryker, 1980). Based on identity theories, person identity is about the personal attributes, characteristics, values and norms that individuals claim as part of their self-concepts and which shape their behaviours

and are not shared with others (Burke & Stets, 2009; Meijers, 1998). An individual's behaviour is independent of others, and is motivated by self-interest, rather than by meanings tied to a social group or the mutual interests of a role (Burke & Stets, 2009).

In the context of this study, employees counted on the CRM system to do their daily job tasks. These tasks included using the system for collecting, storing and accessing customers' information, analysing customers' behaviours, marketing, enhancing customers' experience and communicating with customers to help businesses to gain an insight into their behaviour, modifying their business operations and capitalising on improved customer relations. Employees with strong IT identity developed reliance and dependency on the CRM system to perform their daily job tasks, which led them to use the CRM to its fullest potential. This result is consistent with previous empirical studies that examined individuals' psychological factors (e.g., identity) in relation to IT use in the workplace (Carter, 2012; Carter & Grover, 2015; Mishra et al., 2012; Stein et al., 2013). For instance, Carter and Grover (2015) argued that IT identity can intimately impact stabilised IS-related behaviours as individuals routinely interact with the feature set of an IS. Stein and colleagues (2013) found that employees typically develop their IT identity in relation to enterprise systems to perform their professional roles and tasks.

Drawing on identity theories, the functions of IT, if aligned with personal psychological characteristics and the identity preferences of employees, influence how IT becomes a landmark in employees' identity in relation to IT, which in turn influences continuance use behaviours in workplaces. The findings of this study also are aligned with previous studies that explained the relationship between psychological factors and IT continuance use behaviours (Ortiz De Guinea & Markus, 2009; Stein et al., 2013). For instance, Carter and colleagues (2012) also adopted psychological theories and reported a strong relationship between the meanings young adults ascribed to the self in relation to their mobile phones and their deep usage, which suggests that IT identity impacts a variety of IT-related behaviours, including IT deep use.

This study used Carter and colleagues' (2012) conceptualisation of IT identity to assess employees' level of IT identity through its three reflective sub-dimensions (dependency,

emotional attachment and relatedness), in order to measure employees' level of reliance, confidence, attachment and feeling of connectedness to the cloud CRM system to support their daily job tasks in the workplace. The analysis shows that employees are dependent, emotionally attached and reliant on the cloud CRM system to do their daily job tasks more efficiently.

6.3.1.2 The Role of IT Identity in explaining IS Extended Use, Integrative Use and Emergent Use Behaviours

Sub research questions: What is the influence of employees' IT identity on their IS extended use, integrative use and emergent use behaviours within an organisation?

IT identity and extended use: *Extended use* of an IS refers to the use of more features of a system to perform job tasks in the workplace. Based on the research findings, employees' IS extended use behaviour was also found to be positively influenced by their IT identity ($\beta = 0.51$, $t=7.96$, $p < 0.001$). If an employee has feelings of connectedness with an IS, and enthusiasm and reliance on an IS as a means by which to perform job tasks in the workplace, then she/he is likely to engage and commit to using more of the system functionalities and features. Employees personal attributes and characteristics regarding working with an IS are very important and have a significant effect on how users find ways to use more features of a system to do their job tasks in the workplace. For example, sales employees who feel connected and dependent on the CRM system to do their daily jobs are likely use more features of the CRM such as pipeline, dashboard, account and forecast to do their sales jobs more efficiently.

The findings of this study suggest that employees with a strong emotional attachment to a system (i.e., IT identity) are more motivated to pursue efficient performance. Then, based on their persistence in pursuing efficient performance, they use the system in an extended way to perform a diverse range of job tasks within an organisation. For example, through perceiving the benefit and impact of the CRM system, employees with strong IT identity in relation to CRM are likely to employ their high levels of skills and capabilities to determine for themselves how to extend the usage of the CRM system in workplace. In addition,

employees with strong reliance, dependency and enthusiasm towards a system act on problems and improve the quality of their work by initiating changes in the way work is done, which includes using most of the IS features to improve job tasks in the workplace. This finding is in line with previous studies that argued that individuals' enthusiasm and confidence associated with IS use is critical for users to engage in creative and extended modes of IS use to achieve IS effectiveness (Burton-Jones & Straub, 2006; Nah et al., 2004; A. Schwarz & Chin, 2007). In other words, personal characteristics such as confidence of working with an IS are very important in terms of employees' extensive use a system within an organisation (Grublješič & Jaklič, 2015; H. W. Kim & Gupta, 2014). In addition, previous studies examined the influence of IT identity on IS deep use behaviour and found a positive relationship between individuals' feelings of reliance, connectedness and emotional attachment in relation to an IS and their IS extended use behaviour (Carter, 2012).

IT identity and integrative use: *Integrative use* of an IS refers to using the system to establish or enhance flow linkages among a set of job tasks in the workplace. The research findings showed that employees' IS integrative use behaviour was positively influenced by their IT identity ($\beta = 0.40$, $t = 8.09$, $p < 0.001$). If an employee has feelings of connectedness with an IS, as well as enthusiasm and reliance on an IS as a means by which to perform job tasks in the workplace, then she/he is likely to show more willingness to share job information and make interconnections among job tasks and with others. Subsequently, she/he is more able to better organise the related tasks, reinforce linkages among related tasks and enhance coordination through IS use. For example, employees with strong reliance and attachment to the CRM system are likely to use the system to integrate their different job tasks, such as integrating customer information from accounts and leads, and then to create a marketing campaign by integrating the tasks and information among the different features of the CRM system.

The findings of this study confirm that employees' perception of the impact of a target system can lead these employees to utilise a high level of skills and capabilities to find out how to integrate different features of the system to do their job tasks in the workplace. In addition, if a proactive employee is interested in extra-role behaviours, she/he will engage more in behaviours that match with her/his own personal values such as using a system in a more

integrated manner. This finding has received empirical support from studies that show that employees with strong motivational and psychological forces are more likely to embrace IS features in order to coordinate multiple job tasks (H. W. Kim & Gupta, 2014). Previous studies also argued that individuals' connectedness and reliance on a system can positively influence their IS use behaviours (Burton-Jones & Straub, 2006; A. Schwarz & Chin, 2007). In addition, according to Wang and Hsieh (2006), if employees have satisfactory interactions and enthusiasm towards an IS, they are more likely to embrace that IS in order to better organise the related tasks.

IT identity and emergent use: *Emergent use* of an IS refers to using the system in order to accomplish job tasks that were not feasible or recognised before. The research findings showed that employees' IS emergent use behaviour was positively influenced by their IT identity ($\beta = 0.29$, $t = 3.84$, $p < 0.001$). Through IT identity, employees' personal interest and enthusiasm in learning IS features is likely to motivate them to engage in exploring new features of an IS, to be open to challenges and to be willing to take risks. Employees with strong IT identity are likely to expend intensive effort in acquiring information and trying out innovative features of an IS, which subsequently leads to a greater extent and scope of exploratory IS usage. Therefore, employees tend to explore a wide range of new IS features and evaluate how different features can benefit them and the organisation. Employees with strong IT identity may have the tendency to explore more new ways of using an IS, rather than relying on standardised routines to enhance their IS infusion behaviours within an organisation. This finding is in line with previous studies that reported positive relationships between individuals' IT identity and their IS exploratory use, where employees explore the new features of an IS (Stein, 2013). Individuals' psychological interaction and experience with an IS also encourages them to explore new features of an IS (Thatcher et al., 2011). When employees mentally depend on a system, they are more likely to invest time and effort in engaging in extra-role behaviours, such as exploring new ways to use the system to do their job tasks (Wang & Hsieh, 2006).

Overall, in terms of the first research question and sub research questions, this study confirms that employees' IT identity is an important factor that has a positive and significant influence on employees' IS infusion behaviour and employees' IS extended use, integrative use and

emergent behaviours within an organisation. The path coefficient between employees' IT identity and IS infusion as a single-dimensional construct (β = 0.51) was high. In addition, the path coefficient between employees' IT identity and their extended use (β = 0.51) was higher than the path coefficient between employees' IT identity and IS integrative use (β = 0.40) and between employees' IT identity and IS emergent use (β = 0.29) behaviours. These findings reveal that employees' IT identity as their IT-related person identity has a strong impact on their IS infusion behaviour. In addition, employees' IT identity has a greater impact on their IS extended use behaviour compared to their IS integrative use and emergent use behaviours in workplace. In the case of this study, employees who had stronger reliance, dependency and attachment to the CRM system were more likely to use the CRM system to its fullest potential (IS infusion behaviour) as well as to use most features of the CRM system (IS extended use) to do their daily job tasks, compared to using the CRM system in an integrative manner (IS integrative use) and exploring the new features of the CRM system (IS emergent use) within an organisation.

6.3.2 The Role of IS Infusion Role Identity in Explaining IS Infusion Behaviour and its Sub-dimensions

This section presents the role of employees' IS infusion role identity in IS infusion as well as extended use, integrative use and emergent use behaviours within an organisation. Within this study, role identity theory was applied to explain the determinants of individuals' role identity and the impact of role identity on individuals' behaviour. Based on the theoretical framework, this study proposed that individuals' IS infusion role identity is shaped by six determinants: self-support, social support, commitment, extrinsic and intrinsic gratifications, which positively influence employees' IS infusion behaviour within an organisation.

6.3.2.1 The Role of IS Infusion Role Identity in IS Infusion Behaviour (as a single-dimensional construct)

Research Question 2: What is the influence of employees' IS infusion role identity on their IS infusion behaviour within an organisation?

IS infusion role identity refers to the extent to which employees personally view that using the most features of a system or reinforcing linkages among multiple job tasks through a system or exploring the new features in innovative ways is an important part of their sense of self as an employee. Employees' IS infusion role identity was found to have a positive influence on employees' IS infusion behaviour within an organisation ($\beta = 0.27$, $t = 4.66$, $p < 0.001$). Thus, employees who personally view that using the CRM system to its fullest potential is an important part of their sense of self as employees are more engaged in IS infusion behaviour in the workplace. From a theoretical perspective, employees who see their IS infusion role identity as being in a higher position in their role identity prominence hierarchy are likely to engage in IS infusion behaviour in order to complete their job tasks beyond the prescribed or formal guidelines for the use of system features within an organisation. Employees' perception of the value and influence of IS infusion role identity leads them to assume this role identity, and thus apply their high levels of skills to determine for themselves how to infuse the system to better perform their job tasks. This result is consistent with previous studies that reported employees' IS-related role identities positively influence their IS continuance use behaviour in organisations (Mishra et al., 2012; Stein et al., 2013). Previous studies confirmed the positive relationship between employees' role identity and their role-related behaviours in the workplace (Farmer et al., 2003; Farmer & Van Dyne, 2010; Reid, 1999). Past studies also argued that role identity can be considered as a determinant of OCB (Dávila & Finkelstein, 2010; Finkelstein & Penner, 2004), as well as individuals' infusion behaviour. Individuals with strong role identities are more likely to act in extra-role behaviours (Farmer et al., 2003).

In addition, the post-hoc analysis findings demonstrated that IS infusion role identity partially mediates the relationships between IT identity and IS infusion behaviour as well as extended use, integrative use and emergent use behaviours. These results clearly show that the

introduction of IS infusion role identity as a mediating variable can provide a richer picture of the relationship between individuals' person identity, role identity and behaviours in relation to IS. This finding shows that employees' strong IS infusion role identity may strengthen the relationship between employees' IT identity and their IS infusion behaviours. Employees' personal interest and enthusiasm toward an IS shapes their personal view of themselves in relation to IS use as an employees, which subsequently leads them to use the system to its fullest potential to do their job tasks in the workplace.

6.3.2.2 The Role of IS Infusion Role Identity in Explaining IS Extended Use, Integrative Use and Emergent Use Behaviours

Sub research questions: What is the influence of employees' IS infusion role identity on their IS extended use, integrative use and emergent use behaviours within an organisation?

IS infusion role identity and extended use: The research findings showed that employees' IS infusion role identity has a positive influence on employees' IS extended use behaviour within organisation ($\beta = 0.24$, $t = 4.05$, $p < 0.001$). Thus, employees who personally view that using the CRM system to its fullest potential is an important part of their sense of self as an employee are more engaged in IS extended use behaviour in the workplace. In other words, employees with greater IS infusion role identity tend to use more of the CRM features (such as account, lead, opportunity, report) to complete their job tasks beyond the prescribed or formal guidelines for the use of the system, to perform a wider range of tasks within an organisation. Based on their persistence and hard work in showing their IS infusion role identity in an organisation, they are likely to apply their skills to use the system in an extended way to accommodate various job tasks. When employees' role identity receives strong support from their own self and others, as well as commitment, resource investment and external and internal gratifications in relation to IS use in the workplace, these employees are likely to be motivated as employees to engage in using more features of an IS to do their job tasks. In this study, employees' role identity in relation to CRM infusion received support from different sources. For example, an employee may have received positive expectations from co-workers and supervisors about her/his strong capability regarding CRM usage. Co-workers' and supervisors' perceptions of her/his commitment to using the CRM system and

her/his use of both time and energy to infuse the CRM system provided the employee with a feeling of satisfaction from using the CRM system, which in turn created a strong CRM infusion role identity for that specific employee in the workplace. As a result, employees' strong CRM role identity enabled them to extend CRM use through different features such as lead, pipeline, contact and report. This result is supported by role identity theory which maintains that individuals' role identity prominence influences their behaviour (McCall & Simmons, 1966, 1978). The positive relationship between individuals' role identity and their identity-related behaviours is also supported in other contexts (Biddle et al., 1987; P L Callero, Howard, & Piliavin, 1987; Granberg & Holmberg, 1990; Reid, 1999; Theodorakis, 1994). For instance, Mishra and colleagues (2012) reported that employees with stronger IS-related identity are likely to engage more in IS assimilation behaviours.

In addition, findings demonstrated that IS infusion role identity partially mediates the relationship between IT identity and IS extended use behaviour. This finding shows that employees with strong IS infusion role identity can strengthen the relationship between their personal preference toward a system and their IS extended use behaviour. Employees' personal interest and enthusiasm toward an IS may improve their personal view of themselves in relation to IS use as an employee, which subsequently leads them to use more features of the system to do their job tasks in the workplace. The findings indicate that an employee who has a strong IT identity tends to use the CRM in an extended way and if the same employee has a strong role identity in relation to CRM infusion in line with her/his person identity, she/he is likely to show a much greater level of the CRM extended use behaviour in the workplace.

IS infusion role identity and integrative use: Employees' IS infusion role identity was identified as having a positive influence on employees' IS integrative use behaviour within an organisation ($\beta = 0.30$, $t = 5.16$, $p < 0.001$). Therefore, an employee with strong IS infusion role identity tends to use a target IS in an integrative manner to reinforce linkages among related job tasks. Based on the findings of this study, employees' confidence in their ability to perform their IS infusion role identity competently is critical for them to better organise their related job tasks and to make linkage among multiple job tasks. Employees with a strong IS infusion role identity are more likely to embrace IS features in order to better coordinate

multiple job tasks than those who have a weak IS infusion role identity. For example, a marketing employee with strong CRM use role identity is likely to integrate the features of the CRM, such as account, lead and campaign, to create a link between account information and lead sections in order to automatically get the information from these two features in the campaign chart. This finding is consistent with previous studies that showed that when an employee is committed to the use of a system, she/he is more likely to engage in extra-role behaviours beyond the job description, such as creating an interconnectedness between job tasks and other tasks (Wang & Hsieh, 2006). According to H. W. Kim and Gupta (2014), employees' psychological factors positively impact their IS integrative use behaviour within an organisation. The relationship between individuals' role identity and their IS integrative use behaviours also received support from previous studies. For example, in a study by (Mishra et al., 2012), employees' role identity (i.e., physicians' role identity) positively impacted their IS use behaviour to ensure the information was integrated, in order to make linkage among job tasks. Another study argued that employees are likely to develop their IS-related identities to perform their professional roles and better organise the related job tasks (Stein et al., 2013).

In addition, findings demonstrated that IS infusion role identity partially mediates the relationship between IT identity and IS integrative use behaviour. Employees' strong IS infusion role identity can strengthen the relationship between their IT identity and IS integrative use behaviours. An employee with strong self-interest and emotional attachment towards a system may show a strong IS infusion role identity that leads them to pursue IS use behaviours in order to ensure the information is integrated and interconnectedness is enhanced among job tasks in the workplace.

IS infusion role identity and emergent use: The research findings showed that employees' IS infusion role identity had a positive influence on employees' IS emergent use behaviour within an organisation ($\beta = 0.40$, $t = 5.30$, $p < 0.001$). Emergent use requires an employee to use a target IS in a new way that was not recognised or feasible before (H. W. Kim & Gupta, 2014). The findings of this study show that employees with strong IS infusion identity are likely to expend intensive effort in acquiring information and trying out innovative features of an IS, which may subsequently lead to greater IS use behaviour in the workplace. These

users are likely to explore a wide range of new IS features and evaluate how different features can benefit them to perform their jobs more competently in the organisation. In the context of this study, when employees were committed to the use of a CRM in the workplace, they personally viewed that using the CRM system to its fullest potential was an important part of their sense of self as an employees. Therefore, their CRM use identity became important to them and they were more likely to engage in behaviours that matched their role identity, such as exploring the new features of the CRM including trying the system's advanced analytical features that were not feasible before. This finding is supported by previous studies (Farmer & Dyne, 2010; Ke et al., 2012) that suggested that individuals with strong role identity toward IS use are likely to explore more new ways of using IS, rather than relying on standardised routines to enhance their role and job performance.

In addition, the findings demonstrated that IS infusion role identity partially mediates the relationship between IT identity and IS emergent use behaviour. This finding shows that employees' strong IS infusion role identity may strengthen the relationship between personal dependency, emotional attachments, reliance on a system and their exploratory use of an IS. Employees' reliance and connectedness to an IS can improve their personal view of themselves in relation to IS use as employees, which subsequently motivates them to explore the new features of the IS to do their job tasks in the workplace. The findings suggest that an employee who has a strong IT identity and reliance on the CRM system may tend to use the CRM in an innovative way; however, if the same employee has a strong role identity in relation to CRM infusion in line with her/his person identity, she/he is more likely to attempt to explore a greater level of the CRM features in the workplace.

Overall, for the second research question and sub research questions, this study confirms that employees' IS infusion role identity positively influences employees' IS infusion behaviour as well as IS extended use, integrative use and emergent use behaviours within an organisation. The path coefficient between employees' IS infusion role identity and IS emergent use behaviour ($\beta = 0.40$) was higher than the path coefficient between employees' IS infusion role identity and IS infusion ($\beta = 0.27$), IS extended use ($\beta = 0.24$) and IS integrative use ($\beta = 0.30$) behaviours. These findings show that employees' IS infusion role identity has a greater impact on their IS emergent use behavior, compared to other IS infusion

behaviours. In the case of this study, those employees who personally viewed that using the CRM system to its fullest potential was an important part of their sense of self as employees were more engaged in exploring the new features of the CRM system, an activity that was not previously feasible. This comparison reveals that employees with stronger IS infusion role identity tend to engage more in innovative and exploratory use of a target IS, rather than trying most features of an IS (extended use) or making linkage among job tasks (integrative use). Stronger IS infusion role identity may arouse the innovative aspect of employees' IS use behaviour in workplace.

6.3.3 The Role of IT Identity as the Antecedent of IS Infusion Role Identity

Research Question 3: What is the influence of employees' IT identity on their IS infusion role identity within an organisation?

According to the research findings, employees' IT identity had a strong positive influence on employees' IS infusion role identity within an organisation ($\beta = 0.73$, $t = 20.63$, $p < 0.001$). Employees' IT identity accounted for 53% of the variance in employees' IS infusion role identity. This finding is in line with the argument that individuals' person identity affects their related role identity (Burke & Stets, 2009), which is a workplace role identity in the context of this study. Employee' IT identity as a set of meanings that an employee attaches to the self in relation to a particular IT, and the interactions with that specific IT, affects the extent to which an employee personally views that using that specific IT to its fullest potential is an important part of her/his sense of self as an employee. This finding is in line with Burke and Stets (2009) argument that person identity is recognised as a master identity operating through roles, groups and situations. Individuals perform a role and group/social identity that is more consistent with the meaning of their person identity (Burke, 2004). In addition, identity theories maintain that individuals' person identity affects their internalised expectations about competent performance in their work roles (McCall & Simmons, 1966; Stryker & Burke, 2000). In other words, it is expected that person identity influences the selection of role and group identities. This study suggests that employees with a strong degree of dependency, reliance and attachment to a specific IS to do their daily job tasks tend to perform roles that are more consistent with their IT related person identity. Employees'

reliance, dependency and deep attachment to an implemented IT enable them to retain and strengthen their autonomy and dominant role identity in the IS infusion process. Employees who are personally attached and dependent on a system to do their job tasks are likely perform roles that are in line with their personality. Hence, employees' identity that is related to a specific IS become related to who they are in the roles they perform within an organisation. This result clearly shows that the introduction of IT identity as a person identity and IS infusion role identity can provide a richer picture of the relationship between individuals' person identity and role identity in relation to an IS in IS use models. This finding is also consistent with previous empirical studies regarding the effect of individuals' person identity on their related role identity in the workplace (Carter et al., 2012; Lamb & Davidson, 2005; Mishra et al., 2012).

Hence, with the third research question, this study confirms that employees' IT identity is a strong antecedent of employee's IS infusion role identity within an organisation.

6.3.4 The Moderator Role of Perceived Organisational Valuing of IS Infusion

The research findings show that the relationship between employees' IS infusion role identity and their IS infusion behaviour is positively moderated by employees' perception regarding organisational valuing of the IS infusion behaviour. This infers that the relationship between employees' IS infusion role identity and their IS infusion behaviour is positively greater when organisational valuing of IS infusion is positive, and lower when organisational valuing of IS infusion is negative ($\beta = 0.06$, $t = 2.39$, $p < 0.5$). In this study, employees' perceived organisational valuing of IS infusion behaviour is a measure of a general perception about organisational support regarding CRM infusion in the workplace in different ways such as top management support, encouraging an organisational atmosphere, norms, guidelines, interventions and culture of IS deep use. The results show that employees with either strong or weak perceptions of organisational valuing of IS infusion have differences in the impact of their IS infusion role identity on IS infusion engagement behaviour. If employees with strong IS infusion role identity find themselves working under conditions where infusion behaviour is valued and supported in an organisation, they are likely to engage more in IS infusion behaviour. On the other hand, when employees with strong IS infusion role identity

find themselves working under conditions where infusion behaviour is irrelevant or devalued, they are likely to opt out of IS infusion engagement. In the context of this study, those employees who had an IS infusion role identity perceived that their organisation's guidelines, interventions and culture appreciated the CRM infusion. This perception strengthened and encouraged employees toward a greater willingness to use the CRM to its fullest potential in the workplace. Therefore, if top management values CRM infusion behaviour and provides training to encourage this behaviour in an organisation, employees are likely to feel that their CRM infusion role and behaviour are valued and supported and that they can practice the use of the CRM to its fullest potential without feeling threatened by others. This finding is in line with prior studies that found that perceived organisational valuing of a specific behaviour positively moderates the relationship between employees' related role identity and that specific behaviour in a way that the relationship is positively greater when organisational valuing of IS infusion is positive, and lower when organisational valuing is negative (Farmer et al., 2003).

6.4 Summary of Chapter Six

This chapter discussed the findings presented in Chapter Five. All three main research questions were answered and the 10 hypotheses were discussed in the light of theoretical arguments and previous studies.

The results of this study indicate that employees' IS infusion behaviour, IS extended use, integrative use and emergent use behaviours are positively influenced by IT identity and IS infusion role identity. The relationships between IT identity and IS infusion, IS extended use, integrative use and emergent use behaviours are partially mediated by employees' IS infusion role identity. Meanwhile, employees' IT identity as a person identity was found to be a strong antecedent of employees' IS infusion role identity within an organisation. Finally, employees' perceived organisational valuing of IS infusion behavior positively moderates the relationship between employees' IS infusion role identity and their IS infusion behaviour within an organisation. In sum, all the hypotheses are supported. In the next chapter, an overall summary of the research, the theoretical and practical contributions of this study and concluding remarks are presented.

CHAPTER Seven: Conclusions

7.1 Overview of Chapter Seven

The first section of this chapter presents a summary of the previous six chapters. It then provides a summary of the empirical findings to address the three research questions of this study. This is followed by two sections that discuss the theoretical and practical contributions of this study. Then, the limitations of this study are presented and suggestions and guidelines for future research are provided. Finally, this thesis ends with concluding remarks.

7.2 Summary of the Study

Overall, this study has aimed to understand the IT identity and IS infusion role identity factors that explain IS infusion behaviour as well as extended use, integrative use and emergent use behaviours within an organisation. This study elaborated briefly on the literature on identity, IS infusion behaviour and its three sub-dimensions, and provided an overview and understanding of the patterns in previous studies that examined the influencing factors of IS infusion behaviour. Based on the research questions and literature analysis, the theoretical and knowledge gaps were identified that motivated this study. Literature on IS infusion and its influencing factors provided a useful background on the role of psychological factors such as identity to understand employees' IS infusion behaviour within an organisation. In addition, this study was motivated by the call for more research to examine the determinants of the psychological factors (e.g., identities) of IS infusion behaviour within an organisation (Dávila & Finkelstein, 2010; Hassandoust et al., 2016; Ortiz De Guinea & Markus, 2009). The research questions of this study are presented below.

Research Question 1: What is the influence of employees' IT identity on their IS infusion behaviour within an organisation?

Sub research question 1.1: What is the influence of employees' IT identity on their IS extended use behaviour within an organisation?

***Sub research question 1.2*:** What is the influence of employees' IT identity on their IS integrative use behaviour within an organisation?

Sub research question 1.3: What is the influence of employees' IT identity on their IS emergent use behaviour within an organisation?

Research Question 2: What is the influence of employees' IS infusion role identity on their IS infusion behaviour within an organisation?
Sub research question 2.1: What is the influence of employees' IS infusion role identity on their IS extended use behaviour within an organisation?
Sub research question 2.2: What is the influence of employees' IS infusion role identity on their IS integrative use behaviour within an organisation?
Sub research question 2.3: What is the influence of employees' IS infusion role identity on their IS emergent use behaviour within an organisation?

Research Question 3: What is the influence of employees' IT identity on their IS infusion role identity within an organisation?

Three theoretical lenses – Stryker's identity theory, McCall and Simmons' role identity theory and Burke's person identity theory – were applied in order to provide theoretical arguments to support the research models that sought to investigate the influence of individuals' IT identity and IS infusion role identity on IS infusion behaviour as well as extended use, integrative use and emergent use behaviours within an organisation. The selections of these theories was based on their relevancy in examining the identity-behaviour relationship phenomenon. Two research models were developed: the first model examined the influence of IT identity and IS infusion role identity on extended use, integrative and emergent use behaviours, and the second model examined the influence of IT identity and IS infusion role identity on IS infusion behaviour as a single-dimensional construct.

An online survey was used as the data collection technique to gather information from employees who had experience in using the CRM system. In total, a dataset of 413 was used to test the research models. A structural equation modelling (SEM) - partial least squares (PLS) technique was adopted to assess the validity and reliability of the measurement and structural models.

The results of the hypothesised relationships in the research models were presented and the mediating and moderating relationships in the structural models were reported. Overall, all of the hypotheses in the research models were supported.

The research findings showed that IT identity as employees' person identity positively influenced their IS infusion behaviour as well as their extended use, integrative use and emergent use behaviours within an organisation. In this study, IT identity emerged as a stronger predictor of extended use, compared to other dependent variables, that is, IS infusion behaviour, integrative use and emergent use respectively.

The findings also showed that employees' IS infusion role identity positively influenced their IS infusion behaviour as well as their extended use, integrative use and emergent use behaviours within an organisation. In this study, IS infusion role identity emerged as a stronger predictor of emergent use, compared to other dependent variables, that is, integrative use, IS infusion behaviour and extended use respectively. The research finding also showed that employees' IT identity as person identity positively influenced their IS infusion role identity. In particular, IS infusion role identity partially mediated the relationship between employees' IT identity and their IS infusion behaviour as well as extended use, integrative use and emergent use behaviours.

The result showed that employees' perception regarding organisational valuing of IS infusion positively moderated the relationship between their IS infusion role identity and their IS infusion behaviour within an organisation. Overall, these findings are mostly consistent with the theories and extant research, upon which theoretical and practical implications can be drawn.

This study's findings suggest that usage of information systems plays an important role in employees' professional life by being continuously present and part of employees' work activities directed at achieving their everyday job tasks. IS can enter into employees' working life, in which the self and others are positioned, where their personal and professional identities (i.e., IT identity and IS infusion role identity) in relation to IS are performed (Stein et al., 2013).

7.3 Theoretical Contributions

This study contributes to IS infusion research by applying identity theories to examine the relationships between employees' identities and their IS infusion behaviour within an organisation. It provides insights into IS usage behaviours in organisations. The insights from identity theories suggest the important role of psychological factors in explaining IS use in organisations and everyday life. Although the focus of this study was on explaining the infusion of information systems through the lens of identity theories, the person and role bases of identity and its impacts on long-term behaviours can be a useful theoretical lens to study a variety of IS use phenomena such as assimilation and routinisation. The theoretical contributions to the IS infusion literature are presented below.

This thesis offers a better understanding of IS infusion by comprehensively evaluating IS infusion behaviour as a single-dimensional construct as well as its three sub-dimensions, namely, extended use, integrative use and emergent use behaviours. To make sure their IS investment has been successful, organisations need to ensure that their employees infuse the system to do their daily job tasks. Within organisations, some IS users may remain in their comfort zone, while others may exceed the boundaries of what the IS has to offer beyond their job descriptions (Kim & Gupta, 2014). According to IS infusion literature, most of the IS implementations in the workplace do not reach the infusion stage. In addition, analysis of the IS literature related to infusion revealed inconsistencies in what constitutes IS infusion behaviour; therefore, it should be considered as a single-dimensional construct or constituted of several sub-dimensions (O'Connor, O'Rahailligh, & O'Donoghue, 2012). In particular, some studies have investigated IS infusion as a single-dimensional construct (e.g., infusion) (Fadel, 2012; Jones et al., 2002; Sundaram et al., 2007), or one or two of its sub-dimensions (e.g., extended use or trying to innovate) (Ahuja & Thatcher, 2005; Hsieh, Rai & Xu, 2011; Hsieh & Wang, 2007; Ke, Tan, Sia & Wei, 2013; Saeed & Sue, 2008; Sun, 2012). By interpreting IS infusion as a single-dimensional construct or examining only one or two sub-dimensions of IS infusion, previous research failed to investigate every facet of IS infusion behaviour. To address this limitation in the literature, this research examined IS infusion as a single-dimensional construct as well as its three sub-dimensions: extended use, integrative use and emergent use behaviours as proposed by Zmud and colleagues (Cooper & Zmud,

1990; Saga & Zmud, 1994).

The IS use literature, with the exception of a few studies (e.g., Carter & Grover, 2015; H. W. Kim & Gupta, 2014; Mishra et al., 2012; Stein et al., 2013), does not pay enough attention to the role and influence of psychological factors, particularly in relation to IS infusion behaviours. To explain IS infusion behaviours, previous research primarily relied on a limited set of variables such as organisational, technological, environmental and some individual factors to explain the early stages of IS implementation such as IS adoption (Hsieh & Wang, 2007; Jones, Sundaram & Chin, 2002; Saeed & Sue, 2008). Although these variables are helpful in explaining IS adoption, they cannot accurately explain the IS infusion stage in the IS implementation model (Kim & Gupta, 2014). This is because IS infusion requires users to be proactive in using an IS beyond their standardised job description. Moreover, IS adoption reflects rational behaviours, whereas IS infusion is concerned with social learning and political behaviours. Thus far, the IS use literature has had minimal focus on users' unique characteristics in relation to IS and professional roles that may shape infusion behaviors (Hassandoust, Techatassanasoontorn, & Tan, 2015). Infusion is derived from organisational citizenship behaviour as an extra-role behaviour, which refers to user activities that exceed the formal requirements and contribute to effective functioning of the organisation (Dávila & Finkelstein, 2010). This kind of behavior primarily depends on user characteristics and their intrinsic motivational forces. To help fill a gap in the previous IS literature, the present study introduced user identities as the drivers of IS infusion behaviour, thus reflecting a psychological orientation in IS use behaviours. In terms of the influence of individuals' psychological factors on their long-term behaviours, identity acts as a sense-making filter and drives individuals' behaviours, such as technology use in organisations (Mishra et al., 2012).

This study extends IS infusion research by examining the influence of IT identity as person identity and IS infusion role identity as role identity on IS infusion behaviour, an important focus in order to develop a better understanding of IS infusion behaviour in the workplace. This understanding is also important as it can give better knowledge from a psychological and political point of view as to what extent employees infuse IS (or not) within an organisation. Based on identity theories, employees' person and role identities together

constitute their identity, which is a reflection of their personal characteristics and enactment of their roles as employees (Burke & Stets, 2009). Drawing on three identity theories (i.e., Stryker's identity theory, McCall and Simmons' role identity theory and Burke's person identity theory), this study proposed two research models in order to identify identity-specific factors to explain individuals' IS infusion behaviour within an organisation. Overall, this study addressed the gap of the current models of IS use, which have not paid much attention to the influence of psychological factors such as identities on long-term and richer IS use behaviours.

Integrating person identity into other identity bases helps to better understand and explain individuals' long-term behaviour (Burke & Stets, 2009). Individuals' IT identity, as manifested in their reliance, dependency and emotional attachment to an IS, strongly influences the role they perform in relation to IS use, which in turn positively influences their IS infusion behaviour as well as extended use, integrative use and emergent use behaviours. Thus, the identity factors as strong predictors of IS use behaviours can be added into the IS use models to explain IS long-term use behaviours. The majority of the research that draws upon and contributes to identity theories has been mostly theoretical, and empirical research in this domain is very limited. This empirical research fills a gap in the literature through its investigation of the role of IT identity and IS infusion role identity to explain IS infusion behaviour within an organisation.

The findings showed that employees' IT identity as their person identity influenced employees' IS infusion role identity in the workplace. The understanding of the relationship between individuals' person identity and role identity is important in order to facilitate a theoretical model that relates to individuals' person and role identities and thus provides an understanding of IS use behaviours within an organisation. The relationship between individuals' person identity and role identity was suggested by previous studies (Burke & Stets, 2009; Carter, 2012), and this study confirmed this relationship within an IS context. The findings of this study demonstrate that in order to understand an individual's specific role identity, her/his person identity related to that specific role identity needs to be investigated.

This study contributes to theory development (Whetten, 1989) by adding a relationship between person identity and role identity and explaining why and how this relationship happens. Employees with a strong degree of dependency, reliance and attachment to a specific IS to do their daily job tasks tend to perform roles that are more consistent with their IT related person identity. Employees' reliance, dependency and deep attachment to an implemented IT enable them to retain and strengthen their autonomy and dominant role identity in the IS infusion process. These employees are likely to perform roles that are in line with their personality. Why is this relationship important? Person identity is recognised as a master identity operating through roles, groups and situations. Individuals perform a role and group/social identity that is more consistent with the meaning of their person identity (Burke, 2004). In addition, identity theories maintain that individuals' person identity affects their internalised expectations about competent performance in their work roles.

Drawing on three identity theories (Burke, 2004; McCall & Simmons, 1966, 1978; Stryker, 1980), this study operationalised IT identity and IS infusion role identity as second-order constructs through their sub-dimensions within an organisational context. IT identity was operationalised through three reflective dimensions: dependency, emotional attachment and relatedness. IS infusion role identity was operationalised through six formative determinants: self-support, social support, commitment, resource investment, and external and internal gratifications. Most of previous studies examined the role identity construct as a single-dimensional construct through a few measurement items (Farmer et al., 2003; Farmer & Van Dyne, 2010; Theodorakis, 1994). This study used the nuanced operationalisations of the IS infusion role identity construct through the six formative determinant factors to provide a more comprehensive theoretical way in which to measure and understand the role identity construct compared to measuring it via only one determinant factor. These measurement items can be applied in related future research studies with minor adaptations to suit their empirical contexts. Table 7.1 presents a summary of unique findings of this study in relation to the current body of knowledge in the literature.

Table 7.1. Summary of Contributions of This Study

What is known from Literature	Unique findings of this study
• Previous studies suggest that workplace role identities can influence employees' work-related behaviours, such as organisational citizenship behaviours (Finkelstein & Penner, 2004), and IS assimilation behaviours (Mishra et al., 2012).	• This study extends this line of theoretical argument by finding that employees' role identity in relation to IS infusion (IS infusion role identity) is a predictor of their IS infusion behaviour as well as extended use, integrative use and emergent use behaviours.
• Previous studies on identity in the IS domain found that there are significant relationships between an individual's person identity and her/his IS use behaviour (Carter & Grover, 2015; Mishra et al., 2012; Stein, 2013; Stein et al., 2013). However, much of the research on the topic of IT and identity has examined the indirect relations between technology and an individual's identity through emotional factors (Stein et al., 2013).	• This study investigates the direct relations between technology and an individual's identity, which is conceptualised as IT identity. The findings suggest that employees' IT identity is a predictor of their IS infusion behaviour as well as extended use, integrative use and emergent use behaviours.
• Identity theories suggest that the meanings of individuals' person identities are likely to influence the meanings of their role identities when individuals have a choice in roles to perform (Burke & Stets, 2009).	• This study empirically tests this theoretical argument and finds that employees' IT identity is a predictor of their IS infusion role identity within an organisation.
• Role identity develops, in part, through social supports from others such as colleagues, supervisors, and top management in organisations. Further, maintenance of desired and valued identities is important in almost any workplace (Farmer et al., 2003).	• This study finds that perceived organisational valuing of IS infusion positively moderates the relationship between an employee's IS infusion role identity and IS infusion behaviour within an organisation.

7.4 Practical Contributions

Besides the theoretical contributions, this study has relevant practical contributions. This research suggests practical implications for designing customised training interventions, effective communication campaigns and specific management strategies, as well as the provision of a motivational atmosphere to encourage employees to use a system to its fullest potential.

The analysis revealed that social support and external gratifications have a strong influence on shaping employees' role identity in relation to IS use. Burke and Stets' (2009) findings suggest that offering rewards and support for enacting IT identity and IS infusion role identity may be highly relevant. Managers should be aware of the impact of peers on employees'

formulation of their role identity. Supervisors should prepare a working atmosphere in which peers are encouraged to reflect on each other's IS usage behaviours. Managers and supervisors should show their expectation, support and commitment for IS infusion in organisations. Managers can play a significant role in the promotion of IS infusion behaviour as they can provide incentives and support for employees to use an IS to its fullest potential. It is important that managers and policymakers prepare strategies and conditions that ensure employees' their IS infusion behaviour is supported and rewarded in order to reinforce employees' role identities in organisations. For example, leaders and managers can provide opportunities for employees to talk about their expectations and discuss their concerns about the system and its impacts on work. Moreover, managers may find it useful to prepare ongoing socialisation programs to reinforce and reward employees' desired IS use behaviours.

Organisations face the ongoing issue of how to guide employees toward behaviours that are organisationally desired. A logical implication of this study is that IT project leaders and managers should strongly promote IS use behaviours and devise effective means to communicate the utility of an IS to target users. Information sessions and sufficient training are needed to ensure that employees regard the target system as a reliable tool with which to do their daily tasks in the workplace. Customised training sessions and effective communication campaigns are essential in order for employees to learn how to appropriately use the system to do their job tasks and to understand how their usage affects other tasks and performances in business processes. This study suggests that in order to strengthen employees' IT identity and motivate them to depend on the target system to do their daily job tasks, managers need to focus primarily on designing customised training interventions. These interventions should focus on developing employees' understanding of organisational improvement goals and IS investment through their effective and full use of the system.

According to the findings of this study, an organisation that values IS infusion behaviour should provide an atmosphere in which demonstrations of IS infusion behaviour are valued and encouraged in the workplace. When employees perceive that their organisation values IS infusion behaviours, they are likely to be more motivated to engage in IS infusion behaviours. The results suggest that managers should identify employees with strong IS

infusion role identities and place them in positions in which they can act as super users in order to provide them with enhanced status and opportunity. The potential of employees' self-image in relation to IS infusion (i.e., IT identity) will not be evidenced unless managers demonstrate that the organisation values IS infusion behaviour and prepares a supporting atmosphere for this behaviour. Similar to Burke (1991) findings, in order for organisational valuing of IS infusion to be apparent to employees, organisations should diligently implement work structures, human resource practices and organisational policies that support IS infusion behaviour. Failure to provide a context that appreciates IS infusion-identity-specific behaviours may ultimately lead employees with strong IS infusion role identity to seek psychological balance by withdrawing from this behaviour within an organisation. When IS infusion is not sufficiently valued, organisations' potential to influence the IT identity-behaviour relationship may be weakened (Carter, 2012).

The findings also provide managers with an understanding of the influence of users' identities in relation to IS on the full use of information systems in organisations. Thus, management can provide recruitment strategies in order to carefully determine and assess employees' personal views, self-support, commitment and dedication towards the system usage in the workplace. By identifying and then recruiting employees with strong self-support and commitment to IS use, management can gain the benefits of IS investment through employees' full use of a system.

This study found that employees' age and organisational position can also provide useful directions to managers and policymakers. Within the firms that participated in this study, younger participants were shown to have a higher level of IS infusion behaviour. In addition, employees' organisational position positively affected their IS infusion behaviour. Those employees in customer-related and front-line team positions (such as customer service representative/managers) showed higher scores for IS infusion behaviours. Thus, managers and supervisors can consider employees' age and position when designing training programs to encourage IS infusion behaviour in the workplace. Additionally, the study found that former IT experience does not have a significant impact on IS infusion behaviours. The experience and skills of employees familiar with other systems may not enable them to

effectively use a system and may not be a differentiator and promoter of IS infusion behaviours (Mishra et al., 2012).

Given the positive influence of IT identity and IS infusion role identity on IS infusion, extended use, integrative use and emergent use behaviours, identifying their antecedents, as well as their relative influence, is highly relevant to designing organisational mechanisms that promote and manage employees' IS infusion behaviours in the workplace. Previous studies suggested that employees' willingness to invest in interacting with IT and playing a professional role is motivated by the extent to which they believe in pursuing an opportunity to increase their personal and professional resources and abilities (e.g., by exploring the many features of an IT) to follow this goal (Aron et al., 2003). Organisations can help to promote employees' IT identity and IS infusion role identity by providing them with opportunities to use IT in order to coordinate among job tasks, and by implementing mechanisms to support and reward employees' attempts to explore new features of the system.

7.5 Limitations of the Study

While the findings of this study provide insightful implications for research and practice, these findings should be viewed with respect to certain limitations.

First, the cross-sectional design of the data collection method using a single point in time may limit the implications of the results. Because trends and the technological needs of organisations change at a rapid pace, employees' behaviours in these workplaces may also change. Accordingly, because the empirical data used in this study were collected at a specific point in time rather than through a longitudinal study, readers are encouraged to exercise caution in extending the findings from this study to understand employees' IS infusion behaviour over time. In addition, it may be difficult to conclude suitable causal relationships based on cross-sectional data (Rindfleisch, Malter, Ganesan, & Moorman, 2008). Hence, future studies may find it necessary to observe any changes in employees' identities and IS use behaviours over time through a longitudinal study. By applying the longitudinal study design, the causal relationships between identities and IS infusion behaviour can be strengthened.

Second, the results may have been impacted by sample selection bias. Participants taking part in the survey were those using the cloud CRM system within an organisation in New Zealand at the time of the survey, which may be considered as limiting the generalisability of this study. Future studies may address this point by testing the theoretical models in the context of other countries.

Third, there may be limitation in the measurement strategy of this study. The participants self-evaluated themselves to assess if they are using the system to its fullest potential. This approach relies on an assumption that participants have the sufficient knowledge to make this assessment. However, a participant may ignore that some features exist in the targeted system.

Forth, this study used PLS-SEM to analyse the measurement and structural models, hence the results may have been impacted by PLS-SEM bias. According to Hair and colleagues (2014), PLS-SEM bias referred to the methodology property where relationships in a measurement model are slightly overestimated and relationships in a structural model are slightly underestimated. However, the authors explained that this bias was negligible in most settings encountered in empirical research.

7.6 Future Research

Several promising opportunities for future research remain.

Drawing upon social psychology research, this study explored the influence of employees' person and role identities on their IS infusion behaviour in the workplace. Since individuals can hold many identities simultaneously, future research should further investigate the relationships between IT identity, IS infusion role identity and other workplace identities such as social identity and IS infusion behaviours. It is important to acknowledge that person, role and social identities do not exist in isolation from the many other identities that individuals develop in the social positions they occupy and in their behaviours in relation to IS infusion in the workplace. This means that managerial interventions cannot be designed

without reference to how a new IS may conflict with meanings contained in employees' other salient identities. For example, under what conditions are workplace behaviours driven by IT identity and an employee's IS infusion role identity rather than identity as a member of the organisation or vice versa? From the theoretical point of view, since individuals interact with IT in situations where there exist behavioural decisions aligned with multiple identities (Stryker and Burke 2000), research that investigates the interplay between IT identity, IS infusion role identity and other identities within the workplace is important for better understanding long-term IS use behaviours.

The primary goal of this study was to examine the impact of IT identity and IS infusion role identity on IS infusion constructs. This study focused on the influence of employees' person and role identities in relation to IS use on their IS infusion behaviours in the workplace; however, the overarching goal of explaining IS infusion behaviour in organisations requires other factors to be included, in addition to identity-related factors. The research models of this study showed the predictors accounted for 0.57, 0.63, 0.62 and 0.56 of the variance explained for IS infusion, extended use, integrative use and emergent use behaviours respectively. Altogether these findings suggest that while the current models offer moderate to high explanatory power for the outcome variables, there is an opportunity for future research to improve on these models by considering factors that were not included in the current models such as individuals' unique characteristics and motivational forces. The extra-role behaviour (i.e., IS infusion behaviour) primarily depends on individuals' characteristics and their intrinsic motivational forces (Hassandoust et al., 2016; Kim & Gupta, 2014; Ng & Kim, 2009), and the relationship between IT identity, IS infusion role identity and IS use behaviours remains an area for future research. Therefore, future research may consider including individuals' characteristics and motivational forces among predictors of IS infusion behaviours.

In this study, IT identity and IS infusion role identity are causal factors of IS infusion behaviours. According to Burke's identity theory (2004), there is an identity process loop of identity, perception, behaviour, outcome and environment. Then future research may explore the reciprocal relationship between identities and IS infusion behaviours.

Some researchers studied the influence of individuals' identities through work practices and roles. Lamb and Davidson (2005) argue that IT use has a profound influence on scientists' identities, because the IT is increasingly part of scientists' work practices and the fulfilment of their role in society. Similarly, Walsham Walsham (1998) demonstrates how, after the implementation of a decision support system, autonomous bank managers, who were seen as the pillars of the local community, start to see themselves as loan workers, subject to much tighter control and surveillance. Therefore, future research may consider investigating the influence of individuals' infusion behaviour on there IS-related identities within workplaces.

Motivational related factors are another promising area that should be further investigated in future research (Hassandoust et al., 2016; Ng & Kim, 2009). In order to provide a better understanding of IS infusion, research should have an active motivational orientation in order to explain an individual's IS infusion behaviour (Cooper & Zmud, 1990; Kim & Gupta, 2014). Psychological forces enable individuals to innovate beyond management's formal and standardised IS usage (Jasperson et al., 2005; Kim & Gupta, 2014). Accordingly, theories that are based on authentic motivation, such as the psychological empowerment theory, may help to explain IS infusion behaviour. Empowerment theory utilises a political and learning model to explain individuals' feeling of being in control based on an active engagement in a workplace and the pursuit of extra-roles behaviours (Ng & Kim, 2009).

Another promising future research area lies with the investigation of the influence of IS infusion behaviour on an individual's job performance (Devaraj & Kohli, 2003; Sundaram et al., 2007). The relationship between IS infusion and performance, though implied in some definitions of IS infusion (i.e., the extent to which the individual fully utilises an IS to enhance her/his productivity to support work), has not been directly examined (Jones et al., 2002).

Moreover, the concept of identities can be explored through qualitative field work. Qualitative methods can help in understanding the social context, as they equip the researcher with the best interpretations participants have regarding the actions and also aspirations and views they have of themselves and other participants (Walsham, 1998). Qualitative research can provide explanatory insights regarding how identities shape infusion behaviours, and can

help to identify desired goals for encouraging employees' person and role identities within an organisation.

Because this study was cross-sectional, the possibility of reverse causality exists insofar as IS infusion behaviours may influence employees' IT identity and IS infusion role identity. Future research should incorporate longitudinal designs to account for reciprocal causality in relations presented in the research models of this study.

In addition, organisational level studies are important to understand the macro level dynamics of infusing IS into the work practices of employees within an organisation. Additionally, different types of IS (not just enterprise systems) should be investigated in future studies. More work remains to be done in theorising and empirically investigating the relationships between identity in relation to IS and long-term IS use behaviours, including IS infusion.

Finally, common method bias is a concern in survey-based research. This study tested for common method bias and found that it was not a significant issue affecting the findings. As per the suggestions of Podsakoff et al. (2003), this study also (1) assured respondents that responses were anonymous, (2) attempted to have simpler and more direct questions for ease of understanding and (3) included a marker variable in the questionnaire. These steps jointly mitigated the threat of common method bias. However, future research can avoid the issue of common method bias by collecting data from multiple sources, including secondary sources. Future research can also take additional measures such as active and passive non response analysis (Rogelberg & Stanton, 2007). For better understanding and confidence in generalising the data collected from a survey, it is important to have some understanding of how non respondents compare with respondents (Rogelberg & Stanton, 2007).

7.7 Concluding Remarks

This study applied identity theories and examined IS infusion behaviour (i.e., in the CRM context) among employees within an organisation in New Zealand. This study utilised a novel theoretical and exploratory lens: that of employees' identities. This research has contributed to theory and practice by applying the lens of identity theories to understand IS

infusion behaviour and its three sub-dimensions, extended use, integrative use and emergent use behaviours. The research models and results of this study provide a comprehensive view of the role of employees' IT identity and IS infusion role identity and extend the empirical research by applying identity theories. From a practical point of view, the results of this study demonstrate how different types of employee identity impact their IS infusion behaviour, which provides levers that managers and leaders can manipulate. In addition, it is important for researchers to examine the infusion of a variety of other IS (besides the CRM system) in workplaces.

References

Abdollahzadegan, A., Hussin, A. R. C., Moshfegh Gohary, M., & Amini, M. (2013). The organizational critical success factors for adopting cloud computing in SMEs. *Journal of Information Systems Research and Innovation (JISRI), 4*(1), 67-74.

Adam, A., Griffiths, M., Keogh, C., Moore, K., Richardson, H., & Tattersall, A. (2006). Being an 'it'in IT: gendered identities in IT work. *European Journal of Information Systems, 15*(4), 368-378.

Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication. *MIS Quarterly, 16*(2), 227-247.

Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. *MIS Quarterly, 24*(4), 665-694.

Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research, 9*(2), 204-215.

Ahuja, M. K., & Thatcher, J. B. (2005). Moving Beyond Intentions and Toward The Theory of Trying: Effects of Work Environment and Gender on Post-Adoption Information Technology Use. *MIS Quarterly, 29*(3), 427-459.

Akah, B., & Bardzell, S. (2010). Empowering products: personal identity through the act of appropriation*ACM.* Symposium conducted at the meeting of the CHI'10 Extended Abstracts on Human Factors in Computing Systems

Alvarez, R. (2008). Examining technology, structure and identity during an enterprise system implementation. *Information Systems Journal, 18*(2), 203-224.

Alvesson, M., Lee Ashcraft, K., & Thomas, R. (2008). Identity matters: Reflections on the construction of identity scholarship in organization studies. *Organization, 15*(1), 5-28.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior, 10*(1), 123-167.

Armitage, C. J., & Conner, M. (1999). Distinguishing Perceptions of Control From Self-Efficacy: Predicting Consumption of a Low-Fat Diet Using the Theory of Planned Behavior. *Journal of Applied Social Psychology, 29*(1), 72-90.

Aron, A., Aron, E. N., & Norman, C. (2003). Self-Expansion Motivation and Including Other in the Self. In G. J. Fletcher & M. S. Clark (Eds.), *Blackwell Handbook of Social Psychology: Interpersonal Processes*. Oxford, UK: Blackwell Publishing, Ltd.

Babbie, B. (1990). *Survey research methods* (2nd ed.). Belmont, CA: Wadsworth.

Bagozzi, R. P. (1994). *Principles of marketing research*: Blackwell Cambridge, MA.

Bagozzi, R. P., & Yi, Y. (1991). Multitrait-multimethod matrices in consumer research. *Journal of consumer research, 17*(4), 426-439.

Bala, H., & Venkatesh, V. (2015). Adaptation to information technology: a holistic nomological network from implementation to job outcomes. *Management Science, 62*(1), 156-179.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*: Prentice-Hall, Inc.

Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology studies, 2*(2), 285-309.

Barki, H., Paré, G., & Sicotte, C. (2008). Linking IT implementation and acceptance via the construct of psychological ownership of information technology. *Journal of Information Technology, 23*(4), 269-280.

Barki, H., & Pinsonneault, A. (2005). A model of organizational integration, implementation effort, and performance. *Organization Science, 16*(2), 165-179.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173-1182.

Barrett, M., & Scott, S. (2004). Electronic trading and the process of globalization in traditional futures exchanges: a temporal perspective. *European Journal of Information Systems, 13*(1), 65-79.
Barrett, M., & Walsham, G. (1999). Electronic trading and work transformation in the London insurance market. *Information Systems Research, 10*(1), 1-22.
Beebe, K. R., Pell, R. J., & Seasholtz, M. B. (1998). *Chemometrics: a practical guide* (Vol. 4): Wiley-Interscience.
Belk, R. (1988). *Possessions and self*: Wiley Online Library.
Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS Quarterly, 24*(1), 169-196.
Bhattacherjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. *MIS Quarterly*, 351-370.
Biddle, B. J., Bank, B. J., & Slavings, R. L. (1987). Norms, Preferences, Identities and Retention Decisions. *Social Psychology Quarterly, 50*(4), 322-337.
Blumer, H. (1986). *Symbolic interactionism: Perspective and method*: Univ of California Press.
Boffo, C., & Barki, H. (2003). Conceptualizing information system use: A behavioral and perceptual framework. *Cahier du GReSI no, 3*(5), 1-16.
Bollen, K. A. (1984). Multiple indicators: Internal consistency or no necessary relationship? *Quality and Quantity, 18*(4), 377-385.
Bollen, K. A. (1989). A new incremental fit index for general structural equation models. *Sociological Methods & Research, 17*(3), 303-316.
Bollen, K. A., & Lennox, R. (1991). Conventional wisdom on measurement: A structural equation perspective. *Psychological bulletin, 110*(2), 305-314.
Boudreau, M. C., Gefen, D., & Straub, D. W. (2001). Validation in information systems research: a state-of-the-art assessment. *MIS Quarterly, 25*(1), 1-16.
Boudreau, M. C., & Seligman, L. (2006). Quality of use of a complex technology: A learning-based model. In *Contemporary Issues in End User Computing* (pp. 248). United States: University of Texas.
Brewer, M. B., & Gardner, W. (1996). Who is this" We"? Levels of collective identity and self representations. *Journal of personality and social psychology, 71*(1), 83-93.
Bryman, A., & Bell, E. (2007). *Business research strategies* (2nd ed.): Oxford university press.
Burke, P. J. (1991). Identity processes and social stress. *American Sociological Review, 56*(6), 836-849.
Burke, P. J. (2004). Identities and social structure: The 2003 Cooley-Mead award address. *Social Psychology Quarterly, 67*(1), 5-15.
Burke, P. J., & Cast, A. D. (1997). Stability and Change in the Gender Identities of Newly Married Couples [research article](4), 277. Retrieved from http://ezproxy.aut.ac.nz/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edsjsr&AN=edsjsr.2787090&site=eds-live&scope=site
Burke, P. J., & Reitzes, D. C. (1981). The link between identity and role performance. *Social Psychology Quarterly, 44*(2), 83-92.
Burke, P. J., & Stets, J. E. (1999). Trust and commitment through self-verification. *Social Psychology Quarterly, 62*(4), 347-366.
Burke, P. J., & Stets, J. E. (2009). *Identity Theory*. New York: Oxford University Press.
Burton-Jones, A., & Grange, C. (2012). From use to effective use: a representation theory perspective. *Information Systems Research, 24*(3), 632-658.
Burton-Jones, A., & Straub, D. W. J. (2006). Reconceptualizing System Usage: An Approach and Empirical Test. *Information Systems Research, 17*(3), 228-246.
Callero, P. L. (1985). Role-identity salience. *Social Psychology Quarterly, 48*(3), 203-215.
Callero, P. L., Howard, J. A., & Piliavin, J. A. (1987). Helping behavior as role behavior: Disclosing social structure and history in the analysis of prosocial action. *Social Psychology Quarterly, 50*(3), 247-256.

Carte, T. A., & Russell, C. J. (2003). In pursuit of moderation: Nine common errors and their solutions. *MIS Quarterly, 27*(3), 479-501.
Carter, M. (2012). *Information Technology (IT) Identity: A Conceptualization Proposed Measures, And Research Agenda* (Doctoral Thesis). University of Clemson. (UMI No. 3512101)
Carter, M. (2013). IT Identity: Developing Valid Measures through CFA-Based MTMM Analysis.
Carter, M., & Grover, V. (2015). Me, My Self, and I(T): Conceptualizing Information Technology Identity and Its Implications [Article]. *MIS Quarterly, 39*(4), 931-957.
Carter, M., Grover, V., & Thatcher, J. B. (2012). Mobile Devices and the Self: Developing the Concept of Mobile Phone Identity. In *Strategy, Adoption, and Competitive Advantage of Mobile Services in the Global Economy* (pp. 150-164). Hershey, PA: IGI Global (Eds.). doi:10.4018/978-1-4666-1939-5
Castells, M. (1997). *The power of identity. The information age: economy, society, and culture*. Oxford, UK: Blackwell Publishers.
Cavana, R. Y., Delahaye, B. L., & Sekaran, U. (2001). *Applied business research: Qualitative and quantitative methods*: John Wiley & Sons Australia.
Cenfetelli, R. T., & Bassellier, G. (2009). Interpretation of formative measurement in information systems research. *MIS Quarterly, 33*(4), 689-707.
Chaplin, W. F., John, O. P., & Goldberg, L. R. (1988). Conceptions of states and traits: dimensional attributes with ideals as prototypes. *Journal of personality and social psychology, 54*(4), 541.
Charng, H. W., Piliavin, J. A., & Callero, P. L. (1988). Role identity and reasoned action in the prediction of repeated behavior. *Social Psychology Quarterly, 51*(4), 303-317.
Chin, W. W. (1998a). Commentary: Issues and opinion on structural equation modeling: JSTOR.
Chin, W. W. (1998b). The partial least squares approach to structural equation modeling. *Modern methods for business research, 295*(2), 295-336.
Chin, W. W. (2010a). Bootstrap cross-validation indices for PLS path model assessment. In *Handbook of partial least squares* (pp. 83-97): Springer.
Chin, W. W. (2010b). How to write up and report PLS analyses. In *Handbook of partial least squares* (pp. 655-690): Springer.
Chin, W. W., & Marcolin, B. L. (2001). The future of diffusion research. *ACM Sigmis Database, 32*(3), 7-12.
Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research, 14*(2), 189-217.
Chin, W. W., Thatcher, J. B., & Wright, R. T. (2012). Assessing common method bias: problems with the ULMC technique. *MIS Quarterly, 36*(3), 1003-1019.
Churchill, J. G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of marketing research, 16*(1), 64-73.
Clayton, S. (2003). Environmental identity: A conceptual and an operational definition. In S. Clayton & S. Opotow (Eds.), *Identity and the natural environment*. Cambridge, MA: MIT Press.
Cohen, J. (1988). Statistical power analysis.
Compeau, D., Higgins, C. A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly, 23*(2), 145-158.
Cook, A. J., Kerr, G. N., & Moore, K. (2002). Attitudes and intentions towards purchasing GM food. *Journal of Economic Psychology, 23*(5), 557-572.
Cooper, R. B., & Zmud, R. W. (1990). Information Technology Implementation Research: A Technological Diffusion Approach. . *Management Science, 36*(2), 123-139.
Creswell, J. W. (2007). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.): Prentice Hall.
Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*: SAGE Publications, Incorporated.

Creswell, J. W., & Clark, P. (2011). Designing and conducting mixed methods research. London: Sage.
Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*: Sage.
Cusumano, M. (2010). Cloud computing and SaaS as new computing platforms. *Communications of the ACM, 53*(4), 27-29.
Da Cunha, J. V., & Orlikowski, W. J. (2008). Performing catharsis: The use of online discussion forums in organizational change. *Information and Organization, 18*(2), 132-156.
Dávila, M., & Finkelstein, M. A. (2010). Predicting organizational citizenship behavior from the functional analysis and role identity perspectives: Further evidence in Spanish employees. *The Spanish Journal of Psychology, 13*(1), 277-283.
Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry, 11*(4), 227-268.
Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems, 19*(4), 9-30.
Deng, X., & Chi, L. (2012). Understanding postadoptive behaviors in information systems use: A longitudinal analysis of system use problems in the business intelligence context. *Journal of Management Information Systems, 29*(3), 291-326.
Dennison, C. M., & Shepherd, R. (1995). Adolescent food choice: an application of the theory of planned behaviour. *Journal of Human Nutrition and Dietetics, 8*(1), 9-23.
DesRoches, C. M., Campbell, E. G., Rao, S. R., Donelan, K., Ferris, T. G., Jha, A., . . . Shields, A. E. (2008). Electronic health records in ambulatory care—a national survey of physicians. *New England Journal of Medicine, 359*(1), 50-60.
Devaraj, S., & Kohli, R. (2003). Performance Impacts of Information Technology: Is Actual Usage the Missing Link? *Management Science, 49*(3), 273-289.
Dobson, P., Jackson, P., & Gengatharen, D. (2013). Explaining Broadband Adoption in Rural Australia: Modes of Reflexivity and the Morphogenetic Approach. *MIS Quarterly, 37*(3), 965-991.
Donaldson, D. R., & Yakel, E. (2013). Secondary Adoption of Technology Standards: The case of PREMIS. *Archival Science, 13*(1), 55-83.
Eder, L. B., Arinze, B., Darter, M. E., & Wise, D. E. (2000). An Analysis of Intranet Infusion Levels *Information Resources Management Journal, 13*(3), 14-22.
Eder, L. B., & Igbaria, M. (2001). Determinants of Intranet Diffusion and Infusion. *Omega, 29*(3), 233–242.
Efron, B., & Tibshirani, R. J. (1993). An introduction to the bootstrap, volume 57 of Monographs on Statistics and Applied Probability. *Chapmann & Hall*.
Fadel, K. J. (2012). User Adaptation and Infusion of Information Systems. *Journal of Computer Information Systems, 52*(3), 1-10.
Farmer, S. M., & Aguinis, H. (2005). Accounting for subordinate perceptions of supervisor power: an identity-dependence model. *Journal of Applied Psychology, 90*(6), 1069-1083.
Farmer, S. M., & Dyne, L. V. (2010). The idealized self and the situated self as predictors of employee work behaviors. *Journal of Applied Psychology, 95*(3), 503-516.
Farmer, S. M., Tierney, P., & Kung-Mcintyre, K. (2003). Employee creativity in Taiwan: An application of role identity theory. *Academy of Management Journal, 46*(5), 618-630.
Farmer, S. M., & Van Dyne, L. (2010). The idealized self and the situated self as predictors of employee work behaviors. *Journal of Applied Psychology, 95*(3), 503-516.
Finkelstein, M. A., & Penner, L. A. (2004). Predicting organizational citizenship behavior: Integrating the functional and role identity approaches *Social Behavior and Personality: An International Journal, 32*(4), 383-398.
Ford, E. W., Menachemi, N., Peterson, L. T., & Huerta, T. R. (2009). Resistance is futile: but it is slowing the pace of EHR adoption nonetheless. *Journal of the American Medical Informatics Association, 16*(3), 274-281.

Foreman, P., & Whetten, D. A. (2002). Members' identification with multiple-identity organizations. *Organization Science, 13*(6), 618-635.
Forman, C., Ghose, A., & Wiesenfeld, B. (2008). Examining the relationship between reviews and sales: The role of reviewer identity disclosure in electronic markets. *Information Systems Research, 19*(3), 291-313.
Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research, 18*(3), 382-388.
Freese, L., & Burke, P. J. (1994). Persons, identities, and social interaction. In B. Markovsky (Ed.), *Advances in group processes*. Greenwich, CT: JAI Press.
Gal, U., & Kjærgaard, A. L. (2009). *Identity in organizations: A review of information systems research*
Gallivan, M. J. (2001). Organizational Adoption and Assimilation of Complex Technological Innovations: Development and application of a new framework. *ACM Sigmis Database, 32*(3), 51-85.
Gartner. (2016). Retrieved from http://www.gartner.com/technology/research/it-spending-forecast/
Gefen, D., Straub, D., & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems, 4*(1), 7-84.
Granberg, D., & Holmberg, S. (1990). The intention-behavior relationship among US and Swedish voters. *Social Psychology Quarterly, 53*(1), 44-54.
Gray, D. E. (2013). *Doing research in the real world*: Sage.
Grube, J. A., & Piliavin, J. A. (2000). Role identity, organizational experiences, and volunteer performance. *Personality and Social Psychology Bulletin, 26*(9), 1108-1119.
Grublješič, T., & Jaklič, J. (2015). Conceptualization of the business intelligence extended use model. *Journal of Computer Information Systems, Forthcoming.*
Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research, 2*(163-194), 105-117.
Guba, E. G., & Lincoln, Y. S. (2000). Epistemological and methodological bases of naturalistic inquiry. In *Evaluation models* (pp. 363-381): Springer.
Hackbarth, G., Grover, V., & Mun, Y. Y. (2003). Computer playfulness and anxiety: positive and negative mediators of the system experience effect on perceived ease of use. *Information & Management, 40*(3), 221-232.
Hair, J. J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2013). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
Hair, J. J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
Hair, J. J. F., Ringle, C., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139-152.
Harman, H. H. (1976). *Modern factor analysis*: University of Chicago Press.
Hassandoust, F., Techataassnasoontorn, A. A., & Tan, F. B. (2016). Factors Influencing the Infusion of Information Systems: A Literature Review. *Pacific Asia Journal of the Association for Information Systems, 8*(1), 1-32.
Hassandoust, F., Techatassanasoontorn, A., & Tan, F. (2015). The impact of individual's identities on the infusion of Information Systems within organisations*Association for Information Systesm (AIS)*. Symposium conducted at the meeting of the Proceedings of the 2015 European Conference on Information Systems, Munich.
Heise, D. R. (1979). *Understanding events: Affect and the construction of social action*. New York: Cambridge University Press.
Henseler, J., & Chin, W. W. (2010). A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. *Structural Equation Modeling, 17*(1), 82-109.
Henseler, J., Ringle, C., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in international marketing, 20*(1), 277-319.

Hogg, M. A. (2006). Social identity theory. *Contemporary Social Psychological Theories, 13*, 111-136.
Hsieh, J. P. A., Rai, A., & Xu, S. X. (2011). Extracting Business Value from IT: A Sensemaking Perspective of Post-Adoptive Use. *Management Science, 57*(11), 2018–2039.
Hsieh, J. P. A., & Wang, W. (2007). Explaining Employees' Extended Use of Complex Information Systems. *European Journal of Information Systems, 16*(3), 216–227.
Huber, F., Herrmann, A., Meyer, F., Vogel, J., & Vollhardt, K. (2008). *Kausalmodellierung mit Partial Least Squares: Eine anwendungsorientierte Einführung*: Springer-Verlag.
Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic management journal, 20*(2), 195-204.
Ifinedo, P. (2011). Examining the influences of external expertise and in-house computer/IT knowledge on ERP system success. *Journal of Systems and Software, 84*(12), 2065-2078.
Igbaria, M., & Iivari, J. (1995). The Effects of Self-Efficacy on Computer Usage. . *Omega, International Journal of Management Science, 23*(6), 587-605.
Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of consumer research, 30*(2), 199-218.
Jasperson, J. S., Carter, P. E., & Zmud, R. W. (2005). A Comprehensive Conceptualization of Post-Adoptive Behaviors Associated with Information Technology Enabled Work Systems. *MIS Quarterly, 29*(3), 525-557.
Jones, E., Sundaram, S., & Chin, W. (2002). Factors Leading to Sales Force Automation Use: A Longitudinal Analysis. *Journal of Personal Selling & Sales Management, 22*(3), 145-156.
Joreskog, K., & Wold, H. (1979). The ML and PLS techniques for modeling with latent variables: Comparative aspects Symposium conducted at the meeting of the Proceedings of the conference" Systems under indirect observation. Causalitystruclureprediction," October
Karahanna, E., Straub, D. W., & Chervany, N. L. (1999). Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly, 23*(2), 183-213.
Karimi, J., Somers, T. M., & Bhattacherjee, A. (2007). The role of information systems resources in ERP capability building and business process outcomes. *Journal of Management Information Systems, 24*(2), 221-260.
Ke, W., Tan, C. H., Sia, C. L., & Wei, K. K. (2012). Inducing Intrinsic Motivation to Explore the Enterprise System: The Supremacy of Organizational Levers. *Journal of Management Information Systems, 29*(3), 257-290.
Kerlinger, F. N. (1986). Foundations of Behavioral Research (Holt, Rinehart and Winston, New York, NY).
Kim, H. W., Chan, H. C., & Gupta, S. (2016). Examining information systems infusion from a user commitment perspective. *Information Technology & People, 29*(1), 173-199.
Kim, H. W., Chan, H. C., & Lee, S. H. (2012). A User Commitment Approach to Information Systems Infusion Symposium conducted at the meeting of the Pacific Asia Conference on Information Systems
Kim, H. W., & Gupta, S. (2014). A User Empowerment Approach to Information Systems Infusion. *IEEE Transactions on Engineering Management, 61*(4), 656-668.
Kim, S. S., & Malhotra, N. (2005). A longitudinal model of continued IS use: An integrative view of four mechanisms underlying postadoption phenomena. *Management Science, 51*(5), 741-755.
Kirkman, B. L., & Rosen, B. (1999). Beyond self-management: Antecedents and consequences of team empowerment. *Academy of Management Journal, 42*(1), 58-74.
Kishore, R., & McLean, E. R. (2007). Reconceptualizing Innovation Compatibility as Organizational Alignment in Secondary IT Adoption Contexts: An Investigation of Software Reuse Infusion. *IEEE Transactions on Engineering Management, 54*(4), 756-775.

Kock, N., Chatelain-Jardon, R., & Carmona, J. (2008). An experimental study of simulated Web-based threats and their impact on knowledge communication effectiveness. *IEEE Transactions on Professional Communication, 51*(2), 183-197.
Koo, C., Chung, N., & Kim, H. W. (2015). Examining explorative and exploitative uses of smartphones: a user competence perspective. *Information Technology & People, 28*(1), 133-162.
Kwon, T. H., & Zmud, R. W. (1987). Unifying the fragmented models of information systems implementation. In *Critical issues in information systems research* (pp. 227-251). New York: John Wiley & Sons, Inc.
Lamb, R., & Davidson, E. (2005). Information and communication technology challenges to scientific professional identity. *The Information Society, 21*(1), 1-24.
Lamb, R., & Kling, R. (2003). Reconceptualizing users as social actors in information systems research. *MIS Quarterly, 27*(2), 197-235.
Lassila, K. S., & Brancheau, J. C. (1999). Adoption and Utilization of Commercial Software Packages: Exploring Utilization Equilibria, Transitions, Triggers, and Tracks. *Journal of Management Information Systems, 16*(2), 63-90.
Leary, M. R., & Tangney, J. P. (2012). *Handbook of self and identity* (2nd ed.). New York: Guilford Press.
Leclercq-Vandelannoitte, A. (2014). Interrelationships of identity and technology in IT assimilation. *European Journal of Information Systems, 23*(1), 51-68.
Lee, S., Han, I., & Park, J. S. (2000). Effects of Organizational Characteristics on EDI Implementation in Korea. *Telecommunication Systems, 14*(1), 331-337.
Lee, Y., Lee, J., & Lee, Z. (2006). Social influence on technology acceptance behavior: self-identity theory perspective. *The DATA BASE for Advances in Information Systems, 37*(2-3), 60-75.
Leonard-Barton, D. (1988). Implementation as mutual adaptation of technology and organization. *Research Policy, 17*(5), 251-267.
Lewis, B. R., Templeton, G. F., & Byrd, T. A. (2005). A methodology for construct development in MIS research. *European Journal of Information Systems, 14*(4), 388-400.
Li, X., Hsieh, J. P. A., & Rai, A. (2013). Motivational Differences Across Post-Acceptance Information System Usage Behaviors: An Investigation in the Business Intelligence Systems Context. *Information Systems Research, 24*(3), 659–682.
Limayem, M., & Cheung, C. M. (2008). Understanding information systems continuance: The case of Internet-based learning technologies. *Information & Management, 45*(4), 227-232.
Lin, C. K., Chuang, H. M., & Wang, L. C. (2014). Analyzing the Merits of Cloud CRM by MEC and ISM. In *Future Information Technology* (pp. 231-236): Springer.
Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology, 86*(1), 114-121.
Lopez, J., & Scott, J. (2000). *Social structures* Buckingham, UK: Open University Press.
Lord, R. G., & Brown, D. J. (2004). *Leadership processes and follower self-identity*. Mahwah, NJ: Erlbaum.
Ma, M., & Agarwal, R. (2007). Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities. *Information Systems Research, 18*(1), 42-67.
Maas, J. B., Fenema, P. C., & Soeters, J. (2014). ERP System Usage: the Role of Control and Empowerment. *New Technology, Work and Employment, 29*(1), 88-103.
MacKenzie, S. B. (2003). The dangers of poor construct conceptualization. *Journal of the Academy of Marketing Science, 31*(3), 323-326.
MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly, 35*(2), 293-334.
Mael, F., & Ashforth, B. E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational behavior, 13*(2), 103-123.

Malhotra, M. K., & Grover, V. (1998). An assessment of survey research in POM: from constructs to theory. *Journal of operations management, 16*(4), 407-425.
Mathieson, K., Peacock, E., & Chin, W. W. (2001). Extending the technology acceptance model: the influence of perceived user resources. *ACM Sigmis Database, 32*(3), 86-112.
McCall, G. J., & Simmons, J. L. (1966). *Identities and interactions*. New York: Free Press.
McCall, G. J., & Simmons, J. L. (1978). *Identities and interactions: An examination of associations in everyday life* (revised ed.). New York
McKnight, D. H., Carter, M., Thatcher, J. B., & Clay, P. F. (2011). Trust in a Specific Technology: An Investigation of Its Components and Measures. *Transactions on Management Information Systems, 2*(2), 12-36.
McMillan, S. J., & Morrison, M. (2006). Coming of age with the internet A qualitative exploration of how the internet has become an integral part of young people's lives. *New media & society, 8*(1), 73-95.
Mead, G. H. (1934). *Mind, self, and society*. Chicago: University of Chicago Press.
Meijers, F. (1998). The development of a career identity. *International Journal for the Advancement of Counselling, 20*(3), 191-207.
Mertens, D. M. (2003). Mixed methods and the politics of human research: The transformative-emancipatory perspective. *Handbook of mixed methods in social and behavioral research*, 135-164.
Meso, P., Musa, P., Straub, D., & Mbarika, V. (2009). Information infrastructure, governance, and socio-economic development in developing countries. *European Journal of Information Systems, 18*(1), 52-65.
Mishra, A. N., Anderson, C., Angst, C. M., & Agarwal, R. (2012). Electronic health records assimilation and physician identity evolution: An identity theory perspective. *Information Systems Research, 23*(3-part-1), 738-760.
Moore, J. B., ,II. . (2002). *Information technology infusion: A motivation approach*. The Florida State University. Retrieved from http://ezproxy.aut.ac.nz/login?url=http://search.proquest.com/docview/305593180?accountid=8. doi:305593180. Available from ProQuest Dissertations and Theses database.
Murphy, G. D., Chang, A., & Unsworth, K. (2012). Differential effects of ERP systems on user outcomes—a longitudinal investigation. *New Technology, Work and Employment, 27*(2), 147-162.
Nah, F. F.-H., Tan, X., & Teh, S. H. (2004). An empirical investigation on end-users' acceptance of enterprise systems. *Information Resources Management Journal (IRMJ), 17*(3), 32-53.
Nambisan, S., Agarwal, R., & Tanniru, M. (1999). Organizational mechanisms for enhancing user innovation in information technology. *MIS Quarterly, 23*(3), 365-395.
Neuman, W. L. (2011). Social research methods: Qualitative and quantitative approaches In (7th ed.). London, United Kingdom: Pearson.
Newsted, P. R., Huff, S. L., & Munro, M. C. (1998). Survey instruments in information systems. *MIS Quarterly, 22*(4), 553-554.
Ng, E. H., & Kim, H. W. (2009). Investigating information systems infusion and the moderating role of habit: A user empowerment perspective Symposium conducted at the meeting of the International Conference on Information Systems
Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed., Vol. 226). New York: McGraw Hill.
O'Connor, Y., O'Rahailligh, P., & O'Donoghue, J. (2012). Individual Infusion of M-Health Technologies: Determinants and Outcomes Symposium conducted at the meeting of the ECIS
Oakley, R., & Palvia, P. (2012). A study of the impact of mobile self-efficacy and emotional attachment on mobile device infusion Symposium conducted at the meeting of the The Americas Conference on Information Systems
Orlikowski, W. J. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization Science, 3*(3), 398-427.

Orlikowski, W. J. (2010). The sociomateriality of organisational life: considering technology in management research. *Cambridge Journal of Economics, 34*(1), 125-141.
Ortiz De Guinea, A., & Markus, M. L. (2009). Why break the habit of a lifetime? Rethinking the roles of intention, habit, and emotion in continuing information technology use. *MIS Quarterly, 33*(3), 433-444.
Owen, D. L. (2003). Recent developments in European social and environmental reporting and auditing practice: a critical evaluation and tentative prognosis.
Pao-Long, C., & Lung, S. S. C. (2002). Organizational changes for advanced manufacturing technology infusion: An empirical study. *International Journal of Management, 19*(2), 206-217.
Parker, S. K. (2007). That is my job 'How employees' role orientation affects their job performance. *Human Relations, 60*(3), 403-434. doi:10.1177/0018726707076684
Parthasarathy, M., & Bhattacherjee, A. (1998). Understanding post-adoption behavior in the context of online services. *Information Systems Research, 9*(4), 362-379.
Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly, 31*(4), 623-656.
Podsakoff, P. M., MacKenzie, S. B., Jeong-Yeon, L., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies [Article]. *Journal of Applied Psychology, 88*(5), 879-903.
Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual review of psychology, 63*, 539-569.
Podsakoff, P. M., & Organ, D. W. (1986). Self-Reports in Organizational Research: Problems and Prospects. *Journal of Management, 12*(4), 531-544. doi:10.1177/014920638601200408
Pongpattrachai, D., Cragg, P., & Fisher, R. (2014). IT Infusion within the Audit Process: Spreadsheet Use in Small Audit Firms. *International Journal of Accounting Information Systems, 15*(1), 26–46.
Pope, J. P., & Hall, C. R. (2014). Initial Development of the Coach Identity Prominence Scale: A Role Identity Model Perspective. *Journal of Sport & Exercise Psychology, 36*(3), 244-257.
Ramamurthy, K., Sen, A., & Sinha, A. P. (2008). Data Warehousing Infusion and Organizational Effectiveness. *IEEE Transactions on Systems, man and Cybernetics-Part A: Systems and Humans, 38*(4), 976-994.
Rasche, A., & Chia, R. (2009). Researching strategy practices: a genealogical social theory perspective. *Organization studies, 30*(7), 713-734.
Ravichandran, T., & Rai, A. (2000). Quality management in systems development: an organizational system perspective. *MIS Quarterly*, 381-415.
Ray, N. M., & Tabor, S. W. (2003). Cybersurveys come of age: Smart marketers are overcoming the challenges of online research. *Marketing Research, 15*(1), 32-37.
Real, K., Bramson, R., & Poole, M. S. (2009). The symbolic and material nature of physician identity: Implications for physician–patient communication. *Health communication, 24*(7), 575-587.
Reid, S. A. (1999). *Augment Identity Theory: Toward an Empirical Measure of Role-Identity Prominence* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9965018)
Riley, A., & Burke, P. J. (1995). Identities and Self-Verification in the Small Group. *Social Psychology Quarterly, 58*(2), 61-73.
Rindfleisch, A., Malter, A. J., Ganesan, S., & Moorman, C. (2008). Cross-sectional versus longitudinal survey research: Concepts, findings, and guidelines. *Journal of marketing research, 45*(3), 261-279.
Ringle, C., Sarstedt, M., & Straub, D. (2012). A critical look at the use of PLS-SEM in MIS Quarterly. *MIS Quarterly (MISQ), 36*(1), iii-xiv.
Ringle, C., Wende, S., & Will, A. (2005). *SmartPLS (Version 2.0 M3)* Retrieved from http://www.smartpls.de

Roberts, N., & Thatcher, J. (2009). Conceptualizing and testing formative constructs: tutorial and annotated example. *ACM Sigmis Database, 40*(3), 9-39.
Rogelberg, S. G., & Stanton, J. M. (2007). Introduction understanding and dealing with organizational survey nonresponse. *Organizational Research Methods, 10*(2), 195-209.
Rossman, G. B., & Wilson, B. L. (1985). Numbers and words combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation review, 9*(5), 627-643.
Saeed, K. A., & Abdinnour-Helm, S. (2008). Examining the effects of information system characteristics and perceived usefulness on post adoption usage of information systems. *Information & Management, 45*(6), 376–386.
Saga, V. L., & Zmud, R. W. (1994). The nature and determinants of IT acceptance, routinization, and infusion*Elsevier Science Inc.* Symposium conducted at the meeting of the Proceedings of the IFIP TC8 working conference on diffusion, transfer and implementation of information technology
Schwarz, A., & Chin, W. (2007). Looking forward: Toward an understanding of the nature and definition of IT acceptance. *Journal of the Association for Information Systems, 8*(4), 231-243.
Schwarz, G. M., & Watson, B. M. (2005). The influence of perceptions of social identity on information technology-enabled change. *Group & Organization Management, 30*(3), 289-318.
Sekaran, U. (2006). *Research methods for business: A skill building approach*: John Wiley & Sons.
Serpe, R. T. (1987). Stability and change in self: A structural symbolic interactionist explanation. *Social Psychology Quarterly, 50*(1), 44-55.
Serpe, R. T., & Stryker, S. (1987). The construction of self and reconstruction of social relationships. *Advances in group processes, 4*, 41-66.
Serpe, R. T., & Stryker, S. (2011). The symbolic interactionist perspective and identity theory. In *Handbook of identity theory and research* (pp. 225-248): Springer.
Sluss, D. M., & Ashforth, B. E. (2007). Relational identity and identification: Defining ourselves through work relationships. *Academy of Management Review, 32*(1), 9-32.
Sosik, J. J., Kahai, S. S., & Piovoso, M. J. (2009). Silver bullet or voodoo statistics? A primer for using the partial least squares data analytic technique in group and organization research. *Group & Organization Management, 34*(1), 5-36.
Sparks, P. (2000). Subjective expected utility-based attitude–behavior models: The utility of self-identity. In *Attitudes, behavior, and social context: The role of norms and group membership* (pp. 31-46). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
Sparks, P., & Guthrie, C. A. (1998). Self-Identity and the Theory of Planned Behavior: A Useful Addition or an Unhelpful Artifice? 1. *Journal of Applied Social Psychology, 28*(15), 1393-1410.
Sparks, P., & Shepherd, R. (1992). Self-identity and the theory of planned behavior: Assesing the role of identification with" green consumerism". *Social Psychology Quarterly, 55*(4), 388-399.
Sparks, P., Shepherd, R., Wieringa, N., & Zimmermanns, N. (1995). Perceived behavioural control, unrealistic optimism and dietary change: An exploratory study. *Appetite, 24*(3), 243-255.
Stein, M. K. (2013). *Use and Non-Use of IT in the Workplace: Studies on Emotions, Identity and Technology*: ERIC.
Stein, M. K., Galliers, R. D., & Markus, M. L. (2013). Towards an understanding of identity and technology in the workplace. *Journal of Information Technology, 28*(3), 167-182.
Stets, J. E., & Biga, C. F. (2003). Bringing identity theory into environmental sociology. *Sociological Theory, 21*(4), 398-423.
Stets, J. E., & Burke, P. J. (2000). Identity theory and social identity theory. *Social Psychology Quarterly, 63*(3), 224-237.
Stets, J. E., & Burke, P. J. (2003). A sociological approach to self and identity. *Handbook of self and identity*, 128-152.

Stets, J. E., & Serpe, R. T. (2016). *New Directions in Identity Theory and Research*: Oxford University Press.
Steward, M. D., Hutt, M. D., Walker, B. A., & Kumar, A. (2009). Role identity and attributions of high-performing salespeople. *Journal of Business & Industrial Marketing, 24*(7), 463-473.
Straub, D., Boudreau, M. C., & Gefen, D. (2004). Validation guidelines for IS positivist research. *The Communications of the Association for Information Systems, 13*(1), 380-427.
Stryker, S. (1968). Identity salience and role performance: The relevance of symbolic interaction theory for family research. *Journal of Marriage and the Family, 30*(4), 558-564.
Stryker, S. (1980). *Symbolic interactionism: A social structural version*: Benjamin-Cummings Publishing Company.
Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social Psychology Quarterly, 63*(4), 284-297.
Stryker, S., & Serpe, R. T. (1982). Commitment, identity salience, and role behavior: Theory and research example. In *Personality, roles, and social behavior* (pp. 199-218): Springer New York. doi:10.1007/978-1-4613-9469-3_7
Stryker, S., & Serpe, R. T. (1994). Identity salience and psychological centrality: Equivalent, overlapping, or complementary concepts? *Social Psychology Quarterly, 57*(1), 16-35.
Stryker, S., & Vryan, K. D. (2006). The symbolic interactionist frame. In *Handbook of social psychology* (pp. 3-28): Springer.
Sullivan, C. H. (1985). Systems Planning in the Information Age. *Sloan Management Review, 26*(2), 3-12.
Sun, H. (2012). Understanding User Revisions When Using Information System Features: Adaptive System Use and Triggers. *MIS Quarterly, 36*(2), 453-478.
Sundaram, S., Schwarz, A., Jones, E., & Chin, W. W. (2007). Technology Use on the Front Line: How Information Technology Enhances Individual Performance. *Journal of the Academy of Marketing Science, 35*(1), 101-112.
Swarm, J., W. B. . (1983). Self-verification: Bringing social reality into harmony with the self. *Social psychological perspectives on the self, 2*, 33-66.
Tajfel, H. (1981). *Human groups and social categories: Studies in social psychology*. Cambridge, UK: Cambridge University Press.
Tajfel, H., & Turner, J. C. (2004). The Social Identity Theory of Intergroup Behavior. In *Social identity and intergroup relations* (pp. 276-293). New York, NY, US: Psychology Press.
Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research, 6*(2), 144-176.
Teddlie, C., & Tashakkori, A. (2010). Overview of contemporary issues in mixed methods research. *Sage handbook of mixed methods in social and behavioral research, 2*, 1-44.
Terry, D. J., Hogg, M. A., & White, K. M. (1999). The theory of planned behaviour: self-identity, social identity and group norms. *British Journal of Social Psychology, 38*(3), 225-244.
Thatcher, J. B., McKnight, D. H., Baker, E. W., Arsal, R. E. u., & Roberts, N. H. (2011). The Role of Trust in Postadoption IT Exploration: An Empirical Examination of Knowledge Management Systems. *IEEE Transactions on Engineering Management, 58*(1), 56-70.
Theodorakis, Y. (1994). Theodorakis, Y.(1994). Planned behavior, attitude strength, role identity, and the prediction of exercise behavior. The Sport Psychologist, 8, 149-165. *Psychologist, 8*, 149-165.
Theodorakis, Y., Bagiatis, K., & Goudas, M. (1995). Attitudes toward teaching individuals with disabilities: Application of planned behavior theory. *Adapted Physical Activity Quarterly, 12*, 151-151.
Thoits, P. A., & Virshup, L. K. (1997). Me's and we's. In *Self and identity: Fundamental issues* (pp. 106-133)
Thompson, M. (2012). People, practice, and technology: Restoring Giddens' broader philosophy to the study of information systems. *Information and Organization, 22*(3), 188-207.
Tian, Y. (2011). Cloud Computing CRM-Management of Small and Medium Customers the Choice of International. *Contemporary Logistics*(2), 126-129.

Tripsas, M. (2009). Technology, identity, and inertia through the lens of "The Digital Photography Company". *Organization Science, 20*(2), 441-460.
Tsushima, T., & Burke, P. J. (1999). Levels, agency, and control in the parent identity. *Social Psychology Quarterly, 62*(2), 173-189.
Tyre, M. J., & Orlikowski, W. J. (1996). The episodic process of learning by using. *International Journal of Technology Management, 11*(7-8), 790-798.
Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. *JITTA: Journal of Information Technology Theory and Application, 11*(2), 5-39.
Vaast, E., & Walsham, G. (2005). Representations and actions: the transformation of work practices with IT use. *Information and Organization, 15*(1), 65-89.
Van Akkeren, J., & Rowlands, B. (2007). An epidemic of pain in an Australian radiology practice. *European Journal of Information Systems, 16*(6), 695-711.
Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the Qualitative-Quantitative Divide: Guidelines for Conducting Mixed Methods Research in Information Systems. *MIS Quarterly, 37*(1), 21-54.
Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204.
Venkatesh, V., & Goyal, S. (2010). Expectation disconfirmation and technology adoption: polynomial modeling and response surface analysis. *MIS Quarterly, 34*(2), 281-303.
Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly, 24*(1), 115-139.
Walsham, G. (1998). IT and changing professional identity: Micro-studies and macro-theory. *JASIS, 49*(12), 1081-1089.
Wang, W., & Hsieh, J. (2006). Beyond routine: Symbolic adoption, extended use, and emergent use of complex information systems in the mandatory organizational context Symposium conducted at the meeting of the ICIS, Milwaukee
Wang, W., Hsieh, J. P. A., Butler, J. E., & Hsu, S.-H. (2008). Innovate with Complex Information Technologies: A Theoretical Model and Empirical Examination. *Journal of Computer Information Systems, 49*(1), 27-36.
Weick, K. E. (1995). *Sensemaking in organizations* (Vol. 3). Thousand Oaks, CA: Sage.
Werts, C. E., Linn, R. L., & Jöreskog, K. G. (1974). Intraclass reliability estimates: Testing structural assumptions. *Educational and Psychological measurement, 34*(1), 25-33.
Whetten, D. A. (1989). What constitutes a theoretical contribution? *Academy of Management Review, 14*(4), 490-495.
Whitley, E. A., Gal, U., & Kjaergaard, A. (2014). Who do you think you are? A review of the complex interplay between information systems, identification and identity. *European Journal of Information Systems, 23*(1), 17-35.
Winston, E. R., & Dologite, D. G. (1999). Achieving IT Infusion: A Conceptual Model for Small Businesses. *Information Resources Management Journal, 12*(1), 26-38.
Wold, H. (1982). Soft modelling: the basic design and some extensions. *Systems under indirect observation, Part II*, 36-37.
Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review, 26*(2), 179-201.
Yang, K. S. (1981). The formation and change of Chinese personality: A cultural-ecological perspective. *Acta Psychologica Taiwanica, 23*(1), 39-56.
Zmud, R. W., & Apple, L. E. (1992). Measuring Technology Incorporation/Infusion. *Journal of Product Innovation Management, 9*(2), 148-155.

Appendices

Appendix A – Ethics Application Approval

AUT UNIVERSITY
TE WĀNANGA ARONUI O TAMAKI MAKAU RAU

AUTEC SECRETARIAT

27 February 2015

Felix Tan

Faculty of Business and Law

Dear Felix

Ethics Application: **15/44 The impact of individual's identities on the infusion of information systems within an organisation.**

Thank you for submitting your application for ethical review to the Auckland University of Technology Ethics Committee (AUTEC). I am pleased to confirm that your ethics application has been approved for three years until 26 February 2018.

Please note that a revised version of the questionnaire needs to be submitted to AUTEC for its records after the pilot phase.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through http://www.aut.ac.nz/researchethics. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 26 February 2018;
- A brief report on the status of the project using form EA3, which is available online through http://www.aut.ac.nz/researchethics. This report is to be submitted either when the approval expires on 26 February 2018 or on completion of the project;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, we ask that you use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

All the very best with your research,

Kate O'Connor

Executive Secretary

Auckland University of Technology Ethics Committee

Cc: Farkhonedeh Hassandoust fhassand@aut.ac.nz; Angsana Techatassanasoontorn

Appendix B – Participants Information Sheet

Participant Information Sheet

Date Information Sheet Produced: 04-05-2015
Project Title: The Impact of Individual's Identities and Empowerment on the Infusion of Information Systems within an organisation

An Invitation
Greetings, my name is Farkhondeh Hassandoust. I am a doctoral student at Auckland University of Technology (AUT) and I invite you to participate in this study, which is part of the requirements for my doctoral degree. Your participation in this study is voluntary and will take approximately 10 minutes of your valuable time. You are able to leave the survey any time before completion. I am conducting a draw in which 2 survey respondents will win a $100 gift card.

What is the purpose of this research? The research project plans to investigate the factors that influence employees to use Information Systems (IS) such as Salesforce CRM (Customer Relationship Management) to its fullest potential. The study will investigate those users that we refer to as "IS infusers" (IS deep users), who tend to use most features of the systems in an innovative fashion to coordinate multiple tasks; in other words, use the system to its fullest potential even beyond their job description and management expectation. For example, an employee who uses the most available features (sections) of CRM such as lead, opportunity, reports, accounts, contacts, files, forecasts, chatter, data analytics (e.g., dashboard, pipeline), campaign, ideas, products etc., in innovative ways to perform work tasks.

The research will examine the IS infusers as compared to shallow users. Shallow users use the system for the purpose of completing their job according to management expectation and the job description; they do not care about other available features of the system. On the contrary, "IS infusers tend to experience and use most features of the systems or explore the new features of the systems in an innovative fashion to coordinate multiple job tasks beyond management expectation and their job description.

The research is required as part of fulfilling the requirements of a PhD degree in Business Information Systems. The research findings will be published as a doctoral thesis and in related academic papers.

How was I identified and why am I being invited to participate in this research? This study focuses on end-users of cloud CRM systems for data collection. We have contacted a few cloud CRM providers to identify the list of organisations that adopt cloud CRM systems in New Zealand. For the purposes of this study, cloud CRM end-users (employees) interested in participating in the study must have interacted for at least one year with the cloud CRM system in their organisation.

What will happen in this research? End-users (employees) of a cloud CRM system who have met the criteria in the previous question and agreed to participate in this study, will be given a survey link. The survey will ask them questions about their demographic information (such as age, gender, etc) and their interaction with the cloud CRM system. I am conducting a draw in which 2 survey respondents will win a $100 gift card. At the end of the survey, you will be redirected to a separate site where you can optionally enter our prize draw. The winners will be randomly selected when data collection has been completed.

What are the discomforts and risks? There is no discomfort or risk, as the survey questions are about daily routine work practices. Your participation is anonymous and voluntary.

What are the benefits? The findings of this study will provide managers with insight of individual behaviours into the factors that influence why infusion of the systems occurs (or fails to occur) and provide managers with an understanding of factors that influence the full use of information systems. In addition, managers may find it useful to prepare continuance socialisation programmes to reinforce and reward desired identity-related behaviours of employees. Results from this study can be used to help organisations assess actual benefits from the cloud systems through the use of the systems, provide guidelines for designing interventions to promote individuals' deep-uasge (infusion) behaviours, and foster higher levels of infusion among cloud CRM users. Ultimately, the research results will help organisations secure more benefit from their technology investments.

How will my privacy be protected? This is an anonymous survey and respondents can not be identified. The data is kept securely and will only be reported in documents, such as a PhD thesis and papers published in academic conferences or journals.

What are the costs of participating in this research? The only cost of participating in this web survey is your time- takes 10 minutes approximately.

What opportunity do I have to consider this invitation? You will have at least one month to complete the survey once you have received a link to the survey.

How do I agree to participate in this research? By completing this web survey, you are indicating your consent to participate in the research.

Will I receive feedback on the results of this research? You are welcome to email Farkhondeh Hassandoust (fhassand@aut.ac.nz), if you wish to receive a summary of the research findings. In addition, a hard copy of the research findings will be stored in and made available to you through the AUT University Library – City Campus.

What do I do if I have concerns about this research? Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Prof. Felix Tan, felix.tan@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext 6038.

Whom do I contact for further information about this research?

Researcher Contact Details:
Farkhondeh Hassandoust, fhassand@aut.ac.nz, 921 9999 ext 5896
Project Supervisor Contact Details:
Prof. Felix Tan, felix.tan@aut.ac.nz, 921 9999 ext 9487
Dr. Angsana Techatassanasoontorn, angsana@aut.ac.nz, 921-9999 ext 9235

Approved by the Auckland University of Technology Ethics Committee on 27 February 2015, AUTEC Reference number 15/44.

Appendix C – Online Questionnaire

Purpose: This research project plans to investigate the factors that influence employees to use Information Systems (IS) such as Salesforce CRM to its fullest potential. This study will be surveying those users that we refer to as ***"IS infusers"*,** who tend to use ***most features of the systems*** *or* ***explore the new features of the systems*** *in an* ***innovative fashion to coordinate multiple job tasks.***
For example, an IS infuser refers to an employee who uses the most available features (sections) of CRM such as lead, opportunity, reports, accounts, contacts, files, forecasts, chatter, data analytics (e.g., dashboard, pipeline), campaign, ideas, products etc., to perform work tasks.

This questionnaire has 30 main questions and will take approximately 10 minutes to complete. Completion of the questionnaire affirms your consent and willingness to participate in this survey. All information will be kept confidential and anonymous. The information gathered will be used only for academic purposes.

A draw will be held where 2 respondents (who meet the criteria as an *IS Infuser* and fill up the survey completely) **will win a prize of a NZ$100 gift card (2x$100).** If you have any questions about this survey, please address them to: Farkhondeh Hassandoust, Faculty of Business and Law, Auckland University of Technology, Auckland. Phone: 021 02994171, e-mail: fhassand@aut.ac.nz. Thank you for your participation.

Please provide information about your background below.

Gender: o Female o Male
Age: o <19 years old o 20-29 years old o 30-39 years old o 40-49 years old o >50 years old
Please specify your role (position): o Sales Representative o Marketing Representative o Sales Manager o Marketing Manager o Account Manager o Sales Specialist o Customer Service Manager

- Customer Service Representative
- Others (Please specify)

Tenure (years): How many years have you been with your current organisation?
- <2 years
- 2-4 years
- 4-6 years
- 6-8 years
- 8-10 years
- >10 years

How long (years) have you worked with the CRM (Customer Relationship Management) system?
- I have not worked with the CRM system yet.
- <1 year
- 1-3 years
- >3 years

How many years of experience do you have with using other business applications before using the CRM system?
- No experience with other business applications
- <1 year
- 1-3 years
- 3-5 years
- >5 years

What is the highest level of your education?
- High school
- Bachelor's Degree
- Master's Degree
- Doctorate Degree
- Others (Please specify)

What kind of CRM system are you using in your organisation?
- Salesforce CRM
- Microsoft Dynamics
- Oracle Sales Cloud
- SugarCRM
- Zoho CRM
- Netsuite CRM
- Others (Please specify)

Think about the way you use the CRM system. Features of the CRM system may include: Email, Contacts, Accounts, Leads, Opportunities, Campaigns, Forecasts, Reports, Dashboards, among others.
Please tick the check-boxes that represent your using of the CRM system (you can tick more than one check-box):
- I use most features of the CRM system.
- I explore the new features of the CRM system.
- I use the CRM system in an innovative fashion to coordinate multiple job tasks.
- None of the above

Please pay attention to the below points:

1. You may come across similar questions in the next sections. We hope that you will answer all of them honestly. We need to include similar questions to establish statistical reliability and validity.

2. Please be reminded that ***IS Infuser*** *refers to the user who* ***uses the most features*** *of CRM or* ***explores the new features*** *of CRM in an* ***innovative fashion*** *to coordinate* ***multiple job tasks****.*

Please tick the check-boxes where required, or select the options that best represent your preferences.	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
On average, as an employee, I think I do well at being the sort of IS infuser that I perceive myself to be. On average, I think that I have the important characteristics/skills to be an IS infuser. On average, I feel I do well at being an IS infuser.							
On average, I believe my colleagues think I do well at being an IS infuser. On average, I believe my colleagues think that I have the important characteristics to be an IS infuser. On average, my colleagues think I am a good example of an IS infuser.							
As an employee, I feel that I have devoted myself to being the kind of IS infuser that I perceive myself to be. I feel I have strongly committed myself to being recognised as an IS infuser. I feel that I have devoted a lot of myself to view myself as an IS infuser.							
As an employee, I have given most of my working time to being the kind of IS infuser that I perceive myself to be.							

As an employee, I have given most of my working available resources to being the kind of IS infuser that I perceive myself to be. As an employee, I have given most of my energy to being the kind of IS infuser that I perceive myself to be.							
Aside from pure enjoyment, on average, I get rewards (e.g., bonus, promotion, praise) from being an IS infuser. I increase my productivity by being an IS infuser. I accomplish tasks more quickly by being an IS infuser. I improve my job performance by being an IS infuser. I enhance my effectiveness in my job by being an IS infuser.							

Note:

1. You may come across similar questions in the next sections. We hope that you will answer all of them honestly. We need to include similar questions to establish statistical reliability and validity.

2. Please be reminded that ***IS Infuser*** *refers to the user who* ***uses the most features*** *of CRM or* ***explores the new features*** *of CRM in an* ***innovative fashion*** *to coordinate* ***multiple job tasks****.*

"2 pages to go"

Please tick the check-boxes where required, or select the options that best represent your preferences.	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Thinking about myself in relation to the CRM use, I feel dependent on this system to do my job tasks. Thinking about myself in relation to the CRM, I am counting on this system to do my job tasks. Thinking about myself in relation to the CRM, I am reliant on this system to do my job tasks. Thinking about myself in relation to the CRM, I feel that I need this system to do my job tasks.							
Thinking about myself in relation to the CRM to do my job tasks, I feel energised. Thinking about myself in relation to the CRM to do my job tasks, I feel confident. Thinking about myself in relation to the CRM to do my job tasks, I feel pumped up. Thinking about myself in relation to the CRM to do my job tasks, I feel enthusiastic.							
Thinking about myself in relation to the CRM, I feel close to this system.							

Thinking about myself in relation to the CRM, I feel connected with this system. Thinking about myself in relation to the CRM, I am in coordination with this system. Thinking about myself in relation to the CRM, I feel linked with this system.							

Note:

1. You may come across similar questions in the next sections. We hope that you will answer all of them honestly. We need to include similar questions to establish statistical reliability and validity.

2. Please be reminded that ***IS Infuser*** *refers to the user who* ***uses the most features*** *of CRM or* ***explores the new features*** *of CRM in an* ***innovative fashion*** *to coordinate* ***multiple job tasks****.*

"1 page to go"

Please tick the check-boxes where required, or select the options that best represent your preferences.	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I am using the CRM system to its fullest potential to support my own work. I am using all capabilities of the CRM system in the best fashion to help me on the job. I doubt that there are any better ways for me to use the CRM system to support my work. My use of the CRM system has been integrated and incorporated into my work at the highest level.							
I fully use the available CRM system features to complete my tasks. I use most of the available CRM system features in performing my tasks. I make use of the available CRM system features thoroughly to accommodate my tasks. I use all available CRM system features to help me in my tasks.							
I use the CRM system for better connections among tasks.							

I use the CRM system to organise various tasks in an integrative manner. I use the CRM system to coordinate multiple tasks. I use the CRM system to handle related tasks.							
I explore new uses of the CRM system to support my tasks. I often experiment with new ways of using the CRM system to accomplish my tasks. I often find new uses of the CRM system in performing my tasks. I use the CRM system in novel ways to complete my tasks.							

Note:

1. You may come across similar questions in the next sections. We hope that you will answer all of them honestly. We need to include similar questions to establish statistical reliability and validity.

2. Please be reminded that ***IS Infuser*** *refers to the user who* ***uses the most features*** *of CRM or* ***explores the new features*** *of CRM in an* ***innovative fashion*** *to coordinate* ***multiple job tasks****.*

"Last page"

Please tick the check-boxes where required, or select the options that best represent your preferences.	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Top management is very supportive of IS infusion behaviours in my organisation.							
I feel being an IS infuser is supported and encouraged in my organisation.							
Top management values IS infusion behaviours in my organisation.							
I can be an IS infuser without feeling threatened by others in my organisation.							
Being an IS infuser is encouraged in my organisation.							
Being an IS infuser is fostered in my organisation.							

Please be patient and assist us by answering the following set of questions. They refer to Brand Image. Please answer these questions based on your 'gut' feeling. The exact answer is not important to us – but it is required for statistical calibration of the earlier questions.

Please consider your attitudes towards the Air New Zealand's marketing and advertising campaigns from all media such as TV, Internet, magazines, radio and sponsorship activities. How much do you agree or disagree with each of the following statements about Air New Zealand?

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Thinks outside the square Are warm and engaging Are daring Are spirited Are imaginative Are up-to-date							

In your opinion, what influence an employee's CRM/IS infusion behaviours in organisations? Why?

Please add any other comments here:

Thank You for Completing Our Survey!

Thank you for taking time out to participate in this survey. We truly value the information you have provided. Your responses are vital for my PhD research.