Importance of IT and Role Identities in Information Systems Infusion

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Abstract

Information systems (IS) should be infused into individuals' work activities for organizations to extract value from these systems. Studies have identified various factors that impact IS infusion, but few have examined the importance of individuals' identities and the role of contextual factors. Drawing on identity and status characteristics theories, this study conceptualizes individuals' material identity as IT identity, and role identity as IS infusion role identity and examines their relationships and effects on IS infusion as well as the role status characteristics play in shaping these relationships. The models were evaluated using survey data collected from enterprise systems users. Findings suggest that individuals' IT identity shape IS infusion role identity, and together, these identities influence their IS infusion. Additionally, work-related and personal characteristics strengthen the relationships between identities and IS infusion. This study highlights the role of individual's IT and role identities and status characteristics in fostering IS infusion.

Keywords Identity theories · IS infusion · IT identity · Material identity · Personal characteristics · Role identity · Work-related characteristics

1 Introduction

Information systems (IS) implementation research has demonstrated that the most successful IS implementations are those in which users take full advantage of system features (Jasperson et al., 2005). While different reasons may contribute to why IS implementations 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 behavior is defined as the degree to which an IS application is used by users to its fullest potential within an organization (Saga & Zmud, 1993).

Despite the significance of user IS infusion in realizing benefits from IS implementations, research has not paid enough attention to how an individual's characteristics in relation to their IS-related roles may shape infusion behaviors. Recent research (Carter, 2012; Dávila & Finkelstein, 2010; Fadel,

2012; Hasan et al., 2016) has argued that IS infusion involves voluntary, exploratory, and proactive behaviors toward IS use, which is distinct from IS adoption behavior because it requires individuals to put in significant adaptation efforts to engage in deep use of IS. This suggests that those who manage to attain IS infusion are likely to identify with an IS through their interactions with technology based on 'who they are' as individuals and their IS-related roles in an organization (Carter & Grover, 2015; Hassandoust et al., 2015; Stein et al., 2013). In previous studies, it has been suggested that individuals' identities are central to understanding IS-related behaviors within professional communities and organizations (Balapour et al., 2019; Carter et al., 2017; Mishra et al., 2012). Identity relates to how a person defines herself[1] with unique characteristics and self-concepts, and her claim to perform a role competently within the workplace (Burke, 1991). This study theorizes the relationship between individual identities and performance-related behaviors by examining the influence of IT identity and IS-related role identity on IS infusion behaviors.

The need to examine the impact of individuals' identities on their IS infusion behaviors can be argued in the following ways. First, previous studies have suggested that psychological factors, particularly those related to identities, are likely to play a

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[1] The use of "her/him" and "she/he" is potentially distractive to readers; therefore, this study will use female pronouns throughout the manuscript.

stronger role in explaining proactive behaviors such as IS infusion behaviors (Carter & Grover, 2015; Carter et al., 2017; Kim & Gupta, 2014; Saga & Zmud, 1993; Stein et al., 2013). When individuals psychologically depend on an IS, they are more likely to invest time and effort in engaging in proactive behaviors (Thatcher et al., 2010; Wang & Hsieh, 2006). Second, the notion of identities has been used to explain IS use in organizations, including IS assimilation (Leclercq-Vandelannoitte, 2014; Mishra et al., 2012) and ongoing use of information technology (IT) in the workplace (Stein et al., 2013). For example, Mishra et al. (2012) found that physicians' role identity of a care provider explains their electronic health record system assimilation.

Identity emerges over time as individuals learn the meanings and expectations associated with social categories from others and from self-evaluations (Burke, 2004). As individuals increasingly interact with technology, IT identity, a new form of material identity, reflects the extent to which these individuals identify with an IT. According to identity theories (McCall & Simmons, 1966; Stryker & Burke, 2000), an individual's identity associated with deep attachment to IT use affects her internalized expectations about competent performance in her work role. In an empirical study, Mishra and colleagues (2012) found that health employees' reliance and dependence on the implemented IT enabled them to retain and strengthen their autonomy and dominant role identity among physicians. Therefore, employees' IT identity impacts their role identities and both IT and role identities facilitate employees' behaviors in an organization.

In addition, to generate further insights, we contextualize the influence of role identity and IT identity as prior research have suggested (Burton-Jones & Gallivan, 2007; Hsieh et al., 2011). Drawing on the intersection of status characteristics theory and identity theory, we also explore the role of personal characteristics (gender, age, education) and work-related characteristics (position or role in an organization, tenure, and former IT experience with business applications) in shaping the relationship between identities and IS infusion.

The above discussion and extant literature suggest that as individuals interact with a specific IS in an organization, these interactions become essential to the sense of who they are as individuals. In the context of IS use, it is likely that IT identity as a form of material identity shapes individuals' IS infusion behaviors in an organization, through IS infusion role identity. IT identity as an individual's material identity refers to the sense of who they are in relation to IT and is defined 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). IS infusion role identity refers to the meanings and expectations of behaviors that a person ascribes to herself in relation to the use of IS to its fullest potential to perform job tasks. As we are studying professionals in a workplace, their personal and work-related context may well play an important role in their sense making. Hence, we seek to answer the research questions: *To what extent does*

individuals' IT identity shape their IS infusion role identity in the use of IS to its fullest potential within an organization? How important are both individuals' IT identity and IS infusion role identity to their IS infusion behaviors within an organization? How do personal and work-related characteristics play a role in shaping the relationships between identities and IS infusion?

The rest of the paper is organized as follows. In the next section, we review prior research on IS infusion behaviors, followed by a discussion on IT and role identities and relevant arguments to explain how IT and role identities shape behaviors. We then develop the research models that theorize the influence of IT and IS infusion role identities and contextual characteristics on IS infusion and propose the research hypotheses. Next, we discuss the research methodology and the results. Finally, the paper concludes with a discussion of findings, implications for theory and practice, and the limitations of the study along with opportunities for future research.

2 Literature on IS Infusion

IS infusion is the last stage in the six-stage IS implementation model. The six stages are initiation, adoption, adaptation, acceptance (assimilation), routinization, and infusion (Cooper & Zmud, 1990). From a behavioral perspective, IS infusion is realized when "the IT application is used to its fullest potential" (Cooper & Zmud, 1990, p.125). An individual's IS infusion behavior has been conceptualized as a single-dimensional construct that reflects IS use at its fullest potential (Cooper & Zmud, 1990; Jones et al., 2002; Karimikia et al., 2020; Maas et al., 2014; O'Connor & O'Reilly, 2018; Sundaram et al., 2007), as well as through three distinct and related ways to achieve IS infusion, namely extended use, integrative use, and emergent use (Fadel, 2012; Kim & Gupta, 2014; Saga & Zmud, 1993). *Extended use* refers to the use of more features of a system to perform job tasks without considering the interconnectedness of these tasks with others, or new ways of applying the system to accomplish job tasks beyond the prescribed guidelines (Hsieh & Wang, 2007; Hsieh et al., 2011; Saeed & Abdinnour-Helm, 2008; Saga & Zmud, 1993). *Integrative use* involves "using the technology to establish or enhance flow linkages among a set of work tasks" (Saga & Zmud, 1993, p.80), while *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, 1993, p.80), which suggests an innovative way to use IS to support job tasks. Since previous studies (e.g., Kim & Gupta, 2014) have reported that extended use, integrative use, and emergent use are influenced differently by determinants, this study will evaluate IS infusion as a single dimensional construct as well as the three different ways of using an IS to its fullest potential.

Although IS infusion can be studied at an organizational level, this study focuses on individual IS infusion behaviors. A

summary of selected individual IS infusion studies is presented in Appendix Table 6. A recent literature review study on IS infusion behaviors identified 85 influencing factors and grouped them into five main categories: organizational, environmental, technological, task-job, and individual factors (Hassandoust et al., 2016). Other recent studies have focused on individual factors such as empowerment, commitment, intrinsic motivations, and other psychological factors, which show the importance of psychological factors in explaining IS infusion (Hasan et al., 2016; Kim & Gupta, 2014). As IT plays an increasingly important role in people's work lives, it has become intertwined with how individuals view themselves and the actions they take (Carter et al., 2017; Mishra et al., 2012; Stein et al., 2013). In other words, there is a need to look at new theoretical perspectives that can help explain behaviors in the roles individuals occupy in an organization in relation to IT. In this study, we apply identity theories[2] in social psychology to develop a conceptual model to explain IS infusion behaviors in organizations. Next, we discuss identity theories and how IT identity and role identity shape individual behaviors.

Self-concept and identity are key concepts in identity theories. Identity is a set of meanings that defines individuals and guides their behaviors (Burke & Stets, 2009; McCall & Simmons, 1978; Stryker & Burke, 2000). Identities constitute person identity, role identity, and social identity. Recently, Carter and Grover (2015) conceptualized IT identity as a fourth perspective of identity that shapes post-adoption IS use (Carter et al., 2020a, b). Individuals have different identities that relate to the idiosyncratic personal characteristics they possess (e.g., moral, hardworking), the various roles they perform (e.g., mother, professor), and the various social groups they affiliate with (e.g., work groups) (Burke & Stets, 2009). For example, an individual may have an understanding of what is required to be ethical when she thinks about herself as a moral person, and a notion of what it means to be productive when she reflects about herself as an academic professor (Stets & Serpe, 2016). These meanings allow her to define herself in terms of a moral person identity and an academic role identity. Previous studies have used identity theories to demonstrate how identities, internalized and enacted by people, can change their behavior. However, most studies have primarily investigated role identities (Carter & Grover, 2015). Little is known about the part played by individuals' IT identity in shaping their role identity

and in turn, how these identities influence individual behavior, particularly in the IS related context.

Burke's identity theory concentrates on person identity or the set of self-interpretations that defines a person as a unique, identifiable, and distinct entity (Burke, 2004; Burke & Stets, 2009). Research has suggested that person identity operates like a master identity because person identity is constantly activated, high in identity salience, and ranked higher than role and social identity (Burke, 2004; Burke & Stets, 2009). Fundamentally, the meanings of a person's identity have implications for how that person behaves, and the person's behavior, in turn, confirms the meanings of the specific identity. Carter and Grover (2015) applied identity theories to develop a new construct, IT identity, which reflects how individuals view the use of an IT as integral to their self-concept through the incorporation of IT capabilities as personal resources. In particular, a strong IT identity means that "use of the [target IT] is integral to my sense of self" (Carter & Grover, 2015, p. 938).

McCall and Simmons' (1978) role identity theory focuses on the roles individuals occupy in society (e.g., professor, parent, or spouse). A role identity is a set of internalized meanings associated with a role or an individual's imaginative view of herself when thinking of herself being and acting as an occupant of that position. People have many role identities and the concept of prominence hierarchy is used to organize these identities. Prominence denotes the importance of an identity to an individual. An identity is likely to be high in the prominence hierarchy when individuals "receive support from others for the identity, when they are committed to the identity, and when they receive rewards (both extrinsic and intrinsic) for the identity" (Stets & Serpe, 2013, p. 37). In other words, self-support, social support, commitment, resource investment, external gratifications, and internal gratifications shape identity prominence (McCall & Simmons, 1978). When a role is more prominent, that specific role is accepted as the salient role in the hierarchy. We believe that IS use-related role identity[3] sits higher in a hierarchy of role identities for some individuals who embrace the meanings of IS use in their self-concept. These individuals are likely to see themselves as being deep users of IS when they think of themselves because they primarily rely on the use of this particular IS to effectively complete their job tasks. Based on these theoretical arguments, we next explain how we apply material identity and role identity as IT identity and IS infusion role identity respectively in this study.

2.1 Conceptualization of IT Identity

To develop an understanding of IS infusion behaviors in an organization, it is important to consider an individual's interactions

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[2] Note that a variety of theories have been used in the IS literature to conceptualize identity. For instance, Stein et al. (2013) built on a socio-technical school of thought to study identities around IT use in organizations. Leclercq-Vandelannoitte (2014) drew on Foucault's conception of identity to analyze identity and technology relationships in IT assimilation. In this study, we draw on identity theory rooted in structural symbolic interactionism, which argues that an identity is a set of meanings that defines individuals in particular roles or as persons with specific characteristics that differentiate them from others (Stets and Serpe 2013).

[3] For the rest of this paper, the term 'role identity' will be used instead of 'role identity prominence'.

and perceived relationships with a particular IS in order to find answers to the question, "Who am I, as an individual, through my use of this technology?" (Carter & Grover, 2015).

IT identity is conceptualized as a higher order construct with three dimensions: dependence, emotional energy, and relatedness. Dependence reflects "a person's sense of reliance upon an IT" (Carter & Grover, 2015, p. 945). Emotional energy refers to "a person's enduring feelings of emotional energy and enthusiasm in relation to an IT" (Carter & Grover, 2015, p. 945), while 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). Affective emotional responses to an IT, a strong sense of connection, and successful experiences with an IT reflect stronger identification with a particular IT.

2.2 Conceptualization of IS Infusion Role Identity

IT identity focuses on self-expansion through exploration and learning until the interaction with IT becomes routinized through the use of a set of IT features. However, as reported in previous studies, some users move from 'use' to 'deep use,' which requires their commitment and willingness to experiment with IT to extend the frontiers of IT use (Hasan et al., 2016; Kim & Gupta, 2014). These individuals are likely to incorporate the social role of being an IS infuser in an organization into their self-concept. Based on the theoretical argument of role identity, individuals' IS infusion role identity is likely to form through their self-support, social support, commitment, resource investment, and external and internal gratifications within an organization. Individuals' self-support regarding IS infusion role identity refers to self-confirming feedback that the infusion behaviors they enact fit their view of infusion role identity. Individuals' social support regarding IS infusion role identity refers to their belief in colleagues' perceptions of how they perform as IS infusers and how their colleagues regard their important characteristics as IS infusers. Individuals' commitment regarding IS infusion role identity 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. Individuals' resource investment regarding IS infusion role identity refers to how much of their working time and energy is devoted to being IS infusers. Individuals' external gratifications regarding IS infusion role identity refers to their work improvement in performance, speed, productivity, and effectiveness by being IS infusers. Individuals' internal gratifications regarding IS infusion role identity refers to their positive feeling and enjoyment from being IS infusers.

Next, we present the research models that will be used to evaluate the influence of IT identity and IS infusion role identity on IS infusion behavior and extended use, integrative use, and emergent use.

3 Research Model and Hypotheses

Drawing on identity theories, we present the two proposed research models and discuss the hypothesized relationships between IT identity and IS infusion role identity as well as their importance to IS infusion behavior. The first model conceptualizes three ways of achieving IS infusion namely, extended, integrative, and emergent use behaviors, while the second model uses IS infusion behavior as a single variable. Drawing on the intersection of status characteristics theory and identity theory, we theorize that three personal characteristics (gender, age, education) and three work-related characteristics (position or role in an organization, tenure, and former IT experience with business applications) may play a role in shaping the relationship between identities and IS infusion. These contextual variables are included as moderators in the research models. Figure 1 presents the research models.

3.1 Impact of IT Identity on IS Infusion Role Identity

When individuals have a choice in roles to perform, the meanings attributed to IT use are likely to influence the meanings of their role identities (Burke & Stets, 2009). For example, when a worker identifies her personality with objects associated with her (e.g., technologies), she is more likely to consider those objects to be instrumental in delivering her job tasks with a sense of fulfilment. It is important to recognize that situational context influences the self through shared language and meanings that enable individuals to assume different roles in relation to that specific context (da Costa Netto & Maçada, 2019). Individuals' IT identity reflects their deep attachment with an object like an IS affects their internalized expectations about competent performance in their work roles that are related to that targeted system usage (McCall & Simmons, 1966; Stryker & Burke, 2000). This is because individuals' personal characteristics and attachment to an IS 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 strong IT identity may choose to claim role identities that align with their IT identity. A study by Mishra et al. (2012) on the care-provision process among physicians found that their reliance and dependence on the implemented IS enabled them to retain and strengthen their autonomy and dominant IS assimilation role identity. Similarly, previous studies have suggested that an individual's engagement and participation in a digital-based community impacts the formation of the individual's role identities, as the 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 (Carter, 2012; Carter et al., 2017). Therefore, it is expected that individuals' IS infusion role identity is influenced by their IT identity in the workplace. This leads to the following hypothesis:
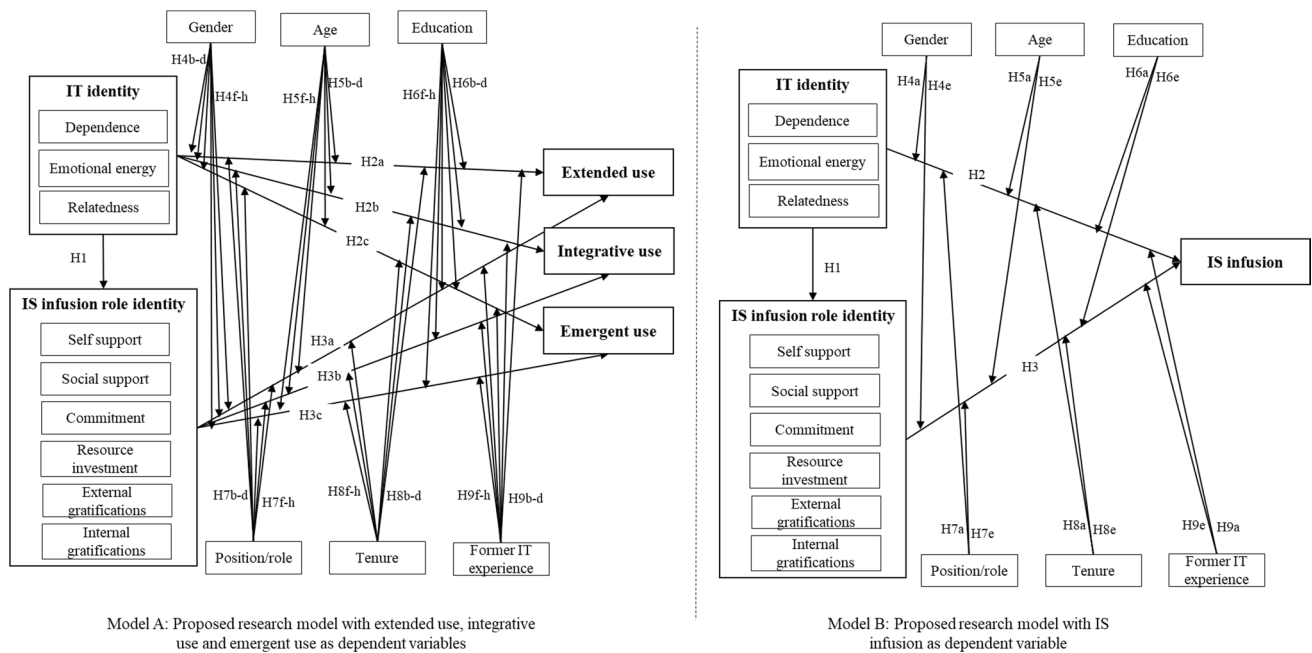
Fig. 1 Research models

Hypothesis 1: IT identity is positively associated with IS infusion role identity within an organization.

3.2 Impact of IT Identity on IS Infusion, Extended, Integrative, and Emergent use Behaviors

When individuals mentally depend on a system to do their job tasks, they are more likely to act proactively; that is, they invest time and effort in engaging in proactive behaviors, such as using the system to its fullest potential. 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 IS infusion, it is necessary to assess the influence of individuals' IT identity in relation to the IS that they use on a regular basis. An individual with strong IT identity seeks more information, increases her knowledge about the IT's features, and finds out how to apply previously unused features to perform different tasks (Esmaeilzadeh, 2021). For example, Stein and colleagues (2013) found that individuals develop their identity in relation to the systems-in-use, which influence their use of these technologies to accomplish job tasks. In another study, Carter (2012) found 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. Esmaeilzadeh (2021) found that a strong IT identity can inspire users of smart devices to explore previously unused features and embedded resources and capabilities that can be utilized for additional health-related tasks. Through perceiving the benefit

and impact of the target system, individuals with a strong personal preference and salient IT identity will have more passion, reliance, and enthusiasm toward using the targeted system and are therefore more likely to extend the usage of the targeted system to reach a better outcome (extended use). Furthermore, they may use the target system to reinforce the linkage among related job tasks to improve their task accomplishment (integrative use), or, when confronted with unexpected issues, individuals with a salient IT identity may explore and find innovative ways of using a target IS (emergent use). On this basis, it is expected that there is a positive relationship between individuals' IT identity and their use of an IS to its fullest potential within an organization. Thus, we hypothesize:

Hypothesis 2: IT identity is positively associated with IS infusion behavior within an organization.
Hypotheses 2(a-c): IT identity is positively associated with IS extended use, integrative use, and emergent use behaviors within an organization.

3.3 Impact of IS Infusion Role Identity on IS Infusion, Extended, Integrative, and Emergent use Behaviors

Individuals are motivated to use an IS if that system can support them to improve their role identity performance (Armitage & Conner, 1999). Drawing on role identity theory, individuals' IS infusion role identity indicates their internal

expectations regarding the use of an IS to its fullest potential, which subsequently influence them to be proactive in using IS features to perform a number of job tasks, enhance linkages among job tasks, and explore new ways of using IS to support job tasks (Burke & Stets, 2009; McCall & Simmons, 1978; Stryker & Burke, 2000). Mishra et al. (2012, p. 740) argue that a "[p]hysician's role and social identities together constitute their professional identity." In their study, they focused on the professional role identity of physicians as care providers and the professional social identity of physicians as part of the extended community of care and reported that these identities influence physicians' IS use behaviors. As IS plays an increasingly important role in people's work lives, people's roles become increasingly inseparable from their interactions with IS (Carter & Grover, 2015). In other words, if an individual receives self-confirming feedback on the fit between her enacted behavior and her view of IS infusion role identity (self-support), and also receives support from others (social support), commits to the use of an IS, invests significant effort, time, and energy (resource investment) when using the IS, receives extrinsic rewards such as a bonus or promotion, and receives intrinsic rewards such as satisfaction and enjoyment from using the IS (external and internal gratifications), then it will likely impact on her role identity prominence and influence her IS infusion behavior. When an individual is committed to the use of an IS, she is more able to appreciate the benefits of IS usage and more likely to engage in using more features of the system (Wang & Hsieh, 2006). She is also better able to interconnect multiple job tasks than those who have weak role identity in relation to IS (Wang et al., 2008), and to show more commitment and competency in the role, therefore expending effort in trying out innovative features of IS. We therefore hypothesize:

Hypothesis 3: IS infusion role identity is positively associated with IS infusion behavior within an organization. Hypotheses 3(a-c): IS infusion role identity is positively associated with IS extended use, integrative use, and emergent use behaviors within an organization.

3.4 Contextualization for IS Infusion Behaviors in Organizations

The context in which information systems in general and enterprise systems in particular are deployed can affect system use (Burton-Jones & Gallivan, 2007) and infusion behaviors (Hsieh et al., 2011). Therefore, we should appropriately contextualize the influence of role identity and IT identity, which were initially developed for a broad set of behaviors (Burke & Stets, 2009; McCall & Simmons, 1978; Stets & Serpe, 2016) and information technologies (Carter & Grover, 2015), before using them to understand IS infusion behaviors in organizations. In addition, we do not know enough about the interplay between

IT identity and other contextual characteristics such as individual differences (Carter et al., 2020b). By incorporating context into our theory development, we can generate rich theoretical and practical insights (Hong et al., 2014; Johns, 2017).

We consider the guidelines offered by Hong et al. (2014) for incorporating context into the theorizing of IS phenomena. To identify salient contextual factors, we begin with Burton-Jones and Gallivan's (2007) suggestion that researchers should account for elements of IS use, i.e., user, system, and task when building theories of system use. To further specify pertinent contextual variables, we turn to status characteristics theory (Berger et al., 1972) which helps explain how social structures influence the identity verification process whereby individuals actively seek out opportunities aimed at keeping their perceptions of how others view them congruent with their self-view (Burke & Stets, 2009). Different status characteristics (e.g., age, gender, education) are linked with the verification of identities (Burke et al., 2007; Stets & Harrod, 2004; Stryker & Burke, 2000). This is because one's position in the social structure becomes important in a situation when it is perceived to be relevant to expectations about performance associated with a particular identity. For example, Stets and Harrod (2004) found that high-status individuals have access to resources which help them in their identity verification process. Burke et al. (2007) found that higher status individuals based on gender (males) aid their verification process of leadership identity because women are typically not viewed as competent or provided equal resources compared to men.

Since we study professionals in the workplace, their IT identity and role identity tend to involve a task orientation that requires competence, knowledge and skills needed to do well in their jobs (Stets & Harrod, 2004). Therefore, we theorize that three personal characteristics (gender, age, education) and three work-related characteristics (position or role in an organization, tenure, and former IT experience with business applications) may play a role in shaping the relationship between identities and IS infusion. Gender carries general expectations for competence and skills. In a workplace context, men, due to their highly task-oriented nature, tend to hold high positions on the status characteristic of gender and will find it easier to verify their IT identity and role identity than females (Burke et al., 2007). Therefore, we expect that the relationship between IT identity and IS infusion and between IS infusion role identity and IS infusion will be especially salient for men. Although age as a status characteristic generally designates competence, increased age has been found to be associated with challenges in processing complex stimuli, difficulty with paying attention to information on the job (Venkatesh et al., 2003) and declines in cognition that become impediment to technology use (Carter et al., 2020a). Thus, we expect that the relationship between IT identity and IS infusion and between IS infusion role identity and IS infusion will be stronger for those who are younger. Education is important with the

verification of task-oriented identities such as IT identity and role infusion identity. The status characteristic of education indicates that individuals with high education have more knowledge and skills than those low in education (Stets & Harrod, 2004). Therefore, we expect that the influence of IT identity and IS infusion role identity on IS infusion will be moderated by education, such that the effect will be stronger for those with higher education. Individuals' positions or roles in an organization such as those in customer-oriented or front-line positions may have more opportunities to develop competence in their application of IT to situations and problems that arise on a daily basis. Thus, we expect that the relationship between IT identity and IS infusion and between IS infusion role identity and IS infusion will be especially salient for employees who hold customer-oriented or front-line positions. Finally, tenure and IT experience with business applications in task-oriented identities such as IT identity and IS infusion role identity signify competence, resources, knowledge, and skills. Therefore, we expect that the relationship between IT identity and IS infusion and between IS infusion role identity and IS infusion will be stronger for those with longer tenure and those with more experience with business applications.

It is important to recognize that there is the potential for a three-way interaction between personal and work-related contextual characteristics and identity. This is because several status characteristics (e.g., education, gender, organizational position) may be salient in a given situation. The theory argues that individuals are likely to combine the implications of each of these salient characteristics and their relevance to the task at hand (Berger et al., 1972; Ridgeway & Smith-Lovin, 1999). However, researchers (Dawson & Richter, 2006; Jaccard & Turrisi, 2003) have suggested that a three-way interaction can either be probed empirically or proposed in a hypothesis with a full explanation of the specification of its manifestation (Dawson, 2014). Since there is no definite theoretical reasoning to help us specify the exact form of interaction, we choose to perform post hoc probing on three-way interactions and report the results, if applicable.

Following the guideline offered by Hong et al. (2014) and theoretical arguments supported by empirical evidence from research at the intersection of identity theory and status characteristics theory, we incorporate three personal and work-related contextual characteristics as moderators of the relationships between IS infusion role identity and IS infusion and between IT identity and IS infusion. This approach allows us to explicate the interplay among identity variables and contextual variables and improve the explanatory power of our research models. Therefore, we hypothesize:

Hypothesis 4a: Gender moderates the relationship between IT identity and IS infusion behavior, such that the relationship between IT identity and IS infusion behavior will be stronger for men.

Hypothesis 4b-d: Gender moderates the relationship between IT identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior such that the relationship between IT identity and these IS use behaviors will be stronger for men.

Hypothesis 4e: Gender moderates the relationship between IS infusion role identity and IS infusion behavior, such that the relationship between IS infusion role identity and IS infusion behavior will be stronger for men.

Hypothesis 4f-h: Gender moderates the relationship between IS infusion role identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IS infusion role identity and these IS use behaviors will be stronger for men.

Hypothesis 5a: Age moderates the relationship between IT identity and IS infusion behavior, such that the relationship between IT identity and IS infusion behavior will be stronger for younger employees.

Hypothesis 5b-d: Age moderates the relationship between IT identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IT identity and these IS use behaviors will be stronger for younger employees.

Hypothesis 5e: Age moderates the relationship between IS infusion role identity and IS infusion behavior, such that the relationship between IS infusion role identity and IS infusion behavior will be stronger for younger employees.

Hypothesis 5f-h: Age moderates the relationship between IS infusion role identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IS infusion role identity and these IS use behaviors will be stronger for younger employees.

Hypothesis 6a: Education moderates the relationship between IT identity and IS infusion behavior, such that the relationship between IT identity and IS infusion behavior will be stronger for employees with higher education.

Hypothesis 6b-d: Education moderates the relationship between IT identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IT identity and these IS use behaviors will be stronger for employees with higher education.

Hypothesis 6e: Education moderates the relationship between IS infusion role identity and IS infusion behavior, such that the relationship between IS infusion role identity and IS infusion behavior will be stronger for employees with higher education.

Hypothesis 6f-h: Education moderates the relationship between IS infusion role identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IS infusion

role identity and these IS use behaviors will be stronger for employees with higher education.

Hypothesis 7a: Organizational position moderates the relationship between IT identity and IS infusion behavior, such that the relationship between IT identity and IS infusion behavior will be stronger for employees with customer-facing positions.

Hypothesis 7b-d: Organizational position moderates the relationship between IT identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IT identity and these IS use behaviors will be stronger for employees with customer-facing positions.

Hypothesis 7e: Organizational position moderates the relationship between IS infusion role identity and IS infusion behavior, such that the relationship between IS infusion role identity and IS infusion behavior will be stronger for employees with customer-facing positions.

Hypothesis 7f-h: Organizational position moderates the relationship between IS infusion role identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IS infusion role identity and these IS use behaviors will be stronger for employees with customer-facing positions.

Hypothesis 8a: Job tenure moderates the relationship between IT identity and IS infusion behavior, such that the relationship between IT identity and IS infusion behavior will be stronger for employees with longer tenure.

Hypothesis 8b-d: Job tenure moderates the relationship between IT identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IT identity and these IS use behaviors will be stronger for employees with longer tenure.

Hypothesis 8e: Job tenure moderates the relationship between IS infusion role identity and IS infusion behavior, such that the relationship between IS infusion role identity and IS infusion behavior will be stronger for employees with longer tenure.

Hypothesis 8f-h: Job tenure moderates the relationship between IS infusion role identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IS infusion role identity and these IS use behaviors will be stronger for employees with longer tenure.

Hypothesis 9a: IT experience moderates the relationship between IT identity and IS infusion behavior, such that the relationship between IT identity and IS infusion behavior will be stronger for employees with more IT experience.

Hypothesis 9b-d: IT experience moderates the relationship between IT identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IT identity and these IS use behaviors will be stronger for employees with more IT experience.

Hypothesis 9e: IT experience moderates the relationship between IS infusion role identity and IS infusion behavior, such that the relationship between IS infusion role identity and IS infusion behavior will be stronger for employees with more IT experience.

Hypothesis 9f-h: IT experience moderates the relationship between IS infusion role identity and IS extended use behavior, IS integrative use behavior, and IS emergent use behavior, such that the relationship between IS infusion role identity and these IS use behaviors will be stronger for employees with more IT experience.

4 Methodology

This study empirically evaluates the application of the research models amongst enterprise system users in organizations. The population of interest to this research is sales and marketing professionals who have had the experience of using a CRM system (e.g., Salesforce.com, Microsoft Dynamics) for more than one year to complete job tasks in organizations.

4.1 Survey Instrument

We used measurement items that have been validated in previous studies. A seven-point Likert scale (strongly disagree, disagree, slightly disagree, neutral, slightly agree, agree, and strongly agree) was used to measure all of these key constructs. The measurement items are presented in Appendix Table 7.

4.2 Pre-test and Pilot Test

In order to fine-tune the survey, the questionnaire was refined in two stages: pre-test and pilot study (Straub et al., 2004). For the pre-test, five domain experts were approached for their comments on the face validity of the measurement items and the clarity of the questions. Several refinements were then made to improve the flow and structure of the questions according to these experts' feedback. The pilot test was conducted at a company that had used a CRM system for more than three years. Findings of the pilot study from 42 respondents indicated that there were no major difficulties in understanding the questionnaire items and instructions. For this study, indicator reliability of 0.70 or higher was accepted. The measurement item analysis resulted in deleting one item related to external gratifications (EXTG5 with indicator reliability of 0.48) to ensure the construct validity. The elimination of this item follows the guideline that an item can be eliminated only when the indicator's reliability is low and the elimination of that item causes an increase in composite reliability (CR) (Gefen et al., 2000). In this case, the elimination of EXTG5 increased CR from 0.910 to 0.960. We then assessed the reliability of

the remaining items: the Cronbach's alpha coefficients of all constructs were > 0.7, which met the guideline of Gefen and colleagues (2000). These results showed that the survey items were reliable and valid.

In the field survey, we received 510 responses with 413 responses remaining after removing incomplete responses. The data were collected from employees working in the marketing and sales teams of two major telecommunication companies in New Zealand. The CRM system most used by respondents was Salesforce CRM (68.3%). A summary of the respondents' demographic information is presented in Table 1.

5 Data Analysis

This research used Partial Least Squares – Structural Equation Modeling (PLS-SEM) through SmartPLS 3.0 software to evaluate the research models from a predictive perspective (Hair et al., 2019). PLS-SEM is an appropriate approach for large complex models with many latent variables (Henseler et al., 2009). This study followed the state-of-the-art guidelines proposed by Hair et al. (2019) to evaluate the measurement and structural models. In order to evaluate the out-of-sample predictive power of the models, the latest principles proposed by Shmueli et al. (2019) were considered.

5.1 Assessment of Measurement Models

The validity and reliability of the measurement models (Models A and B) were assessed through internal consistency reliability, indicator reliability, convergent validity, and discriminant validity of the measurement items (Chin, 2010). In this study, IT identity is considered as a second-order reflective construct, reflecting three distinct but highly correlated dimensions, while IS infusion role identity is modeled as a second-order formative construct with six reflective first-order factors. Overall, internal consistency reliability, indicator reliability, and convergent validity were tested and reported a satisfactory level (Appendix Table 8).

Discriminant validity was assessed based on the newly introduced criterion for establishing discriminant validity in PLS-SEM, known as Heterotrait-Monotrait (HTMT) criterion (Hair et al., 2019). Typically, for conceptually similar constructs, HTMT values above 0.9 would suggest the lack of discriminant validity between the constructs and with respect to conceptually distinct constructs, HTMT values less than 0.85 indicate discriminant validity (Henseler et al., 2009). All the HTMT values in different models were then less than 0.85, implying the establishment of discriminant validity based on $HTMT_{0.85}$ criterion. Cross-loadings of the items in all models and $HTMT_{0.85}$ tables are provided in Appendix Tables 9, 10, 11, 12. Correlations from the pooled analysis for both models are reported in Tables 2 and 3.

The item weights were examined for IS infusion role identity, which is a formative construct. Generally, formative constructs have lower absolute values in item loadings compared to reflective constructs (Karimi et al., 2007). This study used the approach suggested by Petter et al. (2007) to assess formative construct validity, which involves testing multicollinearity among the indicators of the formative construct. The formative constructs of IS infusion role identity had weights ranging from 0.11 to 0.45. The VIF ranged from 2.333 to 2.998, which are lower than 3.3, and all were statistically significant with t-statistics from 6.03 to 21.83, $p < 0.001$ as shown in Appendix Table 13, indicating that multicollinearity is not an issue among formative indicators. In addition, we evaluated the VIF on the interactions between moderators and independent variables. The results showed that all the VIFs ranged from 2.20 to 4.411, which are below the recommended threshold of 5 (Appendix Table 14), indicating that multicollinearity is not a concern in our models.

To reduce the potential for common method bias (CMB), we followed procedural guidelines established in the literature (MacKenzie et al., 2011). Overall, the results supported that CMB was not a significant issue for this study. The implemented procedural and statistical approaches are presented in Appendix Table 15.

5.2 Assessment of Structural Models and Hypothesis Testing

To determine the statistical significance of the path coefficients, we ran the bootstrapping method using the number of samples as 2,000 and the number of cases as 300. Most main relationship hypotheses were supported, and the details of the supported hypotheses are presented in Table 4.

IT identity explains 60% of the variance of IS infusion role identity. Taken together, IT identity and IS infusion role identity explain 69% of the variance in IS infusion behavior. Moreover, IT identity and IS infusion role identity explain 63%, 61%, and 57% of the variances in extended use, integrative use, and emergent use respectively. We discuss these findings in detail in the next section.

In addition to evaluating the magnitude of the R^2 values as a criterion of predictive accuracy, we also applied the predictive sample reuse technique (Q^2) to evaluate predictive relevance using a blindfolding procedure. The predictive relevance of IS infusion, extended use, integrative use, and emergent use were obtained using a two-stage approach with the values of 0.577, 0.553, 0.509, and 0.420, respectively. These results show that the models have predictive relevance (Chin & Dibbern, 2010).

5.3 Results

Our results show that H1 was supported (path coefficient = 0.779, t-value = 29.703, p-value = 0.000), validating the notion that individuals' IT identity significantly shapes their IS infusion role identity. The result indicates that individuals' IT identity (as a set of meanings that individuals attach to the self in relation to a particular IT, and the

Table 1 Demographic information of respondents (*n* = 413)

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%
Current Position in the Organization	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 in the Current Position	< 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%
	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%

interactions with that specific IT) affects the extent to which they internalize their self-perceptions about the expectations of using an IS to its fullest potential to perform job tasks (McCall & Simmons, 1966; Stryker & Burke, 2000), thereby supporting their role identity in the IS infusion process.

H2 (path coefficient = 0.409, t-value = 7.601, p-value = 0.000), H2a (path coefficient = 0.470, t-value = 6.845, p-value = 0.000), H2b (path coefficient = 0.321, t-value = 5.977, p-value = 0.000), and H2c (path coefficient = 0.208,

t-value = 2.501, p-value = 0.000) were also supported, indicating that individuals' IT identity shapes their IS infusion behaviors. This is in line with the tenet of identity theories (Burke, 2004; Stryker, 1980) as discussed earlier. In this study, individuals' IT identity as material identity is guided by their own personal goals, self-interests, and values in relation to IS use rather than expectations or goals of the group or their role in the workplace. The findings of this study suggest that individuals who feel a sense of connectedness, reliance, confidence, and enthusiasm

Table 2 Correlations for all factors (Model A)

	Gender	Age	Role	Tenure	Former IT experience	Education	Dependency	Relatedness	Emotional energy	Extended use	Integrative use	Emergent use	Self support	Social support	Commitment	Resource investment	External gratification
Age	0.209**																
Role	0.051	-0.044															
Tenure	0.064	0.464**	0.002														
Former IT experience	0.092	0.351**	-0.013	0.218**													
Education	0.069	-0.006	0.128**	-0.019	0.043												
Dependency	-0.078	-0.143**	0.018	-0.05	-0.053	0.005											
Relatedness	-0.119*	-0.133*	0.037	-0.123*	-0.079	0.031	0.553**										
Emotional energy	-0.081	-0.186**	0.044	-0.183**	-0.073	0.009	0.560**	0.769**									
Extended use	-0.134**	-0.277**	0.055	-0.127*	-0.105*	0.049	0.548**	0.709**	0.653**								
Integrative use	-0.135**	-0.196**	0.034	-0.136**	-0.054	0.039	0.543**	0.665**	0.660**	0.794**							
Emergent use	-0.127**	-0.211**	0.165**	-0.106*	-0.062	0.066	0.443**	0.573**	0.638**	0.698**	0.750**						
Self support	-0.097*	-0.029	0.001	-0.008	-0.021	-0.018	0.484**	0.544**	0.491**	0.529**	0.587**	0.545**					
Social support	-0.123*	-0.136**	0.07	-0.04	0.009	-0.027	0.399**	0.485**	0.438**	0.498**	0.504**	0.520**	0.746**				
Commitment	-0.121*	-0.096	-0.026	-0.006	-0.015	0.037	0.279**	0.365**	0.300**	0.341**	0.309**	0.347**	0.420**	0.471**			
Resource investment	-0.172**	-0.176**	0.132**	-0.097*	-0.129**	-0.055	0.473**	0.525**	0.554**	0.563**	0.500**	0.543**	0.502**	0.522**	0.515**		
External gratification	-0.079	-0.074	-0.082	-0.094	-0.015	-0.035	0.519**	0.564**	0.582**	0.550**	0.647**	0.552**	0.636**	0.549**	0.339**	0.430**	
Internal gratification	-0.078	-0.049	-0.042	-0.110*	-0.039	-0.062	0.400**	0.502**	0.528**	0.465**	0.523**	0.507**	0.533**	0.482**	0.327**	0.401**	0.558**

$* p < 0.05; ** p < 0.01; *** p < 0.001$

Table 3 Correlations for all factors (Model B)

	Gender	Age	Role	Tenure	Former IT experience	Education	Dependency	Emotional energy	Relatedness	Commitment	IS infusion	Self support	Social support	Resource investment	External gratifications
Age	0.185**														
Role		0.046													
Tenure	0.075	0.504**	-0.037												
Former IT experience	0.117*	0.410**	0.101	0.155**											
Education	0.063	-0.017	-0.097	-0.011	-0.022										
Dependency	-0.095	-0.157**	-0.094	-0.115*	-0.001	-0.042									
Emotional energy	-0.135*	-0.239**	-0.035	-0.138*	-0.08	-0.01	0.600**								
Relatedness	-0.128*	-0.204**	-0.101	-0.095	-0.054	-0.018	0.564**	0.779**							
Commitment	0.012	-0.085	0.059	0.024	-0.01	-0.013	0.114*	0.097	0.141**						
IS infusion	-0.126*	-0.232**	-0.022	-0.066	0.076	0.035	0.453**	0.411**	0.387**	0.075					
Self support	-0.095	-0.074	0.06	-0.019	-0.058	-0.038	0.226**	0.180**	0.209**	0.420**	0.054				
Social support	-0.131*	-0.066	0.028	0.04	-0.069	0.006	0.178**	0.146**	0.160**	0.471**	0.052	0.746**			
Resource investment	-0.067	-0.093	0.05	0.01	-0.07	-0.033	0.222**	0.228**	0.210**	0.515**	-0.014	0.502**	0.522**		
External gratifications	-0.122*	-0.048	-0.004	-0.037	0.001	-0.068	0.246**	0.281**	0.287**	0.339**	0.013	0.636**	0.549**	0.430**	
Internal gratifications	-0.112*	-0.123*	-0.01	-0.032	-0.094	-0.081	0.187**	0.280**	0.264**	0.327**	-0.032	0.533**	0.482**	0.401**	0.558**

$* p < 0.05$; $** p < 0.01$; $*** p < 0.001$

Table 4 Supported hypotheses results

Hypothesis	Path coefficient	*t*-value	*p*-value
H1: IT identity is positively associated with IS infusion role identity within an organization	0.779	29.703	0.000
H2: IT identity is positively associated with IS infusion behavior within an organization	0.409	7.601	0.000
H2a: IT identity is positively associated with IS extended use behavior within an organization	0.470	6.845	0.000
H2b: IT identity is positively associated with IS integrative use behavior within an organization	0.321	5.977	0.000
H2c: IT identity is positively associated with IS emergent use behavior within an organization	0.208	2.501	0.000
H3: IS infusion role identity is positively associated with IS infusion behavior within an organization	0.451	8.303	0.000
H3a: IS infusion role identity is positively associated with IS extended use behavior within an organization	0.286	4.471	0.000
H3b: IS infusion role identity is positively associated with IS integrative use behavior within an organization	0.377	6.244	0.000
H3c: IS infusion role identity is positively associated with IS emergent use behavior within an organization	0.478	6.013	0.000
H6e: Education moderates the relationship between IS infusion role identity and IS infusion behavior, such that the relationship between IS infusion role identity and IS infusion behavior will be stronger for employees with higher education	0.101	2.258	0.024
H6f: Education moderates the relationship between IS infusion role identity and IS extended use behavior, such that the relationship between IS infusion role identity and IS extended use behavior will be stronger for employees with higher education	0.112	2.589	0.010
H6h: Education moderates the relationship between IS infusion role identity and IS emergent use behavior, such that the relationship between IS infusion role identity and IS emergent use behavior will be stronger for employees with higher education	0.159	2.108	0.036
H7b: Organizational position moderates the relationship between IT identity and IS extended use behavior, such that the relationship between IT identity and IS extended use behavior will be stronger for employees with customer-facing positions	0.193	2.836	0.005
H7f: Organizational position moderates the relationship between IS infusion role identity and IS extended use behavior, such that the relationship between IS infusion role identity and IS extended use behavior will be stronger for employees with customer-facing positions	-0.232	3.507	0.000
H7h: Organizational position moderates the relationship between IS infusion role identity and IS emergent use behavior, such that the relationship between IS infusion role identity and IS emergent use behavior will be stronger for employees with customer-facing positions	-0.249	2.665	0.010
H8d: Job tenure moderates the relationship between IT identity and IS emergent use behavior, such that the relationship between IT identity and IS emergent use behavior will be stronger for employees with longer tenure	-0.248	2.577	0.011
H9f: IT experience moderates the relationship between IS infusion role identity and IS extended use behavior, such that the relationship between IS infusion role identity and IS extended use behavior will be stronger for employees with more IT experience	0.101	2.083	0.033

This table presents all the supported hypotheses. There are several unsupported hypotheses on the moderating effects, including H4a-h, H5a-h, H6a-d, H6g, H7a, H7c-d, H7e, H7g, H8a-c, H8e-h, H9a-e, H9g-h

when thinking about themselves in relation to an IT (i.e., strong IT identity) are more motivated to pursue infusion behaviors as well as extended, integrative, or emergent IS use.

When scrutinizing the different aspects of IS infusion, our study's findings reveal that individuals' IT identity has a greater impact on extended use than on integrative use and emergent use in the workplace. In other words, individuals who have stronger reliance, dependence, and attachment to the system are more likely to use most features of the system in a deeper manner to do their daily job tasks, as opposed to making innovative and exploratory use of the system.

In addition to the influence of IT identity, we found support for H3 (path coefficient = 0.451, t-value = 8.303, p-value = 0.000), H3a (path coefficient = 0.286, t-value = 4.471, p-value = 0.000), H3b (path coefficient = 0.377, t-value = 6.244, p-value = 0.000), and H3c (path coefficient = 0.478, t-value = 6.013, p-value = 0.000), regarding the influence of IS infusion role identity on IS infusion behaviors. This is in line with findings from Finkelstein and Penner (2004) who examined role identity and organizational citizenship behavior. Our results

showed that individuals who personally view the use of an IS to its fullest potential to be an important part of their sense of self are more engaged in IS infusion behavior in the workplace. From a theoretical perspective, individuals 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 behavior beyond the prescribed or formal guidelines for the use of system features within an organization. When individuals receive strong support from their own self and others on their role identity, as well as commitment, resource investment, and external and internal gratifications in relation to IS use in the workplace, they are likely to be motivated to engage in using more features of an IS or explore the new features of the system in an innovative fashion or reinforce the linkages among multiple job tasks.

The findings show that individuals' IS infusion role identity has a greater impact on their IS emergent use than on extended and integrative use; that is, these individuals are more engaged in exploring the new features of the system. Thus, individuals with strong IS infusion role identity show more commitment and

competency in their role and expend effort in trying out innovative features of an IS. This result is consistent with previous studies that have reported that employees' IS-related role identities positively influence their IS continuance use behavior in organizations (Farmer et al., 2003; Finkelstein & Penner, 2004).

However, the results of testing hypotheses associated with the influence of contextual characteristics as moderators (gender, age, education, position in organization, tenure, and former IT experience) on the relationships between IT identity and IS infusion, extended, integrative, and emergent use as well as the relationships between IS infusion role identity and IS infusion, extended, integrative, and emergent use, were not all supported. Education is the only personal characteristics that shows significant moderating effects. In particular, H6e is supported (path coefficient = 0.101, t-value = 2.258, p-value = 0.024), suggesting that education moderates the relationship between IS infusion role identity and IS infusion. H6f is supported (path coefficient = 0.112, t-value = 2.589, p-value = 0.010 and H6h is supported (path coefficient = 0.159, t-value = 2.108, p-value = 0.036), indicating that education moderates the relationships between IS infusion role identity and extended use and emergent use respectively. These results suggest that employees with higher education who possess strong IS infusion role identity are endowed with more resources and are more committed to using a CRM system to its fullest potential and more likely to engage in extended and emergent use of these systems. The remaining personal characteristics (i.e., age, gender in H4a-h and H5a-h) had no significant moderator relationships between IT identity, IS infusion role identity and IS infusion, extended use, integrative use, and emergent use behaviors. According to status characteristics theory, age and gender are considered diffuse status characteristics that signify general competencies and may not exert influence in IS infusion behaviors compared to other specific status characteristics (e.g., education, tenure, former IT experience) that are more closely associated with knowledge and skills required to engage in IS infusion (Berger et al., 1972; Stets & Harrod, 2004). The three work-related contextual characteristics have moderating effects on selected relationships between IT identity and IS infusion behaviors and between IS infusion role identity and between IS infusion behaviors. In particular, we found that H7b is supported (path coefficient = 0.193, t-value = 2.836, p-value = 0.005), indicating that an individual's position in the organization moderates the relationships between IT identity and extended use. H7f is supported (path coefficient = -0.232, t-value = 3.507, p-value = 0.000), and H7h is supported (path coefficient = -0.249, t-value = 2.665, p-value = 0.001), suggesting that organizational position moderates the relationship between IS infusion role identity and extended use and emergent use. These results indicate that employees with more customer-related and front-line team positions (e.g., customer service representative/managers) who embrace strong IT identity and IS infusion role identity are dependent on the CRM systems or are committed to the use of CRM systems for better engagement and greater use of the features of CRM systems. H8d is supported (path coefficient = -0.248, t-value = 2.577, p-value = 0.011). The negative moderating influence of tenure on the relationship between IT identity and emergent use of CRM systems, suggesting that newly joined employees who embrace strong IT identity and IS infusion role identity are more dependent on the CRM systems and are more committed to fully using the systems and trying the new features of these systems. This result contrasts with our hypothesized role of tenure. This may be because those who have longer experience in their positions may develop habits of IT use that lead to fewer attempts at developing deep use of a system (Carter et al., 2020b). Finally, H9f is supported (path coefficient = 0.101, t-value = 2.083, p-value = 0.033), showing a positive moderation effect of former IT experience on the relationship between IS infusion role identity and extended use of CRM systems.

Figure 2 in Appendix shows the interaction diagrams that provide a more nuanced understanding of the interaction of personal and work-related characteristics on the relationships between individual identities and IS infusion.

5.4 Post-hoc Analysis

Due to the non-significant moderating effect of some contextual characteristics on the relationships between IT identity, IS infusion role identity, and IS infusion, extended, integrative, and emergent use behaviors, we further investigated if there are differential impacts of these relationships amongst employees who have different levels of former IT experience and CRM experience. Employees with more IT experience or CRM experience may show a higher level of attachment, dependency, and commitment to engage in IS infusion behaviors compare to employees with less IT and CRM experience.

We conducted a multi-group analysis (MGA) of former IT experience and CRM experience to detect any significant differences in path coefficients of the relationships between IT identity, IS infusion role identity, and IS infusion behaviors. We followed the approaches suggested by Henseler et al. (2009) to assess the variances in population parameters based on the differences in path coefficients and t-values. The parametric test results indicated that there were significant differences in the relationships between IT identity and IS infusion, extended, and integrative use behaviors among employees with more than three years CRM experience and employees with one to three years experience with CRM. The parametric test results also showed that there were significant differences in the relationships between IS infusion role identity and IS infusion, and extended use behaviors among employees with more than three years CRM experience and employees with one to three years experience with CRM. Moreover, the parametric test results indicated that there were significant differences in the relationships between IT identity, IS infusion role identity and IS infusion and extended use behaviors

among employees with more former IT experience than employees with less former IT experience. The MGA results are presented in Appendix Table 16.

Moreover, we tested the mediator role of IS infusion role identity between IT identity and IS infusion, extended, integrative, and emergent use behaviors. From the analysis, IS infusion role identity was found to influence IS infusion, extended use, integrative use, and emergent use positively, and also IS infusion role identity was positively influenced by IT identity. In particular, based on Baron and Kenny's (1986) guidelines, IS infusion role identity partially mediated the relationship between IT identity and extended use, integrative use, and emergent use behaviors. Subsequently, Sobel's test was used to assess the significance of the mediating relationship, which showed that IS infusion role identity was a significant mediator. The results are presented in Appendix Table 17.

6 Discussion and Implications

In this section, we discuss the theoretical and practical contributions of this study. We highlight the strength of the impact of individuals' IT identity on their IS infusion role identity and confirm the importance of these identities in explaining IS infusion behaviors. We also acknowledge the limitations of this study and offer avenues for future research.

6.1 Contributions to Research and Practice

This study contributes to both research and practice. Drawing on identity theories, this research offers insights into the role and importance of IT identity and role identity in IS infusion behaviors in organizations. In particular, the findings reveal that individuals' IT identity as their material identity strongly influences their IS infusion role identity within an IS use context. In this case, individuals who have strong IT identity are likely to choose roles consistent with these meanings to give them more opportunities to interact with the IS that they view as integral to their self-concept.

The study further extends our understanding that individuals' IT and role identities have different degrees of influence on the three ways that demonstrate IS infusion behaviors. In particular, IT identity has a stronger influence on extended use and integrative use while IS infusion role identity exerts a stronger influence on emergent use. This means that both IT identity and IS infusion role identity play a complementary role in promoting the overall IS infusion behaviors that involve using a number of IS features, new feature exploration, and novel use of IS features. This study therefore finds that individuals' identities are important drivers of their IS infusion behavior, be it their extended, integrative, or emergent IS use.

In addition, this study also points out that employees' personal and work-related characteristics play a role in IS infusion behaviors, thus helping to enrich our understanding of employees' infusion behaviors in an organization. In particular, some of the salient work-related characteristics that strengthen the influence of IT identity and IS infusion role identity on IS infusion behaviors are IT experience in general and CRM experience in particular, and whether employees are in customer-related or front-line roles. Education as a personal characteristic also shapes the influence of IS infusion role identity on IS infusion behaviors.

Methodologically, this study operationalized IT identity and IS infusion role identity as second-order constructs through their sub-dimensions within an organizational context. IT identity was operationalized through three reflective dimensions: dependence, emotional energy, and relatedness. IS infusion role identity was operationalized through six formative determinants: self-support, social support, commitment, resource investment, and external and internal gratifications. Most previous studies have examined the role identity construct as a single-dimensional construct through only a few measurement items (Farmer & Van Dyne, 2010; Farmer et al., 2003). Although both single-dimensional and multi-dimensional constructs are appropriate to measure identity, our study shows that the operationalization of IT identity and IS infusion role identity as multidimensional constructs offers rich understanding of their influence on IS infusion behaviors in an organization. Future research may want to adapt these measurement items to suit their study contexts of IS use in organizations.

Table 5 presents a summary of the unique findings of this study in relation to the current body of knowledge in the literature.

In terms of practice, given the impact of IT identity and IS infusion role identity in IS infusion, extended use, integrative use, and emergent use behaviors, organizations can help to promote individuals' IT identity and IS infusion role identity by providing them with opportunities to use IT to coordinate among job tasks, and by implementing mechanisms to support and reward individuals' attempts to explore new features of the system. One possibility to strengthen individuals' IT identity and motivate them to depend on the target system to do their daily job tasks is to design customized training interventions. These interventions should focus on developing individuals' understanding of organizational improvement goals and IS investment through their effective and full use of the system.

The analysis revealed that social support and external gratifications have a strong influence on individuals' role identity in relation to IS use. Therefore, managers should outline their expectation and provide appropriate resources to encourage IS infusion behavior. In addition, organizations should develop strategies and conditions to reassure individuals that their IS infusion behavior is supported and rewarded and thus reinforce

Table 5 Summary of contributions of this study

What is known from Literature	Unique findings of this study
• Previous studies have suggested that workplace role identities can influence employees' work-related behaviors, such as organizational citizenship behaviors (Finkelstein & Penner, 2004) and IS assimilation behaviors (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 behaviors and also partially mediates the relationship between employees' IT identity and their IS infusion behaviors
• Previous studies on identity in the IS domain have reported significant relationships between an individual's identity and her IS use behavior (Carter & Grover, 2015; Mishra et al., 2012; 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 based on emotional factors (Stein et al., 2013)	• This study investigates the direct relations between technology and an individual's identity, which is conceptualized as IT identity. The findings suggest that employees' IT identity is a predictor of their IS infusion behavior as well as extended use, integrative use, and emergent use behaviors
• Identity theories suggest that the meanings of individuals' salient 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 organization
	• Both IT identity and IS infusion role identity play a complementary role in promoting the overall IS infusion behaviors
• Previous studies have argued that the context in which information systems in general and enterprise systems in particular are deployed can affect system use (Burton-Jones & Gallivan, 2007) and infusion behaviors (Hsieh et al., 2011)	• This study considers the guidelines offered by Hong et al. (2014) for incorporating context into theorizing IS phenomena and draws on status characteristics theory to identity personal and work-related contextual variables. We find that employees' organizational position, education, and tenure moderate selected relationships between IT identity and IS infusion behaviors and IS infusion role identity and between IS infusion behaviors. In addition, this study highlights that employees' former IT experience and CRM experience make a difference to the relationships between IT identity, IS infusion role identity, and employees' IS infusion behaviors

individuals' IS infusion role identity. An organization that values IS infusion behavior should provide opportunities and a working atmosphere in which peers are encouraged to reflect on each other's IS usage behaviors, talk about their expectations, and discuss their concerns about the system and its impacts on work. Managers should identify those individuals with strong IS infusion role identity and place them in positions in which they can act as super users in order to provide these individuals with enhanced status and opportunity to influence other users.

6.2 Limitations and Future Research

While the findings of this study provide insightful contributions for research and practice, certain limitations should be acknowledged. The methodology adopted, i.e., a cross-sectional survey design and a quantitative approach, may limit the interpretation of the results. With the intertwined nature of the relationship between identity and behavior, future studies should (i) investigate how individuals' IT identity and IS infusion role identity change over time as they continue to interact with IS; and (ii) establish the cause and effect, while also examining the possible reciprocal causation in the research models longitudinally. Future studies may apply qualitative research methods to provide explanatory insights and underlying meanings regarding how individuals' IT identity and IS infusion role identity shape their IS infusion behaviors.

It is also plausible that the results may have been impacted by sample selection bias. Future studies may address this point by testing the theoretical models in other systems and contexts. 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 (e.g., social identity, professional identity) and IS infusion behaviors.

7 Conclusions

This study applied identity and status characteristics theories to examine IS infusion behaviors among individuals within an organization. The research models and results of this study provide a comprehensive view of the role of individuals' (i) IT identity and IS infusion role identity, (ii) their personal and work-related characteristics; and (iii) their importance in explaining IS infusion behaviors. Individuals' emotional energy and high dependence and reliance on IS constitute strong IT identity and notably influence individuals' role identity in relation to IS infusion, and together, they subsequently shape individuals' IS infusion behaviors. From a practical point of view, the findings suggest that managers should focus on providing employees with opportunities and programs to nurture their IT identity and IS infusion role identity, which in turn will influence their IS infusion behavior and help organizations to achieve their expected benefits from IS implementations.

Appendix

Table 6 Summary of individual level infusion studies. Adapted and expanded from Hassandoust et al. (2016)

Authors/Year	Theoretical Foundation	Target System	Influencing Factors (Independent Variables)	Dependent Variable	Findings
Afonso et al. (2015)	-	Electronic Document Management System	Routinization, Extent of use	Infusion	Positively significant relationship between routinization and IS infusion Significant relationship between extent of use and IS infusion
Ahuja and 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
Donaldson and Yakel (2013)	DOI	Preservation metadata: implementation strategies	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
Fadel (2012)	Coping theory	Electronic Medical System	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
Grublješič and Jaklič (2015)	TOE, ECT, UTAUT, TAM, DeLone and McLean IS success model	Business Intelligence Systems	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)
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
Hsieh et al. (2011)	Sense-making theory	Operational customer relationship management	Technology quality, Service quality	Extended use	Positively significant relationships between technology quality, service quality and IS extended use

Table 6 (continued)

Authors/Year	Theoretical Foundation	Target System	Influencing Factors (Independent Variables)	Dependent Variable	Findings
Hsieh and Wang (2007)	ISC, TAM and Synthesized model	Enterprise Resource Planning (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
Jones et al. (2002)	TRA and TAM	Sales Force Automation	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
Ke et al. (2012)	Motivation theory	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
Hasan et al. (2016)	Socio-technical system theory	Enterprise system	User commitment	Infusion	Positively significant relationship between user commitment and IS infusion
Kim et al. (2012)	Commitment theory	Enterprise systems	User commitment	Infusion	Positively significant relationship between user commitment and IS infusion
Kim and 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
Kishore and McLean (2007)	Structuration and Sense-making theories	Software process innovation	Organizational alignment, Compatibility, Voluntariness, Relative advantage	Infusion	Positively significant relationship between organizational alignment and IS infusion. Negatively significant relationship between voluntariness and IS infusion. Insignificant relationships between compatibility, relative advantage and IS infusion
Koo et al. (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
Li et al. (2013)	Motivation theory	Business intelligence system	Intrinsic motivation to experience stimulation, Intrinsic motivation to know, Intrinsic motivation toward accomplishment, Perceived usefulness	Innovative use	Positively significant relationships between all these influencing factors and innovative use of IS
Maas et al. (2014)	-	ERP	Organizational control, Empowerment	Infusion	Marginally positively significant relationship between organizational control and IS infusion. Positively significant relationship between empowerment and IS infusion

Table 6 (continued)

Authors/Year	Theoretical Foundation	Target System	Influencing Factors (Independent Variables)	Dependent Variable	Findings
McKnight et al. (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
Marakhimov and Joo (2017)	Coping theory	Healthcare wearable devices	Problem-focused coping efforts, Emotion-focused coping efforts	Extended use	Positively significant relationship between problem-focused coping efforts and emotion-focused coping efforts and extended use
Nambisan et al. (1999)	Delphi study	-	Knowledge acquisition	Intention to explore (Emergent use)	Positively significant relationship between knowledge acquisition and IS emergent use
Pao-Long and Lung (2002)	Organizational change model and Job characteristic model (JCM)	Advanced manufacturing technology	Centralization of structures, Complexity of structure, Formalization of structure, Skill variety, task identity, Feedback of task, Task significance, Autonomy, Individual's attitude, Sufficiency of education and training	Infusion	Positively significant relationships between skill variety, task identity, feedback of task, individual's attitude, sufficiency of education and training and IS infusion. Negatively significant relationship between centralization of structures and IS infusion. Insignificant relationships between complexity of structure, formalization of structure, task significance, autonomy and IS infusion
Pongpattrachai et al. (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
Saeed and 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
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
Sundaram et al. (2007)	TPB/TRA and performance concept	Sales force Automation (SFA)/ CRM systems	Re-utilization	Infusion	Positively significant relationship between re-utilization and IS infusion
Thatcher et al. (2010)	TAM	Knowledge management systems	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
Wang and Hsieh (2006)	Symbolic adoption theory, ISC	ERP	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

Table 6 (continued)

Authors/Year	Theoretical Foundation	Target System	Influencing Factors (Independent Variables)	Dependent Variable	Findings
Wang et al. (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

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

Table 7 Measurement items of the model

Construct	Code	Item	Source
IT identity			
Dependence	DEP1	Thinking about myself in relation to the CRM use, I feel dependent on this system to do my job tasks	(Carter, 2012)
	DEP2	Thinking about myself in relation to the CRM, I am counting on this system to do my job tasks	
	DEP3	Thinking about myself in relation to the CRM, I am reliant on this system to do my job tasks	
	DEP4	Thinking about myself in relation to the CRM, I feel that I need this system to do my job tasks	
Emotional energy	EMOE1	Thinking about myself in relation to the CRM to do my job tasks, I feel energized	(Carter, 2012)
	EMOE2	Thinking about myself in relation to the CRM to do my job tasks, I feel confident	
	EMOE3	Thinking about myself in relation to the CRM to do my job tasks, I feel pumped up	
	EMOE4	Thinking about myself in relation to the CRM to do my job tasks, I feel enthusiastic	
Relatedness	REL1	Thinking about myself in relation to the CRM, I feel close to this system	(Carter, 2012)
	REL2	Thinking about myself in relation to the CRM, I feel connected with this system	
	REL3	Thinking about myself in relation to the CRM, I am in coordination with this system	
	REL4	Thinking about myself in relation to the CRM, I feel linked with this system	
IS infusion role identity			
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	
	SEL3	On average, I feel I do well at being an IS infuser	
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	
	SOC3	On average, my colleagues think I am a good example of an IS infuser	
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 I have strongly committed myself to being recognized as an IS infuser	
	COM3	I feel that I have devoted a lot of myself to view myself as an IS infuser	
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	
	RES3	As an employee, I have given most of my energy to being the kind of IS infuser that I perceive myself to be	
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	
	INT3	On average, I feel good about myself from being an IS infuser	
External gratifications	EXTG1	Aside from pure enjoyment, on average, I get rewards (e.g., bonus, promotion, praise) from being an IS infuser	(Li et al., 2013)
	EXTG2	I increase my productivity by being an IS infuser	
	EXTG3	I accomplish tasks more quickly by being an IS infuser	
	EXTG4	I improve my job performance by being an IS infuser	
	EXTG5	I enhance my effectiveness in my job by being an IS infuser. (dropped)	

Table 7 (continued)

Construct	Code	Item	Source
IS infusion	INF1	I am using the CRM system to its fullest potential to support my own work	(Sundaram et al., 2007)
	INF2	I am using all capabilities of the CRM system in the best fashion to help me on the job	
	INF3	I doubt that there are any better ways for me to use the CRM system to support my work	
	INF4	My use of the CRM system has been integrated and incorporated into my work at the highest level	
Extended use	EXTU1	I fully use the available CRM system features to complete my tasks	(Kim & Gupta, 2014)
	EXTU2	I use most of the available CRM system features in performing my tasks	
	EXTU3	I make use of the available CRM system features thoroughly to accommodate my tasks	
	EXTU4	I use all available CRM system features to help me in my tasks	
Integrative use	INTU1	I use the CRM system for better connections among tasks	(Kim & Gupta, 2014)
	INTU2	I use the CRM system to organize various tasks in an integrative manner	
	INTU3	I use the CRM system to coordinate multiple tasks	
	INTU4	I use the CRM system to handle related tasks	
Emergent use	EMEU1	I explore new uses of the CRM system to support my tasks	(Kim & Gupta, 2014)
	EMEU2	I often experiment with new ways of using the CRM system to accomplish my tasks	
	EMEU3	I often find new uses of the CRM system in performing my tasks	
	EMEU4	I use the CRM system in novel ways to complete my tasks	

Table 8 Loadings, composite reliability (CR) and average variance extracted (AVE) of measurement instruments

Constructs	Indicators	Factor Loadings	Cronbach's Alpha	CR	AVE
Dependence	DEP1	0.884	0.936	0.954	0.839
	DEP2	0.928			
	DEP3	0.948			
	DEP4	0.901			
Emotional energy	EMOE1	0.943	0.937	0.955	0.842
	EMOE2	0.856			
	EMOE3	0.933			
	EMOE4	0.937			
Relatedness	REL1	0.908	0.937	0.955	0.842
	REL2	0.935			
	REL3	0.921			
	REL4	0.905			
Self-support	SEL1	0.924	0.901	0.938	0.835
	SEL2	0.884			
	SEL3	0.933			
Social support	SOC1	0.946	0.930	0.955	0.877
	SOC2	0.920			
	SOC3	0.943			
Commitment	COM1	0.924	0.870	0.939	0.885
	COM2	0.860			
	COM3	0.931			
Resource investment	RES1	0.965	0.959	0.973	0.924
	RES2	0.960			
	RES3	0.959			
External gratifications	EXTG1	0.887	0.944	0.960	0.857
	EXTG2	0.945			
	EXTG3	0.946			
	EXTG4	0.924			
	EXTG5	0.483*			
Internal gratifications	INTG1	0.935	0.907	0.956	0.915
	INTG2	0.831			
	INTG3	0.940			
Extended use	EXTU1	0.92	0.939	0.957	0.846
	EXTU2	0.93			
	EXTU3	0.92			
	EXTU4	0.90			

Table 8 (continued)

Constructs	Indicators	Factor Loadings	Cronbach's Alpha	CR	AVE
Integrative use	INTU1	0.91	0.949	0.963	0.868
	INTU2	0.94			
	INTU3	0.95			
	INTU4	0.93			
Emergent use	EMEU1	0.92	0.944	0.960	0.857
	EMEU2	0.94			
	EMEU3	0.91			
	EMEU4	0.93			
IS infusion	INF1	0.854	0.892	0.925	0.756
	INF2	0.889			
	INF3	0.844			
	INF4	0.889			

*The factor loading less than 0.7 was removed from the constructs. The elimination of this item follows the guideline that an item can be eliminated only when the indicator's reliability is low and the elimination of that item causes an increase in composite reliability (CR) (Gefen et al., 2000)

Table 9 HTMT values for Model A – HTMT$_{0.85}$ criterion

	Commitment	Dependence	Emergent use	Emotional energy	Extended use	External gratifications	IT identity	Integrated use	Internal gratifications	Relatedness	Resource investment	Self-support
Dependence	0.416											
Emergent use	0.488	0.471										
Emotional energy	0.449	0.6	0.677									
Extended use	0.48	0.586	0.739	0.695								
External gratifications	0.529	0.554	0.584	0.62	0.583							
IT identity	0.532	NA	0.672	NA	0.779	0.678						
Integrated use	0.448	0.576	0.792	0.702	0.843	0.683	0.758					
Internal gratifications	0.659	0.559	0.681	0.717	0.618	0.795	0.75	0.699				
Relatedness	0.527	0.592	0.61	0.822	0.756	0.599	NA	0.706	0.685			
Resource investment	0.754	0.499	0.571	0.582	0.591	0.452	0.625	0.525	0.559	0.555		
Self-support	0.658	0.527	0.59	0.535	0.574	0.69	0.632	0.634	0.758	0.591	0.54	
Social support	0.711	0.427	0.553	0.469	0.531	0.585	0.541	0.536	0.68	0.52	0.552	0.815

Table 10 HTMT values for Model B—HTMT$_{0.85}$ criterion

	Commitment	Dependence	Emergent use	Emotional energy	Extended use	External gratifications	IT identity	Integrated use	Internal gratifications	Relatedness	Resource investment	Self-support
Dependence	0.416											
Emergent use	0.488	0.471										
Emotional energy	0.449	0.6	0.677									
Extended use	0.48	0.586	0.739	0.695								
External gratifications	0.529	0.554	0.584	0.62	0.583							
IT identity	0.532	NA	0.672	NA	0.779	0.678						
Integrated use	0.448	0.576	0.792	0.702	0.843	0.683	0.758					
Internal gratifications	0.659	0.559	0.681	0.717	0.618	0.795	0.75	0.699				
Relatedness	0.527	0.592	0.61	0.822	0.756	0.599	NA	0.706	0.685			
Resource investment	0.754	0.499	0.571	0.582	0.591	0.452	0.625	0.525	0.559	0.555		
Self-support	0.658	0.527	0.59	0.535	0.574	0.69	0.632	0.634	0.758	0.591	0.54	
Social support	0.711	0.427	0.553	0.469	0.531	0.585	0.541	0.536	0.68	0.52	0.552	0.815

Table 11 Cross loadings outputs for Model A including all moderators

	Age	Commitment	Dependence	Education	Emergent use	Emotional energy	Extended use	External gratification	Former IT experience	Gender	Integrated use	Internal gratification	Related-ness	Resource investment	Role/Position	Self support	Social support	Tenure
Age	1	-0.054	-0.123	0.139	-0.211	-0.185	-0.276	-0.075	0.351	0.209	-0.196	-0.129	-0.134	-0.179	-0.044	-0.028	-0.135	0.464
COM1	-0.096	**0.935**	0.348	-0.04	0.393	0.367	0.363	0.463	-0.065	-0.083	0.379	0.554	0.444	0.583	0.008	0.571	0.608	-0.003
COM2	-0.123	**0.946**	0.358	-0.032	0.438	0.395	0.453	0.439	-0.113	-0.107	0.388	0.546	0.451	0.712	0.051	0.525	0.596	-0.057
COM3	-0.123	0.396	**0.884**	-0.274	0.41	0.516	0.493	0.508	-0.052	-0.075	0.494	0.522	0.528	0.432	0.007	0.49	0.377	-0.089
DEP1	-0.131	0.333	**0.929**	-0.257	0.427	0.53	0.523	0.482	-0.042	-0.072	0.509	0.458	0.5	0.442	0.031	0.449	0.365	-0.006
DEP2	-0.149	0.343	**0.948**	-0.269	0.435	0.517	0.512	0.474	-0.047	-0.057	0.499	0.481	0.482	0.445	0.037	0.425	0.374	-0.046
DEP3	-0.12	0.303	**0.901**	-0.284	0.351	0.494	0.483	0.445	-0.053	-0.082	0.489	0.428	0.523	0.413	-0.01	0.417	0.353	-0.048
DEP4	-0.177	0.4	0.52	-0.167	0.607	0.516	0.601	0.549	-0.086	-0.051	0.61	0.627	0.724	0.529	0.048	0.483	0.422	-0.166
EMA1	-0.111	0.325	0.496	-0.117	0.519	**0.943**	0.585	0.539	-0.042	-0.05	0.602	0.563	0.681	0.431	0.018	0.449	0.392	-0.137
EMA2	-0.205	0.399	0.501	-0.191	0.619	**0.856**	0.622	0.522	-0.082	-0.097	0.602	0.594	0.714	0.55	0.049	0.444	0.411	-0.167
EMA3	-0.182	0.364	0.545	-0.171	0.593	**0.933**	0.586	0.532	-0.054	-0.095	0.617	0.643	0.707	0.515	0.042	0.433	0.389	-0.198
EMA4	-0.158	0.423	0.389	-0.051	0.586	**0.937**	0.609	0.515	-0.059	-0.097	0.679	0.592	0.515	0.48	0.154	0.522	0.477	-0.095
EME1	-0.216	0.425	0.389	-0.052	**0.922**	0.582	0.635	0.502	-0.062	-0.105	0.673	0.584	0.493	0.509	0.163	0.495	0.484	-0.114
EME2	-0.182	0.368	0.438	-0.073	**0.94**	0.565	0.679	0.508	-0.049	-0.129	0.721	0.571	0.551	0.486	0.104	0.485	0.465	-0.075
EME3	-0.225	0.425	0.423	-0.092	**0.912**	0.604	0.654	0.519	-0.059	-0.138	0.703	0.586	0.566	0.538	0.189	0.515	0.498	-0.106
EME4	-0.056	0.41	0.422	-0.052	**0.928**	0.609	0.5	0.519	-0.005	-0.054	0.58	0.654	0.532	0.368	-0.108	0.595	0.497	-0.103
EXT1	-0.074	0.456	0.5	-0.094	0.475	0.516	0.518	**0.887**	-0.016	-0.081	0.63	0.695	0.541	0.426	-0.03	0.586	0.503	-0.087
EXT2	-0.059	0.446	0.496	-0.076	0.535	0.58	0.516	**0.945**	-0.018	-0.057	0.596	0.694	0.524	0.385	-0.083	0.59	0.517	-0.081
EXT3	-0.086	0.461	0.511	-0.123	0.52	0.542	0.502	**0.946**	-0.018	-0.098	0.587	0.681	0.493	0.414	-0.084	0.585	0.519	-0.075
EXT4	-0.253	0.448	0.485	-0.172	0.513	0.522	0.5	**0.924**	-0.091	-0.099	0.717	0.547	0.678	0.544	0.075	0.542	0.522	-0.113
EXTU1	-0.253	0.399	0.493	-0.151	0.669	0.62	**0.922**	0.533	-0.095	-0.118	0.76	0.541	0.664	0.489	0	0.495	0.455	-0.113
EXTU2	-0.251	0.368	0.544	-0.177	0.627	0.589	**0.928**	0.533	-0.089	-0.109	0.756	0.518	0.651	0.477	0.018	0.491	0.432	-0.12
EXTU3	-0.26	0.389	0.506	-0.15	0.605	0.591	**0.924**	0.482	-0.111	-0.164	0.697	0.495	0.619	0.556	0.101	0.423	0.422	-0.119
EXTU4	-0.26	0.389	0.5	-0.119	0.66	0.599	**0.905**	0.474	-0.111	-0.135	0.697	0.495	0.575	0.49	0.101	0.423	0.422	-0.119
Former IT experience	0.351	-0.096	-0.053	0.09	-0.062	-0.072	-0.105	-0.015	1	0.092	-0.055	-0.056	-0.08	-0.13	-0.013	-0.021	0.009	0.218
INTE1	-0.178	0.4	0.533	-0.178	0.696	0.648	0.748	0.597	-0.059	-0.143	**0.906**	0.63	0.669	0.469	0.022	0.564	0.489	-0.157
INTE2	-0.184	0.356	0.498	-0.108	0.679	0.625	0.754	0.577	-0.067	-0.12	**0.942**	0.58	0.632	0.47	0.039	0.52	0.436	-0.135
INTE3	-0.18	0.379	0.509	-0.105	0.713	0.592	0.722	0.624	-0.037	-0.106	**0.947**	0.595	0.587	0.455	0.029	0.563	0.473	-0.112
INTE4	-0.187	0.384	0.485	-0.148	0.708	0.601	0.743	0.611	-0.04	-0.134	**0.931**	0.615	0.596	0.473	0.037	0.542	0.483	-0.102
INTG1	-0.112	0.565	0.479	-0.119	0.585	0.605	0.518	0.713	-0.033	-0.101	0.602	**0.955**	0.575	0.493	0.003	0.678	0.618	-0.118
INTG3	-0.134	0.554	0.507	-0.155	0.62	0.66	0.574	0.694	-0.074	-0.135	0.641	**0.958**	0.634	0.504	-0.022	0.635	0.579	-0.109
INV1	-0.185	0.662	0.451	-0.125	0.519	0.527	0.542	0.42	-0.134	-0.159	0.488	0.501	0.508	**0.965**	0.141	0.487	0.487	-0.105
INV2	-0.17	0.657	0.462	-0.147	0.516	0.531	0.546	0.413	-0.128	-0.184	0.489	0.501	0.508	**0.96**	0.111	0.494	0.514	-0.087
INV3	-0.16	0.676	0.452	-0.15	0.535	0.537	0.532	0.409	-0.112	-0.148	0.468	0.502	0.501	**0.959**	0.134	0.469	0.506	-0.089
REL1	-0.135	0.412	0.489	-0.123	0.508	0.692	0.613	0.463	-0.082	-0.079	0.594	0.542	**0.908**	0.447	0.035	0.459	0.431	-0.117
REL2	-0.135	0.427	0.534	-0.127	0.529	0.725	0.664	0.555	-0.062	-0.098	0.626	0.604	**0.935**	0.483	0.036	0.501	0.431	-0.125
REL3	-0.135	0.457	0.506	-0.091	0.566	0.714	0.697	0.541	-0.099	-0.124	0.654	0.62	**0.921**	0.509	0.042	0.545	0.496	-0.109
REL4	-0.084	0.448	0.506	-0.122	0.505	0.694	0.631	0.508	-0.05	-0.135	0.575	0.554	**0.905**	0.49	0.022	0.498	0.426	-0.098
Role	-0.044	0.033	0.018	0.09	0.165	0.043	0.053	-0.082	-0.013	0.051	0.034	-0.01	0.037	0.134	1	0.001	0.07	0.002

Table 11 (continued)

	Age	Commitment	Dependence	Education	Emergent use	Emotional energy	Extended use	External gratification	Former IT experience	Gender	Integrated use	Internal gratification	Related-ness	Resource investment	Role/Position	Self sup-port	Social support	Tenure
SEL1	-0.008	0.527	0.487	-0.144	0.501	0.497	0.535	0.598	-0.021	-0.042	0.577	0.654	0.557	0.47	0.029	**0.926**	0.645	0.002
SEL2	-0.039	0.495	0.374	-0.111	0.469	0.394	0.416	0.564	0.007	-0.149	0.489	0.583	0.43	0.42	-0.008	**0.882**	0.69	-0.015
SEL3	-0.032	0.57	0.465	-0.153	0.522	0.454	0.497	0.581	-0.04	-0.08	0.541	0.64	0.501	0.485	-0.019	**0.933**	0.712	-0.009
SOC1	-0.122	0.604	0.396	-0.075	0.501	0.422	0.479	0.53	0.022	-0.112	0.5	0.608	0.445	0.477	0.093	0.722	**0.946**	-0.015
SOC2	-0.144	0.559	0.315	-0.068	0.447	0.361	0.421	0.472	0.004	-0.145	0.423	0.542	0.424	0.452	0.067	0.655	**0.919**	-0.041
SOC3	-0.116	0.63	0.409	-0.101	0.509	0.446	0.495	0.537	-0.001	-0.09	0.491	0.602	0.494	0.535	0.037	0.714	**0.943**	-0.055
Tenure	0.464	-0.033	-0.051	-0.06	-0.106	-0.183	-0.126	-0.093	0.218	0.064	-0.136	-0.118	-0.123	-0.097	0.002	-0.008	-0.039	1
Gender	0.209	-0.102	-0.078	0.118	-0.127	-0.08	-0.133	-0.079	0.092	1	-0.135	-0.124	-0.119	-0.171	0.051	-0.096	-0.122	0.064

Note: Bolded values refer to item loading on its own construct

Table 12 Cross loadings outputs for Model B including all moderators

	Age	Commitment	Dependence	Education	Emotional energy	External gratification	Former IT experience	Gender	IS infusion	Internal gratification	Relatedness	Resource investment	Role/Position	Self support	Social support	Tenure
Age	1	-0.202	-0.24	-0.017	-0.218	-0.202	0.41	0.185	-0.239	-0.126	-0.118	-0.215	0.046	-0.079	-0.237	0.504
COM1	-0.169	**0.946**	0.431	-0.101	0.333	0.402	0.093	-0.064	0.542	0.262	0.312	0.244	-0.027	0.184	0.404	-0.067
COM3	-0.214	**0.944**	0.435	-0.084	0.326	0.389	0.078	-0.044	0.518	0.266	0.317	0.247	-0.083	0.164	0.409	-0.075
Education	-0.017	-0.098	-0.005	1	-0.056	-0.027	-0.022	0.063	0.051	0.024	0.041	-0.037	-0.097	0.008	-0.012	-0.011
DEP1	-0.189	0.449	**0.898**	-0.008	0.613	0.564	0.099	-0.126	0.719	0.561	0.582	0.552	0.005	0.357	0.802	-0.066
DEP2	-0.198	0.398	**0.909**	-0.012	0.632	0.584	0.114	-0.142	0.654	0.474	0.517	0.561	0.006	0.307	0.889	-0.033
DEP3	-0.229	0.401	**0.916**	0.006	0.63	0.555	0.072	-0.151	0.65	0.443	0.478	0.582	0.021	0.3	0.922	-0.099
DEP4	-0.254	0.411	**0.9**	-0.003	0.604	0.52	0.05	-0.173	0.664	0.506	0.54	0.561	0.013	0.34	0.898	-0.111
EMA1	-0.177	0.336	0.685	-0.015	**0.9**	0.756	0.097	-0.175	0.649	0.571	0.631	0.82	0.036	0.429	0.663	-0.118
EMA2	-0.209	0.319	0.628	-0.049	**0.936**	0.776	0.047	-0.149	0.637	0.557	0.608	0.849	-0.011	0.392	0.619	-0.121
EMA3	-0.202	0.312	0.588	-0.095	**0.915**	0.804	0.014	-0.171	0.559	0.565	0.617	0.835	-0.005	0.41	0.579	-0.106
EMA4	-0.212	0.314	0.613	-0.047	**0.927**	0.779	0.04	-0.195	0.615	0.567	0.613	0.795	0.014	0.393	0.583	-0.095
EXT1	-0.169	0.413	0.602	-0.031	0.758	**0.905**	0.096	-0.118	0.546	0.527	0.578	0.687	0.01	0.414	0.587	-0.049
EXT2	-0.202	0.382	0.556	-0.009	0.785	**0.926**	0.057	-0.088	0.534	0.492	0.538	0.706	-0.03	0.362	0.549	-0.039
EXT3	-0.194	0.363	0.543	-0.063	0.811	**0.932**	0.076	-0.15	0.501	0.531	0.569	0.728	-0.003	0.403	0.529	-0.087
EXT4	-0.179	0.384	0.562	0.002	0.773	**0.93**	0.058	-0.139	0.51	0.531	0.566	0.662	-0.007	0.369	0.535	-0.002
Former IT experience	0.41	0.091	0.092	-0.022	0.055	0.078	1	0.117	0.07	0.163	0.169	0.028	0.101	0.093	0.062	0.155
Gender	0.185	-0.057	-0.163	0.063	-0.187	-0.134	0.117	1	-0.141	-0.11	-0.12	-0.149	-0.014	-0.178	-0.17	0.075
INF1	-0.207	0.536	0.72	0.045	0.625	0.522	0.093	-0.098	**0.931**	0.526	0.579	0.539	0.027	0.399	0.68	-0.091
INF2	-0.206	0.509	0.668	0.05	0.59	0.495	0.084	-0.163	**0.928**	0.484	0.534	0.518	-0.006	0.391	0.625	-0.048
INF3	-0.245	0.575	0.654	0.036	0.586	0.499	0.031	-0.143	**0.906**	0.484	0.52	0.503	-0.047	0.334	0.613	-0.057
INF4	-0.213	0.419	0.661	0.056	0.642	0.553	0.044	-0.11	**0.879**	0.437	0.478	0.567	-0.042	0.292	0.634	-0.097
INTG1	-0.123	0.227	0.532	0.001	0.574	0.512	0.128	-0.093	0.493	**0.961**	0.873	0.555	-0.104	0.645	0.484	-0.049
INTG3	-0.12	0.309	0.524	0.043	0.609	0.571	0.185	-0.118	0.528	**0.964**	0.887	0.573	-0.081	0.623	0.466	-0.045
INV1	-0.18	0.218	0.61	0	0.811	0.673	0.06	-0.144	0.54	0.543	0.583	**0.92**	0.051	0.381	0.594	-0.128
INV2	-0.222	0.263	0.586	-0.037	0.847	0.704	0.032	-0.127	0.58	0.549	0.57	**0.928**	0.006	0.363	0.575	-0.14
INV3	-0.191	0.237	0.521	-0.068	0.82	0.708	-0.018	-0.142	0.486	0.528	0.544	**0.916**	-0.003	0.349	0.511	-0.093
REL1	-0.066	0.296	0.524	0.031	0.607	0.541	0.187	-0.115	0.523	0.836	**0.932**	0.559	-0.033	0.673	0.469	-0.056
REL2	-0.14	0.275	0.544	0.022	0.635	0.558	0.111	-0.102	0.544	0.892	**0.944**	0.583	-0.097	0.704	0.496	-0.049
REL3	-0.107	0.323	0.578	0.046	0.617	0.572	0.161	-0.114	0.53	0.78	**0.913**	0.57	-0.065	0.678	0.533	-0.036
REL4	-0.125	0.347	0.533	0.052	0.643	0.601	0.173	-0.115	0.566	0.899	**0.937**	0.577	-0.07	0.669	0.472	-0.048
Role	0.046	-0.058	0.012	-0.097	0.01	-0.008	0.101	-0.014	-0.018	-0.096	-0.071	0.02	1	0.006	0.006	-0.037
SEL1	-0.046	0.181	0.343	0.033	0.44	0.408	0.133	-0.162	0.382	0.66	0.718	0.401	0.02	**0.946**	0.297	-0.032
SEL2	-0.1	0.18	0.336	-0.006	0.411	0.388	0.024	-0.19	0.368	0.611	0.671	0.358	-0.017	**0.941**	0.294	0.021
SEL3	-0.078	0.156	0.334	-0.006	0.388	0.384	0.103	-0.148	0.344	0.577	0.665	0.351	0.015	**0.923**	0.3	-0.007
SOC1	-0.197	0.4	0.892	-0.02	0.626	0.585	0.082	-0.142	0.647	0.453	0.492	0.558	-0.005	0.28	**0.908**	-0.024
SOC2	-0.219	0.383	0.897	-0.005	0.614	0.544	0.06	-0.151	0.63	0.425	0.456	0.567	0.012	0.279	**0.934**	-0.091
SOC3	-0.237	0.403	0.882	-0.007	0.594	0.516	0.031	-0.177	0.654	0.482	0.51	0.555	0.01	0.313	**0.916**	-0.104
Tenure	0.504	-0.075	-0.085	-0.011	-0.12	-0.048	0.155	0.075	-0.08	-0.049	-0.051	-0.131	-0.037	-0.007	-0.079	1

Note: Bolded values refer to item loading on its own construct

Table 13 Indicator reliability for formative construct (IS infusion role identity)

Paths	Indicator Weights	VIF
Self-support	0.161	2.922
Social support	0.113	2.688
Commitment	0.234	2.541
Resource investment	0.446	2.333
External gratifications	0.303	2.481
Internal gratifications	0.355	2.998

Table 14 VIF values for all independent variables and moderators

Moderator*Independent Variable	VIF		
	Extended Use	Integrative Use	Emergent Use
Age*IT identity	3.138		
			3.138
		3.138	
Age*IS infusion role identity			4.02
	4.02		
		4.02	
Education*IT identity	2.2		
			2.2
		2.2	
Education*IS infusion role identity			2.606
	2.606		
		2.606	
Former exp*IT identity	2.719		
			2.719
		2.719	
Former exp*IS infusion role identity			2.877
	2.877		
		2.877	
Gender*IT identity	3.116		
			3.116
		3.116	
Gender*IS infusion role identity			3.242
	3.242		
		3.242	
Role*IT identity	2.725		
			2.725
		2.725	
Role*IS infusion role identity			2.926
	2.926		
		2.926	
Tenure*IT identity	3.767		
			3.767
		3.767	
Tenure*IS infusion role identity			4.411
	4.411		
		4.411	

Table 15 Procedural and statistical remedies used in this study

Techniques	Actions
Procedural remedies (Podsakoff et al., 2003)	
Protecting participants' anonymity and reducing evaluation apprehension	The anonymity of the participants was guaranteed before they took part in the survey. We assured them that there is no right or wrong answers and asked them to answer the questions as truthfully as possible
Obtaining measures of the predictor and criterion variables from different sources	We adopted the measurement items for predictor constructs and criterion variables from different sources
Improving scale items	We adopted validated measurement items from the literature, as discussed in the Methodology section. We checked for items ambiguity through pre-test stage. We also provided examples in the questionnaire to avoid vague concepts
Counterbalancing question order	We controlled for priming effects or biases related to the question context by counterbalancing the order of the measurement of the predictor and criterion variables
Statistical remedies	
Harman's single factor test (Harman, 1976; Podsakoff & Organ, 1986)	All the items were loaded into an exploratory factor analysis to examine the unrotated solution. The exploratory factor analysis of all the measurement items yielded sixty-six factors emerging from the dataset with the first factor extracted accounting 41.98% of the variance, and no factor accounted for the majority of the variance Therefore, we can conclude that CMB is not a major threat to our findings
Partial correlation technique: Lindell and Whitney's (2001) marker variable test	This test uses a theoretically unrelated construct as a control on dependent variables. In this study, we adopted a brand image construct from marketing field regarding participants' attitude towards Air New Zealand marketing campaigns from all media such as TV, magazines, Internet, radio, and sponsorship activities. The difference in the comparative models, one with the marker variable and the other without this marker variable was very minor (0.6%). Also, all the significant paths stayed significant Overall, the results from these techniques support that CMB is not a serious concern for this study

Table 16 Post-hoc analysis results on multi-group analysis (MGA)

MGA for one to three years experience with CRM VS. more than three years CRM experience			
Relationships	Δβ	Δt-value	Δp
IT identity—> IS infusion	0.371	3.202	0.002
IT identity—> Extended use	0.407	3.513	0.001
IT identity—> Integrative use	0.542	2.137	0.033
IS infusion role identity—> IS infusion	0.777	3.126	0.002
IS infusion role identity—> Extended use	0.515	2.338	0.042
MGA for higher former IT experience VS. lower former IT experience			
Relationships	Δβ	Δt-value	Δp
IT identity—> IS infusion	0.290	2.922	0.003
IT identity—> Extended use	0.207	2.386	0.016
IS infusion role identity—> IS infusion	0.210	2.530	0.042
IS infusion role identity—> Extended use	0.342	2.877	0.034

The MGA on other relationships were non-significant

**Table 17** Post-hoc analysis results on mediator relationship—Sobel's Z value

Paths	Path Coefficient	Std. Dev	Type of Mediation	Z	Results
Path c_1	ITI→EXTU	0.737***	0.033	Partial	4.884	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	0.778***	0.026			
Path b_1	ROL→EXTU	0.302***	0.061			
Path c'_1	ITI→EXTU	0.502***	0.063			
Path c_2	ITI→INTU	0.72***	0.03	Partial	5.556	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	5.822	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			
Path c_4	ITI→INFU	0.70***	0.03	Partial	4.611	The relationship between IT identity and IS infusion behavior was partially mediated by IS infusion role identity ($p < 0.001$)
Path a_4	ITI→ROL	0.73***	0.04			
Path b_4	ROL→INFU	0.27***	0.06			
Path c'_4	ITI→INFU	0.51***	0.06			

*** $p < 0.001$. 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, EMEU refers to emergent use, and INFU refers to IS infusion

Interaction diagram: Position moderates IT identity→Extended use
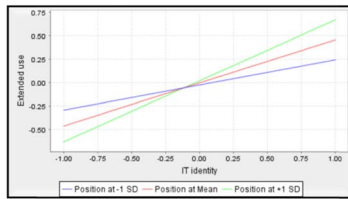
Interaction diagram: Tenure moderates IT identity→Emergent use
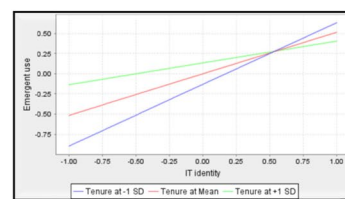
Interaction diagram: Education moderates IS infusion role identity→IS infusion
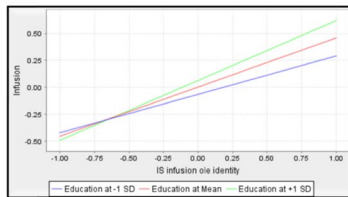
Interaction diagram: Position moderates IS infusion role identity→Extended use
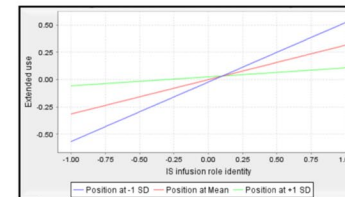
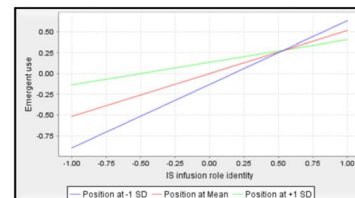Interaction diagram: Education moderates IS infusion role identity→Extended use Extended use
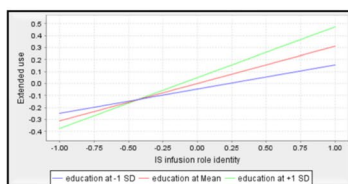
Interaction diagram: Former IT experience moderates IS infusion role identity→
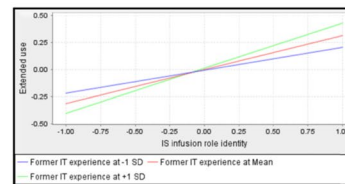
Interaction diagram: Education moderates IS infusion role identity→Emergent use
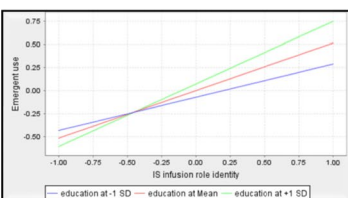
Interaction diagram: Position moderates IS infusion role identity→Emergent use

Note: In the interaction diagrams, the low, middle, and high levels of variables depict sample mean minus one standard deviation, sample mean, and sample mean plus one standard deviation, respectively (Aiken et al. 1991).

Fig. 2 Interaction diagrams for the significant moderation hypotheses of contextual characteristics. Note: In the interaction diagrams, the low, middle, and high levels of variables depict sample mean minus one standard deviation, sample mean, and sample mean plus one standard deviation, respectively (Aiken et al. 1991)

Declarations

Conflicts of Interest The authors declare that there are no conflicts of interest that are directly or indirectly related to this work.

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