The Impact of Positive Behaviours on the Effectiveness of Information Systems Departments

Hadi Karimikia

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Hadi Karimikia

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

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ATTESTATION OF AUTHORSHIP

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

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ABSTRACT

An effective information system (IS) function depends to a great extent upon the perceived system quality, information quality, and service quality by business units across an organization. Effective IS departments ideally design IS systems, share information, and deliver services to distinct business units in organizations to assist business employees in performing their tasks, which provide the latter's organizations with their achieved goals and valued outcomes. Focusing on better linkages between IS and business units, in which IS professionals differently help business employees with their information technology (IT) issues, develops business employees' perception of the quality of systems, information, and services. Indeed, IS professionals provide business employees with a channel to acquaint them with different features embedded into designed systems, to develop their IT-required skills by technical information, and to facilitate their task accomplishment by timely, responsive IT services. This channel has expanded from meeting business employees' routine needs to assisting them beyond the call of duty by displaying positive, supplementary behaviours to task-related behaviours. However, the IS literature is silent on how these behaviours can occur among IS professionals and their non-IS colleagues, and how it affects IS departments' effectiveness, including the quality of produced systems, shared information, and delivered services from IS departments.

Building on organizational citizenship behaviour (OCB) theory, we describe a set of IS-specific OCBs directed towards IS and non-IS peers by IS professionals in a multilevel model of which such behaviours occur within IS departments, and between IS departments and business units. Individual-level analyses indicate disparate IS-specific OCBs carried out by each IS professional, and suggest motivators that encourage OCBs and inhibitors that cease the occurrence of OCBs inside IS departments. Hence, we draw on team-member exchange (TMX) and leader-member exchange (LMX) theories to explain how the quality of relationships among IS professionals and between IS professionals and their IS leaders affect IS-specific OCBs within IS departments. Also, we build upon job burnout theory to examine the nature of IS job characteristics and how negative effects of IS jobs limit carrying out IS-specific OCBs within IS departments. Cross-level analyses illustrate how business employees' perception of unit-level system, information, and service quality is determined by the levels of IS-specific OCBs each IS professional displays. Unit-level analyses show that a set of IS-specific OCBs directed by IS departments towards business units impacts on perceived unit-level system, information, and service quality. Our empirical test of the model employs data from 1112

business employees and 529 IS professionals in 32 large global banks and insurance companies. Overall, our findings suggest that the quality relationships within IS departments promote IS-specific OCBs and the levels of work exhaustion arising from the lack of autonomy, workload, role ambiguity, and role conflict restrict the levels of IS-specific OCBs. Our findings also show that IS-specific OCBs positively affect the system, information, and service quality of IS departments, and emphasize a greater impact of IS-specific OCBs on an IS department effectiveness at individual level than unit level. This study contributes to extant literature by considering IS-specific OCBs exhibited by either IS professionals or IS units and their effects on the effectiveness of IS departments that have been overlooked by most prior research. This study also extends the current literature of antecedents of IS-specific OCBs and how quality of relationships can mitigate the negative effects of endured pressures created by the nature of IS jobs. Our findings provide insights for managers to leverage and promote IS-specific OCBs within IS departments to boost the likelihood of IT contributions to business successes.

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LIST OF ABBREVIATIONS

IT	Information Technology
IS	Information Systems
OCB	Organizational Citizenship Behaviour
TMX	Team-member Exchange
LMX	Leader-member Exchange
AVE	Average Variance Expected
CR	Composite Reliability
KMO	Kaiser Meyer-Olkin
SEM	Structural Equation Modeling
AIC	Akaike's Information Criterion
BIC	Bayesian Information Criterion
ICC	Interclass Correlations
RMSEA	Root Mean Square Error of Approximation
GFI	Goodness-of-Fit Index
SRMR	Standardized Root Mean Square Residual
NNFI	Non-Normed Fit Index
NFI	Normed Fit Index
CFI	Comparative Fit Index
AGFI	Adjusted Goodness-of-Fit Index
TLI	Tucker-Lewis Index
OS	Organizational Spontaneity
CRB	Counter-Role Behaviour
POB	Prosocial Organizational Behaviours

IRB	In-Role Behaviours
ERB	Extra-Role Behaviours

CHAPTER 1: INTRODUCTION

1. 1 Background to the Study

Organizations have significantly increased their investment in information technology (IT) in recent decades to reduce costs and improve decision-making, productivity, sales, profits, efficiency, and customer welfare (DeLone & McLean, 1992; Petter, DeLone, & McLean, 2008). As IT has become more pervasive in organizations, its capabilities have also improved tremendously. One consequence of this is that employees often face great stress from having to adopt as well as use new technologies at an almost unceasing pace (Jasperson, Carter, & Zmud, 2005; Venkatesh, Morris, Davis, & Davis, 2003). Information systems (IS) professionals themselves struggle to keep up with this rate of change, and often end up helping their non-IS colleagues when the latter face uncooperative, unclear or otherwise difficult-to-use technology (Joseph, Ang, Chang, & Slaughter, 2010; Kettinger, Zhang, & Chang, 2013). The use of IT in all aspects of an organization's work means that IS users and IS professionals often interact with each other more frequently nowadays than in previous decades, when IS staff mainly handled back-end systems and databases (Deng & Wang, 2014; Deng, Wang, & Galliers, 2015). Today, IS staff interact with their non-IS peers from across their organization for a host of reasons, such as discovering their IT needs, confirming their specifications when developing requirements for new applications, and conducting system testing and training. These interactions build personal relationships that are relied upon when non-IS employees face challenges with using IT, leading to a parallel growth in the level of informal interaction between these two groups of employees (Basselier & Benbasat, 2004; Bassellier, Reich, & Benbasat, 2001).

The IS literature has long argued for the importance of better linkages between IS and non-IS employees to build shared understanding and increase each other's cross-domain knowledge, so as to ultimately enhance the level of business-IS alignment in an organization (Chan & Reich, 2007; Reich & Benbasat, 1996, 2000). However, in examining the social aspects of these relationships, most research has focused on improving the quality and frequency of communications, and little work has discussed the informal activities IS staff carry out to aid their non-IS colleagues (Jasperson et al., 2005; Ross, Beath, & Goodhue, 1996; Tarafdar & Qrunfleh, 2009). This gap means that there is little attention on what IS employees are actually doing, limiting us from understanding how such positive behaviours influence the performance of the IS department and how they can be promoted. This study begins by reviewing the IS literature and draws on the concept of organizational citizenship behaviour (OCB) to come up with a set of IS-specific OCBs. Social exchange theory is then used to explain the occurrence of OCBs, in terms of the interpersonal motivators that encourage IS professionals to engage in OCBs. This study also builds on job burnout theory to examine the constraints in the IS work environment that may hinder IS professionals from carrying out OCBs. Finally, the impact of such behaviours on the effectiveness of an IS department is examined.

1.2 Formal and Informal Interaction between IS and Business Units

A key determinant of the success of an IS department is the level of alignment between the IS department and its peer business units in terms of their understanding of the role of IT in the organization's strategic direction and operations (Chan & Reich, 2007). Effective IS-business alignment enables organizations to meet demand for better products and services, which improves customer satisfaction (Clark, Cavanaugh, Brown, & Sambamurthy, 1997; Ross et al., 1996; Tarafdar & Qrunfleh, 2009), strengthens their competitive advantage (Bharadwaj, 2000; Clark et al., 1997; Piccoli & Ives, 2005; Ross et al., 1996), and improves

their market position (Henderson & Venkatraman, 1993). More precisely, better alignment between the IS and business functions improves accountability for IT expenditure and IT investment decisions, and is characterized by good relationships between IS professionals and their peers in various business units within organizations (Guillemette & Paré, 2012; Sambamurthy & Zmud, 2012).

Alignment has two aspects- the functional aspect, which refers to the formal structures, policies and processes that IS and business units refer to when interacting with each other, and the social aspect, which refers to the quality of the relationships between the individuals from the IS and business departments (Bassellier & Benbasat, 2004; De Haes & Van Grembergen, 2009; Reich & Benbasat, 2000). The social dimension of alignment (Campbell, Kay, & Avison, 2005; Chan & Reich, 2007; Sledgianowski & Luftman, 2005) is valuable because it influences the level of shared knowledge between IS and business executives (Rau, 2004; Reich & Benbasat, 2000), which has a significant impact on a range of IS-based services that the IS department provides to an organization, from helpdesk support to the implementation of enterprise systems (Ko, Kirsch, & King, 2005; Tarafdar & Qrunfleh, 2009). Indeed, IS-business alignment depends to a large extent on the quality of the formal communications and the partnership between the various IS and business units in an organization (Sledgianowski & Luftman, 2005).

The need for frequent communications and knowledge-sharing between IS professionals and business employees at different levels, such as the managerial level (e.g. between CIOs and CEOs) (Feeny, Edwards, & Simpson, 1992; Rau, 2004; Reich & Benbasat, 1996, 2000), the individual level (between IS professionals and their non-IS coworkers) (Bassellier & Benbasat, 2004), and the group level (between the IS and non-IS units) (Nelson & Cooprider, 1996; Tarafdar & Gordon, 2007), has been widely studied. The IS literature has long argued for the importance of better linkages between IS and business employees to build

shared understanding and cross-domain knowledge, so as to ultimately enhance the social aspect of business-IS alignment in an organization (Benbya & McKelvey, 2006; Campbell, Kay, & Avison, 2005; Chan & Reich, 2007; Reich & Benbasat, 2000). The quality of formal communications and shared knowledge between IS and business units influences the quality of IS department outcomes, such as IS project success or effectiveness (Ewusi-Mensah, 1997; Powell & Yager, 2004; Ramakrishna & Lin, 2004; Roberts, Cheney, Sweeney, & Hightower, 2004), and enhances mutual understanding and relationships between IS and business professionals (Bassellier & Benbasat., 2004). However, only a few of the researchers who study the social aspects of IS-business relationships have discussed the informal interactions between IS professionals and their non-IS colleagues (Jasperson et al., 2005; Ross et al., 1996; Tarafdar & Qrunfleh, 2009). Examples of such informal interactions include a willingness to share workarounds with peers in a non-mandatory context, remote support, troubleshooting, training, and voluntary handholding (Beaudry & Pinsonneault, 2005; Tarafdar & Gordon, 2007; Tarafdar, Qiang, Ragu-Nathan, & Ragu-Nathan, 2011). Such informal activities have been found to enhance IS professionals' self-development and job performance (Constant, Kiesler, & Sproull, 1994; Messersmith, 2007; Sykes & Venkatesh, 2009), as well as the job performance of non-IS employees. The lack of research on such informal interactions means that there has been little attention on what IS professionals do outside their formal responsibilities, preventing researchers from understanding how OCBs, such as helping behaviours, can be encouraged and how they affect the performance of the IS department.

1.3 Research Objectives

To overcome this lacuna in IS research, this study draws on social exchange theory and its specific application as organizational citizenship behaviour (OCB). IS-specific OCBs are defined in this thesis as the positive behaviours exhibited by IS professionals in a non-mandatory or an easy-to-escape context that occur when they assist their IS and non-IS

colleagues with investigating their IT needs, confirming system specifications, and during IT training and mentoring. In the IS context, help provided to non-IS colleagues and IS colleagues can be seen as an example of an OCB, as it leads to improved employee performance, freed resources, improved coordination, and a refreshing work environment (Podsakoff, MacKenzie, Paine, & Bachrach, 2000).

The first objective of this study is to investigate how the quality of inter-personal relationships within IS departments affects the likelihood of IS-specific OCBs occurring between IS professionals or with non-IS colleagues. The second objective of the study is to examine the impact of IS job pressures on the probability that IS-specific OCBs will occur between IS professionals or with non-IS employees. The final objective of the study is to assess the extent to which IS-specific OCB affect the performance of IS departments.

1.4 Research Questions

Our research questions are:

a) ***When are IS professionals more likely to engage in IS-specific OCB?***

b) ***What is the impact of IS-specific OCB on the effectiveness of the IS department?***

The next chapter is an overview of the OCB literature, including its origins, definitions, and dimensions. Following that, a set of IS-specific OCBs is drawn up by reviewing the IS literature for instances of positive behaviours and comparing them with the definitions of the various types of OCBs. The chapter concludes with a description of the factors that support and hinder the occurrence of IS-specific OCBs.

1.5 Thesis Structure

The thesis is organized into six chapters; the chapters are briefly explained below:

Chapter 1 introduces the research background and motivation, objectives, and questions. This chapter highlights the existence of a less-studied area of research: the positive behaviours

shown by IS professionals through interactions they have with their IS and non-IS colleagues. This chapter also examines the impact of such positive behaviours on the performance of IS departments.

Chapter 2 describes the theoretical underpinnings of this study, beginning with a discussion of the origins, definitions, and reconceptualization of OCB. Following on from OCBs, this study reviews the literature for the antecedents OCBs and categorizes different OCBs that occur in the IS context. This chapter explores how OCBs influence relevant organizational outcomes, an area that has been little studied in the IS context. This chapter is followed by a review of research on internally- and externally-felt indicators that encourage and inhibit OCBs.

Chapter 3 makes use of empirical studies to justify the study's research model. This chapter explains the conceptual framework of this study, and presents a multilevel research model.

Chapter 4 describes the research philosophy, research design, and the process of data collection. This is followed by comprehensive discussions, including different statistical tests, on measures of constructs.

Chapter 5 discusses the research testing process and findings. This chapter details the process of data screening, descriptive analyses, exploratory factor analyses, and confirmatory factors analyses carried out for both the individual and unit-level research models. This chapter explains this study's choice of structural equation modelling (SEM) and multilevel SEM to examine the hypotheses. A summary of the results is presented and interpreted based on the path coefficients, the levels of significance, and the squared multiple correlations.

Chapter 6 discusses the findings of this study and compares them with prior research. This chapter then summarizes theoretical and practical contributions of this study and highlights the limitations and potential avenues for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 OVERVIEW

This chapter reviews the literature to provide the background on the IS-specific OCBs that IS professionals carry out. The review also presents the rationale for the effect of such behaviours on the effective functioning of work units. This study begins by discussing various models of extra-role behaviours, and their difference from in-role behaviours (Section 2.2). Second, the literature on the theoretical underpinnings of OCBs and their impacts on organizational effectiveness is reviewed (Section 2.3). Third, research from the IS field is examined to surface and categorize IS-specific OCBs (Section 2.4). Fourth, the review explores the determinants of the effectiveness of IS departments and how IS-specific OCBs influence the effective functioning of IS departments (section 2.5). Finally, the review concludes by discussing theories of the antecedents of OCBs in the IS context (Sections 2.6 and 2.7).

2.2 Extra-role and in-role behaviours

Organizational performance or effectiveness is affected by different types of behaviours performed by members of an organization (Brief & Motowidlo, 1986; Podsakoff & MacKenzie, 1997; Smith, Organ, & Near, 1983; Williams & Anderson, 1991). One category are those that are predefined and prescribed in one's job description and formal role requirements, acknowledged as in-role behaviours (IRB) in the literature (Williams & Anderson, 1991). A second category of behaviours is called extra-role behaviours (ERB) because they are discretionary, performed beyond one's formal role requirements (Brief & Motowidlo, 1986; Van Dyne & Cummings, 1990).

Researchers have contrasted extra-role behaviours with in-role behaviours in terms of four attributes: whether or not extra-role behaviours are discretionary, unrecognized, explicitly

unrewarded, and unenforceable job requirements (George, 1990; George & Brief, 1992; Organ, 1988). Extra-role behaviours are grouped based on these four attributes, and the groups include: prosocial organizational behaviours (POB) (Brief & Motowidlo, 1986), organizational spontaneity (OS) (George & Brief, 1992), counter-role behaviour (CRB) (Staw & Boettger, 1990) and organizational citizenship behaviours (OCB) (Organ, 1988, 1989, 1997; Smith et al., 1983).

A great number of researchers have attempted to define different categories of behaviours and the boundaries between them. Brief and Montowildo (1986) highlighted major differences between in-role and prosocial organizational behaviours, in which in-role behaviours are formally-specified role requirements and extra-role prosocial behaviours are positive social acts which are not formally prescribed and specifically assigned to employees. They defined 13 forms of prosocial organizational behaviour, such as assisting peers with job-related matters or personal matters, and "whistle-blowing", or revealing organizational wrongdoing to outsiders so they will assist the organization.

Another category of extra-role behaviours is organizational spontaneity, which are extra-role behaviours that are discretionary, performed voluntarily, directly recognized by formal reward systems, and contribute to organizational effectiveness (George & Brief, 1992). Unlike organizational spontaneity, OCB incorporates extra-role behaviours that are discretionary, not directly or explicitly recognized by the formal reward systems, not prescribed in one's role requirements, and, taken together, prompt the effective functioning of the organization (Organ, 1989).

Researchers have suggested different models to differentiate extra-role behaviours from each other and from in-role behaviours. George and Brief (1992) have briefly demonstrated isomorphic attributes to show the differences between prosocial organizational behaviours, organizational spontaneity, and organizational citizenship behaviours. They compared these

behaviours based on whether they are: organizationally functional or dysfunctional, prescribed or extra-role, financially rewarded, and active or passive (see Table 1). The first dimension is concerned with the functionality of the behaviours for the organization. Extra-role prosocial behaviours encompass a broad spectrum of discretionary behaviours that are both dysfunctional and functional, but like organizational spontaneity, OCB just describes a functional aspect of extra-role behaviours. The second dimension focuses on the definition of roles, prescribed and extra-role. Organizational spontaneity includes extra-role behaviours, while other two, prosocial organizational behaviours and OCB, represent both in-role and extra-role behaviours. The third dimension depicts whether or not these behaviours can be financially rewarded. Unlike both organizational spontaneity and prosocial organizational behaviours, OCB cannot be recognized by the organizational reward systems. George and Brief (1992) made this assumption that "if an organization had the policy of financially rewarding those who made cost-saving suggestions, the act of making such constructive suggestions would not qualify as the OCB, but it would qualify as a form of organizational spontaneity". Finally, the last dimension illustrates the extent to which the behaviours are passive or active. As noted by George and Brief (1992), organizational spontaneity includes active behaviours and other two, prosocial organizational behaviours and OCB, comprise both active and passive behaviours. Examples of passive behaviours are: staying with organization despite temporary hardships (Brief and Motowildo, 1986, p 716) and avoid complaining (Organ, 1988).

Table 1. Summary of behavioural dimensions of OCB, POB, and OS

Behavioural Dimension	**Behavioural Construct**		
	Organizational Citizenship Behaviours (OCB)	**Prosocial Organizational Behaviours (POB)**	**Organizational spontaneity (OS)**
Organizationally functional vs. Organizationally dysfunctional	Includes functional behaviours	Includes functional and dysfunctional behaviours	Includes functional behaviours

Role prescribed vs. extra role	Includes role-prescribed and extra-role behaviours	Includes role-prescribed and extra-role behaviours	Includes extra-role behaviours
Possibility of financially rewarded	Behaviours cannot be recognized by formal reward system	Behaviours can be recognized by formal reward system	Behaviours can be recognized by formal reward system
Active vs. passive	Includes active and passive behaviours	Includes active and passive behaviours	Active behaviours
Adapted from George and Brief (1992)			

Studies of job performance dimensions also indicate that performing OCB or in-role behaviours is related to job performance and the latter leads to organizational effectiveness (Motowidlo & Van Scotter, 1994; Podsakoff, Ahearne, & MacKenzie, 1997; Podsakoff & MacKenzie, 1997). Indeed, job performance is thoroughly mapped out into behavioural patterns such as task-related and non-task-related behaviours (Motowidlo & Van Scotter 1994; Motowidlo, Borman, & Schmit, 1997). Several researchers have termed non-task-related behaviours "contextual performance", which grants a deeper insight into the nature of extra-role behaviours and different mechanisms of which job organizational performance and effectiveness are affected (Borman, Penner, Allen, & Motowidlo, 2001; Motowidlo & Van Scotter, 1994).

Contextual performance includes behaviours that "*support a broader organizational, social, psychological environment in which technical core must function"* (p.476: Motowidlo & Van Scotter, 1994). Researchers argue that such behaviours may enhance organizational performance by lubricating the social machinery of the organization, reducing friction, and increasing efficiency (Borman & Motowidlo, 1993; DeGroot & Brownlee, 2006; Motowidlo & Van Scotter, 1994). Borman and Motowidlo's (1993) five-dimension model of contextual performance explains that these behaviours occur when employees: 1) put extra effort to complete their task activities; 2) voluntarily complete task activities, which are not formally

part of their job; 3) help and cooperate with other employees; 4) follow organizational rules and procedures; and 5) endorse, support, and defend their organization's objectives.

Since Organ (1997) adapted the definitions of contextual performance to shed unnecessary aspects of the original definitions, OCB has become as vital as task-related behaviours, but differs in degree (Motowidlo, 2000). In the next section, we examine the definitions and origins of the OCB construct, the challenges faced in defining it, and the variety of dimensions that OCB represents.

2.3 Organizational Citizenship Behaviour

OCB was originally defined as "*individual behaviours that are discretionary, not directly or explicitly recognized by the formal reward systems, not prescribed in one's role requirements, and in the aggregate prompt the effective function of the organization.*" (pp 73-74: Organ 1989*).* However, this definition did not clarify the boundary between in-role and extra-role behaviours (Morrison 1994, Graham 1991, George and Brief 1992), leading to other researchers reconceptualising OCB by basing it on contextual performance, since OCB contributes socially and psychologically to the context of work (Borman & Motowidlo, 1993; Degroot & Brownlee 2006; Organ 1997).

Researchers have shown that the discretionary part of the definition is unneeded as OCB can be recognized by supervisors and peers (Podsakoff et al., 2000; Van Dyne & LePine, 1998). Also, Organ (pp83: 1997) explicitly stated that "*OCB might be just as likely as – if not more like as – in-role performance to lead to monetary recompense*". To provide more clarity on OCB, Organ (1997) and Graham (1991) asked researchers to differentiate the concepts of "role" from "job" as a response to Morrison's (1994) study that hypothesized perceived job requirements differ between employees and their employers, or vice versa. The point is that roles vary over time with the expectations of role-senders, e.g., supervisors, while according to the refined OCB based on contextual performance, roles includes everything in one's job that

socially and psychologically contributes to his/her job performance. This reconceptualization offers several advantages: 1) it alters an assumption that OCBs are unrewarded by the formal organizational reward system and OCBs cannot be recognized by officials (Motowidlo, 2000); 2) it sheds some ambiguities of the OCB's original definitions and origins and develops it to be separately viewed from other constructs of extra-role behaviour (Graham,1991); and 3) it is consistent with Borman and Motowidlo's (1993), Motowidlo and Van Scotter's (1986), and Smith's (1986) definition of contextual performance that OCB contributes to maintaining and enhancing social and psychological context in order to support task performance. As a result, Organ (1997) and Motowildo (2000) concluded that OCB and task performance are embodied into job performance, but task performance is a more enforceable job requirement and more likely to lead to systemic rewards. This new conceptualization suggests that OCB refers to: "*individual behaviours that may not be discretionary, that can be directly or explicitly recognized by supervisors and co-workers and promoted by the formal reward systems, and that socially and psychologically contribute to one's job performance and in the aggregate prompt the effective function of the organization*".

Drawing on the reconceptualisation of OCB that has altered some earlier assumptions held by OCB researchers, Table 2 depicts the refined OCB compared with George and Brief's (1992) prior discussions on the differences between the dimensions of extra-role behaviours. As noted above, OCB may no longer form part of extra-role behaviours, since OCB is entwined with enforceable job requirements and guarantee of systematic rewards (Motowidlo, 2000; Organ, 1997). Concerning the extent to which OCB encompasses passive and active behaviours, George and Brief (1992) argued that OCB tends to include passive behaviours due to the aspect of sportsmanship (e.g. avoid complaining). However, some researchers have contradicted their argument and shown that OCB dimensions, e.g. sportsmanship, include active behaviours. For example, based on the definition developed by Podsakoff et al. (2000),

"good sports" are people who do not complain when they are inconvenienced by others, but also maintain a positive attitude even when things go wrong. Also, from the perspective of civic virtue that consists of voice behaviour (Podsakoff, Podsakoff, MacKenzie, Maynes, & Spoelma, 2014; Van Dyne & LePine, 1998), people exhibit such behaviours to challenge the status quo and attempt to promote positive change in the organization by making innovative suggestions and recommending modifications to standard procedures (Van Dyne & LePine, 1998; Van Dyne & Pierce, 2004).

Table 2. Summary of refined behavioural dimensions of OCB, POB, and OS

Behavioural Dimension	**Behavioural Construct**		
	Organizational Citizenship Behaviours (OCB)	**Prosocial Organizational Behaviours (POB)**	**Organizational spontaneity (OS)**
Organizationally functional-organizationally dysfunctional	Includes functional behaviours	Includes functional and dysfunctional behaviours	Includes functional behaviours
Role prescribed-extra role	Includes the degree to which socially and psychologically support job requirements and contribute to job overall performance	Includes role-prescribed and extra-role behaviours	Includes extra-role behaviours
Possibility of financially rewarded	Behaviours can be recognized by formal reward system or the degree to which systematic rewards are guaranteed.	Behaviours can be recognized by formal reward system	Behaviours can be recognized by formal reward system
Active-passive	Includes active behaviours	Includes active and passive behaviours	Includes active behaviours

In an effort to further distinguish OCBs from aspects of employee task performance, researchers have discussed different ideas. George and Brief (1992) and George and Jones (1997) argued that the difference among the various types of OCBs and in-role behaviours depends upon different motivational set that falls outside individuals' self-interest, and is directed towards benefiting organizations. They also implied that the intensity of OCBs can differentiate these behaviours from in-role behaviours. Morrison (1994), and Van Dyne and LePine (1998) hypothesized that overlaps between types of OCB behaviours and between OCB

behaviours and in-role behaviours is subject to how employees and their supervisors perceive OCB and in-role behaviours, as well as employee job attitudes (e.g., how satisfied and committed employees perceive extra-role vs in-role behaviours), job tenure (e.g., experienced employees have a different perception of extra-role and in-role behaviours), and social cues (e.g., structurally equivalent employees perceive behaviours similarly). The boundary is similarly unclear not only when comparing OCB and in-role behaviours, but also between OCB dimensions.

2.3.1 Is OCB unidimensional or multidimensional?

Some researchers have argued that OCB is unidimensional (LePine, Hollenbeck, Ilgen, Colquitt, & Ellis, 2002; Hoffman, Blair, Meriac, and Woehr, 2007), while others have found multiple dimensions, up to 30 different ones (Podsakoff et al., 2000). LePine et al. (2002) meta-analytically reviewed studies measuring overall OCB and studies that used Organ's five-dimension OCB (altruism, sportsmanship, courtesy, civic virtue, and conscientiousness) to investigate the relationships between OCB and its predictors (job satisfaction, organizational commitment, fairness, trait conscientiousness, and leader support). The findings reflected that OCB dimensions were strongly related to each other, that the different OCB dimensions did not explain variance beyond an overall measure in any of the OCB predictors, and that OCB dimensions did not differently affect various predictors, such as satisfaction and commitment. These findings suggest that OCB can be considered a latent construct, whereas a multi-item measure loads on a unidimensional OCB construct. Hoffman et al. (2007) conducted a meta-analytic review on the relationship between a latent OCB factor, task performance and attitudinal variables. They concluded that "… the results support a single factor model of OCB that is distinct, albeit strongly related, with task performance" (p. 561). However, the findings have focused on only five dimensions (altruism, sportsmanship, courtesy, civic virtue, and conscientiousness) out of the more than 30 that have been suggested in the literature.

The benefits of examining different forms of OCBs are to describe the covariation of these behaviours and to see the extent to which these behaviours distinguish themselves from other OCB dimensions as well as task-related behaviours. When OCB dimensions from different studies are compared (Table 4), it can be seen that there is some degree of overlap between them. In the next section, we clarify the similarities and differences of the various OCB dimensions to provide more insight into the extent of their commonality.

2.3.2 The Evolution of OCB Dimensions

Smith et al. (1983) is the earliest article on this topic. The paper defines OCB as a set of individual behaviours that are not easily explained by the same incentives that induce entry and conformity to contractual role prescriptions. It proposes two dimensions of OCB: altruism and generalized compliance. Altruism was defined as being part of helping behaviours aimed directly at individuals. Generalized compliance refers to a more impersonal form of conscientious citizenship directed towards benefiting an organization rather than an individual. Examples of these two behaviours are: altruism as helping your peers who were absent to attain the same progress as others, and generalized compliance as attending functions you are not required to for the sake of your organization's reputation. Following that, Organ (1988) conceptualized an expanded taxonomy of OCB, including altruism, courtesy, civic virtue, conscientiousness and sportsmanship.

Altruism includes behaviours that are directly aimed at helping others, such as assisting employees with a large workload or orienting new employees. Courtesy is a gesture that demonstrates an interest in preventing problems that could otherwise happen to employees. Civic virtue refers to responsible, constructive participation in the overall organization, such as attending meetings regarding the organization. Conscientiousness presents behaviours that go beyond required expectations of good employees in areas, such as resource attention and conservation. Sportsmanship indicates a tolerance of inevitable inconveniences without

complaining. Compared to Smith et al. (1983), Organ's (1988) dimensions are more narrowly defined and distinct.

Organ's (1988) conceptualization of OCB has been the most common framework in OCB research for the following reasons:

1) Organ's five-dimension taxonomy of OCB has a longer historical background than other taxonomies. Other models have not been used as often and there has been less consistency with the specific behaviours being studied (Morrison, 1994);

2) One of the most widely used OCB measurements designed by Podsakoff, MacKenzie, Moorman, and Fetter (1990) was operationalized from Organ's (1989) concepts of five-dimension OCB (LePine et al., 2002); and

While several other taxonomies of OCBs have been presented and operationalized (Borman & Motowidlo, 1993, Morrison 1994; Van Dyne et al., 1994), the behavioural domains of these taxonomies have been found to overlap with each other and with Organ's (1988) five-dimension OCB. Appendix A depicts these various taxonomies and their overlaps with Organ's conceptualization.

In recognition of the overlap between the various OCB taxonomies, researchers have categorized these dimensions into subgroups. William and Anderson (1991) suggested a two-factor model, arguing that OCBs can be distinguished based on who might benefit from them. OCB-I- behaviours "immediately benefit specific individuals and indirectly through this means contribute to the organization (e.g., helping others, who have been absent, takes a personal interest in other employees)," while OCB-O behaviours benefit the organization in general (e.g., giving advance notice when unable to come to work or adhering to informal rules devised to maintain order) (William and Anderson 1991, pp. 601-602). OCB-I captures dimensions such as altruism and courtesy (Organ, 1989), helping and cooperating with other employees

(Borman & Motowidlo, 1993), interpersonal helping (Graham, 1989; Moorman & Blakelly, 1995; and Moorman, Blakely, & Niehoff, 1998), helping co-workers (George & Brief, 1992), interpersonal facilitation (Van Scotter & Motowidlo, 1996). OCB-O incorporates civic virtue, sportsmanship, and conscientiousness (Organ, 1989), following organizational rules and procedures (Borman & Motowidlo, 1993), job dedication (Van Scotter & Motowidlo, 1996), protecting the organization (George & Brief, 1992), and organizational loyalty (Graham, 1989; Moorman & Blakelly, 1995; & Moorman et al., 1998). A meta-analytic study of the relationships between OCB-I, OCB-O, and task performance shows that OCB-I and OCB-O differ from each other and from task-related behaviours (r_c= 0.47 and r_c=0.54, respectively), although OCB-O and OCB-I are strongly correlated (r_c = 0.75) (Podsakoff, Whiting, Podsakoff, & Blume, 2009).

Van Dyne, Cummings, and Parks (1995) and Van Dyne and LePine (1998) suggest a division between affiliation-oriented citizenship behaviour (AOCB) and challenge-oriented citizenship behaviour (COCB). Affiliative behaviour is characterized by interpersonal, cooperative, and other-oriented behaviours that tend to strengthen or maintain relationships with others. In contrast, challenge-oriented behaviour is change-oriented, and emphasizes ideas and issues that challenge the status quo. The most common OCB dimensions identified as AOCB are helping behaviour (e.g., altruism, courtesy, peacekeeping, and cheerleading) (Organ, 1990; Podsakoff et al., 2000), interpersonal facilitation (Van Scotter and Motowildo 1996), and some forms of OCB-I and OCB-O (William & Anderson, 1991). The most common forms of OCBs identified as COCB are civic virtue (Organ, 1989), advocacy participation (Van Dyne, Graham, & Dienesch, 1994), and only some forms of OCB-O (William & Anderson, 1991). The challenge-oriented view also offers a new conceptualization of employee voice behaviour as promotive behaviour emphasizing expression of constructive challenges intended to improve rather than merely criticize. Voice refers to making innovative suggestions for

change and recommending modifications to standard procedures even when others disagree (Van Dyne & LePine, 1998). Employee voice behaviour constructively challenges the status quo and intends to promote positive change in the organization rather than, for example, to examine violations of standards. Van Dyne and LePine (1998) assert that this definition of voice behaviour is important in modern work environments since this behaviour promotes flexibility, innovation and the continuous improvement of business processes.

Podsakoff, Podsakoff, MacKenzie, Maynes, and Spoelma (2014) compare the categorizations of OCB (Table 3) and argue that the AOCB/COCB model transcends the merits of the OCB-I/OCB-O model. The OCB-I/OCB-O model focuses on the intended beneficiary alone, while the AOCB/COCB model builds on the essential nature of the behaviours to define the boundaries between them. Behaviours are classified in the AOCB/COCB model based on why and how they influence unit performance, which is an intrinsic property of the behaviour itself.

Table 3. summary of types of organizational citizenship behaviours

	Affiliation-oriented OCB	**Challenge-oriented OCB**	**Neither**
OCB-I	Interpersonal Helping Altruism Altruism towards colleagues Courtesy Peacekeeping Cheerleading Interpersonal facilitation Interpersonal harmony		

OCB-O	Organizational loyalty Loyal boosterism Organizational identification Endorsement, support, and defence of the organization Spread of goodwill Promotion of company image Sportsmanship Compliance Organizational obedience Protection of company resources Compliance to organizational rules and procedures Civic virtue (attending meetings and other functions that are not required and reading and keeping up with organizational announcements)	Voice Making constructive suggestions Civic virtue (when civic virtue refers to voice) principled dissent advocacy participation Organizational participation Issue selling Taking change	Conscientiousness Individual initiative Personal industry Job dedication Voluntary performance of task activities Self-development Self-training Career development Individual innovation
Adapted from Podsakoff, Podsakoff, MacKenzie, Maynes, and Spoelma (2014)			

As discussed above, the dimensions of OCBs are differentiated based on the nature or the beneficiary of the behaviours. However, the beneficiaries of such behaviours is not limited to individuals or the organization as a whole. In the next section, OCBs are further scrutinized in regards to the benefits directed towards different parties.

2.3.3 Intended beneficiaries of OCB

Employees exhibit OCB with the intent to benefit particular parties (e.g., peers, supervisors, customers, groups, or organizations) (Brief and Motowildo, 1986). William and Anderson (1991) developed this point and labelled OCBs as OCB-I and OCB-O, where "I" refers to individuals, such as co-workers and supervisors, and "O" refers to the organization. OCBs directed towards individuals can be categorized into organizational citizenship behaviour towards supervisors (OCBS) and peers (Podsakoff et al., 1997; Podsakoff, & MacKenzie 1997; Williams & Anderson, 1991). OCBSs are supervisor-directed citizenship behaviours that employees exhibit to benefit their supervisor. OCBs directed towards peers are peer-directed citizenship behaviours exhibited by co-workers who have an equal status and are unique recipients of individually-directed citizenship behaviours (Lavelle, Rupp, & Brockner, 2007).

While several studies have demonstrated the impact of OCBs directed by individuals (e.g., employees) towards individuals (LePine et al., 2002; Podsakoff et al., 2000), OCBs are not limited to individually-focused citizenship behaviours. Group citizenship behaviour (GCB) refers to OCBs engaged in by groups as a whole to benefit other groups (Chen, Lam, Naumann, and Schaubroeck, 2005). Such group-level organizational citizenship behaviours help maintain and enhance the social and psychological context of a group, which supports its ability to perform tasks (Choi and Sy, 2010). Both individual- and group-level OCBs are conceptually and empirically distinct phenomena and their antecedents and consequences have both received broad attention.

2.3.4 OCB and organizational effectiveness

The effect of OCBs has been assessed at both the individual- and unit levels. Podsakoff et al.'s (2009) meta-analysis of the effect of OCBs on individual-level outcomes, such as performance evaluations, reward allocation decisions, turnover intentions, and absenteeism, was consistent with Motowidlo and Van Scotter's (1994) empirical findings, in that OCBs are positively related to managers' ratings of employee performance and the rewards managers allocate to employees. Surprisingly, OCBs were found to be more determinant of employees' job performance than task performance, and have a strong impact on reward recommendations. Employees who exhibit higher levels of OCBs consider leaving and being absent from their organization less often compared to employees with lower levels of OCBs. However, the effects of OCBs on unit-level outcomes are not completely consistent across studies (Podsakoff et al., 2000), because they are influenced by sample size, compensation systems, and technological requirements (Podsakoff & MacKenzie, 1997).

Podsakoff and MacKenzie (1997) listed the ways in which OCBs make organizations more effective (Table 4) and they are summarised below:

a) intra- and inter-work group communications allow the sharing of best practices among co-workers, enhancing productivity;
b) employees provide their managers with valuable suggestions or avoid creating problems for others, managerial productivity is enhanced;
c) free up resources for more productive purposes when experienced employees assist inexperienced employees with additional training and orientation;
d) reducing the need to devote scarce resources to purely maintenance functions;
e) coordinating activities, e.g., participating in work unit meetings or touching base with others, within-between work groups;
f) making an attractive work climate when the sense of belongings, commitment, and loyalty is developed by employees who exhibit helping and sportsmanship behaviours;
g) effectively adapting to environmental changes when employees learn new skills, share information, or make constructive suggestions about changes in their work environments; and
h) increasing the stability of organizational performance when employees help others with their workloads or individually they maintain a high-level output.

Table 4. Why OCBs have a Positive Impact on Organizational Effectiveness

Potential Reasons Why OCBs influence Work Group and/or Organizational Performance	***Examples***
OCBs may enhance co-worker productivity	Employees who help another co-worker "learn the ropes" may help her become a more productive employee faster.
	Over time, helping behaviour can help to spread "best practices" throughout the work unit or group.
OCBs may enhance managerial productivity	If employees engage in civic virtue, the manager may receive valuable suggestions and/or feedback on his or her ideas for improving unit effectiveness.
	Courteous employees, who avoid creating problems for co-workers, allow the manager to avoid falling into a pattern of "crisis" management.
OCBs may free up resources for more productive purposes	If employees help each other with work-related problems, then the manager does not have too; consequently, the manager can spend more time on productive tasks, such as planning.

	Employees that exhibit conscientiousness require less managerial supervision and permit the manager to delegate more responsibility to them.
	To the extent that experienced employees help in the training and orienting of new employees, it reduces the need to devote organizational resources to these activities.
	If employees exhibit sportsmanship, it frees the manager from having to spend too much of his or her time dealing with petty complaints.
OCBs may reduce the need to devote scarce resources to purely maintenance functions	A natural by-product of helping behaviour is that it enhances team spirit, morale, and cohesiveness, thus reducing the need for group members (managers) to spend energy and time on group maintenance functions.
	Employees that exhibit courtesy towards others reduce intergroup conflict; thereby diminishing the time spent on conflict management activities.
OCBs may serve as an effective means of coordinating activities between team members and across work groups	Exhibiting civic virtue by voluntarily attending and actively participating in work unit meetings would help the coordination of effort among team members, thus potentially increasing the group's effectiveness and efficiency.
	Exhibiting courtesy by "touching base" with other team members or members of other functional groups in the organization reduces the likelihood of the occurrence of problems that would otherwise take time and effort to resolve.
OCBs may enhance the organization's ability to attract and retain the best people by making it a more attractive place to work.	Helping behaviours may enhance morale, group cohesiveness, and the sense of belonging to a team, all of which may enhance performance and help the organization to attract and retain better employees.
	Demonstrating sportsmanship by being willing to "roll with the punches" and not complaining about trivial matters sets and example for others, and thereby develops a sense of loyalty and commitment to the organization that may enhance employee retention.
OCBs may enhance the stability of organizational performance	Picking up the slack from others who are absent, or who have heavy workloads, can help to enhance the stability (reduce the variability) of the work unit's performance.
	Conscientious employees are more likely to maintain a consistently high level of output, thus reducing variability in a work unit's performance.
OCBs may enhance an organization's ability to adapt to environmental changes	Employees who are in close contact with the marketplace volunteer information about changes in the environment and make suggestions about how to respond to them; it helps an organization to adapt.
	Employees who attend and actively participate in meetings may aid the dissemination of information in an organization, thus enhancing its responsiveness.

	Employees who exhibit sportsmanship, by demonstrating a willingness to take on new responsibilities or learn new skills, enhance the organization's ability to adapt to changes in its environment.
Adapted from Podsakoff and MacKenzie (1997)	

The summary above explains how managers recognize OCBs, e.g., helping behaviour, civic virtue, and sportsmanship, as facilitating behaviours that make their own jobs easier. Appendix B summarizes the diversity of unit-level outcomes that have resulted from unit-level OCBs in different organizations. To provide comprehensive insight into the diversity of unit-level outcomes, four categories are adapted from Podsakoff's et al. (2014) typology of outcome variables of unit-level OCBs. The categories are: subjective and objective ratings of unit measures (e.g., subjective overall unit effectiveness or performance, or objective measures of quantity produced), improving business process measures (e.g., product quality), customer measures (e.g., customer satisfaction), and financial measures (e.g., sales and/or revenues). The majority of the relationships between distinct outcomes and OCBs have been statistically significant, providing a strong support for Organ's (1989) assumption that OCBs, in aggregate, promote the effective functioning of the organization.

Several researchers have investigated the effect of different OCBs on unit-level outcomes by subjectively measuring unit performance (e.g., subjective team project grades) (Ng & Van Dyne, 2005) or unit effectiveness (e.g., subjective military combat unit effectiveness) (Ehrhart, Bliese, & Thomas, 2006), or also objectively measuring unit performance (e.g., quantity produced or the percentage of employee turnover) (Podsakoff, Ahearne, & MacKenzie 1997; Mackenzie, Podsakoff, & Podsakoff, 2011). To sum up overall effects of OCB on unit-level outcomes, Nielsen, Hrivnak, and shaw (2009) meta-analytically reviewed 38 independent samples (N= 3,097 individuals) in which different types of OCB have a positive effect on team performance; they found that OCBs have a stronger relationship with subjective measures of performance than objective measures of performance. Likewise,

Podsakoff et al. (2009), in a meta-analysis of 168 independent samples (N=51,235 individuals), found out that overall unit-level OCBs are positively associated with a variety of unit-level performance, effectiveness, productivity, efficiency, profitability, and customer satisfaction, and are negatively related to costs and unit-level turnover. In addition, organizational units that are characterized by higher-levels of OCBs have more satisfied customers and lower employee turnover than organizational units with lower-levels of OCBs.

2.3.5 Summary

In the previous sections, OCB behaviours were examined to provide a broad insight into the differentiation between OCB and other similar terms, such as extra-role and prosocial behaviours. Following on from the different nature of OCBs, the conceptualization of OCB and its definition were discussed, including several taxonomies of OCB. Then, in the last subsection, the impact of OCBs on the effective functioning of the organization was discussed, which sheds a light on distinct unit-level outcomes of unit-level OCBs.

OCBs have been studied in different contexts, such as marketing (Brown, Mowen. Donavan, & Licata, 2002), customer service (Bienstock, DeMoranville, & Smith, 2003), or manufacturing (Podsakoff, Ahearne, & MacKenzie, 1997). However, such behaviours have been less studied in the IS context, although interest has been increasing (Deng & Wang 2013; Deng & Wang, 2014; Deng, Wang, & Galliers, 2015). The following section investigate OCBs in the IS context in which IS professionals in IS groups or IS departments additionally support their IS or non-IS colleagues with the corresponding OCBs.

2.4 OCB in the Information Systems Context

The primary task of the IS department or team in an organization is to meet the needs and demands of its peers in business units by providing the skills and support they need to improve or maintain their job performance (Agarwal & Sambamurthy, 2002; Salmela, 1997). These

skills and resources have both technical and human aspects (Tarafdar & Gordon, 2007). The technical aspects refer to skills relating to the management, support and development of hardware, software, databases, applications, and networks (Armstrong & Sambamurthy, 1999; Bharadwaj, 2000), while the human aspects refer to the social and interpersonal skills of IS professionals in working with their colleagues in the various business units (Bharadwaj, 2000; Ross et al., 1996). These "soft skills" are essential for communicating with their non-IS colleagues and gathering relevant knowledge (Joseph, Ang, Chang, & Slaughter, 2010; Teo & Ang, 2001). Both the technical and human aspects of IS skills are important for enhancing a business' agility and performance (Sambamurthy, Bharadwaj, & Grover, 2003), and developing a sustainable competitive advantage (Piccoli & Ives, 2005). They also increase the trust and confidence business units have in their IS departments (Luftman, 2003a, 2003b; Nelson & Cooprider, 1996; Ross et al., 1996; Sledgianowski & Luftman, 2005).

Arguably, using social ties to deliver and receive information is the crucial activity, not the by-product, of information systems design, development and management. Designers or developers with technical skills are often required to improve their social skills to communicate with their project members, so that they can reach out to them and help resolve conflicts to arrive at a consensus (Curtis, Krasner, & Iscoe, 1988; Sawyer, 2004). Besides good communication skills, social ties can also be enhanced by project members, performing specific behaviours to increase unit productivity and morale (Blanchard, Carew, & Parisi-Carew, 1996). In the IS context, an example of such a behaviour could be IS professionals sharing software or data in a non-mandatory context, and in the process enhancing their reputation as team-players (Constant et al., 1994; Constant, Sproull, & Kiesler, 1996).

While the technical expertise of IS professionals is expected by business users, positive behaviours, such as voluntarily leading and scheduling IS project meetings (Curtis et al., 1988; Walz, Elam, & Curtis, 1993), spontaneous handholding, and information- sharing (Jasperson

et al., 2005), fall outside their formal job descriptions and are extra-role behaviours. However, given the centrality of social interaction in the work of IS professionals, such actions are key for achieving outcomes valued by IS professionals, such as the successful completion of software implementation projects and the adoption and assimilation of IT resources into organizational workflows.

Drawing on OCB and its dimensions, we term the positive, discretionary behaviours that IS professionals display when assisting their IS colleagues and non-IS colleagues as ***IS-specific OCB***. Such behaviours occur, for example, when IS professionals help non-IS colleagues use newly adopted or existing systems in the pre- and post-implementation stages (Deng & Wang, 2014; Deng, Wang, & Galliers, 2015). The knowledge of IS professionals are solicited by non-IS colleagues to learn about the various features embedded in systems, so as to achieve effective IS systems use (Santhanam, Seligman, & Kang, 2007).

IS helping and knowledge-sharing behaviours are not only limited to interactions between IS and non-IS employees, but also can be found within IS groups (Hsu, Shih, Hung, & Lowry, 2015; Yen, Hu, Hsu, and Li, 2015). IS professionals interact with each other to maintain systems for employees and serve them with high-quality information. This interaction involves IS professionals engaging in learning activities where they learn from their peers how to deliver IS services (e.g., troubleshooting and informal training) to business groups (Yen et al., 2015). For example, IS professionals help keep their IS colleagues aware of IS security policies, improving the IS security effectiveness of their department (Hsu et al., 2015).

Prior IS researchers have portrayed such behaviours as service-oriented or customer-oriented OCBs and focused more on categorising various OCBs across IS contexts (see Table 5). The term “IS-specific OCB” can be distinguished from the previous terms in two ways: 1) IS professionals act as referents of IS-specific OCBs; and 2) non-IS and IS colleagues are recipients of IS-specific OCBs. More specifically, IS-specific OCBs are directed towards

business employees by IS professionals performing different IS roles in an IS department as well as towards IS peers within an IS department. In fact, IS professionals span multiple business functions and constitute a network to every part of the organization and communicate with business employees with different backgrounds and expertise on IT needs, and IS problems and solutions (Gasson, 2006).

Drawing on the boundary spanning perspective, IS professionals perform boundary spanners' roles to deal with technical and non-technical challenges that non-spanners run into across boundaries (Levina & Vaast, 2005). The occurrence of IS-specific OCBs may affect boundary spanning mechanism in several ways. Such behaviours can be integrated with activities carried out in boundary spanning roles discussed in the literature as ambassador, coordinator, and scout (Ancona & Caldwell, 1991). IS professionals as IS boundary spanners display IS-specific OCBs which compensate for the lack of IS-business-related knowledge within the IS team, reconcile divergent perceptions across the organization and circulate the existing IT-related knowledge between IS and business units. Taken together, IS-specific OCBs comprise activities that IS boundary spanners carry out beyond the call of their duty, including explicit requests for assistance to provide additional help to both business employees and IS peers to enhance the flow of IT-business information, share technical knowledge, and reconcile a variety of cultural clashes within IS-business units. This is valuable because the technical- and non-technical-related knowledge and experience that both IS personnel and business employees gain is important for IS development success (Basselier & Benbasat, 2004; Basselier, Benbasat, and Reich, 2003).

Table 5. OCBs in the IS context

OCB categories	Definition	Explanations and Examples
Customer-oriented OCB (Deng, Wang, & Galliers, 2015)	IS personnel's discretionary behaviors in serving business	Provides business users with extra hands-on training of technical features, e.g., how to process a purchase order in the SAP system.

	users' interests and needs that are not explicitly requested.	Offers additional system-related information which can be useful in a later time, e.g., updating payment rate and the latter's consequences in payroll.
		Offers explanations and additional information on the cause of the problem or on the status of the problem resolution, e.g., receiving recurring error messages and how to fix them.
		Provides personalized information and solutions tailored to business users' business processes and data, e.g., assisting business users with a data discrepancy between the SAP system and the business intelligence application.
		Develops workaround solutions tailored to the technical features that users employed, e.g., finding out features that are not available in the HR/payroll system.
Customer-oriented OCB (Deng & Wang, 2014)	Supportive activities that are not an explicit part of IS workers' job description, not something the IS workers are trained by the organization to do, and not a set of behaviors formally and explicitly rewarded when exhibited, or punished when not.	Help business employees with information requests (e.g., How can I use the system to check the status of a purchasing order) and with diagnosing problems/causes and creating solutions (e.g., helping business users resolve their system usage problems, troubleshooting the problematic incidents, developing solutions, and communicating the results to business users). Taking initiatives are a sequence of activities to ensure that business users fully understand how to use the embedded functions in a system to accomplish their tasks. E.g., the detailed procedure in locating and displaying payment requests in the Supplier Relationship Management (SRM) system.
Information security policy (ISP)-related OCB (Hsu et al., 2015)	How well IS employees perform altruistic behaviors not specified in information security policy (ISP) and how well they voice their opinions and suggestions to benefit their work group.	Behaviours, such as making innovative suggestions, informal training other employees regarding the importance of information leakage that might happen when they fail to log out after accessing their email accounts on public computers, or helping other employees in the work group learn about security policies, improve overall security within departments.
Service-oriented OCB (Yen, Hu, Hsu, & Li, 2015)	Behaviors that are directed from internal IS professionals to business employees, to describe the provision of support and services business employees need to use the systems in an organization.	Consists of the promotion of the image of the IS department to business employees (e.g. defending the IS department image when other IS professionals or business employees criticize it).
		Refers to the extent to which IS employees are respectful to organizational rules and regulations, punctual to attend their job, responsible for organizational resources and aware of delivering high-quality work to business employees.

		Illustrates the performance of specific tasks beyond the call of duty (e.g. performing his/her job duties with unusually few errors and extra-special care).
		Conscientiousness is a pattern of going well beyond minimally required levels of attendance, punctuality, conserving resources or related matters of internal maintenance (e.g., returns phone calls and responds to business employees' messages and requests promptly).
		Participation is responsible, constructive involvement in the political process of the organization (e.g., sharing ideas and views about an ERP system with business employees).
		Describes communications with IS peers and business employees in the workplace to improve individual and group performance (e.g. motivating IS peers and business employees to express their ideas and opinions and frequently communicate with them on how the group can improve).

To surface examples of IS-specific OCB, the IS literature was reviewed thoroughly, and the instances that were found were then related to the various dimensions of OCB listed in the previous section. The literature search process began by investigating all relevant quantitative and qualitative IS studies in electronic databases, such as ScienceDirect, JSTOR, Web of Science, Springer Link, EBSCO Host, ACM Digital Library, IEEE Explore, Google Scholar, and Emerald, with these keywords: *extra-role behaviour, extra-mile behaviour, discretionary behaviour, positive behaviour, IS/IT helping behaviour, knowledge-sharing behaviour, organizational citizenship behaviour, altruism, civic virtue, sportsmanship, conscientiousness, courtesy, voluntary behaviour, informal training and handholding behaviour.* To make the review robust, the results of interviews reported either within or at the end of qualitative studies were deliberately considered. The behaviours that were found were categorized based on the nature of the activities of IS professionals that corresponded to Organ's five-dimension OCB. The IS-specific OCBs are described below.

2.2.1 Helping Behaviours

Helping behaviours are significant because they reduce technology complexity and facilitate the processes of IT adoption (Tarafdar et al., 2011). For example, helping behaviours can appear from IS professionals helping employees learn new software systems or providing employees with technical advice (Messersmith, 2007). The need for IT help among IS users means that less expert IS users technically rely on more expert IS professionals to help them with a wide variety of IT knowledge or to update their IT expertise (Rice, Collins-Jarvis, & Zydney-Walker, 1999).

Generally, three conditions are needed for helping behaviours to take place between IS help providers and IS help seekers (Constant et al., 1994; Constant et al., 1996; Rice et al., 1999). Initially, the use of information systems must be part of the everyday routines of the employees involved with information systems. Next, help providers must possess a surfeit of resources, including intangible resources, such as IS expertise or IT-related knowledge, and tangible resources, such as software, over help seekers. Finally, IS help providers should be organizationally motivated (e.g., reward systems).

Since “give-help” and “get-help” behaviours are exchanged across an organization, IS helping behaviours have a positive impact on job performance, IS project success, or information security policy effectiveness through interpersonal relationships (Gosain, Venkatesh, & Sykes, 2007; Hsu et al., 2015; Rice et al., 1999; Sykes & Venkatesh, 2009; Yen et al., 2015). From an organizational perspective, IS departments help business units meet their IT demands (Sambamurthy & Zmud, 2012). IS helping behaviours are exhibited by IS professionals in an IS department across an organization, and they help in a few ways: by offsetting the limited knowledge of individual users in using new applications, overcoming problems arising from missing data in software, and operating in tightly-controlled and integrated workflows imposed by IT systems (Deng & Wang, 2014). In addition to helping

behaviours directed at business users, these behaviours can also take the form of security behaviours within IS departments, when IS professionals share concerns on IS security (e.g., the importance of information leakage that might happen when IS users fail to log out after accessing their email accounts on public computers) among themselves, improving the effectiveness of IS security policies (Hsu et al., 2015).

IS helping behaviours are also termed customer-oriented organizational citizenship behaviours (COCBs) (Deng & Wang, 2014) and service-oriented organizational citizenship behaviours (SOCBs) (Yen et al., 2015). Both types of behaviours consider business employees as customers whom IS professionals provide with additional IT services. Customer-oriented OCBs (e.g., additional information that will be useful during a later time or providing personalized IS solutions), are directed by IS personnel towards business users to facilitate their learning processes on IS features embedded in IS systems, leading to achieving optimal values of systems (e.g., ERP system) (Deng & Wang, 2014). Also, IS helping behaviours directed at business employees assist them in performing a variety of tasks (e.g., informational and technical tasks), resolving system usage problems, developing solutions, and communicating the results, which result in user and system efficiency (Deng et al., 2015). Likewise, service-oriented citizenship behaviours performed by IS professionals refer to creating values for business employees by delivering high-quality IS services, such as handling unexpected trouble-shooting, periodic updates, or functionality refinements (Yen et al., 2015). Such IS helping behaviours are also exhibited by IS professionals within IS groups in which they can improve their technical and social skills by observing and interacting with their IS peers, resulting in effectively delivered IS services to business work groups.

Helping behaviour is not only limited to face-to-face encounters, but also includes online helping behaviours or the remote IT help desk (Wasko & Faraj, 2005).

2.2.1.1 Online Helping Behaviours

Information systems enable employees to use web-based technologies, which provide IS professionals with new avenues to help their peers in the business units. Examples of web-based technologies are bulletin boards, web communities, and knowledge management systems. The easy-to-escape situations in web-based technologies mean that helpers in online helping situations can decide to escape from giving help by logging off the system or turning off their computers. Online helping behaviour exchanged between users depends on the organizational climate, the help providers' personalities, and the reputational benefits of giving help (Lee & Lee, 2010). Constant et al. (1996) found out that IS professionals spent an average of nine minutes of their working time per day helping their peers or unknown employees by, for example, posting ideas or their prior experiences relevant to IT settings and IT configurations on bulletin boards. Likewise, Kim and Lee (2008) claimed that the use of blogging among IS professionals to help each other improve the cohesiveness of the IS group, and customer satisfaction.

Online helping behaviours are defined in a social network site (SNS) as SNS citizenship behaviours that improve the effective functioning of the SNS (Son, Lee, Cho, & Kim, 2016). SNS citizenship behaviours take the form of voluntary participations of SNS users in the form of altruistic behaviours that encourage the use of SNS among users by detracting from side effects of SNS, including personal information disclosure leading to privacy infringement, cyberbullying, and malicious comments (Son et al., 2016). Thus, SNS citizenship behaviours promote positive communication culture and encourage online users to undertake anti-cyberbullying campaigns and associated activities which lead to the effective online relationships between users and therefore the performance of online communities. These behaviours are also termed as online community citizenship behaviours (OCCBs) that comprise discretionary behaviours that positively impact on online communities in socially encouraging

and developing proper conducts as well as advancing online community norms (Joe & Lin, 2008). As IS professionals have little chance to be in face-to-face relationships with their peers because they are often self-organized, performing OCB activities through social network sites prompt them to get involved in organizational issues and decision-makings (Kim & Lee, 2008).

Online helping behaviours are also seen in virtual teams. Virtual users help their virtual teammates without expectation of return (altruism), and these helping behaviours are conscientiously exhibited in spite of virtual users' anticipation that there may be no return of given helps (civic virtue). Then, they tolerate the risk of no return (sportsmanship) and still tend to help their virtual teammates prevent a problem (courtesy). Furthermore, the accumulation of these behaviours results in virtual members' perceptions of a strong team cohesiveness within their virtual team as well as a strong relationship with their virtual team leader (Oh, Moon, Hahn, & Kim, 2016; Yu & Chu, 2007). IS professionals are also active in virtual teams. For example, IS professionals in virtual teams are satisfied with knowledge-sharing experiences when they are engaged in OCB activities to maintain healthy relationships with other peers (Chiu, Wang, & Fang, 2009).

2.2.1.2 IT Help Desk

The IT help desk, which can also be called the IT Service Desk or IT Call Centre, is a remote support service to assist non-IT employees with IT issues, such as desktop support, diagnosing network problems, or tracking job requests (Whalley, 2007). An IT helpdesk supports the achievement of individual-level outcomes such as user satisfaction, effectiveness, and efficiency (Beaudry & Pinsonneault, 2005; Tarafdar et al., 2011). An IT help desk is also used to facilitate system use processes for employees (Sykes & Venkatesh, 2009).

IS helpdesk professionals display OCBs when they assist their peers who call in beyond what is expected from them. For example, they answer the same questions asked by the same person several times a day or search for answers about ambiguities related to the adoption of a

new information system. Employees become more creative in their use of information systems after calling their IT help desk several times, and IT help desks played an important role in helping new employees adapt to the systems in use (Beaudry & Pinsonneault, 2005). Indeed, IS helping behaviours directed towards users by technical support staff working at a help desk influence the extent to which systems are used effectively. Considerable learning activities and effective IS systems use during post-implementation supports are viewed through interactions in which technical support staff (TSS) assigned to a help desk help IS users from different work units obtain and assimilate knowledge related to conceptual understanding and procedures to use the installed technical systems (Santhanam et al., 2007).

In non-IT customer support contexts, the display of OCBs by employees handling customer phone calls lowers service costs and increases customer satisfaction (Gray & Durcikova, 2006). In more details, employees, as technical support analysts in call centre environments, apply a body of knowledge beyond customers' expectations to provide them with assistance in solving problems with their organization's goods and services. In this context, OCBs are termed as customer orientation behaviours (COBs) directed by call centre employees at customers. Briefly, COBs exhibited by call centre employees are: emotionally supporting customers, providing customers with personalized information, anticipating customer requests, offering explanations and justifications, and educating customers (Rafaeli, Ziklik, & Doucet, 2008). In addition, Rafaeli et al. (2008) reported that customer calls lasted longer than a 3-min duration provide more occurrences of COBs and task efficiency than shorter calls. The results of these customer-oriented behaviours improve customer evaluations of service quality and promote the effective functioning of the organization. Knowledge-sharing behaviour is another form of OCBs exhibited between team members of IS groups to share knowledge in different contexts.

2.2.2 Knowledge-Sharing Behaviours

Knowledge is an individual's know-how or the possession of something helpful for solving problems, and knowledge sharing means providing or transferring one's knowledge to others (Bock, Zmud, Kim, & Lee, 2005), who could be non-IS employees within the organization or IS colleagues in one's team or different teams (Walz et al., 1993). Knowledge becomes valuable when it is shared between an IS function and its business peers to improve job performance (Kettinger et al., 2013). The extent of shared knowledge between IS and business units positively affects the performance of the IS unit (Nelson & Cooprider, 1996), customer service (Ray, Muhanna, & Barney, 2005), and project success (Tarafdar & Gordon, 2007). For example, the extent of knowledge sharing is an important determinant of an effective ERP implementation through successful interactions between IS and business units (Ko et al., 2005).

Sharing information through blogs and via helping makes IT workers in a team more cohesive and, more distally, improves customer satisfaction (Kim & Lee, 2008). Knowledge-sharing behaviours are critical for the viability and sustainability of virtual communities, where members are expected to contribute spontaneously to virtual communities by sharing knowledge without any expectations of return or reciprocation (Xu, Li, & Shao, 2012). For example, knowledge-sharing has been critical for the development of open source software (OSS) in online communities, through mechanisms such as the frequent communication of the required information and supporting informal learning (Iskoujina & Roberts, 2015).

In organizations, IS professionals share their know-how and know-why, and how to manage system-related problems with IS users (Santhanam et al., 2007). IS professionals share their knowledge partly because less expert IS users often search for informal sources when they are dissatisfied with formal sources (Rice et al., 1999), especially if there is a good fit between business and IS professionals in terms of attitudes, language, personality, or perceptions (Constant et al., 1994; Constant et al., 1996; Lee & Lee, 2010). Indeed, IS professionals

facilitate knowledge flow between IS and business units, supporting business units after systems implementation by sharing good technology use practices (Pawlowski & Robey, 2004), solutions (e.g., help files), and knowledge about problems arising from insufficient information and data (Deng & Wang, 2014). Informal training between unit members from the same or different work units facilitates the sharing of knowledge in the use of IT-enabled work systems (Jasperson et al., 2005).

2.2.2.1 Informal Training

The quality of knowledge of IS professionals is a key determinant of IS project success (Bassellier et al., 2001; Davis, 2003; Guillemette & Paré, 2012; Keil, Lee, & Deng, 2013). One way to improve IS professionals' knowledge is to train existing IS employees instead of recruiting new ones (Heckman, 1998; Teo & Ang, 2001). Besides technical skills, IS professionals also need to be familiar with the work of the various business departments in the organization they work in (Bassellier & Benbasat, 2004; Davis, Kettinger, & Kunev, 2009). Training is a method of sharing knowledge and expertise between team members and helps team members achieve their group goals and enhance their performance (Bapna, Langer, Mehra, Gopal, & Gupta, 2013; Bock et al., 2005). As formal training is costly, informal training, such as informal mentoring, can be used as an equivalent alternative (Reid, Allen, Riemenschneider, & Armstrong, 2008; Rice et al., 1999). In the IS context, peer mentoring refers to the matching of more experienced IS team members with less experienced IS team mates in a one-to-one relationship, so that the former can transfer their IT expertise to their junior colleagues (Bryant, Dan, & Thang, 2007; Messersmith, 2007; Rice et al., 1999). In relationships between IS professionals and their non-IS colleagues, IS professionals provide non-IS employees with hands-on training on technical features associated with reported problems and take the initiative to make sure that their non-IS colleagues correctly employ the appropriate technical practices (Deng et al., 2015).

2.2.2.2 Sharing Workarounds

Even though an organization's IT systems may not meet its users' needs, for example, by being unable to provide them the data they need, the organization may be unwilling to change its system because doing so is expensive. Workarounds to compensate for the lack of features and inefficiency of existing information systems can thus often be found in many organizations. Workarounds are an informal way of obtaining data and information from existing IT systems, for instance, by designing local or non-official databases (Petrides, McClelland, & Nodine, 2004). Workarounds are used to make existing IT systems workable, and individuals produce workarounds to customize IS systems in their own ways when IS designers have neglected to consider some aspects relevant to them (Orlikowski and Yates, 2006). Workarounds are a widespread post-implementation phenomenon that are valuable: employees configure their organization's IT resources based on their experiences to meet their needs, and often share them with their colleagues so as to enhance their productivity (Azad & King, 2008). IS professionals tailor workaround solutions of technical features, discussed as personalization-business OCB, and share them with IS users to effectively leverage their IS system to obtain the system efficiency (Deng et al., 2015).

2.2.3 Taking Initiative

Taking initiative was one of the seven aspects of OCB identified by Podsakoff et al. (2000), and it has been found in IS contexts too. For example, Walz et al. (1993) observed 19 meetings of a software design team over four months. At the meetings, only a few participants demonstrated certain prosocial behaviours, such as punctual attendance, taking initiative, paying attention to the broader scope of the project, and performing additional tasks outside their job scope, such as communicating with external experts. Had such behaviours been exhibited by everyone else, the software that was designed would have been more effective and might have met the customer's satisfaction.

Knowledge workers can be proactive and take steps to continually identify new work practices that may benefit their organization. For example, they can search for information that could help them create new ideas and knowledge (Dekas, Bauer, Welle, Kurkoski, & Sullivan, 2013). As organizations adopt more and more IT systems increasingly frequently, IS professionals need to be creative to help their users carry out the work they used to do in the old IT systems with the new systems. Ghosh (2011) related the experience of an IT service manager whose customers called his IT technicians to ask about information that was not stored in a new system. These requests led to the technicians learning the process for making new records, even though this task was not listed in their job description.

Initiative-taking behaviours are found when business employees lack knowledge (low user efficiency) and technical malfunctions occur (low system efficiency) (Deng et al., 2015). In such situations, IS professionals could take the initiative by anticipating the need for additional information, providing personalized information and hands-on walkthroughs on technical features (e.g., workarounds), and offering extra explanations on the origins of problems. Furthermore, these behaviours are also seen when IS professionals as boundary spanners initiate sharing best practices related to technology use with employees from different business work groups (Pawlowski and Robey 2004). Initiative-taking behaviours are also important during IS implementation projects, where IS professionals have to tolerate inconveniences and work turmoil without complaining and maintain a positive attitude, even when things related to the information system do not seem to meet the IS team's interest (Yen, Li, & Niehoff, 2008).

The preceding subsections explored IS-specific behaviours directed towards IS peers and business employees by IS professionals. IS helping and knowledge-sharing behaviours are examples of helping behaviours (e.g., altruism, courtesy, peacekeeping, and cheerleading), and initiative-taking behaviours are analogous to the civic virtue and sportsmanship aspects of

OCB. These examples of the behaviours that IS professionals carry out will help business employees have a better experience with the designed systems, delivered services, and share information, which lead to IS function effectiveness.

2.2.4 Summary

The previous three sub-sections have summarised the types of IS-specific OCBs found in the literature: helping, altruistic knowledge-sharing and initiative-taking. While individual aspects of OCBs within IS departments and between IS professionals and non-IS colleagues have been studied in the IS literature, little attempt has been made to place them within a broader, established framework so that they can be studied in a more integrated manner. Since they are examined in the non-IS context to positively affect the effectiveness of groups and organizations in the non-IS contexts, the next section focuses on investigating the impact of IS-specific OCBs on the IS department's effectiveness.

2.5 The Effectiveness of the IS Function

The term "IS function" refers to the organisational unit that is responsible for delivering IT-related services to an organisation. IS departments play a crucial role in designing and developing quality IS systems, providing high-quality IS-related information, and delivering quality of IS services across the organization. The wider diffusion of IS within organizations means that the IS function's effectiveness must be evaluated with a more business-oriented approach, instead of a technical approach, by considering stakeholders' views of the ability of the IS function to support them in carrying out their job (Davis, 2003; Ravichandran & Lertwongsatien, 2005). In this thesis, the effectiveness of the IS function refers to the *quality of the information, systems, and services that an IS department provides to its users*, which influences user satisfaction and then individual and organizational performance (Chang & King, 2005; DeLone & McLean, 2003; DeLone & McLean, 2013).

System quality considers the technical aspects of an information system and is characterized by the desirable characteristics of the information system itself that produces information, such as ease of use (Gable, Sedera, & Chan, 2008), ease of learning (Sedera & Gable, 2004), system reliability (Hamilton & Chervany, 1981), response time (Iivari, 2005), and system accessibility (McKinney, Kanghyun, & Zahedi, 2002). Information quality is the information product of an information system' output for desired characteristics, such as accuracy (Iivari, 2005), precision (Baily & Pearson, 1983), completeness (Iivari, 2005), understandability (McKinney et al., 2002), and relevance (Gable et al., 2008). DeLone and McLean (D&M) (1992) developed an IS success or effectiveness model that consists of a comprehensive taxonomy with six dimensions of IS effectiveness: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. The model emphasizes the quality of system and information and stakeholders' uses and feelings of satisfaction that result in individual impacts, such as users' job performance, and collectively these individual impacts lead to organizational impacts, such as organization performance. D&M'S IS effectiveness model suggests that the IS systems are first designed and developed by IS departments and include various features that exhibit a various degree of system and information quality. Then, after the IS systems are adopted in work environments, users and managers experience these various features by utilizing the systems and become either satisfied or dissatisfied with the quality of systems and their information products. Hence, utilizing IS systems' various features and information products impacts users in the conduct of their assigned tasks, thereby resulting in users' job performance and in a greater extent, organisational performance (DeLone & McLean, 1992; Petter, DeLone, & McLean, 2013).

A great number of IS researchers have conducted empirical studies on IS effectiveness and its impacts on users based on system and information quality. Users benefit from the quality of IS systems, in terms of their ease of use, functionality, reliability, flexibility, data quality,

portability, and integration, enabling them to perform their tasks effectively (Etezadi-Amoli & Farhoomand, 1996; Goodhue & Thompson, 1995; Laumer, Maier, & Weitzel, 2017; Nelson, Todd, & Wixom, 2005; Teo & Wong, 1998; Wixom & Watson, 2001). Also, information quality, characterized as the accuracy, timeliness, completeness, relevance, and consistency of information, enhances users' decision-making performance, job effectiveness, and work quality (Etezadi-Amoli & Farhoomand, 1996; Laumer et al., 2017; Nelson et al., 2005; Seddon, 1997; Teo & Wong, 1998; Wixom & Watson, 2001).

Davis (1985) suggested that the effectiveness of an IS function or department is reflected in increased use and user satisfaction through the details of problem solving process, the quality of service, and the attributes of information. Consequently, the model of D&M has been extended to take service quality into account for evaluating the effectiveness of the IS function when contributing to the effectiveness of business units (DeLone & McLean, 2003; Petter & McLean, 2009; Urbach & Müller, 2012; Urbach, Smolnik, & Riempp, 2009). Service quality is the quality of support that users receive from IS departments, IS teams, and IS professionals (Petter, DeLone, & McLean, 2008). Examples of service quality, measured in some empirical studies, are: tangible services (e.g., IS has up-to-date hardware and software) (Pitt, Watson, & Kaven, 1995), reliability (e.g., IS is dependable) (Pitt, Watson, & Kaven, 1995; Laumer, Maier & Weitzel, 2017), responsiveness (e.g., IS professionals give prompt service to users) (Chang & King, 2005; Laumer et al., 2017), assurance (e.g., IS professionals possess the knowledge to do their job well) (Pitt et al., 1995), and empathy (e.g., IS has users' best interests at heart) (Kettinger, Lee, & Lee, 1995; Petter & McLean, 2009; Pitt et al., 1995). Interestingly, DeLone and McLean (2003) stated that compared to other two determinants, including system quality and information quality, service quality is the most important one for evaluating an IS department's effectiveness. The reason is that the first two determinants of IS function effectiveness are focused more on products of IS functions rather than services they

represent. In other words, IS services provided by IS professionals change business employees' perceptions of their new-adopted or current IS systems and information that these systems produce. This change in perceptions prompts business employees to view their IS systems as being easy to use or useful as well as to assess information produced by their IS systems as being accurate or consistent. As a result of systems being maintained, information being produced, and IS services being delivered from an IS department to business work groups, business employees become more reliant on their IS department or more satisfied with their IS department's level of effectiveness, leading to their enhanced job performance (Petter et al., 2013) or deeper-level use of an IS system to complete their assigned tasks (Yen et al., 2015).

Some IS researchers have applied the model of D&M to propose their own model in evaluating IS function effectiveness based on IS function's three major dimensions: system, information, and service. Chang and King (2005) have suggested an information systems functional scorecard (ISFS) to assess the effectiveness of the IS function by evaluating the quality of IS service, information, and system. They have defined IS function effectiveness as subject to effectiveness of system, information and service quality provided by IS professionals, IS units, or IS departments within organizations.

To date, a great number of studies have elaborated how IS departments, groups, or professionals provide business units with system, information, and service quality across the organization. For example, IS departments develop IS systems, deliver IT services to business departments, and help them with IT skills and specificity in maintaining effective relationships with business employees, leading to improved competitive advantage and business performance (Ravichandran & Lertwongsatien, 2005). IS departments are valuable sources of IS-related knowledge and resourceful providers of IS expertise that business units use to meet their IS requirements (Sambamurthy & Zmud, 2012). Indeed, IS professionals working at different levels of IS departments are in a supportive relationship with non-IS employees and

provide them with IS services, such as IT remote support, troubleshooting, training, and voluntary handholding (Beaudry & Pinsonneault, 2005; Tarafdar & Gordon, 2007; Tarafdar et al., 2011).

IS departments assist business units in a variety of service roles, such as business analysts, project managers, customer service lines, and top managers. More specifically, IS units interact with business units in organizations to analyse unstructured data, manage projects, and plan whether and when new developments can be applied in hardware and software (Brown, 1999). Consequently, the quality of service, information and system that IS units provide to business units determines the effectiveness of the IS department (Pitt et al., 1995). For example, IS departments are seen as effective if they develop or deploy easy-to-use and useful information systems for business units, as well as provide training and advice on equipment purchases. Therefore, the extent of IS-related knowledge that IS professionals share with non-IS employees, the extent of various information products, e.g., interpretable, understandable, or secure information, that IS systems produce for business units, and the extent of usability aspects and performance characteristics that IS systems have, are determinants of IS department effectiveness (Chang & King, 2005; Ray et al., 2005).

Importantly, the quality of system, information, and services is influenced by the voluntary behaviours exhibited by IS professionals in internal IS departments (Yen et al., 2015), which are termed here as IS-specific OCBs. For example, IS helping behaviours can take the form of security behaviours within IS departments, when IS professionals share concerns on IS security among themselves, improving the effectiveness of IS security policies (Hsu et al., 2015). Different IS-specific OCBs, such as voluntarily leading and scheduling IS project meetings (Curtis et al., 1988; Walz et al., 1993), spontaneous handholding, and information-sharing (Jasperson et al., 2005), have also been found to lead to greater technology

use among IS users. However, the effect of such behaviours on the quality of system, information, service has been overlooked in evaluating IS department effectiveness.

2.5.1 OCB and IS Function Effectiveness

Building on OCB theory and its dimensions, IS researchers have examined the impact of Organ's five dimensions of OCB on the effectiveness of an IS system and found out that these behaviours play an important role in IS users' evaluation of the benefits of an ERP system (e.g., the quality of system and information produced) (Narimani, Tabaeian, Khanjani, & Soltani, 2013). Likewise, Yen et al. (2008) explored the determinants of system and information quality that would affect information system effectiveness during the IS implementation process and provided empirical support for a significant link between OCBs and information system effectiveness. They pointed out that IS professionals in the implementation team actively and voluntarily help IS users with work-related problems, assist them to prevent the occurrence of problems associated with the new system, and communicate and coordinate with IS users to effectively adapt the new system during the IS system implementation process. In explaining the process of pre-and post-IS implementation, IS researchers have investigated that taking-initiative behaviours, such as initiating informal trainings for business employees about features and functions of the system, displayed by IS professionals across the organization cause an improved IS system efficiency (Deng & Wang, 2014). Yoon (2009) used the same OCB dimensions to evaluate an ERP system effectiveness in which IS users believed that the ERP system provides them with relevant, usable, and important information. However, most studies have focused on the impact of OCBs on IS users' system evaluations and information produced by them, and the effect of these behaviours on IS services directed by IS professionals from IS units at business employees have still remained unexplored. IS personnel display IS-specific OCBs, such as service-oriented organizational citizenship behaviours (SOCBs) (Yen et al., 2015) or customer-oriented organizational citizenship behaviours (COCBs) (Deng &

Wang 2014; Deng et al., 2015) to provide business employees with system-related problems and information needs that lead to business employees' acknowledgment of various features of the system and the quality of information the system produces.

These behaviours are seen to occur between IS professionals and their non-IS colleagues and between IS professionals and their IS colleagues (Yen et al., 2015; Hsu et al., 2015). When IS professionals interact with business employees, business employees become exposed to cues and converge in the same level of perceptions of their IS professionals towards the quality of system and information. Thus, business employees who interact with IS professionals will be able to develop shared perceptions and expectations of their own service behaviours and outcomes. Indeed, business employees model IS-specific OCBs vicariously and adopt and sustain such behaviours if they meet their expectations regarding the likely outcomes (Yen et al., 2015). Consequently, when these behaviours become more pervasive in work environment, business employees learn how to use various features and to extract required information from their systems (Compeau & Higgins, 1995). Similar learning process can take place within IS departments when IS professionals interact with their colleagues in the same IS unit to catch up with cues and perceptions of experienced IS professionals, which result in high-quality IS services delivered to business work units. For example, IS professionals, who exhibit behaviours such as making innovative suggestions, training other colleagues regarding the importance of information leakage that might happen when they fail to log out after accessing their email accounts on public computers, or helping other employees in the work group learn about security policies, improve overall effective security within IS departments (Hsu et al., 2015). As a result of previous discussions, IS-specific OCBs displayed by IS professionals through social interaction with their IS peers and non-IS colleagues can lead to the effectiveness of IS system, information, service, resulting in the effectiveness of IS departments.

2.5.2 Summary

The previous section has focused on the IS department effectiveness and its determinants, including the quality of IS system, IS information, and IS service. Following that, the critical role of IS-specific citizenship behaviours, such as voluntarily leading and scheduling IS project meetings, spontaneous handholding, information-sharing, and IS helping behaviours, within IS professionals in the IS department and between IS professionals and their non-IS colleagues from different units on the quality of IS system, IS information, and IS service has been identified. Also, this section has concluded with a discussion of how interactions between IS professionals and their IS peers influence IS department's effectiveness.

Since OCBs are known to have positive consequences for IS departments and organizations, it is worth understanding the factors that promote or hinder their occurrence. Social exchange theory (SET), the underlying basis for the concept of organizational citizenship behaviour (OCB), provides a rich source for identifying these factors. SET refers to the exchange of resources to build relationships, sometimes out of self-interest and at other times as a reciprocal exercise (Mitchell, Cropanzano, & Quisenberry, 2012), as a reaction to positive treatment at work (Spitzmuller, van Dyne, & Ilies, 2008). Engaging in such exchanges requires valued resources to be available to each party, and a minimization of constraints that could restrict the project. Social exchanges are context-dependent, shaped by aspects such as the ambiguity of the issue at the core of the relationship and the use of technology, and the context can both encourage and limit social exchanges (Grodal, Nelson, & Siino, 2014).

IS departments usually consist of a collection of teams handling different aspects of an organization's information systems, as well as project teams that also include representatives from various business units (Agarwal & Sambamurthy, 2002; Chang & King, 2005; Curtis, Krasner, & Iscoe, 1988; Davis, Kettinger, & Kunev, 2009). These features highlight the key role of interpersonal relationships in the context of IS work in organizations. Since prior

research has found that the quality of such relationships is a key predictor of human behaviour (Ilies, Nahrgang, & Morgeson, 2007; Liao & Liu, 2010; Nahrgang, Morgeson, & Ilies, 2009), this study examines the role played by the relationships between IS managers and IS professionals, and among IS professionals, in promoting the growth of IS-specific OCBs.

Constraints on OCBs are often context-specific, and include task characteristics such as task routinization, job autonomy, job satisfaction and task interdependence (Spitzmuller, van Dyne, & Ilies, 2008). A well-known aspect of IS work is the high level of exhaustion experienced by many IS professionals (Tarafdar et al., 2011). IS professionals who suffer such exhaustion will find it difficult to offer the resources required to fulfil their social exchange obligations. This study thus investigates how this factor constrains the occurrence of IS-specific OCBs.

The next section reviews the literature on interpersonal relationships in information systems departments, and relates it to two concepts from the management literature, leader-member exchange (LMX) and team-member exchange (TMX). Following that, the context in which IS work takes place is discussed, specifically focusing on the contextual pressures faced by IS professionals.

2.6 Relationships within IS units

IS professionals exchange tangible and intangible IS resources in their relationships with their IS peers. Tangible resources include IT applications, such as software, while intangible resources comprise tacit knowledge, such as skills relating to the management, support and development of hardware, software, databases, applications, and networks (Constant et al., 1994). The importance of hard and soft skills has been emphasized within IS project teams, as they affect team outcomes (Joseph et al., 2010; Sawyer, Eschenfelder, Diekema, & McClure, 1996; Teo & Ang, 2001). For example, the quality of the communication and interpersonal

skills in software development teams are reflected in the success of the software project (Curtis et al., 1988; Sawyer, 2004).

IS skills are inputs for IS project teams and need to be coordinated between members (Faraj & Sproull, 2000). Faraj and Sambamurthy (2006) in a study of 69 software development teams found that software project teams, like other knowledge teams, are characterized by distributed expertise, a high level of collaboration, and the need to meet the expectations of a diverse set of stakeholders. They point out that programmers in teams with more authority need effective communications if they are under lower conditions of high task uncertainty. They also suggest that software project teams need effective communications between software leaders and their programmers when the team is under high task uncertainty.

The relationship between IS leaders and their staff influences IS departments' outcomes. According to Sambamurthy and Zmud (2012), the IS department can be seen as a unique project team acting with IT service providers to meet an organization's global objectives, or it can be composed of multiple IT project teams with more authority to meet local objectives. Relationships between senior IS managers, such as the Chief Information Officer (CIO) and the Chief Technology Officer (CTO), and IS professionals, differ across different structures of IT centrality. For example, decentralized IS departments influence how the IS demands of their unit are met. CIOs discuss leadership training, mentoring, social skills and effective interpersonal communication, IS requirements and non-IS issues (e.g., flexibility in IS professionals' contracts) with their staff to improve the IS department's efficiency and effectiveness (Chou, Jiang, Klein, & Chou, 2011; Reid et al., 2008). Leaders and members, and among team members, enhance team and organizational outcomes as the result of creative-related behaviours among team members or positive behaviours (e.g., sharing knowledge) across the organization (Atwater & Carmeli, 2009; Lavelle et al., 2007; Martinaityte & Sacramento, 2013; Paré, Tremblay, & Montréal, 2007).

Despite their importance, little research has been carried out on how relationships among IS professionals or between IS managers and IS professionals can be improved. Most existing studies focus on improving relationships between IS and business units (Bassellier et al., 2001; Bassellier & Benbasat., 2004; Chan & Reich, 2007; Nelson & Cooprider, 1996; Reich & Benbasat, 1996, 2000), ignoring relationships within IS departments. Some researchers have found that individual attributes and behaviours influence IS department outcomes, such as IS project success. For example, emotional expressions or positive and negative politeness tactics (e.g., bonding people together, reducing threats to face by respecting others' autonomy and keeping other from getting too close) are known to affect software development teams (Wei, Crowston, Li, & Heckman, 2014).

In the next section, the theories of Leader-Member Exchange (LMX) and Team-Member Exchange (TMX) are used to examine the factors that affect the quality of relationships within the IS department.

2.6.1 Overview of Leader-Member Exchange (LMX) and Team-Member Exchange (TMX)

2.6.1.1 Leader-Member Exchange (LMX)

Leaders and members in teams mutually exchange respect, loyalty, understanding, trust, expertise, technical skills, and support to improve team performance (Scandura, Graen, & Novak, 1986; Uhl-Bien & Graen, 1992). LMX differs from economic exchanges, which are limited to agreements on employment contracts, and is akin to social exchanges characterized by a high degree of mutual trust, respect, and understanding (Carter, Armenakis, Feild, & Mossholder, 2013; Graen & Uhl-Bien, 1995). High-quality LMX occurs when there is frequent communication between members and their leader to support each other's actions (Sin, Nahrgang, & Morgeson, 2009). Attributes of leaders and members, such as conscientiousness (Ilies et al., 2007), affect the quality of LMX as well. The quality of LMX within teams is

positively related to the level of team cohesiveness and work team cooperation. Group members and leaders who work together and cooperate on tasks influence team performance and effectiveness positively (Cogliser & Schriesheim, 2000; Uhl-Bien & Graen, 1992). The consequences of the effect of LMX include job satisfaction, commitment (Cogliser, Schriesheim, Scandura, & Gardner, 2009; Yammarino, 1992), and organizational citizenship behaviour (Atwater & Carmeli, 2009; Henderson, Wayne, Shore, Bommer, & Tetrick, 2008).

Since leaders may not be able to lead every employee in terms of expertise and technical supervision, this lack of support is offset by within-team interaction (Uhl-Bien & Graen, 1992). In a team-oriented system, team members are more autonomously managed by their team-work, and the quality of interaction within teams is more than the traditional approach between members and leaders.

2.6.1.2 Team-Member Exchange (TMX)

Team-Member Exchange (TMX) describes the quality of exchange activities between team members, which comes from the quality of team members' engagement in additional reciprocal behaviour. Since leaders may not be able to lead every employee in terms of expertise and technical supervision, this lack of supports is offset by within-team interaction (Uhl-Bien & Graen, 1992). The quality of within-team interaction is based on the level of cooperation, team work, and coordination among co-workers within a team, and affects the level of productivity and effectiveness of the team (Seers, 1989). The development of TMX relationships is a result of the characteristics, behaviours, and exchanges between team members (Seers, Petty, & Cashman, 1995).

High-quality TMX relationships prevent abusive behaviours, such as withholding important information from co-workers or mocking co-workers' abilities in front of others (Harris, Harvey, & Booth, 2010). Also, high-quality TMX relationships are based on the reciprocity of trust, knowledge and feedback between team members. In high-quality TMX,

members are likely to assist their co-workers, share ideas, provide feedback, and have an open communication style handling conflicts in a constructive manner. High-quality TMX occurs when team members assist their co-workers with ideas, feedback, and trust, and in turn, their colleagues return favours to them as information, assistance, and recognition (Seers, 1989; Seers et al., 1995).

Members with high-quality TMX experience greater team cohesiveness and a higher chance of participating in team decision-making than team members who were traditionally directed by a supervisor (Seers et al., 1995). High-quality TMX has been found to have a significant impact on individual-and-team outcomes, such as job satisfaction, commitment, the manifestation of organizational citizenship behaviours, and performance (Banks, Batchelor, Seers, O'Boyle, Pollack, Gower, 2014; Wech, 2003).

2.6.1.3 Consequences of the Quality of TMX and LMX

Teams with high-quality TMX reflect team members' perceptions of reliable and congenial relationships with teammates, prompting them to enjoy working with each other. Therefore, through emotional contagion, positive emotions make team members feel more satisfied (Banks et al., 2014; Tse & Dasborough, 2008). High levels of TMX improve team members' perception of job satisfaction and support psychological attachments in the work setting: through strong interpersonal relationships, team members support and assist each other, leading to group members' commitment to the team or organization (Bank et al., 2013). As a result of the relationships built based on exchanging trust, emotion, and help, team members are also likely to exchange information and resources to improve the skills of other team members, which improve a higher level of group members' job performance (Banks et al., 2014; Wech, 2003).

The relationship between team member exchange (TMX) and OCB through commitment and satisfaction has been well-studied. Group members, who are individually or

organizationally committed or satisfied, show valuable behaviours such as helping groupmates to complete their tasks (Podsakoff et al., 2000). In addition, members with high TMX are most likely to engage in OCBs, such as taking charge or change-oriented improvement (Love & Dustin, 2013) because of instrumental along with socio-emotional resources provided by group members (Anand, Vidyarthi, Liden, & Rousseau, 2010).

The relationships between high levels of LMX and job-related outcomes have also been examined. The reasons of these relationships are that leaders hold the unique power to punish or reward subordinates, and have access to specific resources, information, and opportunities necessary for job satisfaction, commitment, and performance (Banks et al 2014; Harris, Wheeler, & Kacmar, 2009). The impacts of high-quality LMX are not only limited to job attitudes, but also other outcomes. For example, given resources and opportunities make subordinates feel trusted and experience a strong sense of advocacy and liking from their leaders, which stimulate subordinates to display creative behaviours, and then job performance (Martinaityte & Sacramento, 2013).

Due to the reasons discussed, researchers have found LMX to be one of the strongest predictors of OCBs (Podsakoff et al., 2000; Walumbwa, Cropanzano, & Goldman, 2011). Lavelle and his colleagues (2007) suggest that sources of justice in the organization reach OCB by LMX and TMX. It means that team members commit to their teams by exchanging support and trust with members, which leads to OCB engagements. In addition, the same scenario is between leaders and members in which members committed to their leaders exchange support and trust with their leaders, leading to OCB engagements. However, engaging in OCBs is not possible if members do not have strong social interactions with their mates and leaders (Banks et al., 2014).

2.6.2 Determinants of LMX

Uhl-Bien (2006) stated that leadership is relational, and cannot be captured by examining individual attributes alone. This means that the behaviours of both the leader and members play an important role in reaching a high quality of leader and member relationships (high LMX). For example, conscientious leaders and members have a positive effect on LMX (Ilies et al., 2007). A meta-analysis of the antecedents and consequences of leader-member exchange conducted by Dulebohn, Bommer, Liden, Brouer, and Ferris (2011), which covered 247 studies, containing 290 samples and 21 antecedents and 16 consequences of LMX quality, revealed that members' personality (e.g., conscientiousness, extraversion, positive activity) and leaders' behaviours (e.g., transformational leadership) are positively related to LMX consequences (e.g., OCB) through the quality of LMX. Likewise, Nahrgang et al. (2009) report that agreeable and extravert leaders initiate social relationships with members who in turn respond to leaders with the same behaviours. It is important to note that high-quality LMX occurs because of a match of behaviours and attributes between both leaders and members.

2.6.2.1 Transformative Leadership

Transformative leadership involves behaviours, such as articulating and modelling an appealing vision, encouraging the acceptance of group goals, and providing individual support, intellectual stimulation and high performance expectation (Dulebohn et al., 2011). Transformative leaders transmit to employees a strong vision of the growth opportunities and encourage them to think critically when creativity is needed to appear. Indeed, a leader's transformative behaviours send out a signal to members that their leader is willing to put extra effort into relationships, which in turn members are likely to reciprocate by providing more to the relationships with their leaders than is expected. This leads to an expectation that OCB will occur among members (Cropanzano & Mitchell, 2005).

Transformative leadership refers to a leader moving followers beyond their immediate self-interest through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration (Bass, 1999). Idealized influence and inspirational leadership are exhibited when the leader imagines a desirable future and fantasize how it can be achievable by setting standards of performance and showing determination and confidence. Intellectual stimulation is displayed when the leader helps members to become more innovative and creative. Individualized consideration is displayed when the leader pays attention to members' developmental needs and supports and coaches them to reach a maximum of the growth. Gilmore, Hu, Wei, Tetrick, and Zaccaro (2013) use the definition and dimensions of transformational leadership presented by Bass (1999) and find that followers exposed to a transformative leadership style improve their performance and carry out OCBs. However, transformative behaviours from a leader cannot be expected to affect members if a high quality of LMX does not exist (Carter et al., 2013). Researchers found out that high-quality relationships between transformative leaders and their members positively lead to employees' job performance and OCB (Howell & Hall-Merenda, 1999). The interpretation is that leaders with transformative behaviours work closely with members and set frequent two-way communications and strong ties to better coach and guide them. The ties comprise mutual trust, obligation, respect, and interpersonal support (Sun, Aryee, & Law 2007; Graen & Uhl-Bien, 1995). Therefore, leaders and members involved in high-quality relationships perform at higher levels and engage in OCBs (Cropsnzanao & Mitchell 2005). Previous studies support this idea that transformative leadership style in high-quality LMX relationships enhance employees' OCB engagement and task performance (Carter et al., 2013; Wang, Wang, Law, Hackett, & Chen, 2005).

A CIO with a transformational leadership style is one focused on leading the organization to explore new IT-driven business opportunities that will lead to organizational

innovations and business growth (Broadbent & Kitzis, 2004; Chen, Preston, & Xia, 2010). This is an example of a CIO with "demand-side" leadership, focusing on partnering externally with business to innovate and change the business, compared to CIOs who are "supply-side" leaders, and focus internally on managing the IT function to deliver cost-effective IT support to the business. Demand-side leadership focuses on the exploration, not exploitation, of capabilities (Levinthal & March, 1993; March, 1991) and describes the effort of a CIO who influences IS professionals by arousing strong emotions and identification and empowering them to add values to the organization (Bass, 1985; Rowe, 2001). The latter's IT contribution of CIO's demand-side leadership to business is defined to ensure strategic growth, such as return on investment, sales revenue increase and market share growth, whereas CIO's supply-side leadership contributes more on firm efficacy, including cost savings, operation efficiency, and process improvement (Tallon, Kraemer, & Gurbaxani, 2000). CIOs with this style set effective communication and coordination within IS teams, recognize technical and non-technical skills of IS professionals, and encourage them to participate in creating new strategic opportunities and business innovations (Chen et al., 2010).

As previously discussed, the personalities of both members and leaders are important and high-quality LMX needs both (Dulebohn et al., 2011; Uhl-Bien, 2006). Therefore, moving on from transformative leadership, the next section considers how the personality attributes of IS professionals affect the quality of LMX.

2.6.2.2 Personality Attributes of Team Members

Various dispositional factors, such as conscientiousness, extraversion, proactivity, and positive affectivity, of team members in relationships with their teammates as well as their leaders are identified. These dispositional factors indirectly contribute to the occurrence of OCBs through relationships between team members and between members and their leader, rather than directly lead to OCBs (Podsakoff et al., 2000; Dulebohn et al., 2011). In the next

sub sections, of the team members' personalities or traits that have been examined in previous research, conscientiousness, extraversion, proactivity, and positive affectivity are discussed due to they have a more significant influence on the emergence of the different types of OCB (Barrick, Stewart, Neubert, & Mount, 1998; Barry & Stewart, 1997; Motowidlo et al., 1997; Podsakoff et al., 2000; Smith et al., 1983).

2.6.2.2.1 Conscientiousness

Conscientiousness refers to an individual's personality attributes of impulse control, conformity, and determination (Costa & McCrae, 1992). They argued that the extent of conscientiousness differs among individuals with regards to dependency, reliability, and self-control. Individuals who are high in conscientiousness tend to obey rules, conform to norms, and likely to be responsible and scrupulous. A meta-analytic study found out a moderately strong, positive relationship between the quality of LMX and the occurrence of organizational citizenship behaviours (Ilies et al., 2007). The study also pointed out that certain personality traits (e.g., conscientiousness) are more strongly related to OCB in the presence of a high quality of relationships between leaders and members. In a majority of studies evaluating outcomes of different personalities, conscientiousness is presented as the most reliable and strongest predictor of a team' outcomes (e.g., team performance) in which team members with conscientiousness personality are highly acknowledged by their leader (Barrick et al., 1998; Nahrgang et al., 2009). Conscientious members are able to build a high-quality relationship with their leader that contributes to behavioural outcomes, such as OCBs, attitudinal outcomes, such as satisfaction with leader and job, and organizational commitment.

2.6.2.2.2 Extraversion

Extraversion is the only personality trait that has been consistently and positively related to OCBs in most studies (Vadera, Pratt, & Mishra, 2013). Extraverts are sociable, enthusiastic,

energetic, gregarious, assertive, talkative, and active, and highly able to positively affect group outcomes, such as group performance (Barrick & Mount, 1991; Barry & Stewart, 1997). Members with extraversion personality always express and share their thoughts, stimulate discussion, and have high performance expectations.

Researchers believe that extraversion is positively related to OCB dimensions (e.g., voice) (Crant, Kim, & Wang, 2011; LePine & Van Dyne, 2001). They have also stated that extraverts are more comfortable and skilful to communicate their thoughts, and are more willing to express change-oriented opinions. This is because members with extraversion are more likely to positively respond to interactions with their leaders or more likely to initiate the quality of relationships with their leaders (Nahrgang et al., 2009), thus leading to the occurrence of OCBs within a team (Dulebohn et al., 2011).

2.6.2.2.3 Proactivity

Proactivity refers to taking initiative to influence one's environment and has received considerable attention in previous research (Bateman & Crant, 1993; Crant, 2000). Proactive members take initiative in challenging their current situations and creating new ones rather than accommodating themselves to present conditions (Crant, 2000). Furthermore, members with proactive behaviours are able at anticipating actions that impact themselves and their environments (Crant & Ashford, 2008). Members who are proactive can create and manage relationships, which eventually result in positive work attitudes and behaviours, such as being interested in understanding organizational policies, generating new ideas for improving work processes, and upskilling themselves to learn new skills (Seibert, Kraimer, & Crant, 2001).

Cropanzano and Mitchell (2005) pointed out that positive transaction processes build and maintain predictable, reciprocating systems of relationship. Therefore, a proactive personality demonstrates a willingness to get involved and take initiative to identify and make

contributions (Crant, 2000). Because of that, a proactive personality is associated with employees establishing a high-quality relationship with their leaders. In turn, the quality of these relationships will result in more OCB (Li, Liang, & Crant, 2010). Thus, proactivity creates favourable situations conducive to job satisfaction, organizational commitment, OCBs, and work performance through high-level relationships between members and their leaders (Dulebohn et al., 2011).

2.6.2.2.4 Positive Affectivity

Positive affectivity refers to an employee's relatively receptivity to positive environmental stimuli and experience of positive feelings (Watson & Clark, 1992) and positively influences the quality of leader-member relationships. Positive affectivity encompasses attributes that include enthusiasm, alertness, and joviality, and members with positive affectivity are likely to feel that they have the time, emotional energy, or abilities to engage in OCBs (George, 1990; Kaplan, Bradley, Luchman, & Haynes, 2009; Podsakoff et al., 2000). Members who are higher in positivity affectivity are characterized as "*individuals who tend to be cheerful and energetic, and who experience positive moods, such as pleasure and well-being, across a variety of situations as compared to people who tend to be low energy and sluggish or melancholy*" (Barsade & Gibson, 2007, pp.38). A study of 212 employees and their supervisors found that followers with positive affectivity tend to interpret environmental stimuli, including their leader's leadership style and relationships they have with their leader, in positive ways (e.g., happily, cheerfully, and enthusiastically), which lead to a higher performance and OCB (Gilmore et al., 2013). However, not only are these dispositional characteristics determinant for OCBs through the quality of relationships members have with their leader but also through the quality of relationships members have with each other within a team.

2.6.3 Determinants of TMX

TMX relationships have been studied as the consequences of the interaction of characteristics, behaviours, and exchanges within teams (Seers et al., 1995). Unfortunately, there is little research on TMX and its determinants, such as personality differences or similarities within teams. Thus, the following discussion examines the effect of different personality attributes on a corollary of TMX: individual citizenship behaviours within teams. A team consists of its members' perceptions, cognitions, behaviours, and attitudes (Klein & Kozlowski, 2000). Helping behaviours exchanged between members help teams achieve team goals. Moreover, helping behaviours make it possible for a team to perform better than those teams in which members are working on tasks alone (Porter, 2005). Porter et al. (2003) mentioned that the personalities of team members can positively affect the level of helping behaviours in a team.

Personality attributes, such as conscientiousness, extraversion, emotional stability, and agreeableness, may cause an increase in helping behaviours within team members and then positively affect team outcomes, such as team effectiveness (Barrick et al., 1998). A study conducted by Barry and Stewart (1997) explains that the personalities of team members are positively related to the exchange of helping or loyalty behaviours, thereby resulting in team effectiveness, task accomplishment, and performance. For example, members who are conscientious, extrovert, emotionally stable, and agreeable are highly likely to help their team-mates by sharing their workload or by putting extra effort into task completion (Barrick et al., 1998; Podsakoff et al., 1997).

A review of the IS literature on individual differences within IS teams reveals that most studies have been limited to IS professionals' team-working technical or non-technical skills (Sawyer, 2004) or hard and soft skills (the levels of effective communication or interpersonal skills) (Joseph et al., 2010; Lee & Pai, 2003; Sawyer et al., 1998; Teo & Ang, 2001), with personality traits being less discussed.

2.6.3.1 IS professionals' personalities

A research on IS professionals' personality traits, such as extraversion, conscientiousness, assertiveness, emotional resilience, openness, teamwork disposition, customer service orientation, optimism and work drive, and their effects on job and career satisfaction has been conducted over 1059 IS professionals (Lounsbury, Moffitt, Gibson, Drost, & Stevens, 2007). The results illustrate that IS professionals who are extroverts, sociable, outgoing, gregarious, expressive, warm-hearted, and talkative, have a high level of job and career satisfaction. Furthermore, IS extroverts, who participate regularly in group discussions, interact with other members on requirements in IS projects, and facilitate sharing knowledge within an IS team. Depending on the extent of extraversion among IS professionals, they tend to spend longer hours working on IS projects and make relationships with other members in IS teams (Institute for Management Excellence 2006; Lounsbury et al., 2007).

Although the findings do not support the relationship between conscientiousness and career and job satisfaction, conscientious IS professionals who are dependable, reliable, and trustworthy, adhere to company norms, rules, and values, and are inclined to make relationships with their peers and leader (Caligiuri, 2000; Lounsbury et al., 2007; Witt, Burke, Barrick, & Mount, 2002). Moore (1991) conducted a research on IS professionals' different personality traits with different IS professionals: application programmers, application systems analysts, technical programmers, and data processing managers. Application programmers, who are more sociable than technical programmers and systems analysts, are aware of motives and actions within the work environment. They are content with what comes and spend more time in their workplace. Data processing managers who are laxer and more impulsive, assertive, and competitive, are less concerned with social rules but capable of abstract thinking. Caligiuri (2000) has also acknowledged extraversion and conscientiousness personality traits among IS professionals and found out that IS professionals with extraversion establish their social

networks, which affect their task performance and organizational socialization. Besides, IS leaders recognize conscientious IS professionals to be hardworking, responsible and persistent to accomplish their assigned assignments.

To date, in the IS context, few empirical studies have examined the significant role of IS professionals' personality traits when studying the quality of relationships between IS professionals with themselves and their leaders within IS teams, and in determining the occurrence of OCBs arisen from the quality of such relationships.

2.6.4 Summary

The preceding discussion has examined the factors that support the occurrence of OCBs. Drawing on social exchange theory, two types of interpersonal relationships were examined: between leaders and their staff, and among members of a department or team. Next, the predictors of these relationships were studied, with a focus on personality attributes. Thus, the discussion so far has looked at team and individual attributes that may promote the occurrence of OCBs in an IS context. The following section investigates contextual issues that may restrict the display of such behaviours. Specifically, the nature of IS work may prevent IS professionals from engaging in OCBs (Moore & Love, 2005), because the level of work exhaustion or job burnout is higher in IT departments compared to other departments (Tarafdar et al., 2011).

2.7 Job Burnout Theory

Pines, Aronson, & Kafry (1981) define job burnout as physical, emotional, and mental exhaustion characterized by physical depletion, feelings of helplessness and hopelessness, emotional drain, and the development of negative self-concept and attitudes toward work, life, and people. Burnout is defined as a state of physical, emotional, and mental exhaustion, resulted from long-term working relationship with people and caused by long-term involvement in demanding situations. Despite having support in demanding situations where

workers feel appreciated, job burnout's drivers are beyond workers' control, such as a lack of autonomy, lack of adequate rewards, and workload, which then lead to work stresses (Pines & Aronson, 1983).

Job burnout has been discussed in several occupations, for example health care or social services, to study emotional or physical exhaustion within professionals, such as physicians, technologists, social service workers, and teachers (Kilpatrick, 1989; Leiter, & Schaufeli, 1996). The Maslach Burnout Inventory (MBI) is an instrument designed to assess experienced burnout in a wide range of human service worker and considers psychological syndrome of emotional exhaustion, reduced personal accomplishment, and depersonalization (negative, callous, or excessively detached behaviours toward others) (Maslach & Jackson, 1981). Indeed, other than Pines (1981, 1983), almost all work exhaustion research has made use of the MBI and has emphasized emotional exhaustion in human service work (Maslach & Goldberg, 1998; Schaufeli, Leiter, & Maslach, 2009).

Early research on work exhaustion has empirically and conceptually developed the personal and situational contributing factors in Maslach and Jackson's model to propose approaches how to cope with it, prevent it, or combat it (Leiter & Schaufeli, 1996; Maslach & Goldberg, 1998; Maslach, Schaufeli, & Leiter, 2001). Exhaustion research has been grounded in workers' experiences in workplaces (personal) and has led to a deep understanding of the environmental context of exhaustion (situational) (Maslach, 2003). The new models inspired by Maslach's model comprise three dimensions of job burnout including an overwhelming exhaustion, feelings of cynicism (detachment from the job), and diminished professional self-efficacy (ineffectiveness) (Maslach, 2003; Maslach & Goldberg, 1998). As discussed previously, work exhaustion represents a basic stress response and is a necessary aspect of job burnout. Each of these three aspects of job burnout is associated with some dimension of work life. Researchers have identified six dimensions of work life: workload, autonomy, reward,

community, fairness, and values, and have investigated the effect work life dimensions have on work exhaustion (Lee, Song, Cho, Lee, & Daly, 2003; Leiter & Maslach, 2003, 2009). For example, exhaustion and cynicism originate from conflicts and work overloads at workplaces, while ineffectiveness arises from a lack of resources (information, tools, or time) (Maslach, 2003).

As a result, the effects of these dimensions on work exhaustion are reflected in the organization. For example, work overload and personal conflicts predict diminished organizational commitment, turnover, absenteeism, and physical illness.

2.7.1 Consequences of Work Exhaustion

Work exhaustion affects employees' job attitudes. For example, work exhaustion experienced because of a lack of autonomy, lack of adequate reward, or work overload decreases the extent of job satisfaction among IT professionals or nurses (Lee et al., 2003; Maslach & Jackson, 1981; Moore, 2000b; Pines & Aronson, 1983). Researchers have found that poor levels of factors such as physical working conditions, relationships with peers and managers, pay, promotion, job security, and autonomy, and high levels of factors such as role conflict and work overloads, result in reduced job satisfaction, diminished organizational commitment, and increased turnover intentions (Andrews & Dziegielewski, 2005; Leiter & Maslach, 1988; Lu, Barriball, Zhang, & While, 2012; Lu, While, & Barriball, 2005; Zhang et al., 2014).

Maslach and Jackson (1981) presented their MBI and used one dimension "*feedback from the job itself*" to measure the degree to which carrying out the work activities would give the employee direct and clear information about job performance. They concluded a negative relationship between performance and exhaustion. More precisely, researchers have pointed out that work exhaustion predicted job attitudes, such as turnover intention and organizational commitment in addition to job performance (Chiu & Tsai, 2006; Cropanzano, Rupp, & Byrne,

2003). They also found out that exhaustion negatively affected OCB towards organization (OCBO) and supervisor (OCBS). Similarly, in a longitudinal study, Halbesleben and Bowler (2007) illustrated the relationship between exhaustion and job performance as well as OCB benefits toward individual (OCBI), organization (OCBO), and supervisor (OCBS).

2.7.2 Nature of IS Work

IS work is associated with techno-stress characteristics due to its endemic uncertainty and complexity, and can lead to a sense of insecurity because of rapid changes in IT (Tarafdar et al., 2011). The nature of IS work leads to work-life conflict, longer working hours, various demands, and round-the-clock support (Lacity, Iyer, & Rudramuniyaiah, 2008; Messersmith, 2007). More specifically, IS work is always criticised for not having enough IS resources, and being low in autonomy and recognition, which significantly affect IS professionals' motivation (Sharp, Baddoo, Beecham, Hall, & Robinson, 2009).

2.7.3 IS Work Exhaustion

Work exhaustion has been discussed in several occupations, such as health care or social services, to study emotional or physical exhaustion within professionals, such as physicians, technologists, social service workers, and teachers (Kilpatrick, 1989; Leiter & Maslach, 2003; Leiter & Schaufeli, 1996; Lu et al., 2012; Moore, 2000a, 2000b; Zhang et al., 2014). Leiter and Schaufeli (1996) studied work exhaustion among IS professionals (computer programmers) and others (social service workers and teachers) and considered drivers of work exhaustion, such as work overload or management recognition. They indicated that there was a significant difference between occupational groups regarding experiencing exhaustion. As the early research on work exhaustion studied the role of personal and situational factors, work exhaustion was found out to be more a function of the situation than the person (Leiter & Schaufeli, 1996; Maslach, 2003; Maslach & Goldberg, 1998; Maslach et al., 2001; Pines &

Aronson, 1983). Indeed, instead of focusing on only individual behaviours, it would be better to take into account a fit of job characteristics and individuals together that clearly explains the interaction of person and environment (Maslach, 2003). Individual approaches (for example, personalities) for assessing exhaustion are not sufficient. This means that work exhaustion tends to vary in terms of job characteristics or work life. For example, in very demanding jobs, there are fewer resources and more conflict between workers or between role demands than in less-demanding jobs (Maslach, 2003). Work exhaustion or job burnout is higher in IS departments than in other departments (Tarafdar et al., 2011). IS work exhaustion or job burnout is affected by a lack of autonomy, high workload, role ambiguity, and role conflicts (Joseph, Ng, Koh, & Ang, 2007; Moore, 2000a).

2.7.3.1 Autonomy

Autonomy is defined as "the degree to which the job provides substantial freedom, interdependence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out" (pg. 258, Hackman & Oldham, 1976). Other terms related to autonomy include job control (Day, Paquet, Scott, & Hambley, 2012) and decision latitude (Korunka & Vitouch, 1999), which refers to the breadth of possibilities of decisions regarding action steps, the content of goals and plans, and time frames (Zapf, 1993). A lack of autonomy affects employees' job attitudes and causes them to experience work exhaustion (Lee et al., 2003; Maslach & Jackson, 1981; Moore, 2000b; Pines & Aronson, 1983).

The role of autonomy in the IS context has been studied for more than 20 years. Most researchers have reported that autonomy is positively associated with technology use (Ahuja & Thatcher, 2005; Kraan, Dhondt, Houtman, Batenburg, Kompier, & Taris, 2014; Sardeshmukh, Sharma, & Golden, 2012). For example, professionals who perceive no control over the conditions, processes, procedures, or contents of their work are less keen to use electronic medical records (Walter & Lopez, 2008). Conversely, employees whose managers

or work environments support autonomy are more confident to continue using the internet or computers than employees who work within environments that are more controlling (Roca & Gagné, 2008).

Much research has concluded that a lack of autonomy is problematic for employees experiencing work exhaustion when dealing with new software or current IT systems. At the same time, employees with greater autonomy may have lower levels of work exhaustion: they may find it easier to set aside time to learn the features of IT applications or new technology upgrades, or be able to use IT-based flexible work options (Day et al., 2012; Esmaeilzadeh & Sambasivan, 2012; Kraan et al., 2014; Sambasivan, Esmaeilzadeh, Kumar, & Nezakati, 2012). Research on autonomy has also shown that negative job outcomes that results from technology use are mitigated when employees have freedom in their work-time schedule, access to adequate resources, and control over work-related tasks (Ahuja & Thatcher, 2005; Chesley, 2014; Salanova, Llorens, & Cifre, 2013).

Autonomy has also been found to minimise the negative impacts of technology use on employees, such as work exhaustion and its determinants, including work overload, role ambiguity, role conflict (Ahuja & Thatcher, 2005; Day et al., 2012; Kraan et al., 2014; McKnight, Phillips, & Hardgrave, 2009; Shen & Gallivan, 2004). Kraan et al. (2014) view perceived autonomy as a standardisation mechanism, which can modify and control the negative effects of technology on employees (Kraan et al., 2014). Higher autonomy enables employees to arrange a more proportionate division of work, use less coercive methods, and organise a task sequence to ameliorate the negative effects (for example work exhaustion) of technology use. Autonomy also supports learning about technology, encouraging a healthy environment and undermining work exhaustion from the introduction of new features. IS professionals inherit technical workers' characteristics that include scientific knowledge and practical skills by using complex technologies. Since IS professionals possess the broader skills

and knowledge than managers and administrators, they have a considerable amount of autonomy. The levels of IS professionals' autonomy depends upon the extent to which they are able to act independently of their peers and supervisors in performing their jobs, have freedom to do jobs in their own way, and have opportunities of performing independent thoughts and actions (Lim, 2007). A varying extent of IS professionals' autonomy shape their job satisfaction that is positively associated with a degree of their commitment towards the organization and negatively related to their intention to leave the organisation (Thatcher, Stepnia, & Boyle, 2002). When IS professionals are provided with autonomy, they can carry out their work independently, resulting in a lower incidence of work exhaustion (Ahuja, McKnight, Chudoba, George, & Kacmar, 2007). The lack of autonomy enhances the pressure at work and causes IS professionals not to have time to improve their skills and have limited opportunity to be trained for career advancement (Messersmith, 2007).

Autonomy interacts with the level of work overload, so that employees with greater autonomy do not feel overburdened in having to find novel ways to use IT (Ahuja & Thatcher, 2005).

2.7.3.2 Workload

Employees feel overloaded at work when their job demands exceed their limits (Leiter & Maslach, 2003) and have to do too much in too little time with too few resources (Moore & Love, 2005). New technologies have been found to increase work overload; for example, email systems can distract employees from their work because they are afraid of missing important information that they would be accountable for if they do not respond to emails or check for them frequently (Barley, Meyerson, & Grodal, 2011). Moore (2000a) found out that a high workload due to insufficient IS staff, the lack of resources, unrealistic deadlines, and target dates are the strongest contributors to work exhaustion among IS professionals. Similarly, Savva (2004) reported that one-third of European IT directors are overburdened with managing

impossible workload as a major problem and other primary sources as constant demands from their managers, unrealistic expectations, and feeling of job insecurity. However, the effects of IS workload perceived by IS professionals can be mitigated by enhancing the levels of autonomy (Shih, Jiang, Klein, & Wang, 2013). The implication is that IS professionals who feel pressured or rushed, or are not content of the number of requests, problems, and complaints lied in the nature of the IS jobs, can exert a greater influence at work when they are granted the amount of autonomy, for example setting own schedule for resolving requests and complaints on own course of action (Ahuja, McKnight, Chudoba, George, & Kacmar, 2007). Likewise, Maslach (2003) clarified that work overloads, and role ambiguity and conflicts arise clearly from a lack of resources, insufficient time, and a lack of tools or information to get the job done.

2.7.3.3 IS Role Ambiguity and Conflict

Role ambiguity and role conflict can create work exhaustion, and may be the result of technology emergence. For example, the use of sales force automation technologies (SFA) may increase the ambiguity of employees' roles, making them more complicated (Rangarajan, Jones, & Chin, 2005). Role ambiguity depends on the extent to which employees increase the effort they spend learning how to integrate technology into their routine tasks, and how to confront the uncertainties associated with the process of learning technology (Day et al., 2012; Zigurs & Buckland, 1998). Role conflict occurs when employees have to decide between using their time to learn a new IT system and carrying out their routine duties. Technology alters employees' normal tasks, and if something wrong occurs, it is difficult for them to undo and return to essentially the same conditions in the original tasks to make a new decision. Research by Ang and Slaughter (2001) on permanent and contract IS professionals clarifies that contract IS professionals experience more work exhaustion (IS work overload, IS ambiguity, and IS conflicts) than permanent IS professionals, because they were assigned to outdated software

such as Fox Pro or had limited access to databases and computerized resources. IS role conflicts are created by the differences and similarities among IS professionals' behaviours or perceptions between IT and business units in terms of activities, resource sharing, and goals. For example, conflicts including different goals among IS and business groups negatively affect the strategic IS planning process (Lee & Pai, 2003).

A narrative review with meta-analytic techniques conducted on the effects of role ambiguity and role conflict on the levels of job satisfaction and turnover among IS professionals reported that IS professionals are dissatisfied in their jobs when they are uncertain about expectations of their assigned roles and experience conflicts between assigned roles and demands (Joseph et al., 2007; Lee, 2000). The review also reports that the role conflicts and ambiguities that IS professionals experience lead to intention to leave among IS professionals. The implication is that IS professionals feel exhausted when they are confronted with the extent of role ambiguity and role conflict that reduce the amount of their job satisfaction and organizational commitment (Ahuja et al., 2007; Joseph et al., 2007; Moore 2000b).

Although the impact of work exhaustion on individual IS professionals has been discussed (Joseph et al., 2007; Moore, 2000a), little research has been done on the organizational consequences of IS work exhaustion.

2.7.4 Consequences of IS Work Exhaustion

The attributional model of work exhaustion consequences proposed by Moore (2000b) illustrates the extent to which work exhaustion has a negatively significant effect on IS professionals' job attitudes (e.g., commitment and job satisfaction), perceived achievement and accomplishment at work, and the intention to leave a job. More precisely, she categorised the causes of work exhaustion into the external (e.g., managerial decisions) and internal (e.g., self-esteem) factors that predict diminished job satisfaction, decreased organizational commitment,

enhanced turnover intention, and reduced job behaviours (e.g., voice). Likewise, a few number of empirical and conceptual studies have indicated that IS work exhaustion has a negative effect on IT job attitudes, such as job satisfaction (Moore, 2000b; Shih et al., 2013) and positive effect on IT turnover (Moore, 2000a; Shih et al., 2013).

Ahuja et al. (2007) have argued reasons why IS work exhaustion negatively results in organizational commitment and positively lead to turnover among IS professionals. The reason is that since technologies are substituted for face-to-face social interaction, IS professionals can no longer commiserate with each other to mitigate the negative effect of work exhaustion through social interactions. This feeling of isolation is a strong predictor of commitment and turnover intention among IS professionals (Ahuja et al., 2007). In addition, when IS professionals are pressured, their perceptions of job satisfaction revolve more around financial rewards than non-financial rewards (Shih et al., 2013), and their perceptions of job commitment differ from organizational commitment due to the difficulty in changing profession rather than changing work environment (Chou & Pearson, 2012).

Previous research has highlighted that due to the nature of IS jobs and negative job outcomes experienced by IS professionals in IT work environments, such as IS work exhaustion (Moore & Love, 2005) and job stress (Chou & Pearson, 2012), IS professionals exhibit lower level of OCB-like behaviours than non-IS professionals. However, the need for studies investigating IS work exhaustion and OCB is addressed to investigate how insufficient resources and staff predict IT work exhaustion and then negatively affect the levels of OCB among IS professionals (Moore, 2000a).

2.7.5 Summary

The preceding sections have described how the features of IS work could lead to work exhaustion, and following that constrain the display of OCBs. In more detail, the factors,

including the lack of autonomy, IS workloads, IS role ambiguity, and IS role conflict, have been acknowledged as predictors of IS work exhaustion. The importance of the impact of IS work exhaustion on the occurrence of OCBs have been highlighted, which impedes such behaviours to occur. Thus, at this point, we have presented evidence for the existence of OCBs in the IS context, and described factors that may both promote or limit such behaviours.

Overall, this chapter has reviewed OCBs regarding origins and definitions, and their impacts on the organizational outcomes. The review also distinguished the overlaps between OCBs and other types of extra-role and in-role behaviours. It is followed by discussing examples of OCBs occurring in the IS contexts. This chapter draw on underpinning theories from the management literature to review OCB determinants that can encourage and inhibit the occurrence of OCBs. The next chapter reveals the hypotheses that were developed to answer the research questions based on the literature.

CHAPTER 3: HYPOTHESES AND RESEARCH MODELS

3.1 Overview

This chapter develops a multilevel model focusing on IS-specific OCBs and their antecedents and consequences in the IS context. The individual-level model is hypothesized to describe the antecedents of IS-specific OCBs; the unit-level model is developed based on the consequences of IS-specific OCBs; and the cross-level model denotes the effect of individual-level effect of IS-specific OCBs on unit-level outcomes. The rationale for the development of the multilevel model is based on the lack of a robust model of IS-specific OCBs and determinants that encourage and inhibit these behaviours, and the need for a coherent model on how these behaviours enhance the effectiveness of IS departments.

3.2 Introduction

This study focuses on various positive behaviours as IS-specific OCBs performed by IS professionals within IS departments and across organizations, and the impact of these behaviours on the effectiveness of IS departments. Positive behaviours are performed by IS professionals in different ways: 1) when they voluntarily help their IS peers to learn more about how to better deliver IS services; 2) when they provide business employees with hands-on walkthroughs and personalized information about the IS system use; 3) when they spend extra time providing business employees with remote support services or helping them through web-based technologies; and 4) when they share their technical knowledge with their IS and non-IS colleagues to help them with problems arising from a lack of IT-related knowledge or insufficient information about IT functions embedded in the IS system. Taken together, the consequences of these behaviours determine the quality of IS system, IS information, and IS service, which the latter leads to effectiveness of the IS departments or IS units.

Existing models in IS studies have paid more attention to describe the likelihood of the existence of such positive behaviours in the IS context and only few studies have looked into potential outcomes of such behaviours, such as IS function effectiveness (Yen et al., 2008), IS security effectiveness (Hsu et al., 2015), IS professionals' task efficiency (Deng & Wang, 2014), and employees' level of IS use (Yen et al., 2015). However, there has been no study to examine determinants and inhibitors of such behaviours or nor research to investigate the impact of these behaviours on the effective functioning of the IS departments. This study draws on the OCB theory and its dimensions to identify the corresponding behaviours in the IS context and term them IS-specific OCBs. Also, this study builds on the OCB literature to propose determinants and inhibitors of IS-specific OCBs and investigate the impact of these behaviours on the effective functioning of the IS department.

Figure 1 and 2 depict the research models tested in this study. We propose that personality traits, such as conscientiousness, extraversion, proactivity, and positive affectivity, are determinants of the quality of relationships between IS professionals and their leader and within IS professionals in IS departments or IS units. Then, this quality of relationships provides a basis for IS-specific OCBs within the IS units and between IS units and business work units. On the other hand, determinants of IS work exhaustion, such as the lack of autonomy, IS workload, IS role ambiguity, and IS role conflicts are examined, which are proposed to dampen the occurrence of IS-specific OCBs. Finally, IS-specific OCBs reflected from the quality of relationships within IS units and IS work exhaustion are proposed to affect the effectiveness of the IS department effectiveness.

3.3 Impact of the Personality Attributes of IS Professionals on Intra-IS function Relationships

IS researchers have examined that the lack of attention to interaction within IS departments and poor communications between IS and business units lead to negative outcomes, such as IS project failure, project abandonment, and a lowering of performance and reputation of IS units (Ewusi-Mensah, 1997; Powell & Yager, 2004; Roberts, Cheney, Sweeney, & Hightower, 2004). The composition of an IS team, in terms of the attributes and behaviours of IS professionals, play an important role in IS project success (Ramakrishna & Lin, 2002). Given the centrality of team-member interaction within software development teams, activities and behaviours software developers perform to develop consensus among team members, help their peers focus on product features, functions and actions, and improve team-working skills, determine a success of software projects development (Sawyer, 2004). For this purpose, IS researchers have paid attention to determinants of IS project success and asserted that IS team members' personalities, IS leadership style, and technical competency of IS professionals are key factors in IS project success (Moore and Vucetic 2014; Ewusi-Mensah, 1997). However, most studies have only focused on the diversity of IS team members' technical backgrounds and competencies and other overarching aspects have remained unexplored. IS team members' diverse personalities are a predictor of IS project success because these personalities promote social activities among team members. For example, IS professionals with conscientiousness are dependable, reliable, and trustworthy, adhere to company norms, rules, and values, and are inclined to make relationships with their peers (Caligiuri 2000; Lounsbury et al. 2007; Witt and Bruke 2002).

The quality of the relationships between team members has been viewed to be related to members' personalities. For example, highly experienced sales agents who feel more

responsible than other members help their inexperienced co-workers through within-team interactions to boost their co-workers' sales productivity (Podsakoff et al., 1997). Porter and his colleagues (2003) explored the effect of different personality attributes, such conscientiousness, emotional stability, extraversion and agreeableness, on exchanges within teams when members are helping their mates. They found that conscientiousness is the most important personality attribute and a valid predictor of the quality of relationships within teams. In this research, we expect that conscientiousness of IS professionals in IS departments predicts the quality of relationships within IS teams. So,

H1: The conscientiousness of IS professionals is associated with the quality of the relationships within their IS departments.

A similar discussion has been made between leaders and their members. The argument is that members with certain personalities (conscientiousness and extraversion) are more likely to respond positively to interactions with their leaders or are more likely to initiate high-quality relationships with their leaders (Nahrgang et al., 2009). A high-quality relationship with a leader built by conscientious members contributes to behavioural outcomes, such as OCBs, attitudinal outcomes, such as satisfaction with leader and job, and organizational commitment. Also, the rate of employee turnover and the level of role ambiguity and conflict is diminished when conscientious members build quality relationships with their leader (Dulebohn et al., 2011; Ilies et al., 2007). In the IS context, Caligiuri (2000) has acknowledged conscientiousness personality trait among IS professionals and found out that IS professionals with conscientiousness are highly recognized by IS leaders because they are hardworking, responsible and persistent to accomplish their assigned assignments. Thus,

H2: The conscientiousness of IS professionals is associated with the quality of the relationships with their leader in the IS departments.

Extraverts are sociable, enthusiastic, energetic, gregarious, assertive, talkative, and active, and highly able to positively contribute to group outcomes, such as group performance (Barrick & Mount 1991; Barry & Stewart, 1997). Smith et al. (1983) portrayed extraverts as individuals who tend to be more sensitive to external environments and social stimuli. Researchers have also stated that extraverts are more comfortable and skilful to communicate their thoughts, and are more willing to express change-oriented opinions (Crant, Kim, & Wang, 2011; LePine & Van Dyane 2001). Barry and Stewart (1997) have argued that extraversion is more important than conscientiousness, because members with extraversion personality always express and share their thoughts, stimulate discussion, and have high performance expectations. Because of these reasons, extraverts are perceived to be more effective in group-level processes than conscientious members, and contribute more to team performance and effectiveness. Similarly, Porter et al. (2003) have illustrated the importance of extraversion in teams as well: for example, teams with more extraverts have a high amount of within-team requests and demands for help and support. In the IS context, IS professionals with extraversion personality trait are considered sociable, outgoing, gregarious, expressive, warm-hearted, and talkative. IS extraverts are high in participating in group discussions, interact with other members on requirements in IS projects, and facilitate sharing knowledge within an IS team. Besides, they tend to spend longer hours working on IS projects and make relationships with other members in IS teams (Institute for Management Excellence 2006; Lounsbury et al., 2007). By knowing that, we expect that extraversion of IS professionals predicts the quality of relationships within IS teams. Therefore,

H3: The extraversion of IS professionals is associated with the quality of the relationships within IS departments.

Research by Moore (1991) on IS professionals in different occupations (application programmers, application systems analysts, technical programmers, and data processing managers) revealed that application programmers, who are more sociable than technical programmers and systems analysts, are aware of motives and actions within the work environment. IS professionals with extraversion consciously establish their social networks with others, which affect their task performance and organizational socialization (Caligiuri, 2000). Similar to interactions with members, the personality attributes of members, such as extraversion, play an important role in making effective interactions with the leader (Ilies et al., 2007; Nahrgang et al., 2009). Extraverts seek out opportunities to interact with their leader and are more successful in building such quality relationships than others. The reasons why they maintain interactions with their leader are to gain satisfaction and enhance the possibility of receiving a sent role from the leader (Philips & Bedian, 1994). Hence, we expect that extraversion predicts the quality of relationships with an IS leader in IS units:

H4: The extraversion of IS professionals is associated with the quality of the relationships with their leader in the IS department.

Because of the lack of IS research on the impact of IS professionals' proactivity and positive affectivity personality in IS project teams, we refer to the non-IS literature to justify the importance of proactivity for IS professionals. Proactivity is positively related to employees' networking, creativity, job satisfaction, job commitment, and job performance (Fuller & Marler, 2009; Saks, Gruman, & Cooper-Thomas, 2011). In addition, proactive team members contribute to team learning and team performance (Druskat & Kayes, 2000). Crant (2000) postulated that a proactive personality has a willingness to get involved and takes initiative to identify and make contributions. They are able to quickly adjust by acquiring the required knowledge to become more integrated into the formal and informal structure of the

organization. Because of the information-seeking aspect of proactivity, proactive members are more willing to develop their relationships with co-workers within the team than other personality traits (Saks et al., 2011). Therefore, in the IS context:

H5: The proactivity of IS professionals is associated with the quality of the relationships within IS departments.

A proactive personality is positively associated with employees establishing a high-quality relationship with their leaders (Fuller & Marler, 2009; Saks et al., 2011). In turn, the quality of these relationships results in member OCBs and job satisfaction (Li et al., 2010), and affective commitment and job performance (Zhang, Wang, & Shi, 2012). In the leader-member exchange (LMX) model discussed by Campbell (2000), proactive team members building the quality of relationships with their leader reveal initiatives that exceeds their direct work obligations, have a strong sense of commitment to the team, and feel an above-average sense of responsibilities for the team. Then, in the IS context:

H6: The proactivity of IS professionals is associated with the quality of their relationship with their leader of the IS department.

Positive affectivity refers to an employee's relatively stable level of receptivity to positive environmental stimuli and experience of positive feelings (Watson & Clark, 1992). Members with positive affectivity are able to make relationships with their members to dispose them in positive ways, which result in distinct team outcomes. George (1990) found that positive affectivity is associated with the occurrence of positive team behaviours, such as OCBs. Indeed, positive affect members build relationships with their peers to help them become more confident in performing tasks and induce them to believe that they have enough skills and abilities beyond those of other teams, which therefore result in team creativity (Kim & Shin, 2015). Positive affectivity of members leads to team performance through quality

relationships that positive affect members build with their peers in order to help them focus on their task completion (Collins, Jordan, Lawrence & Troth, 2016). So, in the IS context:

H7: The positive affectivity of IS professionals is associated with the quality of the relationships within IS departments.

Positive affectivity plays an important role in shaping the quality relationships between members and leaders, which the latter leads to members' levels of OCBs, and mitigates the levels of job stress and tension among members (Hochwarter, 2005). Ilies et al. (2007) shortly suggested a potential effect of positive affectivity of team members on the quality of leader-member relationships within teams in which cooperation, helping, and altruism are important for organizational effectiveness. This personality reflects people's general tendency to experience the state positive affectivity and to interpret environmental stimuli, including their leader's leadership style and relationships they have with their leader, in positive ways (e.g., happily, cheerfully, and enthusiastically) (Dulebohn et al., 2011; Gilmore et al., 2013). So, in the IS context:

H8: The positive affectivity of IS professionals is associated with the quality of their relationship with their leader of the IS department.

3.4 Transformative Leadership Style

Based on Moore and Vucetic's (2014) study, IS leadership style plays a key role in IS project success and is highlighted for future research. IS leaders' exchanges, e.g., trust, respect, and interpersonal support, with their IS professionals affect their perception to converge with their leader's perception of activities that must be undertaken, which promote positive behaviours in the IS units (Moore & Love, 2005). Indeed, IS leader-member relationships must be tightly coupled, or else IS professionals will lose an understanding of trust and a perception of fairness

in the IS unit. Therefore, in order to make a quality relationship between IS leader and IS professionals, there is a need of an appropriate leadership style for making critical decisions at different phases to enhance the likelihood of IS projects implementation success (Ewusi-Mensah, 1997).

Various dispositional factors of leaders have been studied to reveal the positive impact of leader on the quality of relationships with members (Nahrgang et al., 2009). Transformational leadership is a set of behaviours that a leader performs to transform or change the basic values, beliefs, and attitudes of his/her members to enable them to perform beyond the minimum levels specified by the organization (Podsakoff et al., 1990). They also reported a positive impact of transformational leader behaviours (articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, individualized support, and intellectual stimulation) on team members' trust in their leader, satisfaction, and OCBs. Transformative leaders implement change, model the intended changes and engage in unscheduled, face-to-face employees' conversations. In turn, employees engage in activities that exchange tangible and intangible benefits with their leader (Carter et al., 2013). Because of the influence of leaders' transformative behaviours (e.g., spend time teaching and coaching members), team members experience less emotional exhaustion and intention to leave (Green, Miller, & Aarones, 2011) and in turn, are willing to strengthen relational ties with their leader based on trust, respect, and interpersonal support (Dulebohn et al., 2011). The transformative leadership behaviours of CIOs need to communicate effectively and coordinate with IS professionals on IT vision, mission, objectives, and strategies to support business changes and innovations (Chen et al, 2010). So, in this research, we hypothesize that transformative IS leaders initiate the quality of relationships with their team members.

H9: Transformative IS leadership is associated with the quality of relationships between IS leaders and their members within IS departments.

3.5 Work Exhaustion

3.5.1 IS Role Conflict

IS role conflict arises from perceptual differences and incompatibilities among IS professionals performing boundary spanning activities between IS and business units on resource sharing and projects' goals (Joseph et al., 2007; Lee & Pai, 2003; Moore, 2000a). IS professionals become dissatisfied in their jobs when they are uncertain about expectations of their assigned roles and experience conflicts between assigned roles and demands (Joseph et al., 2007; Lee, 2000). Moore (2000a) claimed that IS role conflicts place pressures on IS professionals, which result in an increasing work exhaustion. Hence, we suggest a hypothesis to examine the effect of IS professionals' role conflicts on IS work exhaustion. So,

H10: IS professionals experiencing higher levels of IT role conflict will report higher IS work exhaustion.

3.5.2 IS Workload

Employees feel overloaded at work when their job demands exceed their limits (Leiter et al., 2003) and have to do too much in too little time with too few resources (Moore & Love, 2005). Technology has made employees' work more stressful through problems and errors, steep technology-related learning curves, and higher technology-use related workload (Tarafdar et al., 2011). A comprehensive review on determinants of workload, technology usage is a strong predictor of workloads (Ayyagari, Grover, & Purvis, 2011; Derks, Van Mierlo, & Schmitz, 2014; Lindstrom, Leino, Seitsamo, & Torstila, 1997; Quinones, Griffiths, & Kakabadse, 2016;

Salanova, Grau, Cifre, & Llorens, 2000) and causes employees to experience handling two jobs at the same time and high levels of job demands and job time pressure (Chesley, 2010).

Savva (2004) reported that one-third of European IT directors are overburdened by managing impossible IS workload as a major problem and other primary sources as constant demands from their managers, unrealistic expectations, and feeling of job insecurity. IS workload is the strongest contributor to work exhaustion and is a result of insufficient IS resources and IS staff, unrealistic deadlines, and target dates (Moore, 2000a). In our study, we expect that workloads in the IS jobs cause IS professionals to experience work exhaustion. So,

H11: IS professionals experiencing higher workloads will report higher IS work exhaustion.

3.5.3 Autonomy

In pre- and post-IS implementation processes, the impact of autonomy has been extensively examined in numerous studies (Ahuja & Thatcher, 2005; Kraan et al., 2014; Sardeshmukh et al., 2012) and researchers have identified several terms for autonomy: discretion (Avgar, Hitt, & Tambe, 2010), perceive threat to IS professional or professional autonomy (Sambasivan et al., 2012; Walter & Lopez, 2008), decision latitude (Korunka & Vitouch, 1999), job control (Day et al., 2012), and environment and supervisor autonomy support (Roca & Gagné, 2008). Autonomy is positively related to the intention to use IS systems effectively (Sambasivan et al., 2012; Walter & Lopez, 2008), effective use of IT (Deng, Doll, & Truong, 2004), IS continuance intention (Sørebø, Halvari, Gulli, & Kristiansen, 2009), innovation with IS use (Wang, Feng & Wang 2014), and information and communication of technology (ICT) use (Chesley, 2014). Despite studies on the positive impact of technology use, some researchers have focused on the negative effects of technology use and found out that autonomy mitigates the negative effect of technology use on negative job outcomes, such as work stress (Kraan et al., 2014), work exhaustion (Sardeshmukh et al.,

2012), or the amount of workload (Ahuja & Thatcher, 2005). In more details, a lack of autonomy, including the lack of resources or control over the conditions, processes, procedures, or contents of the work, results in employee work exhaustion (Ahuja et al., 2007; Day et al., 2012).

Autonomy is inherently higher in jobs that have a significant IT component in them due to IT affords employees more opportunities to respond to their task demands through managing schedules and adapting technologies to fit the specific circumstances of their life (Ahuja & Thatcher, 2005). Autonomy grants IS professionals a control over the content of their job and a freedom to decide how to perform assigned tasks. In addition, IS professionals are given an authority to initiate IS projects at their job (Ahuja et al., 2007). They also asserted that IS professionals do not feel exhausted because the levels of autonomy among IS professionals reduce the perceived workloads and work-life conflicts. Moore (2000a) have defined the lack of autonomy among IS professionals in a way that IS managers do not accept IS professionals' opinions or suggestions on important decisions about job-related matters. Taken together, IS professionals with a low level of autonomy experience more work exhaustion than others with a higher level of autonomy (Ahuja et al., 2007; Moore, 2000a). So, we propose that IS professionals with the lack of autonomy have a higher level of work exhaustion. Thus,

H12: IS professionals experiencing lower levels of autonomy will report higher IS work exhaustion.

3.5.4 IS Role Ambiguity

IS researchers have pointed out that the role ambiguity results from technology use (Ayyagari et al., 2011). Day et al. (2010) drew upon transactional theory to define the extent that changes as new work conditions technologies impose are perceived as taxing and exceeding employees' resources will determine the extent that employees view technologies as being negative and

harmful. Their conceptual and empirical studies are evidence that physical and psychological efforts expended by employees tackling IT-caused changes lead to stress creators, such as role ambiguity or conflict, which result in work stress and exhaustion (Day et al., 2012; Day et al., 2010).

IS professionals assist business users in a variety of service roles, such as business analysts, project managers, boundary spanners, customer service lines and top managers. The quality of service that individual IS staff and the IS department overall provide to business units determines the effectiveness of the IS department (Pitt et al., 1995). It means that IS professionals have a wide variety of boundary spanning roles between their IS unit and other business units. Joseph et al. (2007) illustrated a negative relationship between IS role ambiguity and job satisfaction among IS professionals. The implication is that IS professionals are dissatisfied in their jobs when they are uncertain about expectations, authority, and clear, planned goals and objectives of their assigned roles, which cause them to experience work exhaustion (Moore, 2000a). Therefore, we hypothesize that IS role ambiguity affects IS professionals' work exhaustion. Thus,

H13: IS professionals who experience higher levels of IT role ambiguity will report higher levels of work exhaustion.

3.6 Work Exhaustion and OCB

IS researchers have proposed integrated frameworks of incurred pressures that IS professionals deal with, and suggested a host of reasons of what is known as negative effects of IS jobs on IS professionals, for example high workloads, longer working hours, around-the-clock supports, and work-life conflicts (Messersmith, 2007). Researchers examined that these negative effects in work environments prompt work exhaustion in which employees experience

high levels of workloads and uncertainties (Leiter & Maslach, 2003, 2009; Leiter & Schaufeli, 1996; Moore, 2000a). Moore (2000a) provided evidence that IS work exhaustion arises when IS professionals perceive high levels of workload, role ambiguity, role conflict, and a lack of autonomy. Then, she elaborated that IS work exhaustion occurs because of insufficient IS staff and resources, unrealistic deadlines and target dates, changes in the technology or business environment, and the unmet expectations and users' needs. It is also argued that IS work exhaustion negatively affects IS professionals' job attitudes, for example job satisfaction and commitment, and heightens their rate of turnover (Joseph et al., 2007; Moore 2000b). According to prior discussions that job attitudes are positively related to citizenship behaviours (Hoffman et al. 2007; LePine et al., 2002; Podsakoff et al., 2000) and negatively related to work exhaustion, IS professionals may be less likely to engage in OCBs when they experience IS work exhaustion. Hence, it is hypothesized:

H14: IS professionals experiencing higher levels of IS work exhaustion will report lower IS-specific OCB.

3.7 The Quality of Relationship within IS Department and OCB

The quality of relationships between a leader and members, and among members in a team are subject to frequent communication, work team cooperation, and team cohesiveness (Scandura et al., 1986; Seers, 1989; Seers et al., 1995; Uhl-Bien & Graen, 1992) and result in the occurrence of OCBs (Anand et al., 2010; Banks et al., 2014; Walumbwa et al., 2011; Wech, 2003). Extended to the IS context, the relationship between IS leaders and their IS staff influences the IS departments' OCBs. For example, CIOs discuss leadership training, mentoring, social skills and effective interpersonal communication, IS requirements and non-IS issues (e.g., flexibility in IS professionals' contracts) with their staff to improve the level of OCBs among IS professionals as well as efficiency and effectiveness of the IS department

(Chou et al., 2011; Reid et al., 2008). Similarly, IS professionals interact with their IS peers to deliver high-quality IS services to business units as well as to exchange tangible and intangible IS resources with IS peers beyond the call of duty specified by the IS department (Hsu et al., 2015; Yen et al., 2015). Taken together, the quality of such interactions may promote OCBs, termed in this study as IS-specific OCBs, by encouraging IS professionals to engage in informal training, and helping, knowledge-sharing, and taking-initiative behaviours within IS teams. So,

H15: the quality of relationships between IS professionals within the IS departments is associated with IS-specific OCB.

H16: the quality of relationships between IS leaders and IS professionals within the IS departments is associated to IS-specific OCB.

3.8 IS-Specific OCB and IS Function's Effectiveness

The effects of OCBs on individual and organizational outcomes, such as employee absenteeism and turnover, and productivity and effectiveness of the organization, have been discussed (Kidwell, Mossholder, & Bennett, 1997; Podsakoff et al., 2000; Podsakoff et al., 2009; Van Dyne & LePine, 1998). Researchers have shown the positive influences of OCBs on group-level outcomes, such as group performance and effectiveness (see Appendix B) (Chen et al., 2005; Ehrhart et al., 2006). For instance, Nielsen et al. (2009) have asserted that OCBs play a key role in the effective functioning of work groups and have a positive impact on group performance.

In the IS context, OCBs have been discussed as customer-oriented OCBs or service-oriented OCBs including remote support, troubleshooting, informal training, and voluntary handholding, that IS professionals perform in helping their IS or non-IS colleagues (Beaudry & Pinsonneault, 2005; Jasperson et al., 2005; Tarafdar & Gordon, 2007; Tarafdar et al., 2011;

Hsu et al., 2015; Yen et al., 2015). The results of such behaviours reflect positive effects on IS departments, such as IS unit effectiveness (Yen et al., 2008), IS security effectiveness (Hsu et al., 2015), and IS system efficiency (Deng & Wang, 2014), and explicate how IS-specific OCBs engender positive impacts on non-IS departments, such as business employees' level of IS use (Yen et al., 2015). Yen et al. (2008) have employed Organ's OCB dimensions to measure IS effectiveness by evaluating the quality of IS system and information. They have quoted that IS professionals who voluntarily help other members participate in user learning and prevent IS implementation-related problems. Then, these helping behaviours make IS systems operate more efficiently and provide a clear, compelling cue to employees in terms of system reliability, functionalities, and ease of use. Likewise, such IS-specific OCBs directed by IS professionals convey a system's ability to provide accurate, secure, accessible, and adequate information to business employees. Yen et al. (2015) have also emphasized the importance of OCBs in improving the quality of IS services. For example, IS professionals display OCBs to afford business employees cost-effective and useful training programs, timely emergency services, and valuable, helpful services. Altogether, Chang and King (2005) discussed that IS function effectiveness is attributed into the three dimensions, such as quality of system, service, and information. Therefore, based on discussions that Klein and Kozlowski (2000) made on the effect of individual-level behaviours on unit-level outcomes, we hypothesize that IS-specific OCBs that IS professionals individually carryout affect the perceived quality of IS system, information, and service among business employees, resulting in the effectiveness of the IS department. So,

H17: Individual-level IS-specific OCBs directed by IS professionals affect the unit-level system quality of IS departments.

H18: Individual-level IS-specific OCBs directed by IS professionals affect the unit-level service quality of IS departments.

H19: Individual-level IS-specific OCBs directed by IS professionals affect the unit-level information quality of IS departments.

The influences of unit-level OCBs on unit- and organizational-level effectiveness are theoretically and empirically by Podsakoff et al. (2000) and Podsakoff and Mackenzie (1997). Unit-level OCBs, such as helping behaviours and sharing knowledge and experience with employees from other departments, enhance the effectiveness of the departments by reducing intergroup conflicts and facilitating group effort coordination. Yen et al. (2015) point out that the effects of IS services delivered from the IS departments or IS teams as aggregated IS services lead to business employees' perception of the quality of IS system, service and information. In this study, we argue that IS-specific OCBs directed towards business units by IS departments may lead to the IS department effectiveness when business employees are more likely perceive the quality of their IS system, service, and information of IS departments. Therefore,

H20: Unit-level IS-specific OCBs directed by IS professionals in IS departments affect the system quality of IS departments.

H21: Unit-level IS-specific OCBs directed by IS professionals in IS departments affect the service quality of IS departments.

H22: Unit-level IS-specific OCBs directed by IS professionals in IS departments affect the information quality of IS departments.

3.9 Research Models

Research Model 1 (Figure 1) demonstrates the impact of within-IS-team relationships and the characteristics of IS jobs on IS-specific OCBs. In more detail, Figure 1 depicts constructs that capture components of dispositional factors of IS professionals and leaders, characteristics of IS jobs, quality of relationships within IS departments, and individual-level IS-specific OCBs. The three constructs, including work exhaustion, quality of relationship among IS professionals, and quality of relationship between IS professionals and IS leader, are demonstrated as predictors of individual-level IS-specific OCBs. Research Model 2 (Figure 2) illustrates how individual-level and unit-level IS-specific OCBs lead to the IS department effectiveness. Figure 2 shows the impact of individual and unit level of IS-specific OCBs as predictors on system, service, and information quality constructs.

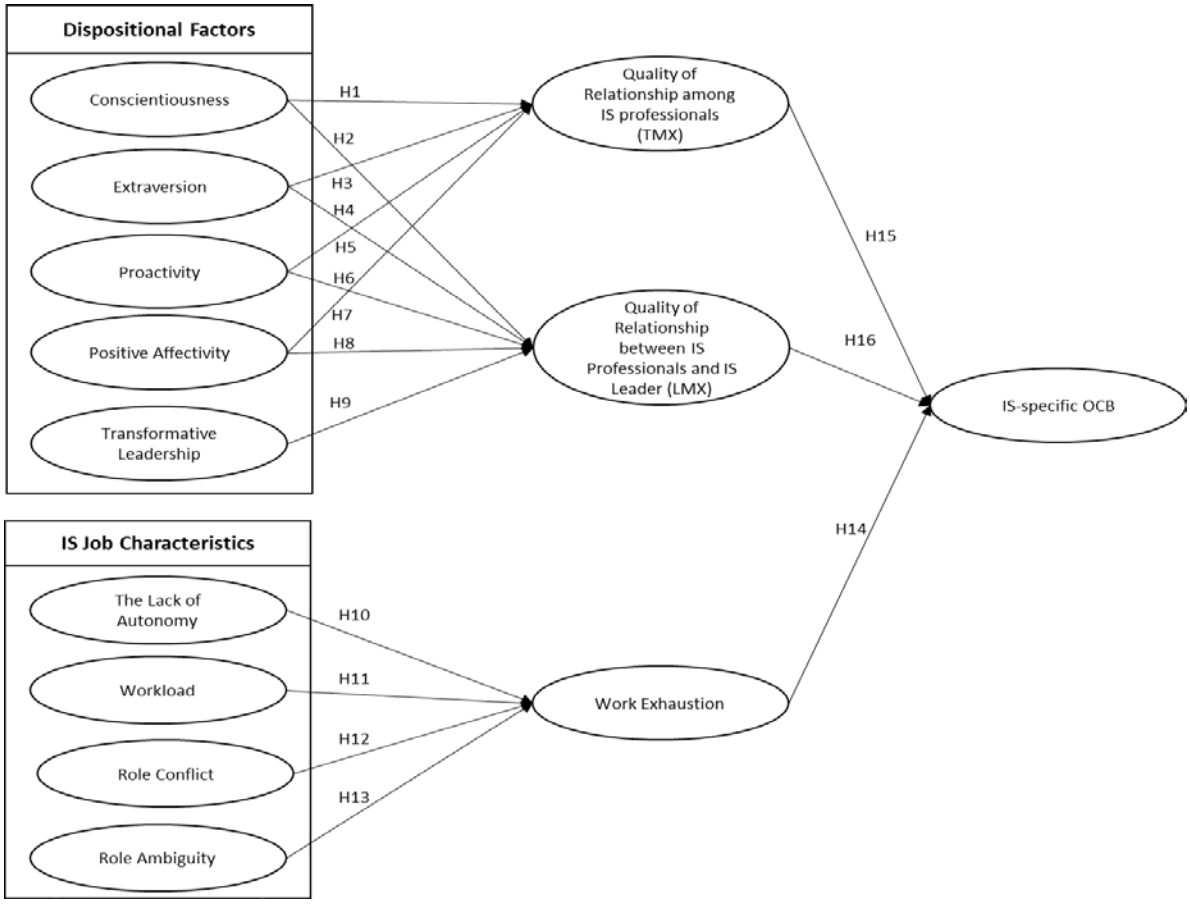


Figure 1: Research Model 1

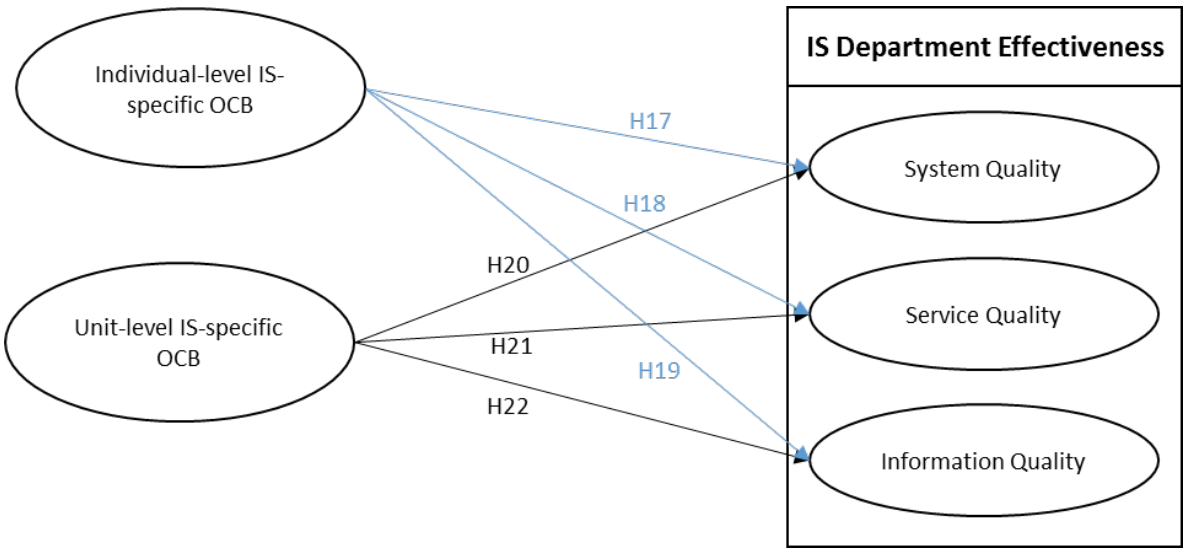


Figure 2: Research Model 2

3.10 Summary

Overall, this chapter elaborated on the theoretical conceptualization of both research models. This chapter used discussions from either IS or non-IS studies to underpin the development of the theoretical framework for this study. The chapter concluded with a demonstration of 22 hypotheses shown in Research Models 1 and 2 to test the research questions developed in Chapter 1. The next chapter focuses on the methodology adopted, followed by research design, data collection processes, and sample demographics.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Overview

This chapter describes the philosophical approach, research design, the processes of data collection, and measures adapted for this study. Also, control variables are presented and the reasons why IS-specific OCBs should control for these variables are given in section 4.7. Section 4.8 delineates one of the techniques used in this study to examine how the suggested model fits data.

4.2 Philosophical Approach

Positivism as a philosophical assumption is the belief that reality can be observable, measurable, and understandable. Positivist research generally attempts to test theories in attempt to enhance the predictive understanding of phenomena. Positivist IS researchers propose an objective physical and social world that exists independent of humans, and whose nature can be relatively unproblematically apprehended, characterized, and measured (Lee & Hubona, 2009; Orlikowski & Baroudi, 1991). Orlikowski and Baroudi (1991) classified IS research and granted a major definition of IS positivist research including that IS research is positivist if there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about phenomenon from the sample to a stated population. A positivist study focuses on three main areas, namely, design issues, data collection, and data analysis (Dubé & Paré, 2003). Positivism is presumed to be suitable for this study to predict the effectiveness of the IS departments through positive behaviours exhibited by IS professionals.

4.3 Research Design

A quantitative method is proposed for this study as this method has been typically used more in IS for confirmatory studies, such as theory testing (Venkatesh, Brown, & Bala, 2013). A correlational design approach means a non-experimental form of quantitative method describing and measuring degree or association (or relationships) between two or more variables or sets of scores (Creswell, 2013). Therefore, a survey design can provide a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population.

Surveys can bring breadth to an IS research by helping IS researchers collect data of different aspects of a phenomenon from many participants (Venkatesh et al., 2013). Due to multiple goals and study levels of this research, distinct data sets from IS professionals and business employees were used to test the models. Because of the essence of multi-level research model, a matched sample of business and IS professionals from each organization was required to collect responses from IS professionals for Model 1 and business employees for Model 2. Having comparable numbers of IS professionals and business employees provides dyads in each organization, which is beneficial in supporting analyses from the perspectives of both IS service providers and recipients. Indeed, Model 1 tends to fit data collected from IS professionals for the individual-level study and Model 2 tends to fit data collected from business employees for the group-level study.

Each IS professional would be asked to rate about 117 items related to their personality attributes, including extraversion, conscientiousness, proactivity, and positive affectivity, the perceptions of their leadership style (transformative leadership), the nature of IS jobs, including lack of autonomy, workload, role conflict, and role ambiguity, the quality of relationship with their IS peers and IS leaders, IS work exhaustion, and the five-dimension OCB (Altruism,

Courtesy, Civic Virtue, Sportsmanship, and Conscientiousness) they carry out in assisting their IS and non-IS peers. Each non-IS employee would respond to 123 items pertaining to unit-level OCB behaviours (e.g., helping behaviours, civic virtue, and sportsmanship), and the IS effectiveness, which is attributed to IS service, information, and system. Responses on OCBs were collected from both IS professionals as internal IS service providers and non-IS employees as recipients of IS services. Both constitute a social context of send-receive IS service and IS-business interaction in an organization. Previous studies usually look into OCBs from the perspectives of the same rater, normally the supervisor, at the same point in time (the literature of sample characteristics can be found in Appendix B). To eliminate common method variance, the OCB dimensions were rated by different sources and/or methods (Hoffman et al., 2007; LePine et al., 2002; Podsakoff et al., 2007). Given the guidance in LePine's et al (2002) research in relation to the choice of methods for measuring different dimensions, peers might be the best at rating individual or interpersonal OCB (or OCB/I) and supervisors are more appropriate to rate organizational OCB (or OCB/O). In this study, different perspectives on the five-dimension and three-dimension OCB conceptualized by Organ (1988) and operationalized by Podsakoff et al. (1990) and Podsakoff et al. 1997) were reflected by both business employees (peer-rating) as recipient of IS services and IS professionals (self-rating) as internal IS service providers. Podsakoff, MacKenzie, Lee, and Podsakoff (2003) suggest that capturing assessments from different resources allows data triangulation, diminishes the potential for common method bias, and yields a greater reliability and validity. Furthermore, to ensure that items of each scale were understandable, the wording of the items was valid, the results would lead to more reliability, and the time necessary for each session was estimated, both a pre-test and a pilot test were conducted with a panel of IS scholars as well as 23 IS professionals and business employees working in banks. In pre-test approach, the questionnaire was reviewed by two faculty members of the department of Business Information Systems (BIS) and one faculty

member of the department of Management at AUT University. The assessment of pre-test led to the fine-tuning of the initially drawn-up items.

4.3.1 Pilot Test of Instrument

Pilot testing is desirable to fine-tune and refine items of an instrument before the actual data collection commences. The purpose of running this test is to make sure the constructed instrument functions well by detecting problems (e.g. inconsistency in the item's contents) related to the measures from the same target sample (Bryman & Bell, 2007). Also, conducting this test enables researchers to estimate the time that an instrument needs to be completed by respondents. The IS and business participants for the pilot test were chosen among IS professionals and business employees working for large-sized banks, and filled in the IS survey online. Sample demographics for IS responses resulted from the pilot test are illustrated in Table 6. IS participants are roughly 61 percent male and 39 percent female. 39 percent of the respondents are between 30 and 40 years old, and the proportion of IS respondents whose ages between 20 and 30 years old, and between 40 and 50 years old is similar (26.1 percent). Only 1 percent of IS respondents were over the age of 50. Regarding the tenure, the percentage of IS respondents who have been with their current organizations for almost 2 years is greater than the remaining sample of IS respondents' tenure. Other IS respondents have a tenure between 2 and 5 years (30.4 percent), between 5 and 10 years (17.4 percent), and more than 10 years (17.4 percent).

Table 6. Pilot IS sample demographics

Gender	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Male	**14**	**60.9**	**60.9**	**60.9**
Female	**9**	**39.1**	**39.1**	**100.0**
Total	**23**	**100.0**	**100.0**	
Age				
20-30	**6**	**26.1**	**27.3**	**27.3**

30-40	**9**	**39.1**	**40.9**	**68.2**
40-50	**6**	**26.1**	**27.3**	**95.5**
50+	**1**	**4.3**	**4.5**	**100.0**
Total	**22**	**95.7**	**100.0**	
Missing	**1**	**4.3**		
Total	**23**	**100.0**	**100.0**	
Tenure				
Almost 2	**8**	**34.8**	**34.8**	**34.8**
Between 2 and 5	**7**	**30.4**	**30.4**	**65.2**
Between 5 and 10	**4**	**17.4**	**17.4**	**82.6**
More than 10	**4**	**17.4**	**17.4**	**100.0**
Total	**23**	**100.0**	**100.0**	

As some researchers recommended a minimum sample size of 100 for conducting structural equation modelling (SEM) (Tabachnick & Fidell, 2001), this study's pilot test only reports Cronbach's alpha for the IS and business constructs to provide evidence on permitting the actual conduct of the research. Table 7 denotes that values of Cronbach's alpha of IS constructs range from 0.82 to 0.97, which are greater than recommended cut-off of 0.70 (Nunnally and Bernstein, 1994).

Table 7. Pilot Test's Reliabilities of Individual-Level IS Constructs

Construct	**Reliability (alpha) α**
Conscientiousness	0.91
Extraversion	0.82
Proactivity	0.87
Positive Affectivity	0.89
Transformative Leadership	0.97
LMX	0.92
TMX	0.91
Lack of Autonomy	0.87
Workload	0.83
Role Conflict	0.82
Role Ambiguity	0.85

Exhaustion	0.92
OCB	0.90

Sample demographics for business responses resulted from the pilot test are illustrated in Table 8. Business participants are roughly 74 percent male and 22 percent female. The business respondents whose ages are between 40 and 50 years old (43.5 percent) has a greater percentage than other ages. The percentages of the age bracket of 20 to 30, 30 to 40, and over 50 years old are 8.7 percent, 39.1 percent, and 4.3 percent, respectively. Regarding the tenure, the percentage of business respondents who have been with their current organizations between 2 and 5 years is greater than the remaining sample of business respondents with a tenure of almost 2 years (26.1 percent), between 2 between 5 and 10 years (13 percent), and more than 10 years (13 percent).

Table 8. Pilot Business sample demographics

Gender	**Frequency**	**Percentage**	**Valid Percentage**
Male	**17**	**73.9**	**77.3**
Female	**5**	**21.7**	**22.7**
Total	**22**	**95.7**	**100.0**
Missing	**1**	**4.3**	
Total	**23**	**100.0**	
Age			
20-30	**2**	**8.7**	**9.1**
30-40	**9**	**39.1**	**40.9**
40-50	**10**	**43.5**	**45.5**
50+	**1**	**4.3**	**4.5**
Total	**22**	**95.7**	**100.0**
Missing	**1**	**4.3**	
Total	**23**	**100.0**	
Tenure			
Almost 2	**6**	**26.1**	**26.1**
Between 2 and 5	**11**	**47.8**	**47.8**
Between 5 and 10	**3**	**13.0**	**13.0**
More than 10	**3**	**13.0**	**13.0**

Total	**23**	**100.0**	**100.0**

Table 9 denotes that values of Cronbach's alpha of non-IS (business) constructs range from 0.95 to 0.98, which are greater than recommended cut-off of 0.70 (Nunnally and Bernstein, 1994). Overall, the results achieved from reliability tests permitted the actual conduct of the research.

Table 9. Reliabilities of Group-Level Non-IS Constructs in Pilot Test

Construct (second-order latent factors)	**Reliability (alpha) α**
Unit-Level OCB	0.95
System Quality	0.97
Service Quality	0.98
Information-Quality	0.98

4.4 Data Collection

For this purpose, both online or pen-and-paper surveys were used for this study to gather both data sets from IS professionals and business employees working in large global banks and insurance companies located in different countries, such as New Zealand, Malaysia, Pakistan, and Iran. Large global banks and insurance companies were chosen as the financial institutions use IT intensively. Thus, they have a large number of IS professionals, unlike small and medium firms, and have frequent and intensive interaction between their internal IS and non-IS staff. Following Hsieh and Wang's (2007) guideline that a two-year period post-IS implementation is needed for capturing OCBs as these behaviours are highly displayed in the extended levels of IS implementation. Large- sized banks and insurance companies were targeted among those which used their implemented IS systems at least two years and had a minimum of a two-year intensive interaction between their internal IS professionals and non-IS employees. This criteria was also double checked in both data sets at early steps of data analysis to ensure whether or not IS or business respondents had interaction greater than two years on the existing systems.

A convenience sample was used, and the banks were selected from the CIO 100 list of top IT users (http://www.cio100.com; http://www.cio.co.nz/cio100nz/; http://www.cio.co.uk/cio100/). Banks on this list were approached for their support of the study by contacting their senior IT managers and also several bank CEOs and CIOs were identified and contacted through LinkedIn.com. Therefore, the invitation letters were sent to them via email to solicit their voluntary participation. Around 230 bank and insurance CEOs, CIOs, and CTOs were contacted in different countries, such as United Kingdom (UK), Canada, Australia, New Zealand, Singapore, India, Malaysia, Pakistan, Thailand, Dubai, South Korea, and Vietnam and so on. Once they had agreed to participate in an online survey, a link to the survey was sent to a senior IS representative of each bank through email so that they could inform their IS and business staff of the project and survey. Support from senior business managers or IT managers of New Zealand and Iranian banks as well as Iranian insurance companies was sought face-to-face, and they agreed on distributing the surveys among the IS professionals and business employees themselves. Therefore, all IS and business questionnaires were delivered to IT managers based on the number of IT and business participants identified by them. In both methods (online and pen-and-paper survey), all employees were informed that participation in this research was voluntary and the confidentiality of their responses would be assured.

Of the 230 banks and insurance companies approached via email or face to face, a total of 32 large-sized banks and insurance companies announced their willingness to participate. In particular, 27 organizations, including 25 insurance companies and 2 banks used pen-and-paper survey, and only five banks used an online survey. Thus, a survey package, including the IS survey for the IS professionals and the business survey for the insurance/bank employees from the same insurance/bank company, was sent to a total of 1740 insurance employees and 840 IS professionals. In order to boost up the likelihood of the surveys' response rates, business

employees and IS professionals were promised a draw of a gift card (2x$100) that would be held at the end of data collection. In addition, I met several bank CEOs or CIOs to highlight the importance of potential outcomes that would have a positive influence on the performance of their companies. Thus, a request from CEOs or CIOs of each company to their IS professionals and insurance/bank employees prompted the response rates of 50.34 % and 51.43 %, respectively, in which 876 completed responses to the business survey and 432 completed responses to the IS survey were received. After deleting unusable responses, including extreme univariate and multivariate outliers, 5 IS responses and 21 business responses were removed from the data sets, reducing the response rates to 49.37 % and 51.07 %. Also, 257 business responses and 102 IS responses were received online from Malaysian and Pakistani banks through Qualtrics.com, while IS responses received from the Singaporean bank, which was 25 IS responses, were excluded from the data set as their non-IS colleagues from business departments did not send any completed response. In the data sets of IS and business responses, no data was removed due to all employees had work experience of more than two years. It means that all IS professionals had work experience of at least two years with the implemented IS systems and there was a minimum of the two-year interaction between business employees and IS professionals on the existing IS systems. So, in total, 1112 business employees and 529 IS responses were identified in the data sets.

The completed IS and business questionnaires from the same organization were grouped to make a matched sample across different organisations, in which at least 9 business employees and 5 IS professionals were found from each participating organization. All in all, 32 organizations were found of which individual cases collected from IS professionals and business employees were nested within IS and business departments. To examine whether the sample size of 32 was sufficient, the literature was reviewed for acceptable values of sample sizes at higher levels. Elison (1993) suggested a minimum sample size of 60, whereas Mass

and Hox (2005) recommended that a minimum sample size of 20 is sufficient for accurate estimation. However, if the interest is in the variance estimates, then the higher-level sample sizes should be larger (50 to 100 groups might suffice) based on the size of the models (Hox, 2013). Hence, according to Hox's (2005) guidelines, the sample size of 32 for this study is sufficient because it provides accurate estimation in the regression coefficients and standard errors. In the next sections, sample demographics and measurements adapted to measure constructs in both models are demonstrated.

4.5 Sample Demographics

Sample demographics for IS responses are illustrated in Table 10. The population of males, which constitutes 59.2 percent, has the higher percentage than the population of females, which makes up 40.8 percent. The sample is mostly populated by young IS employees (53.7 percent) who are between 30 and 40 years old, which their population is twice as large as the number of IS respondents (26.5 percent) whose ages are between 20 and 30 years old. The remaining sample of IS respondents is constituted by middle age employees (15.7 percent) and elders (4.2 percent), which their population is noticeably less than the population of other ages. All IS professionals have worked for almost two years or more than two years. Most of them, around 41.8 percent, have between 5 and 10 years of work experience with their current organizations. Other IS respondents have almost two years (15.9 percent), between 2 and 5 years (24.2 percent), and more than 10 years (18.1 percent) of work experience. The number of IS professionals in different departments shows the intensity of the interaction they may have within their departments with their IS peers, as well as with business employees from other departments. Departments that had between 30 and 40 IS professionals, and those with more than 40 IS employees made up 10.4 percent and 5.5 percent of the sample, respectively. Also, 43 percent of the IS departments had 10 to 30 IS professionals, which is roughly equal to the percentage of departments with fewer than 10 IS employees (40 percent). The number of

IS professionals in banks and insurance companies is depicted in Table 10. Since large organizations are measured as those with more than 250 employees (Edinburg Group, 2012), over 60 percent of the IS respondents were employed in banks and insurance companies with more than 500 employees, and the rest in organizations with more than 250 employees, as defined by the European Union (Edinburgh Group, 2012).

Table 10. IS sample demographics

Gender	Frequency	Percentage	Valid Percentage
Male	313	59.2	59.2
Female	216	40.8	40.8
Total	529	100.0	100.0
Age			
20-30	140	26.5	26.5
30-40	284	53.7	53.7
40-50	83	15.7	15.7
50+	22	4.2	4.2
Total	529	100.0	100.0
Tenure			
Almost 2	84	15.9	15.9
Between 2 and 5	128	24.2	24.2
Between 5 and 10	221	41.8	41.8
More than 10	96	18.1	18.1
Total	529	100.0	100.0
Number of Employees in Departments			
Less than 10	212	40.1	40.5
Between 10 and 20	137	25.9	26.1
Between 20 and 30	91	17.2	17.4
Between 30 and 40	55	10.4	10.5
More than 40	29	5.5	5.5
Total	524	99.1	100.0
Missing Data	5	.9	
Total	529	100.0	
Number of Employees in Organizations			
Less than 500	183	34.6	35.1
Between 500 and 1000	129	24.4	24.7
Between 1000 and 5000	147	27.8	28.2

More than 5000	**63**	**11.9**	**12.1**
Total	**522**	**98.7**	**100.0**
Missing Data	**7**	**1.3**	
Total	**529**	**100.0**	

Not all IS respondents answered all questions, resulting in missing data. The missing data is because of factors, such as the length of the IS survey, time pressures, respondent fatigue, unwillingness to disclose organizational information, or perceived lack of knowledge regarding a specific question or set of questions.

IS respondents were also asked about their specialization and enterprise-level service system. Based on the data set of IS professionals, some respondents indicated more than one specialization or role, and used more than one IS system. Data regarding IS employee role and enterprise-level service system are demonstrated in Table 11 and Table 12, respectively. The most popular roles are software development (27.2 percent), data analysis (20 percent), and database development (19.4 percent). The following other roles in Table 11 show that ITIL (IT Infrastructure Library) (0.8 percent), mobile technology (2.7 percent), cloud computing (3.9 percent), and social media (5 percent) yield a smaller percentage than other roles.

Table 11. Roles of IS Professionals

	Frequency	**Percentage**
Software Development	**144**	**27.2**
Database Development	**103**	**19.4**
Web Analysis	**66**	**12.5**
Business Analysis	**46**	**8.8**
Data Analysis	**104**	**20.0**
Cloud Computing	**20**	**3.9**
Social Media	**26**	**5.0**
Mobile Technology	**14**	**2.7**
IT Project Management	**76**	**14.4**
ITIL	**4**	**0.8**

Some IS respondents indicated more than one role so that the total frequency is greater than the sample size (N=529)

As illustrated in Table 12, most IS respondents use CRM (Customer Relationship Management) (42.6 percent), which constitutes a greater percentage than ERP (Enterprise Resource Planning) (27.2 percent) and SCM (Supply Chain Management) (12.6 percent)

systems. A small group of respondents did not choose any options given in the questionnaire and mentioned their own systems, such as IT service management systems (e.g., ITIL), financial subsystems, and database base management systems (e.g., Oracle).

Table 12. Enterprise-Level Service System Use by IS Professionals

	Frequency	Percentage
ERP (Enterprise Resource Planning)	**144**	**27.2**
CRM (Customer Relationship Management)	**225**	**42.6**
SCM (Supply Chain Management)	**67**	**12.6**
Other Systems	**24**	**4.6**

Some IS respondents mentioned more than one service system

Sample demographics for the non-IS (business) responses are illustrated in Table 13. Among this set of respondents, 52.7 percent are male and 46.7 percent are female, and around half of them have an age between 30 to 40 years. The rest aged between 20 to 30 years and 40 to 50 years. The highest percentage of tenure (62.1 percent) falls within a group of business employees who have been between 2 to 5 years with their organization. Business employees who have almost two years or between 5 to 10 years of tenure constitute almost the same percentage and those who have a tenure above 10 years yield the smallest percentage (7.8 percent). Different proportions of number of business employees in bank or insurance departments are demonstrated, showing that the most populated departments contain more than 40 employees (4 percent) and the less populated departments consist of less than 10 employees (30.8 percent). The results obtained from distinct samples on other departments population also report that departments with business employees between 10 to 20 make 29.9 percent, between 20 to 30 reflect 23.5 percent and between 30 to 40 yield 11.8 percent. According to definitions of large-sized organizations shown by the European Union (EU) and World Bank (the minimum number of employees should exceed 250), all percentages achieved in Table 13 reflect that all chosen organizations, including banks and insurance companies, are large-sized.

Furthermore, most business respondents (39.7 percent) working for organizations that have a population between 1000 to 5000 employees. Other business respondents are from organizations with fewer than 500 employees (21.1 percent), from 500 to 1000 employees (24.6 percent), and more than 5000 employees (14.2 percent).

Table 13. Non-IS (Business) sample demographics

Gender	Frequency	Percentage	Valid Percentage
Female	**519**	**46.7**	**47.0**
Male	**586**	**52.7**	**53.0**
Total	**1105**	**99.4**	**100.0**
Missing	**7**	**0.6**	
Total	**1112**	**100.0**	
Age			
20-30	**236**	**21.2**	**21.3**
30-40	**510**	**45.9**	**46.0**
40-50	**308**	**27.7**	**27.8**
50+	**54**	**4.9**	**4.9**
Total	**1108**	**99.6**	**100.0**
Missing	**4**	**0.4**	
Total	**1112**	**100.0**	
Tenure			
Almost 2	**170**	**15.3**	**15.3**
Between 2 and 5	**690**	**62.1**	**62.1**
Between 5 and 10	**165**	**14.8**	**14.8**
More than 10	**87**	**7.8**	**7.8**
Total	**1112**	**100.0**	**100.0**
Department			
Less than 10	**343**	**30.8**	**30.8**
Between 10 and 20	**332**	**29.9**	**29.9**
Between 20 and 30	**261**	**23.5**	**23.5**
Between 30 and 40	**131**	**11.8**	**11.8**
More than 40	**45**	**4.0**	**4.0**
Total	**1112**	**100.0**	**100.0**
Organization			
Less than 500	**235**	**21.1**	**21.2**
Between 500 and 1000	**274**	**24.6**	**24.7**
Between 1000 and 5000	**442**	**39.7**	**39.9**
More than 5000	**158**	**14.2**	**14.2**
Total	**1109**	**99.7**	**100.0**

Missing	**3**	**0.3**	
Total	**1112**	**100.0**	

Not all business respondents answered all questions, resulting in missing data. The missing data is because of factors, such as the length of the business survey, time pressures, respondent fatigue, unwillingness to disclose organizational information, or perceived lack of knowledge regarding a specific question or set of questions.

Like IS respondents, business respondents were also asked about their specialization and enterprise-level service system. Data regarding business employee role and enterprise-level service system are indicated in Table 14 and Table 15, respectively. Most business employees (51.9 percent) are responsible for corporate affairs, such as internal and external communications function or promoting and protecting the reputation of the business through media. Other common employee roles are marketing (13.4 percent), banking operations (12.4 percent), risk management (9.6 percent), insurance expertise (6.8 percent), and finance (4.9 percent).

Table 14. Roles of Non-IS (Business) Employees	**Frequency**	**Percentage**
Marketing	**135**	**13.4**
Banking Operations	**125**	**12.4**
Corporate Affairs	**525**	**51.9**
Risk Management	**97**	**9.6**
Finance	**50**	**4.9**
Human Resources	**3**	**0.3**
Insurance Expertise	**69**	**6.8**
Risk Management	**3**	**0.3**
Taxation	**4**	**0.4**
Total	**1011**	**100.0**
Missing	**130**	**11.39**
Total	**1141**	

Some business respondents mentioned more than one role.

All enterprise-level systems are listed in Table 15. CRM (Customer Relationship Management) (51.98 percent), ERP (Enterprise Resource Planning) (26.44 percent), and SCM (Supply Chain Management) (10.43 percent) are the most used systems among business employees. Other systems are internet banking (2.97 percent), mobile banking (2.70 percent), core banking systems (1.53 percent), insurance software (1.17 percent), cash management (1 percent), and HR system (1 percent).

Table 15. Enterprise-Level Service System Use	Frequency	Percentage
ERP (Enterprise Resource Planning)	**294**	**26.44**
CRM (Customer Relationship Management)	**578**	**51.98**
SCM (Supply Chain Management)	**116**	**10.43**
Core banking system	**17**	**1.53**
Internet Banking	**33**	**2.97**
Mobile Banking	**30**	**2.70**
Insurance Software	**13**	**1.17**
Cash Management	**1**	**0.09**
HR System	**1**	**0.09**
Total	**1083**	
Missing	**59**	
Total	**1112**	

Some business respondents mentioned more than one enterprise-level system.

4.6 Measures

The measures for the IS and business survey were either taken from previously validated research to fit the context or developed by the authors. All constructs and their items at individual level and unit level presented in Model 1 and 2 are provided in Appendix C.

4.6.1 Personality Traits

Neuroticism-Extraversion-Openness (NEO) Five-Factor Inventory was used to assess Five Factor Model (FFM) of IS professionals' personality traits (conscientiousness and extraversion) (Costa & McCrae, 1992). The instrument contains 12 items for both conscientiousness and extraversion and received a wide attention due to its high reliability and validity within the behavioural literature. The items reflect IS professionals' personality attributes for conscientiousness (e.g., how competent or deliberate IS professionals are) and extraversion (e.g., how gregarious or active IS professionals are). The items of conscientiousness and extraversion were relied on a 4-point Likert-type scale, with -2 being

"very undesirable", -1 being "somewhat undesirable", 1 being "somewhat desirable", and 2 being "very desirable". An even-numbered scale was used to avoid the central tendency bias of respondents in which Asian respondents have a great propensity to choose the midpoint than western respondents (Si & Cullen, 1998).

IS professionals' proactivity was evaluated using six items adapted from Bateman and Crant's (1993) scale. The six-item scale of proactivity has been widely used in prior studies and its high reliability and validity are largely reported (Li et al., 2010). The items focused on taking initial steps in challenging status quo (e.g., If I see something I do not like, I fix it or I love being a champion for my ideas, even against others' opposition) and used a seven-point Likert-type scale, ranging from 1 "strongly disagree" to 7 "strongly agree". IS professionals' positive affectivity was assessed using the Trait Positive Affectivity Scale adapted from Watson's (1988) Positive and Negative Affectivity Scale (PANAS) that contains 10 items to measure positive affectivity (e.g., interested, excited, and enthusiastic). A five-point Likert scale was used to measure positive affectivity, ranging from 1 "very slightly or not at all" to 5 "extremely".

4.6.2 Transformational Leadership

The transformational leadership of IS leaders was assessed using the Multi-Factor Leadership Questionnaire (MLQ-5X, Avolio & Bass, 2004).The scale has reported acceptable levels of reliability and validity within the behavioural literature and it was highly recommended to be used in measuring the transformational leadership behaviours (Tejeda, Scandura, & Pillai, 2001). The scale's items reflect an assessment of dispositions, defined as proclivities that motivate and determine the direction of behaviour (Perkins, 1995), ongoing tendencies towards particular patterns of thinking (Tishman & Andrade, 1995), and ongoing tendencies that guide intellectual behaviour (Tishman, Jay, & Perkins, 1992). IS professionals were asked to assess the dispositional behaviours of their IS leaders by responding to 20 items reflecting disposition-

related behaviours of the transformational aspect of IS leadership. The items included: “My supervisor instils pride in me for the being associated with him/her” and “My supervisor seeks differing perspectives when solving problems”. A five-point response format was used in the 20-item MLQ-5X measure, ranging from 1 “never” to 5 “always”. The dimensions and coefficient alphas for the measurement were charisma (0.79), charismatic behaviour (0.84), inspirational motivation (0.87), intellectual stimulation (0.85), and individualized consideration (0.79). Idealized influence is termed as charisma that represents attributed charisma and charismatic behaviour (Avolio, Bass, & Jung, 1999). A confirmatory factor analysis (CFA) was twice tested to examine whether the five-dimension factor model or the unidimensional model of the transformational leadership better fit the data. First, all 20 items were loaded on the transformational leadership construct, serving as indicators for the latent transformational leadership construct. The results of fit indexes reflected a reasonable fit (/df=3.701, SRMR=0.037, IFI=0.951, NNFI=0.940, CFI=0.951, and RMSEA=0.072). Second, all 20 items were loaded on the respective five dimensions of transformational leadership (attributed charisma, charismatic behaviour, inspirational motivation, intellectual stimulation, and individualized consideration) and then all dimensions were loaded on the higher-order transformational leadership construct, serving as first-order indicators for the higher order factor (transformational leadership). The resulting fit indexes also showed a reasonable fit (/df=2.398, SRMR=0.029, IFI=0.952, NNFI=0.969, CFI=0.975, and RMSEA=0.051), accepting the null hypothesis that there is no difference between these two models (ΔCFI < 0.05) (Little, 1997). Thus, transformational leadership (α=0.95) was treated as a global construct (unidimensional) in this study. This is consistent with results of prior transformational leadership research (Carter et al., 2013; Wang et al., 2005). The confirmatory factor analysis was reconciled with the results derived from the exploratory factor analysis in which all transformational leadership items were loaded on one factor.

4.6.3 The Quality of LMX and TMX

The quality of relationship between IS leaders and IS professionals was evaluated using Graen and Uhl-Bien's (1995) seven-item scale (LMX-7). Sample items are "Do you know where you stand with your leader?", "Do you usually know how satisfied your leader is with what you do?", and "How would you characterize your working relationship with your leader? The LMX-7 scale has been cross-culturally validated by Schaubroeck and Lam (2002), who have established measurement invariance across Chinese and American samples. A distinct five-point Likert scale format was adapted for each LMX item: for example, for these items "Do you know where you stand with your leader?" and "Do you usually know how satisfied your leader is with what you do?", the five-point scale ranged from 1 "rarely" to 5 "very often", while for the item "How would you characterize your working relationship with your leader?", the five-point scale format was represented from "extremely ineffective" (1) to "extremely effective" (5).

Also, IS professionals were asked about the quality of relationships with their IS peers based on a 10-item TMX scale developed by Seers et al. (1995). Studies have reported a high reliability and validity for the TMX-10 scale. For example, Liao and Liu (2010) showed evidence of the construct validity of the TMX-10 scale in a Chinese context. The 10-item TMX scale is comprised of two dimensions: exchange contributions ($\alpha = 0.87$), including the member' contribution to the team (e.g. How often do they make suggestions about better work methods to other team members?") and exchange receipts ($\alpha = 0.84$), including what the member received from the team (e.g. How well do other team members understand your job problems and needs?") (Seers et al., 2001). A confirmatory factor analysis (CFA) was twice tested to look into whether the model with two dimensional TMX or unidimensional TMX better fit the data. First, the model was tested, while all 10 items of TMX were loaded as

indicators on the unidimensional TMX construct. The results of fit indexes showed a good fit (/df=4.404, SRMR=0.080, IFI=0.986, NNFI=0.959, CFI=0.986, and RMSEA=0.080). Second, all 10 items were loaded on the respective two dimensions of TMX (exchange contributions and exchange receipts) and then all two dimensions were loaded on the higher-order TMX construct, serving as first-order indicators for the second-order factor (TMX). The resulting fit indexes demonstrated a perfect fit (/df=2.192, SRMR=0.033, IFI=0.992, NNFI=0.986, CFI=0.992, and RMSEA=0.048), accepting the null hypothesis that there is no significant difference between these two models (ΔCFI < 0.05 and ΔCFI < 0.01) (Cheung & Rensvold, 2002; Little, 1997). Finally, to see to what extent a higher-order TMX accounted for correlations among the first-order TMXs, the target coefficient (Marsh & Hocevar, 1985), a ratio of the chi-square of a first-order model to the chi-square of a higher-order model, was calculated. The target coefficient is scaled from 0 to 1 and larger values are indicative of better models. Our result showed 0.80, indicating that the variation of higher-order factor was satisfactorily captured by the first-order factors. Also, paths from the first-order TMXs (0.87 for exchange contributions and 0.73 for exchange receipts) to the higher-order TMX were significant and greater than the cut-off of 0.7. The results obtained from the EFA, in this study, represented two factors of TMX with eigenvalues greater than 1 and the total variance of 61.86 percent, which were consistent with the results reported by Seers et al. (1995) and Liao, Liu, and Loi (2010). Since the correlation between the two dimensions (0.6) were less than the correlation (0.8) reported by Liao et al. (2010), the results of the EFA witnessed a two-dimension TMX, the results of the CFA represented no difference between the model with the unidimensional TMX and the model with multidimensional TMX, and the result obtained from the target coefficient is close to 1, this study tended to treat the TMX construct as a second-order construct and its dimensions as first-order constructs.

4.6.4 Work Exhaustion, Role Ambiguity, Role Conflict, Workload and the Lack of Autonomy

IS professionals' level of exhaustion was assessed using the five-item scale of General Burnout Questionnaire (Scheufeli et al., 1995). A six-point Likert scale was adapted with 1 being "never" and 6 being "daily". Sample items are "I feel emotionally drained from my work" or "Working all day is really a strain for me". A six-item and eight-item scales developed by Rizzo et al. (1970) were used to evaluate the IS professionals' role conflict and role ambiguity, with a seven-point Likert scale ranging from 1 "strongly disagree" and 7 "strongly disagree". The sample items for role ambiguity are "I feel certain about how much authority I have" or "I know exactly what is expected of me", and for role conflict are "I receive an assignment without adequate resources and materials to execute it" or "I work on unnecessary things". Perceived workload of the IS professionals was measured using a four-item scale presented by Kirmeyer and Dougherty (1988). The two different seven-point Likert scale formats were used ranging from 1 "strongly agree" to 7 "strongly disagree' and 1" daily" to 7 "once a year or less". The sample items are "I feel that the amount of work I do interferes with how well it is done" or "I feel busy or rushed". Finally, a five-item participation scale by Mohr (1971) and Hrebiniak (1974) was used to evaluate IS professionals' lack of autonomy in the IS departments, with a seven-point Likert scale format ranging from 1" strongly disagree" to 7 "strongly agree". The sample items include "If I had a suggestion for improvement to make, it would be difficult for me to get a hearing on it from my manager" or "I get few opportunities, if any, to participate in management decisions that affect significant aspects of my job". A high reliability of all scales have been reported, in the IS context, by Moore (2000a).

4.6.5 Organizational Citizenship Behaviour (OCB)

The IS-specific OCBs were assessed using Podsakoff's et al. (1990) 24-item scale measuring the five-dimension OCB developed based on Organ's (1988) OCB's five major definitions. The instrument consisted of five subscales (altruism, courtesy, civic virtue, conscientiousness, and sportsmanship) and each subscale included five items, except civic virtue with four items. An example of each subscale's item is listed as follows:

1. Altruism (e.g., I help others who have been absent).
2. Courtesy (e.g., I take steps to try to present problems with other workers).
3. Civic virtue (e.g., I attend meetings that are not mandatory, but are considered important).
4. Sportsmanship (e.g., I consume a lot of time complaining about trivial matters), and
5. Conscientiousness (e.g., I attend at work that is above the norm).

A seven-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree" was utilized to evaluate the five-dimension OCB. The OCB measurement has reported satisfactory levels of reliabilities in the behavioural literature (Podsakoff et al. 1990). The OCB measure was used to capture the perception of each IS professional for Model 1. Following LePine's et al. (2002) and Hoffman's et al. (2007) suggestions, OCB was treated as a latent construct in this study treating OCB dimensions as imperfect indicators of a single construct instead of deficient indicators of OCB. Therefore, to be consistent with the instrumental results obtained by LePine et al. (2002) and Hoffman et al. (2007), we treated OCB as a second-order construct and its five dimensions as the first-order constructs. One of the advantages of taking into account that OCB dimensions are simply reflections of the same underlying construct lies in disadvantages of the aggregate model of OCB in which OCB composites are not guided by theory as well as less likely to reveal the effect of lower variances of OCB dimensions on the

overall OCB scores (LePine et al., 2002). A confirmatory factor analysis (CFA) was twice tested to show whether the model with five dimensional OCB or unidimensional OCB better fit the data. First, the model was tested, while all 24 items of OCB were loaded as indicators on the unidimensional OCB construct. The results of fit indexes showed a good fit (/df=3.458, SRMR=0.050, IFI=0.946, NNFI=0.929, CFI=0.945, and RMSEA=0.068). Second, all 10 items were loaded on the respective five dimensions of OCB (Altruism, courtesy, civic virtue, sportsmanship, and conscientiousness) and then all five dimensions were loaded on the higher-order OCB construct, serving as first-order indicators for the second-order factor (OCB). The resulting fit indexes demonstrated a perfect fit (/df=2.767, SRMR=0.039, IFI=0.955, NNFI=0.929, CFI=0.955, and RMSEA=0.048), accepting the null hypothesis that there is no significant difference between these two models (ΔCFI < 0.05) (Little, 1997). Finally, to see to what extent a higher-order OCB accounted for correlations among the first-order OCBs, the target coefficient (Marsh & Hocevar, 1985), a ratio of the chi-square of a first-order model to the chi-square of a higher-order model, was calculated. The target coefficient is scaled from 0 to 1 and larger values are indicative of better models. Our result showed 0.92, indicating that the variation of higher-order factor was satisfactorily captured by the first-order factors. Also, paths from the first-order OCBs, Altruism (0.83), courtesy (0.81), civic virtue (0.72), sportsmanship (0.75), and conscientiousness (0.71), to the higher-order OCB were significant and greater than the cut-off of 0.70. As a result of conducted tests, this study treated the OCB construct as a second-order construct and its dimensions as first-order constructs. The coefficient alphas of OCB dimensions were: altruism (0.90), courtesy (0.88), civic virtue (0.89), sportsmanship (0.90), and conscientiousness (0.91).

4.6.6 Group-level Organizational Citizenship Behaviour (OCB)

The IS-specific unit-level OCBs were measured using Podsakoff's et al. (1997) 13-item scale measuring unit-level OCB dimensions, such as helping behaviours (e.g., altruism,

courtesy, peacekeeping, and cheerleading), civic virtue, and sportsmanship, based on Organ's (1988) OCB's five major definitions. The measurement was modified according to a referent-shift consensus approach to assist business respondents to shift the referent of the item description from an individual (i.e., "I/this employee/my team member") to a more collective assessment or unit referent (i.e., IS professionals/IS department). Some example of the modified items are as follows:

- IS professionals help bank/insurance employees out if they fall behind in their work;
- The IS department provides constructive suggestions about how bank employees can improve their effectiveness;
- IS professionals attend and actively participate in team meetings;
- The IS department always find fault with what bank employees are doing.

The advantages of obtaining unit-level OCB measures from a key informant, in this study business employees, are: first, business employees provide a different perspective on OCB and its certain dimensions directed by their IS department and IS professionals; second, obtaining OCB measures from business employees may lower a threat of common method bias resulting from effects of the same source or rater (Podsakoff et al., 2014). A Seven-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree" was used to evaluate the unit-level OCB dimensions. The OCB measure used in this study was aimed at capturing the perception of business employees working at large-sized banks or insurance companies on IS-specific behaviours displayed by their IS departments for Model 2. To bring evidence into our discussion to be consistent with the results of LePine et al. (2002) and Hoffman et al. (2007) that there is no significant difference between unidimensional and multidimensional OCBs, two tests were run. Then, we examined the loading factors between the second-order unit-level OCB and its first-order dimensions and compared them with the suggested cut-off of 0.7. A

confirmatory factor analysis (CFA) was twice tested to show whether the model with three-dimension OCB or unidimensional OCB better fit the data. First, the model was tested, while all 13 items of OCB were loaded as indicators on the unidimensional OCB construct. The results of fit indexes indicate a perfect fit (/df=3.557, SRMR=0.033, IFI=0.986, NNFI=0.973, CFI=0.986, and RMSEA=0.048). Second, all 13 items were loaded on the respective three dimensions of OCB (helping behaviour, civic virtue, and sportsmanship) and then all three dimensions were loaded on the higher-order OCB construct, serving as first-order indicators for the second-order factor (OCB). The resulting fit indexes demonstrated a perfect fit (/df=3.648, SRMR=0.027, IFI=0.985, NNFI=0.975, CFI=0.985, and RMSEA=0.049), accepting the null hypothesis that there was no significant difference between these two models (ΔCFI < 0.05 and ΔCFI < 0.01) (Cheung & Rensvold, 2002; Little, 1997). The next test was to investigate how a higher-order OCB accounted for correlations among the first-order OCBs, using the target coefficient (Marsh & Hocevar, 1985). A ratio of the chi-square of a first-order model to the chi-square of a higher-order model was 0.97, which fell between 0 and 1, indicating that the variation of the first-order factors was satisfactorily explained by the higher-order factor. The last step was to compare loading factors between OCB and its dimensions in the measurement model. Sportsmanship was removed from the measurement model in Model 2 due to a low loading factor than 0.3 (Tabachnick & Fidell, 2001). Therefore, paths from the first-order OCBs, helping behaviour (0.89) and civic virtue (0.86) to the higher-order OCB were significant and greater than the cut-off of 0.70. As a result of applied tests, this study treated the unit-level OCB construct as a second-order construct and its dimensions as first-order constructs. The coefficient alphas of the OCB dimensions were: helping behaviour (0.88), civic virtue (0.80), and sportsmanship (0.78).

4.6.7 IS Department Effectiveness

As the outsourcing of IS sub-functional areas has been growing, measuring IS function effectiveness has become crucial and creates a need for more IS research to assess the effectiveness of the IS function within organizations (Lacity & Willcocks, 2009). In this study, a functional scorecard from Chang and King (2005) was adapted to assess the IS function effectiveness by measuring the business employees' perceptions of the quality of IS system, information, and service delivered from their IS departments. This study adapted a six-point Likert-type scale, ranging from 1 "hardly at all" to 5 "to a great extent", while the sixth Likert point indicated "not applicable", to evaluate the quality of IS system, information and service.

The IS system quality was assessed using a 42-item scale measuring a six-dimension system quality: 1) impact on job; 2) impact on external constituencies; 3) impact on internal processes; 4) impact on knowledge and learning; 5) systems usage characteristics; and 6) intrinsic systems quality. For example, the statements "To what extent do your organization's IS/IT systems make it easier to do your job?" and "To what extent do your organization's IS/IT systems have fast response time?" were used to assess impact on job and intrinsic system quality, respectively. A confirmatory factor analysis (CFA) was twice tested to show whether the model with the six-dimension system quality or unidimensional system quality better fit the data. First, the model was tested, while all 42 items of system quality were loaded as indicators on the unidimensional system quality construct. Items with standardized factor loading lower than 0.30 were eliminated one at a time (Tabachnick & Fidell, 2001). The results of fit indexes indicate a bad fit (/df=7.615, SRMR=0.060, IFI=0.833, NNFI=0.820, CFI=0.833, and RMSEA=0.077). Second, all 42 items were loaded on the respective six dimensions of system quality (impact on job, impact on external constituencies, impact on internal processes, impact on knowledge and learning, systems usage characteristics, and intrinsic systems

quality), and then all six dimensions were loaded on the higher-order system quality construct, serving as first-order indicators for the second-order factor (system quality). The resulting fit indexes demonstrated a reasonable fit (/df=4.320, SRMR=0.049, IFI=0.917, NNFI=0.910, CFI=0.917, and RMSEA=0.055), rejecting the null hypothesis that there was a significant difference between these two models (ΔCFI > 0.05 and ΔCFI > 0.01) (Cheung & Rensvold, 2002; Little, 1997). Hence, the results indicated that the model with six-dimension system quality showed a better fit to the data. In addition to the CFA test, standardized factor loadings between a second-order system quality construct and its first-order dimensions, including impact on job (0.85), impact on external constituencies (0.95), impact on internal processes (0.91), impact on knowledge and learning (0.88), systems usage characteristics (0.78), and intrinsic systems quality (0.88), were investigated to be greater than the recommended cut-off of 0.70. Coefficient alphas of system quality dimensions were: impact on job (0.91), impact on external constituencies (0.87), impact on internal processes (0.87), impact on knowledge and learning (0.90), systems usage characteristics (0.89), and intrinsic systems quality (0.85).

A 36-item scale of IS information quality was developed to assess the seven dimensions of the information quality: 1) intrinsic quality of information; 2) reliability of information; 3) contextual quality of information; 4) presentational quality of information; 5) accessibility of information; 6) flexibility of information; and 7) usefulness of information. Examples of the information quality items are “To what extent the amount of information is adequate?” and “To what extent the information can be easily maintained?” used to measure the usefulness and flexibility, respectively. A confirmatory factor analysis (CFA) was twice tested to show whether the model with the seven-dimension information quality or unidimensional information quality better fit the data. First, the model was tested, while all 36 items of information quality were loaded as indicators on the unidimensional information quality construct. Items with standardized factor loading lower than 0.30 were eliminated one at a time

(Tabachnick & Fidell, 2001). The results reflected a reasonable fit (/df=5.675, SRMR=0.041, IFI=0.906, NNFI=0.900, CFI=0.906, and RMSEA=0.065). Second, all 36 items were loaded on the respective seven dimensions of information quality (intrinsic quality of information, reliability of information, contextual quality of information, presentational quality of information, accessibility of information, flexibility of information, and usefulness of information), and then all seven dimensions were loaded on the higher-order information quality construct, serving as first-order indicators for the second-order factor (information quality). The resulting fit indexes yielded a perfect fit (/df=3.242, SRMR=0.031, IFI=0.956, NNFI=0.950, CFI=0.956, and RMSEA=0.045), accepting the null hypothesis that there was no significant difference between these two models (ΔCFI = 0.05) (Little, 1997). Although the result of CFA test reflected that the two models had no difference, the unidimensional information quality model did not fit as perfect as the model with the seven dimensions of information quality. Also, standardized coefficients between distinct dimensions and the higher-order information quality were intrinsic quality of information (0.93), reliability of information (0.94), contextual quality of information (0.82), presentational quality of information (0.91), accessibility of information (0.96), flexibility of information (0.90), and usefulness of information (0.89) were significant and greater than the suggested cut-off of 0.70. Coefficient alphas of information quality dimensions were: intrinsic quality of information (0.85), reliability of information (0.81), contextual quality of information (0.73), presentational quality of information (0.70), accessibility of information (0.83), flexibility of information (0.89), and usefulness of information (0.91).

The IS service quality was evaluated using a 32-item scale measuring a five-dimension service quality: 1) responsiveness of services; 2) intrinsic quality of service providers; 3) interpersonal quality of service providers; 4) IS training; 5) flexibility of services. The sample of items are “To what extent the training programs offered by the IS function are useful” or

"To what extent IS people provide services for you promptly" adapted to measure the IS training and intrinsic quality of service providers, respectively. A confirmatory factor analysis (CFA) was twice tested to show whether the model with the five-dimension service quality construct or unidimensional service quality construct better fit the data. First, the model was tested, while all 32 items of service quality were loaded as indicators on the unidimensional service quality construct. Items with standardized factor loading lower than 0.30 were eliminated one at a time (Tabachnick & Fidell, 2001). The results did not demonstrate a reasonable fit (/df=7.561, SRMR=0.043, IFI=0.900, NNFI=0.890, CFI=0.900, and RMSEA=0.078). Second, all 32 items were loaded on the respective five dimensions of service quality (responsiveness of services, intrinsic quality of service providers, interpersonal quality of service providers, IS training, and flexibility of services), and then all five dimensions were loaded on the higher-order service quality construct, serving as first-order indicators for the second-order factor (service quality). The resulting fit indexes indicated a perfect fit (/df=3.901, SRMR=0.032, IFI=0.957, NNFI=0.951, CFI=0.956, and RMSEA=0.051), rejecting the null hypothesis that there was a significant difference between these two models (ΔCFI > 0.05) (Little, 1997). Therefore, the model with the five dimensions of the service quality construct was selected and the paths from the second-order service quality construct to the first-order factors (responsiveness of services (0.89), intrinsic quality of service providers (0.98), interpersonal quality of service providers (0.84), IS training (0.86), and flexibility of services (0.93)) were significant and greater than the recommended cut-off of 0.70. The coefficient alphas of the service quality dimensions were: responsiveness of services (0.85), intrinsic quality of service providers (0.93), interpersonal quality of service providers (0.84), IS training (0.97), and flexibility of services (0.87).

4.7 Control Variables

Researchers have suggested that OCBs should be controlled for gender, age, and tenure (Organ & Ryan, 1995) due to it is more likely that the levels of OCB in organizations vary on the basis of gender (Kacmar, Bachrach, Harris, & Zivnuska, 2011; Tourigny, Baba, Han, & Wang, 2013), age (Aryee & Chay, 2001), and Tenure (Ng & Feldman, 2010). For example, Lovell et al. (1999) hypothesized that women received higher OCB scores than men and concluded that women were expected to display altruistic behaviours and willing to engage in OCBs more than men. The role of gender, age, and tenure have not only been examined in non-IS context but also in the IS context, e.g., behavioural IS use (Venkatesh & Bala, 2008; Venkatesh et al. 2003). Regardless of whether or not the role of gender, age, and tenure have a significant relationship with OCBs, these variables have been suggested as control variables or independent variables of OCBs that IS professionals exhibit (Chou & Pearson, 2012; Paré, & Tremblay, 2004; Paré, Tremblay, & Lalonde, 2001). Therefore, gender, age, and tenure were identified as control variables for IS-specific OCBs in this study, and measured using a categorical scale (see Table 8).

4.8 Data Analysis

Structural equation modelling (SEM) was used in this study for Model 1 (AMOS) and 2 (M-Plus). Using SEM reduces the impacts of measurement error and enables researchers to assess the fit of the model to data (Preacher, 2011). Measurement error in an independent variable (or predictor) can bias estimates of its effects on a dependent variable (or criterion), bias the effects of other independent variables on the dependent variable, and attenuate estimates of the amount of variance in the dependent variable accounted for by the independent variables (Podsakoff et al., 2014). However, Podsakoff et al. (2014) report that only 20 % of studies on OCBs used these techniques and there is an avenue for future research to take advantage of the benefits of latent variable structural equation modelling.

According to Model 1, hypotheses 1 to 16 were individual-level analyses. Hypothesis 17 to 22 were analysed in two ways: a) multi-level model analysis (the individual-level predictor *IS-Specific OCB* was regressed against the group-level dependent variable *IS Department Effectiveness*), and b) group-level model analysis (Model 2) (the group-level predictor *IS-Specific Group-OCB* was regressed against the group-level dependent variable *IS Department Effectiveness*).

4.9 Summary

This chapter described the research design and the process of data collection, and presented an interpretation of sample demographics. This chapter then outlined the adapted measurements and provided appropriate tests to justify unidimensionality and multidimensionality of some individual and unit-level constructs. The chapter concluded with control variables used in this study. The next chapter focuses on the results achieved from the statistical analyses.

CHAPTER 5: DATA ANALYSIS AND RESULTS

5.1 Overview

The next sections demonstrate steps taken in data screening and illustrate a report on results of several statistical techniques applied to variables for testing normality, reflecting underlying processes of constructs, evaluating the threat of common method bias (CMB), and testing the hypothesized correlations between variables.

5.2 Data Screening

Dealing with missing values is one of the most important stages in data screening due to its effect on the generalizability of results. A few values (around 5 percent) were missing and the pattern of missing values were randomly scattered in both datasets. At early stages, some data were checked in terms of their contribution to the levels of variance (for example, if data were left blank or standard deviations were closer to zero for most of variables). In the first dataset, which contained data for Model 1, only two cases were deleted as they had no answer or contained repeated values (low standard deviation). In the second Model, which contained data for Model 2, nine cases were deleted as all items measuring unit-level OCB, system quality, information quality, and service quality of IS departments, were completely left without answers. Following that, a mean substitution method was applied for the rest of missing values to replace them with the mean values of variables (Hair, Black, Babin, Anderson, & Tatham, 2009). This method has some advantages: first, researchers are not required to guess at missing values; second, because the mean is closer to itself rather than to the missing value it replaces, the variance of a variable is reduced because of reduction in variance, but the correlation between variables is not inflated (Tabachnick & Fidell, 2001). Thus, the rest of missing values were replaced with the mean of variables.

5.2.1 Outliers

An outlier is a case with such as extreme value on one variable (a univariate outlier) or such as an unusual combination of scores on two or more variables (multivariate outlier) (Tabachnick & Fidell, 2001). As the existence of both univariate and multivariate distort statistics, Z scores for identifying univariate outliers was applied, and then cook's distance and Mahalanobis distance for identifying multivariate outliers were measured. Once potential cases of univariate outliers that were in excess of 3.29 were located in both datasets, the search for multivariate outliers began. Mahalanobis distance was interpreted and potential cases of multivariate outliers with probability estimate ($P < 0.001$) were identified. Also, potential cases with influence scores larger than 1 in cook's distance were acknowledged (Tabachnick & Fidell, 2001). However, according to Tabachnick and Fidell's (2001) suggestions, a few potential extreme outliers of standardized scores (z scores) are expected in the large sample size (N). Taken together, in this study, three cases were deleted from the first dataset (individual level) and twelve cases were eliminated from the second dataset (unit level) due to Mahalanobis distance with probability less than 0.001, and cook's distance greater than 1.

5.2.2 Normality

In this study, normality of variables is evaluated by both statistical and graphical methods. The statistical method presents the two components of normality, skewness and kurtosis. Ideally, a distribution is normal when the values of skewness and kurtosis are zero (Tabachnick & Fidell, 2001). Muthen and Kaplan (1985) suggested different cut-offs for univariate skewness and kurtosis. They pointed out that variables with univariate skewness and kurtosis between -1 and 1, have no distortion to normality. Following that, they recommended that values of skewness and kurtosis cannot be a distortion to normality when only a few of the skewness and kurtosis values are considered with an absolute value greater than 2 and correlations larger than 0.5. As presented in Table 16, most of the variable items of Model 1

have kurtosis and skewness in the range of -1 to 1, except one item of extraversion variable (Ext4) and one item of OCB (OCB1) with values of 2.43 and 2.41, respectively. All composite variables of Model 1, in Table 17, have a value of less than 2 except extraversion with a value of 3.25. Thus, based on cut-offs recommended by Muthen and Kaplan (1985), the assumption of normality was met due to values of skewness and kurtoses were in good agreement with the values of normal distribution. However, in a large sample size, the significant levels of skewness and kurtosis are not as important as their actual size and the visual appearance of the distribution (Tabachnick & Fidell, 2001). Because of that, frequency histograms of variables as graphical device for assessing normality were used.

Table 16. Assessment of Univariate Normality of items of each variable in Model 1

Variable	Code	Min	Max	Skewness	Kurtosis
Conscientiousness	Con1	-2	2	-1.33	0.82
	Con2	-2	2	-1.16	0.48
	Con3	-2	2	-1.46	1.30
	Con4	-2	2	-1.45	1.45
	Con5	-2	2	-1.38	1.24
	Con6	-2	2	-1.39	1.63
Extraversion	Ext1	-2	2	-1.26	0.47
	Ext2	-2	2	-1.43	1.66
	Ext3	-2	2	-1.10	0.52
	Ext4	-2	2	-1.59	2.43
	Ext5	-2	2	-1.26	1.16
	Ext6	-2	2	-1.53	1.94
Positive Affectivity	PA1	1	5	-0.33	-0.38
	PA2	1	5	-0.18	-0.3
	PA3	1	5	-0.49	0.09
	PA4	1	5	-0.56	-0.07
	PA5	1	5	0.04	-0.53
	PA6	1	5	-0.46	0.15
	PA7	1	5	-0.26	-0.30
	PA8	1	5	-0.52	0.17
Proactivity	Pr1	1	7	-0.66	-0.24

	Pr2	1	7	-0.72	-0.34
	Pr3	1	7	-0.57	-0.27
	Pr4	1	7	-0.96	0.41
	Pr5	1	7	-0.76	-0.03
	Pr6	1	7	-0.48	-0.31
Transformative Leadership	TL1	1	5	-0.37	-0.34
	TL2	1	5	-0.29	-0.73
	TL3	1	5	-0.45	-0.30
	TL4	1	5	-0.37	-0.49
	TL5	1	5	-0.34	-0.61
	TL6	1	5	-0.42	-0.48
	TL7	1	5	-0.4	-0.6
	TL8	1	5	-0.42	-0.49
	TL9	1	5	-0.21	-0.72
	TL10	1	5	-0.28	-0.55
	TL11	1	5	-0.39	-0.6
	TL12	1	5	-0.16	-0.55
	TL13	1	5	-0.35	-0.32
	TL14	1	5	-0.39	-0.24
	TL15	1	5	-0.28	-0.46
	TL16	1	5	-0.36	-0.62
	TL17	1	5	-0.36	-0.45
	TL18	1	5	-0.41	-0.4
	TL19	1	5	-0.37	-0.63
	TL20	1	5	-0.37	-0.62
LMX	LMX1	1	6	-0.56	0.20
	LMX2	1	6	-0.4	-0.20
	LMX3	1	6	-0.42	-0.14
	LMX4	1	6	-0.36	-0.05
	LMX5	1	6	-0.31	-0.46
	LMX6	1	6	-0.51	0.39
	LMX7	1	5	-0.73	-0.12
TMX	TMX1	1	6	-0.26	-0.15
	TMX2	1	6	-0.39	-0.27
	TMX3	1	6	-0.40	-0.08
	TMX4	1	5	-0.60	0.12
	TMX5	1	5	-0.42	-0.19

	TMX6	1	6	-0.51	0.07
	TMX7	1	6	-0.37	-0.10
	TMX8	1	6	-0.34	-0.19
	TMX9	1	6	-0.48	-0.02
	TMX10	1	6	-0.38	-0.11
Workload	Wor1	1	7	-0.32	-0.21
	Wor2	1	7	-0.12	-0.40
	Wor3	1	7	-0.39	-0.21
	Wor4	1	7	-0.24	-0.33
Role Conflict	RC1	1	7	-0.47	0.17
	RC2	1	7	-0.14	-1.23
	RC3	1	7	-0.09	-1.08
	RC4	1	7	-0.45	-0.57
	RC5	1	7	-0.46	-0.43
	RC6	1	7	-0.14	-0.39
	RC7	1	7	-0.17	-0.74
	RC8	1	7	0.05	-1.28
Role Ambiguity	RA1	1	7	-0.15	-0.67
	RA2	1	7	-0.24	-0.71
	RA3	1	7	-0.13	-0.71
	RA4	1	7	-0.06	-1.13
	RA5	1	7	-0.09	-1.19
	RA6	1	7	-0.06	-0.94
Lack of Autonomy	LA1	1	7	-0.12	-0.66
	LA2	1	7	0.03	-0.45
	LA3	1	7	-0.3	-0.39
	LA4	1	7	-0.24	-0.48
	LA5	1	7	0.05	-0.57
Exhaustion	EX1	1	6	0.36	0.05
	EX2	1	6	0.23	-0.09
	EX3	1	6	0.26	-0.12
	EX4	1	6	0.34	0.31
	EX5	1	6	0.25	-0.32
OCB	OCB1	2	7	-1.72	2.41
	OCB2	2	7	-0.88	0.17
	OCB3	1	7	-0.31	-0.04
	OCB4	2	7	-0.66	0.03

	OCB5	2	7	-0.74	0.08
	OCB6	1	7	-0.58	0.12
	OCB7	2	7	-0.25	-0.57
	OCB8	1	7	-0.97	0.79
	OCB9	1	7	-1.21	1.17
	OCB10	1	7	-0.73	0.66
	OCB11	1	7	-0.66	0.25
	OCB12	1	7	-0.64	0.33
	OCB13	1	7	-0.56	0.15
	OCB14	1	7	-0.57	-0.17
	OCB15	1	7	-0.91	1.02
	OCB16	1	7	-0.8	0.69
	OCB17	1	7	-0.82	0.93
	OCB18	1	6	-0.85	0.57
	OCB19	2	7	-0.05	-0.41
	OCB20	2	7	-0.48	-0.48
	OCB21	2	7	-0.31	-0.47
	OCB22	2	7	-0.52	0.26
	OCB23	2	7	-0.38	-0.40
	OCB24	2	7	-0.55	-0.29

Table 17. Assessment of Univariate Normality of Composite Variables in Model 1

	CON	EXT	PR	PA	TL	LMX	TMX	RA	RC	WOR	LA	EX	OCB
Sample Size(N)	529	529	529	529	529	529	529	529	529	529	529	529	529
Missing Values	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean	1.07	1.08	4.92	3.71	3.42	3.74	3.68	4.15	4.20	4.51	4.11	3.05	4.69
Std. Deviation	0.85	0.72	1.21	0.65	0.76	0.72	0.70	1.39	1.22	1.05	1.09	0.83	0.76
Skewness	-1.41	-1.80	-0.82	-0.42	-0.38	-0.59	-0.50	-0.29	-0.10	-0.62	-0.14	0.85	-1.29
Std. Error of Skewness	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Kurtosis	1.38	3.25	0.07	0.19	-0.33	-0.05	0.08	-0.98	-0.56	0.11	-0.57	0.46	1.77
Std. Error of Kurtosis	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21

CON = Conscientiousness; EXT = Extraversion; PR = Proactivity; PA = Positive Affectivity; TL = Transformative Leadership; LA = Lack of Autonomy; WOR = Workload; RC = Role Conflict; RA = Role Ambiguity; EX = Exhaustion.

Therefore, histograms of each variable are presented below and elaborately discussed in terms of their skewness and kurtosis. To interpret skewness and kurtosis of each variable, this study follows the rule of thumb suggested by Bulmer (1979): 1) if a value of skewness is less than -1 or greater than +1, the distribution is highly skewed; 2) if a value of skewness is between -1 and – ½ or between + ½ and 1, the distribution is moderately skewed; and 3) if a value of skewness is between – ½ and + ½ , the distribution is approximately symmetric. In addition, a normal distribution has kurtosis between -3 and 3, in which values greater than 3 is too peaked (leptokurtic), values is equal to zero is normal, and values less than -3 is too flat (platykurtic).

The first figure shows the curve of OCB variable. The skewness is -1.29, which is highly skewed, and the kurtosis is 1.77, which falls between the appropriate interval of -3 and +3. So, the values of skewness and kurtosis are in the agreement with values of normal distribution.

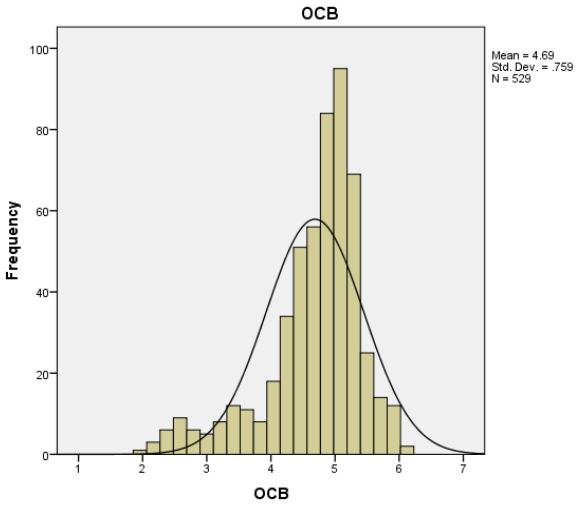


Figure 3. OCB

The below figure demonstrated the curve of exhaustion variable. The skewness is 0.85, which is moderately skewed, and kurtosis is 0.46, which is close to zero, representing a normal kurtosis.

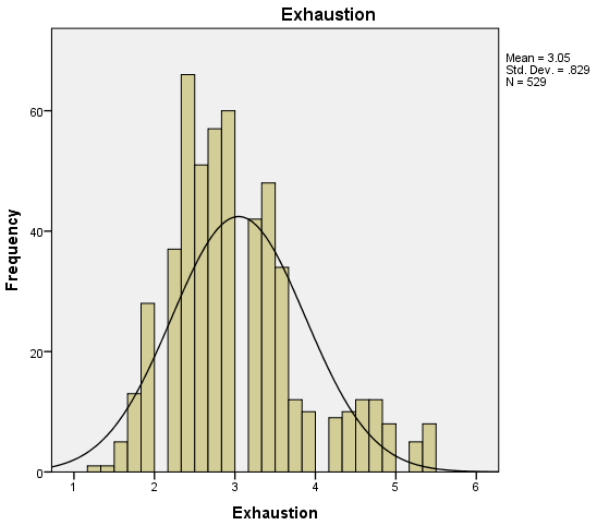


Figure 4. Exhaustion

The curve of lack of autonomy variable is shown below. The value of skewness and kurtosis is – 0.14 and – 0.54, respectively, representing that the distribution is approximately symmetric and normally kurtotic.

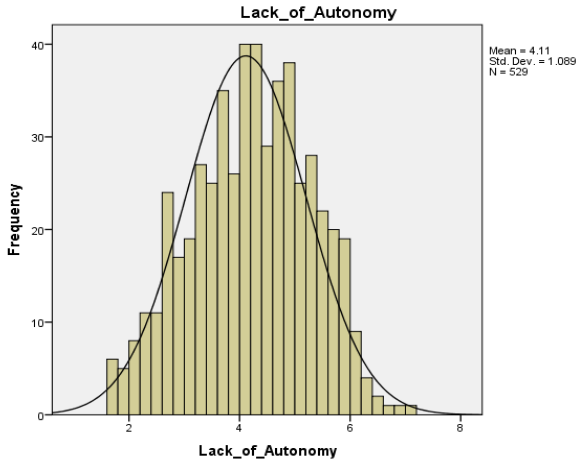


Figure 5. Lack of Autonomy

The values of skewness (- 0.62) and kurtosis (0.11) for workload show that the distribution is symmetric and normally kurtotic. It means that the workload variable is normally distributed.

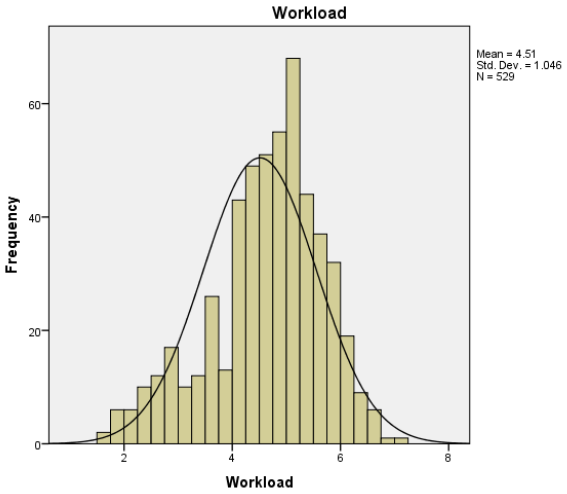


Figure 6. Workload

The distribution of the role conflict is normal because the below curve is symmetric, which makes up a value of – 0.10, and the curve is normally kurtotic with a value of – 0.56.

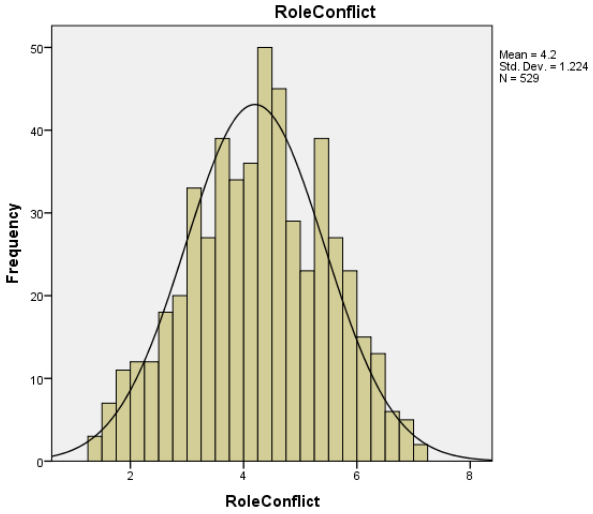


Figure 7. Role Conflict

The below figure represents that the role ambiguity is normally curved because the value of skewness is – 0.29, which falls between – ½ and + ½, and the value of kurtosis is – 0.98, which falls between -3 and 3. Therefore, the distribution is symmetric and has a normal kurtosis.

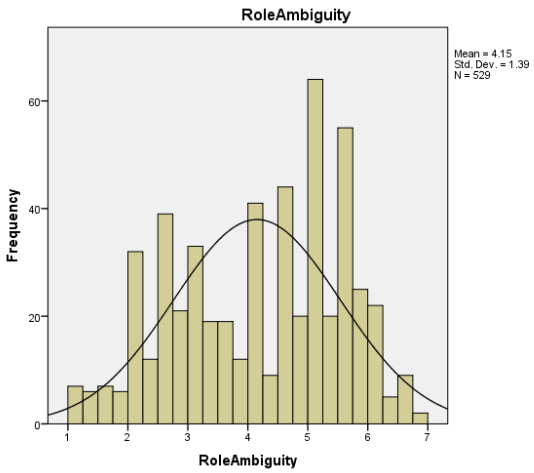


Figure 8. Role Ambiguity

The distribution of the TMX variable is presented below. The value of skewness is – 0.50 and kurtosis is 0.08. The variable is symmetrically skewed and normally kurtoted. Therefore, kurtosis and skewness are in the agreement with values of normal distribution.

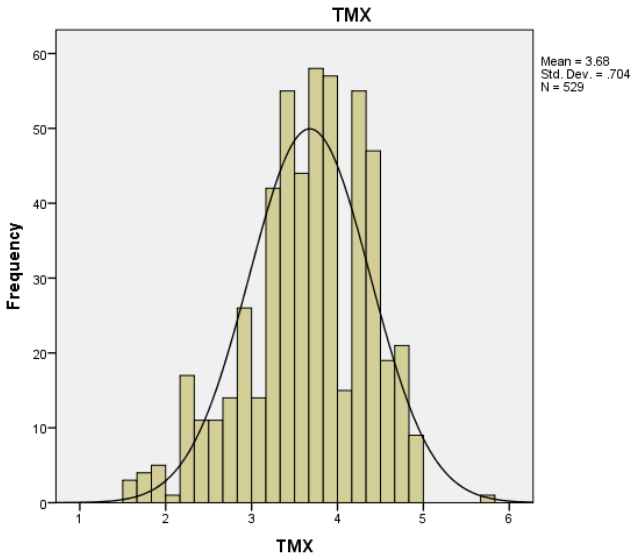


Figure 9. TMX

The LMX variable is normally distributed because the value of skewness is – 0.59, which almost falls between – ½ and + ½, and the value of kurtosis is – 0.05, which is close to zero and falls between -3 and 3.

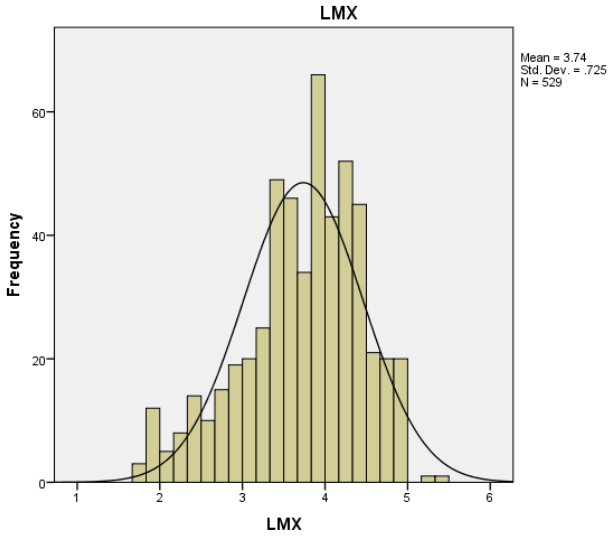


Figure 10. LMX

The curve of transformative leadership variable demonstrates the skewness value of -0.38, which falls between – ½ and + ½, and the kurtosis value of – 0.33, which falls between the appropriate interval of -3 and +3. So, the values of skewness and kurtosis are in the agreement with values of normal distribution.

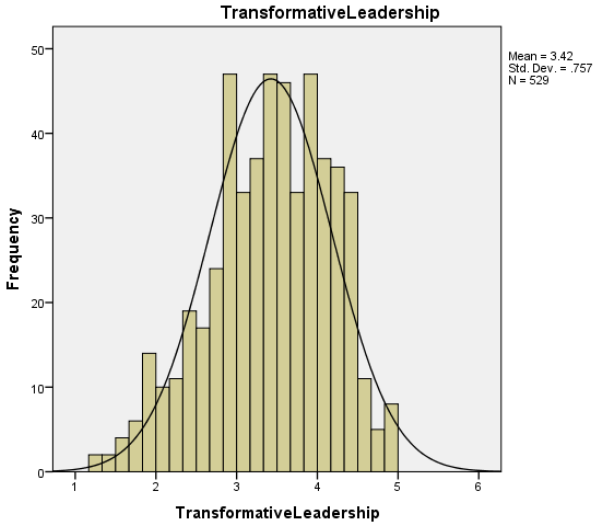


Figure 11. Transformative Leadership

The positive affectivity variable is shown below. The value of skewness and kurtosis is – 0.42 and 0.19, respectively, representing that the distribution is approximately symmetric and normally kurtotic.

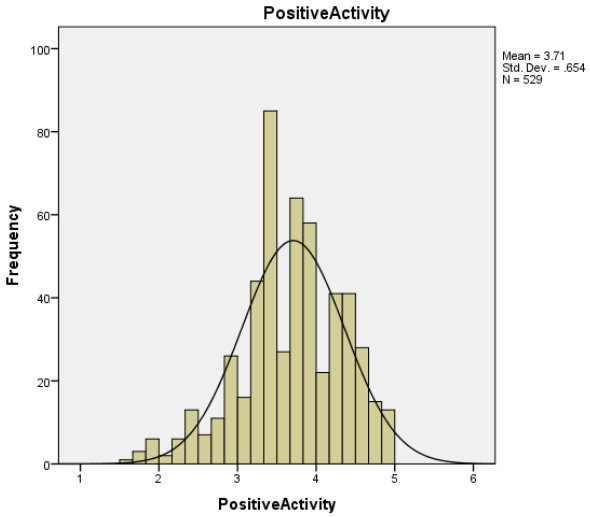


Figure 12. Positive Affectivity

The distribution of the proactivity is normal because the below curve is symmetric, which makes up a value of – 0.82, and the curve is normally kurtotic with a value of 0.07. Thus, the values of both skewness and kurtosis are in agreement with the values of normal distribution.

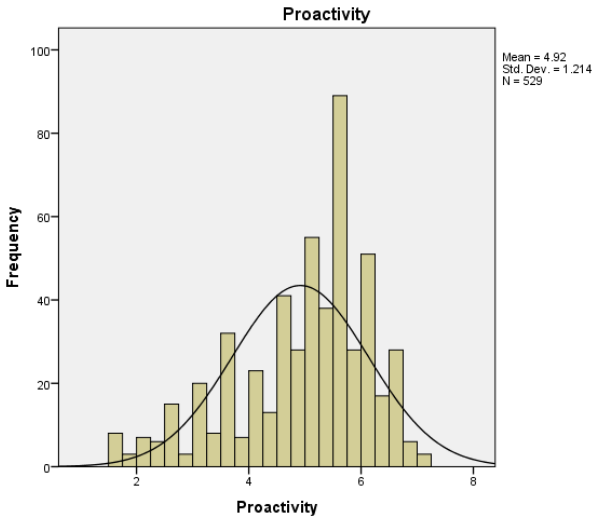


Figure 13. Proactivity

The extraversion variable is curved in the below figure. The value of skewness and kurtosis is – 1.80 and 3.25, respectively, representing that the distribution is highly skewed and too peaked. As discussed earlier, a highly kurtotic distribution cannot be a distortion to

normality if a few kurtoses are considered with an absolute value greater than 2 and correlations larger than 0.5.

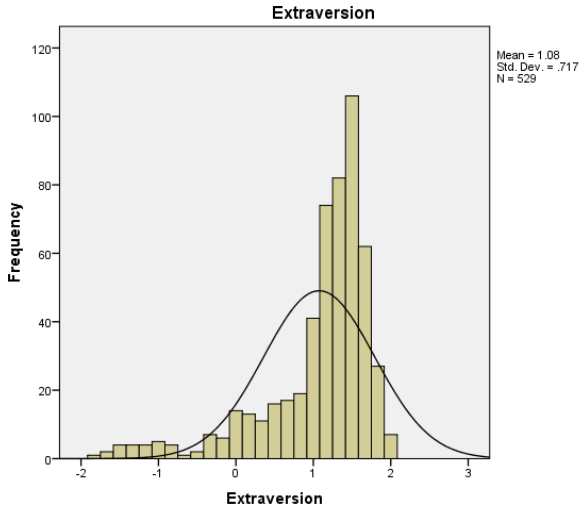


Figure 14. Extraversion

The curve of conscientiousness variable reflects the skewness value of -1.80, which is highly skewed and the kurtosis value of 1.38, which falls between the appropriate interval of -3 and +3. So, the values of skewness and kurtosis are in the agreement with values of normal distribution.

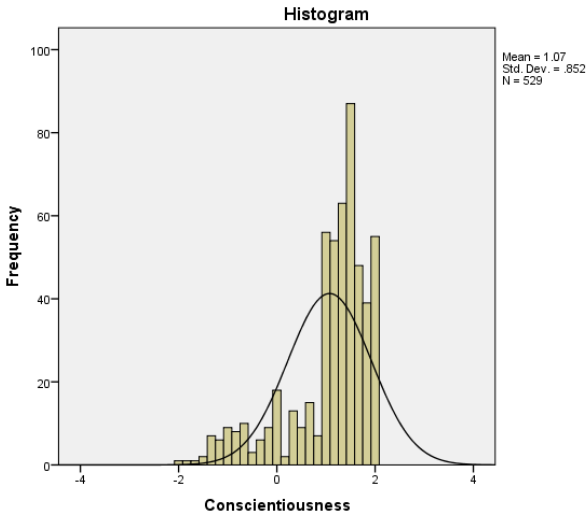


Figure 15. Conscientiousness

All values of skewness and kurtosis of observed variables in Model 2 are demonstrated in Table 18. According to Muthen and Kaplan's (1985) suggested cut-offs on different ranges of appropriate values of skewness and kurtosis, all observed variables of unit-level OCB,

system quality, information quality, and service quality have values between -1 and 1, and only some observed variables of system quality have values that exceed the recommended value of 2.00 of which they ranged from 2.00 to 2.64. In addition to skewness and kurtosis of observed variables, the values of skewness and kurtosis of constructs are also shown in Table 19. All values fall within the suggested cut-offs by Muthen and Kaplan (1985), except a value of kurtosis (2.28) of system quality construct. However, the values of skewness and kurtosis indicated in Table 19 cannot be a threat to normality based on Muthen and Kaplan's (1985) interpretation of the exceeding values of skewness and kurtosis and show a good agreement with the values of normal distribution.

Table 18. Assessment of Univariate Normality of items of each variable in Model 2

Variable	Code	Min	Max	Skewness	Kurtosis
Unit-level OCB	OCB1	1	7	-1.09	0.50
	OCB2	1	7	-0.63	-0.26
	OCB3	1	7	-0.48	-0.21
	OCB4	1	7	-0.65	0.14
	OCB5	1	7	-0.72	0.01
	OCB6	1	7	-0.62	-0.13
	OCB7	1	7	-0.32	-0.61
	OCB8	1	7	-0.47	-0.54
	OCB9	1	7	-0.43	-0.21
	OCB10	1	7	-0.54	-0.15
	OCB11	1	7	-0.35	-0.37
	OCB12	1	7	-0.05	-0.79
	OCB13	1	7	-0.22	-0.80
System Quality	SYS1	0	5	-1.31	2.54
	SYS2	0	5	-1.30	2.63
	SYS3	0	5	-1.33	2.64
	SYS4	0	5	-1.31	2.33
	SYS5	0	5	-1.34	2.34
	SYS6	0	5	-1.24	2.07
	SYS7	0	5	-1.29	2.17
	SYS8	0	5	-1.24	1.88
	SYS9	0	5	-1.34	2.06
	SYS11	0	5	-1.22	1.82
	SYS12	0	5	-1.24	1.88
	SYS13	0	5	-1.10	1.56

	SYS14	**0**	**5**	**-1.22**	**1.90**
	SYS15	**0**	**5**	**-1.27**	**2.03**
	SYS16	**0**	**5**	**-1.36**	**1.99**
	SYS18	**0**	**5**	**-1.18**	**1.97**
	SYS19	**0**	**5**	**-1.33**	**2.46**
	SYS20	**0**	**5**	**-1.19**	**1.91**
	SYS21	**0**	**5**	**-1.39**	**2.33**
	SYS23	**0**	**5**	**-1.36**	**2.36**
	SYS24	**0**	**5**	**-1.26**	**1.93**
	SYS25	**0**	**5**	**-1.36**	**2.43**
	SYS26	**0**	**5**	**-1.25**	**2.00**
	SYS27	**0**	**5**	**-1.25**	**1.82**
	SYS28	**0**	**5**	**-1.23**	**2.00**
	SYS29	**0**	**5**	**-1.28**	**2.01**
	SYS30	**0**	**5**	**-1.24**	**1.77**
	SYS31	**0**	**5**	**-1.12**	**1.54**
	SYS32	**0**	**5**	**-1.10**	**1.78**
	SYS33	**0**	**5**	**-1.22**	**2.29**
	SYS34	**0**	**5**	**-1.31**	**2.28**
	SYS35	**0**	**5**	**-1.29**	**2.37**
	SYS36	**0**	**5**	**-1.24**	**2.22**
	SYS37	**0**	**5**	**-1.20**	**2.12**
	SYS38	**0**	**5**	**-1.03**	**1.91**
	SYS39	**0**	**5**	**-1.01**	**2.08**
	SYS40	**0**	**5**	**-1.14**	**2.39**
	SYS41	**0**	**5**	**-1.21**	**2.49**
	SYS42	**0**	**5**	**-1.08**	**2.04**
Information Quality	**INF1**	**0**	**5**	**-0.75**	**-0.52**
	INF2	**0**	**5**	**-1.15**	**0.49**
	INF3	**0**	**5**	**-0.81**	**-0.22**
	INF4	**0**	**5**	**-0.94**	**0.04**
	INF5	**0**	**5**	**-0.90**	**-0.23**
	INF6	**0**	**5**	**-0.99**	**-0.02**
	INF7	**0**	**5**	**-0.92**	**-0.14**
	INF8	**0**	**5**	**-1.23**	**0.70**
	INF9	**0**	**5**	**-1.19**	**0.67**
	INF10	**0**	**5**	**-1.22**	**0.84**
	INF11	**0**	**5**	**-0.97**	**0.12**
	INF12	**0**	**5**	**-1.08**	**0.39**
	INF13	**0**	**5**	**-0.92**	**0.00**
	INF14	**0**	**5**	**-0.98**	**0.05**
	INF15	**0**	**5**	**-0.87**	**-0.16**
	INF16	**0**	**5**	**-0.80**	**-0.23**
	INF17	**0**	**5**	**-1.08**	**0.35**
	INF18	**0**	**5**	**-0.93**	**-0.05**

	INF19	**0**	**5**	**-0.96**	**-0.12**
	INF20	**0**	**5**	**-0.69**	**-0.69**
	INF21	**0**	**5**	**-0.84**	**-0.27**
	INF22	**0**	**5**	**-1.02**	**0.12**
	INF23	**0**	**5**	**-0.80**	**-0.36**
	INF24	**0**	**5**	**-0.81**	**-0.30**
	INF25	**0**	**5**	**-0.91**	**-0.04**
	INF26	**0**	**5**	**-0.80**	**-0.44**
	INF27	**0**	**5**	**-0.76**	**-0.47**
	INF28	**0**	**5**	**-0.80**	**-0.34**
	INF29	**0**	**5**	**-0.75**	**-0.43**
	INF30	**0**	**5**	**-0.83**	**-0.27**
	INF31	**0**	**5**	**-0.95**	**0.03**
	INF32	**0**	**5**	**-0.99**	**0.13**
	INF33	**0**	**5**	**-0.99**	**0.14**
	INF34	**0**	**5**	**-0.94**	**-0.03**
	INF35	**0**	**5**	**-0.92**	**-0.10**
	INF36	**0**	**5**	**-0.97**	**0.01**
Service Quality	**SER1**	**0**	**5**	**-0.43**	**-1.13**
	SER2	**0**	**5**	**-0.42**	**-0.94**
	SER3	**0**	**5**	**-0.53**	**-0.98**
	SER4	**0**	**5**	**-0.51**	**-1.00**
	SER5	**0**	**5**	**-0.87**	**-0.35**
	SER6	**0**	**5**	**-0.89**	**-0.29**
	SER7	**0**	**5**	**-0.76**	**-0.45**
	SER8	**0**	**5**	**-0.78**	**-0.40**
	SER9	**0**	**5**	**-0.89**	**-0.28**
	SER10	**0**	**5**	**-0.81**	**-0.53**
	SER11	**0**	**5**	**-0.57**	**-0.93**
	SER12	**0**	**5**	**-0.68**	**-0.61**
	SER13	**0**	**5**	**-0.69**	**-0.57**
	SER14	**0**	**5**	**-0.67**	**-0.66**
	SER15	**0**	**5**	**-0.70**	**-0.57**
	SER16	**0**	**5**	**-0.52**	**-0.96**
	SER17	**0**	**5**	**-0.62**	**-0.71**
	SER18	**0**	**5**	**-0.91**	**-0.29**
	SER19	**0**	**5**	**-0.82**	**-0.49**
	SER20	**0**	**5**	**-0.83**	**-0.42**
	SER21	**0**	**5**	**-0.83**	**-0.41**
	SER22	**0**	**5**	**-0.78**	**-0.55**
	SER23	**0**	**5**	**-1.08**	**0.12**
	SER24	**0**	**5**	**-1.01**	**-0.13**
	SER25	**0**	**5**	**-1.08**	**0.17**
	SER26	**0**	**5**	**-0.76**	**-0.66**
	SER27	**0**	**5**	**-0.59**	**-0.91**

	SER28	**0**	**5**	**-0.93**	**-0.26**
	SER29	**0**	**5**	**-0.67**	**-0.78**
	SER30	**0**	**5**	**-0.69**	**-0.61**
	SER31	**0**	**5**	**-0.75**	**-0.66**
	SER32	**0**	**5**	**-0.61**	**-0.86**

Table 19. Assessment of Univariate Normality of Composite Variables in Model 2

	Unit-Level OCB	**System Quality**	**Service Quality**	**Information Quality**
Sample Size(N)	**1112**	**1112**	**1112**	**1112**
Missing Values	**0**	**0**	**0**	**0**
Mean	**4.53**	**3.65**	**2.93**	**3.21**
Std. Deviation	**0.99**	**0.70**	**1.30**	**0.99**
Skewness	**-0.51**	**-1.59**	**-0.53**	**-0.73**
Std. Error of Skewness	**0.07**	**0.07**	**0.07**	**0.07**
Kurtosis	**0.58**	**2.28**	**-0.84**	**-0.53**
Std. Error of Kurtosis	**0.15**	**0.15**	**0.15**	**0.15**

The report on normality is not only limited to the values of skewness and kurtosis of each variable, but it also includes the visual appearance of the normal distribution (Tabachnick & Fidell, 2001). The below histograms illustrate the normal distribution of the four variables in Model 2. The curve of unit-level OCB has the skewness and kurtosis of -0.51 and 0.58, respectively. The interpretation is that the distribution is moderately skewed and significantly kurtoted.

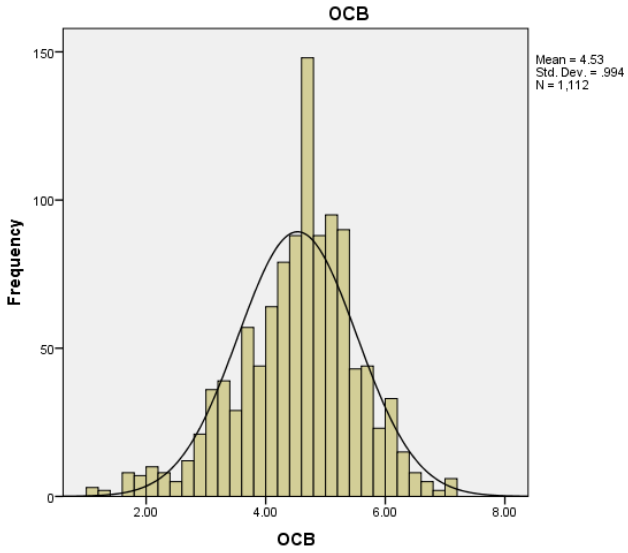


Figure 16. Unit-Level OCB

The next figure presents the normal distribution of the system quality. The skewness is -1.59 and kurtosis is 2.28. The curve of the system quality variable shows that the distribution is highly skewed and has a normal kurtosis as the kurtosis value falls between the appropriate interval of -3 and +3. Hence, the value of skewness and kurtosis is in the agreement with values of normal distribution.

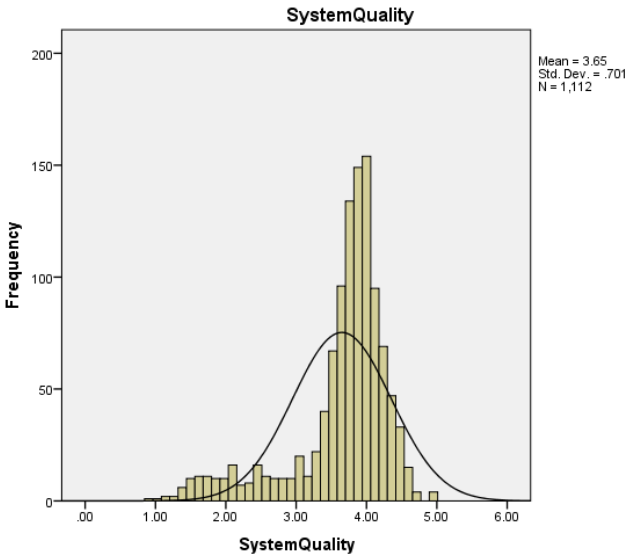


Figure 17. System Quality

The assumption of normal distribution is kept for the service quality variable. The value of skewness and kurtosis is -0.53 and -0.84, indicating a moderate skewness and normal kurtosis.

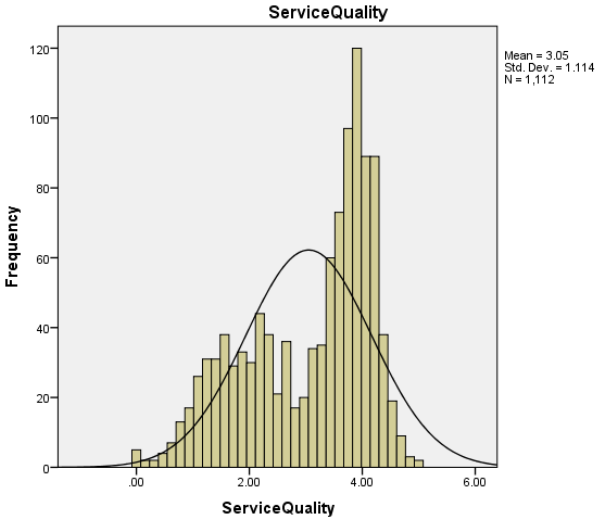


Figure18. Service Quality

The curve of information quality variable is shown in the following figure. The value of skewness and kurtosis is – 0.73 and -0.53, respectively, representing that the distribution has a moderate skewness and normal kurtosis.

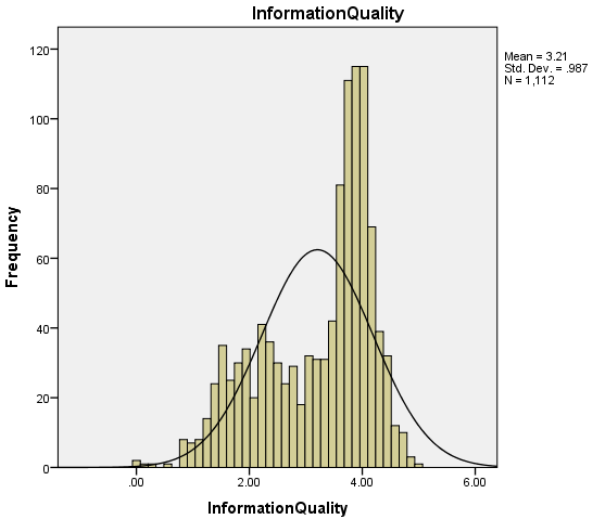


Figure19. Information Quality

The next section focuses on employing an exploratory factor analysis (EFA) to explore the choice of factor extraction technique, rotation technique, and interpretation of the factor analysis outputs. The most significant reasons of studying the EFA are to decide the number of factors to retain and examine how variance for given variables are distributed regarding other variables in the datasets. The EFA would be separately run for both datasets of Model 1 and Model 2.

5.3 Exploratory Factor Analysis

Exploratory factor analysis summarizes data by grouping correlated variables. EFA is a common analysis performed in the early stages of the research to provide a tool for consolidating variables and for generating hypotheses about underlying processes (Tabachnick & Fidell, 2001). Extraction is a theorem from matrix algebra, indicating that under certain conditions, matrices can be diagonalized. The factor extraction technique used in this study was ***Maximum Likelihood*** due to its goal of analysis and special features provided by this technique. The goal of this analysis is to estimate factor loadings for population that maximize the likelihood of sampling the observed correlation matrix. A feature of this technique is a significance test for factors, especially useful for confirmatory factor analysis (CFA) that is a sophisticated technique used in the advanced stages of the research process to evaluate a theory about latent processes and whether the hypothesized model fit data (Tabachnick & Fidell, 2001). The rotational technique used in this study was ***Promax*** because the rotational type was oblique that offers the unique contribution of each factor to the variance of each variable (Gorsuch, 1983). In fact, dissimilar to orthogonal rotation, oblique rotation methods assume that the factors are correlated.

Different tests were performed to analyse factors of Model 1 and Model 2. Hence, the interpretations of the results are as follows: 1) Kaiser-Meyer-Olkin (KMO) test that measures sampling adequacy for each variable was 0.923 for Model 1 and 0.970 for Model 2, reflecting an acceptable value between 0.8 and 1. It means how adequate the sampling was to suit the factor analysis. Another test with the same goal to check whether the variance of variables was equal across the sample in this study was Bartlett's test of sphericity. The result of this test for Model 1 and 2 was significant ($\alpha = 0.000$), meaning that the variance was homogeneous across the sample; 2) the extraction with the promax rotation was used to estimate the number of factors from eigenvalues. The 18 factors shown, in Appendix D, yield eigenvalues greater than 1, which can be taken as evidence that the number of factors should be 18, and reflect cumulative percentages of variance of 59 percent (Model 1) and 55 percent (Model 2), which are evidence of total explained variance of all factors in individual and group-level models, respectively. The proportion of the variance explained by each factor is illustrated in Appendix D. For Model 1, the factors accounts for between 1.30 and 21.92 percent of the variance in the set of individual variables, and for Model 2, the factors account for between 0.85 and 25.98 percent of the variance among group-level variables. To test the results derived from the promax rotation, the scree plots of the eigenvalues (below) were used to assess adequacy of extraction and number of factors. The scree plots visually show breaks of 18 factors, which is consistent with the results suggesting in the promax rotation; 3) the residual correlation matrix was checked in terms of actual correlations between pairs of variables with effects of factors. The results yielded only 2 percent for Model 1 and 1 percent for Model2, suggesting a small probability that there was presence of other factors that could be generated for the current variables (Tabachnick & Fidell, 2001);

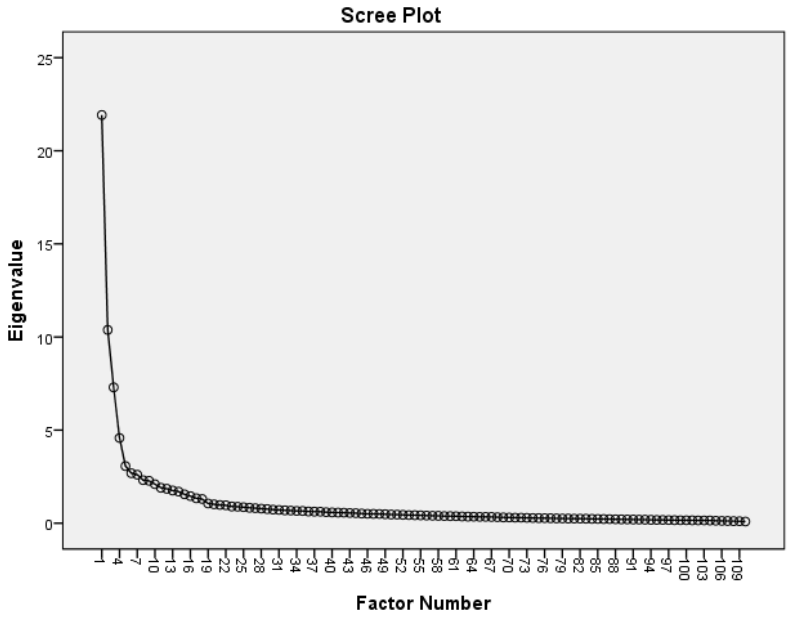


Figure 20. Scree Plot of Model 1

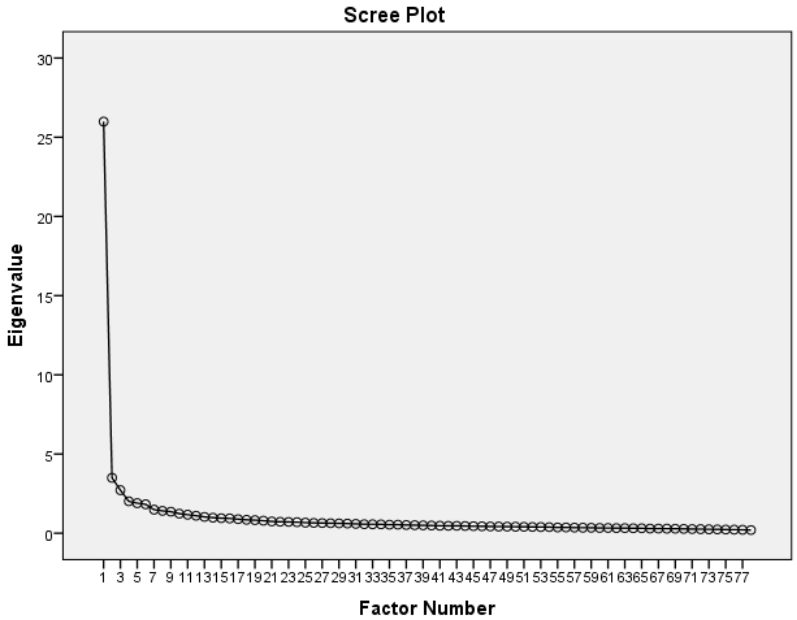


Figure 21. Scree Plot of Model 2

And 4) the pattern matrix was interpreted rather than the structure matrix as the difference between high and low loadings is more apparent in the pattern matrix, and the correlations between variables and factors are inflated by overlap between factors in the structure matrix (Tabachnick & Fidell, 2001). The pattern matrix is a measure of the unique

relationship between the factor and its variables and demonstrates a group of variables loading on separate factors. According to Cormery and Lee's rule of thumb, only variables with the factor loadings of 0.32 and above were kept and interpreted for this study. Based on their suggestions on different ranges of factor loadings, loadings in excess of 0.71 are considered excellent, 0.63 very good, 0.55 good, 0.45 fair, and 0.32 poor. Factor loadings of variables of Model 1 and Model 2 are presented in Table 20 and 21. Most of the loadings are greater than 0.63 or 0.71, reflecting that the factor loadings are reconciled with the higher cut-offs. Some items of the variables were excluded from the pools as they could cross-load with other factors (they had a large factor loading of above 0.3 onto multiple factors) while cross loadings with a difference of 0.3 between the primary highest and secondary highest factor loadings were retained in the pools (Tabachnick & Fidell, 2001).

Table 20. Factors and Cross Loadings of Model 1

Variable	CON	EXT	PR	PA	TL	LMX	TMX-R	TMX-C	LA	WOR	RC	RA	EX	OCB-A	OCB-C	OCB-V	OCB-S	OCB-T
CON1	0.786																	
CON2	0.829																	
CON3	0.869																	
CON4	0.695																	
CON5	0.706																	
CON6	0.433																	
EXT1		0.326																
EXT2		0.683																
EXT3		0.645																
EXT4		0.711																
EXT5		0.687																
EXT6		0.667																
PR1			0.699															
PR2			0.761															
PR3			0.839															
PR4			0.730															
PR5			0.929															
PR6			0.677															
PA1				0.695														
PA2				0.636														
PA3				0.742														
PA4				0.733														
PA5				0.485														
PA6				0.770														
PA7				0.648														
PA8				0.667														
PA9				0.687														
PA10				0.700														
TL4					0.643													
TL5					0.636													
TL6					0.743													
TL7					0.717													
TL8					0.753													
TL9					0.592													
TL11					0.518													
TL12					0.721													
TL13					0.709													
TL14					0.792													
TL15					0.741													
TL16					0.766													
TL17					0.675													
TL18					0.819													
TL19					0.749													
TL20					0.774													
LMX2						0.694												
LMX3						0.481												
LMX4						0.715												
LMX5						0.774												
LMX6						0.757												
LMX7						0.805												
TMX1							0.528											
TMX2							0.721											
TMX3							0.626											
TMX4							0.765											
TMX5							0.760											
TMX7								0.838										
TMX8								0.833										
TMX9								0.553										
LA1									0.589									
LA2									0.653									
LA3									0.804									
LA4									0.799									
LA5									0.669									
WOR1										0.470								
WOR2										0.384								
WOR3										0.879								
WOR4										0.877								
RC1											0.461							
RC2											0.566							
RC3											0.680							
RC4											0.766							
RC5											0.714							
RC6											0.799							
RC7											0.803							
RC8											0.547							
RA1												0.737						
RA2												0.787						
RA3												0.842						
RA4												0.894						
RA5												0.891						
RA6												0.882						
EX1													0.693					
EX2													0.589					
EX3													0.721					
EX4													0.720					

EX5													0.697					
OCB1														0.626				
OCB2														0.870				
OCB3														0.502				
OCB4														0.879				
OCB5														0.747				
OCB6															0.838			
OCB7															0.510			
OCB8															0.777			
OCB9															0.682			
OCB10															0.781			
OCB11																0.750		
OCB12																0.857		
OCB13																0.771		
OCB14																0.756		
OCB15																	0.766	
OCB16																	0.769	
OCB17																	0.806	
OCB18																	0.876	
OCB19																	0.692	
OCB20																		0.806
OCB21																		0.803
OCB22																		0.760
OCB23																		0.893
OCB24																		0.777

CON = Conscientiousness; EXT = Extraversion; PR = Proactivity; PA = Positive Affectivity; TL = Transformative Leadership; TMX-R = Exchange Receipt; TMX-C = Exchange Contribution; LA = Lack of Autonomy; WOR = Workload; RC = Role Conflict; RA = Role Ambiguity; EX = Exhaustion; OCB-A = Altruism; OCB-C = Courtesy; OCB-V = Civic Virtue; OCB-S = Sportsmanship; OCB-T = Conscientiousness.

Table 21. Factors and Cross Loadings of Model 2

Variable	IOJ	IOEC	IOIP	IOKL	ISQ	SUC	IST	ROS	FOS	IQOSP	INQOSP	IQOI	PQOI	FOI	UOI	OCB-H	OCB-V	OCB-S
SYS3	0.655																	
SYS4	0.728																	
SYS5	0.738																	
SYS6	0.803																	
SYS7	0.742																	
SYS8	0.706																	
SYS9	0.558																	
SYS13		0.510																
SYS14		0.642																
SYS15		0.605																
SYS19			0.586															
SYS20			0.566															
SYS21			0.515															
SYS25				0.672														
SYS26				0.816														
SYS27				0.801														
SYS28				0.602														
SYS29				0.640														
SYS30					0.338													
SYS32					0.536													
SYS33					0.587													
SYS34					0.625													
SYS38						0.437												
SYS39						0.719												
SYS40						0.799												
SYS41						0.675												
SYS42						0.761												
SER1							0.670											
SER2							0.646											
SER3							0.817											
SER4							0.656											
SER7								0.683										
SER8								0.633										

SER12									0.764									
SER13									0.612									
SER14									0.602									
SER15									0.637									
SER23										0.758								
SER24										0.642								
SER25										0.689								
SER26										0.467								
SER28											0.374							
SER29											0.674							
SER30											0.842							
SER31											0.704							
SER32											0.643							
INFO2												0.585						
INFO3												0.651						
INFO4												0.664						
INFO5												0.303						
INFO6												0.498						
INFO7												0.430						
INFO11													0.596					
INFO12													0.542					
INFO21														0.524				
INFO22														0.453				
INFO23														0.393				
INFO24														0.741				
INFO25														0.804				
INFO26														0.543				
INFO27														0.364				
INFO31															0.544			
INFO32															0.612			
INFO33															0.700			
INFO34															0.826			
INFO35															0.745			
INFO36															0.616			
OCB1																0.610		
OCB2																0.698		
OCB3																0.832		
OCB4																0.897		
OCB5																0.702		
OCB8																	0.537	
OCB9																	0.852	
OCB10																	0.595	
OCB11																		0.541
OCB12																		0.840
OCB13																		0.692

IOJ = Impact on Job; IOEC = Impact on External Constituencies; IOIP = Impact on Internal Processes; IOKL = Impact on Knowledge and Learning; ISQ = Intrinsic System Quality; SUC = System Usage Characteristics; IST = Information Systems Training; ROS = Responsiveness of Services; FOS = Flexibility of Services; IQOSP = Intrinsic Quality of Service Provider; INQOSP = Interpersonal Quality of Service Provider; IQOI = Intrinsic Quality of Information; PQOI = Presentational Quality of Information; FOI = Flexibility of Information; UOI = Usefulness of Information; OCB-H = Helping Behaviours; OCB-V = Civic Virtue; OCB-S = Sportsmanship.

The results derived from the EFA satisfactorily identified the number of factors (latent constructs) and the underlying factor structure of the measured variables (observed variables). CFA were then performed in this study to test the hypotheses that relationships between

observed variables and their underlying latent constructs (factors) exist. Amos (Arbuckle, 2014) was used for performing CFA through structural equation modelling, using a two-step analytic approach. First, the measurement models were assessed in terms of the validity and reliability of the measures of Model 1 (see chapter 5.4) and Model 2 (see chapter 5.5). Second, once the results of the measurement models were accepted, the structural models were evaluated to assess the strength of the relationships among the individual constructs (see section 5.6.3) and group-level constructs (see section 5.7.2).

5.4 Reliability and Validity Analysis of Individual-Level Variables

The measurement model of Model 1 was assessed for internal consistency, and convergent and discriminant validity. The results are presented in Table 22, indicating the means, standard deviations, number of items, factor loadings, and reliabilities (Cronbach' Alpha (α)) of the constructs. All items that loaded on respective factors exhibited values of about 0.70 or greater than 0.70. However, there were some low-loading items between 0.50 and 0.70. As a guideline, Chin (1998) states that standardized loadings should be greater than 0.707, but also noted that this rule of thumb should not be as rigid as at early stages of scale development. Loadings of 0.5 or 0.6 may be acceptable if additional indicators in the block could serve as a basis for comparison. For all constructs, internal consistency reliabilities (Cronbach' Alpha (α)) were greater than the recommended cut-off of 0.70 (Nunnally & Bernstein, 1994).

Table 22. Factor Loadings and Reliabilities of Individual Constructs

Construct	Mean	Standard Deviation	No. of Items	Confirmatory Factor Loadings Range	Reliability (alpha) α
Conscientiousness	1.07	0.85	6	0.76-0.81	0.88
Extraversion	1.08	0.72	6	0.63-0.74	0.79
Proactivity	4.92	1.21	6	0.74-0.83	0.90

Positive Affectivity	3.71	0.65	10	0.67-0.76	0.89
Transformative Leadership	3.42	0.76	20	0.65-0.77	0.94
LMX	3.74	0.72	7	0.74-0.80	0.89
TMX	3.68	0.70	10	0.68-0.90	0.90
Lack of Autonomy	4.11	1.09	5	0.64-0.76	0.83
Workload	4.51	1.05	4	0.50-0.90	0.79
Role Conflict	4.20	1.22	8	0.63-0.83	0.87
Role Ambiguity	4.15	1.40	6	0.70-0.91	0.93
Exhaustion	3.05	0.83	5	0.68-0.76	0.83
OCB	4.69	0.76	24	0.67-0.86	0.94

The results of the correlations and standardized regression weights were used to calculate Composite Reliability (CR), Average Variance Extracted (AVE), and Maximum Shared Squared Variance (MSV) for each construct (see Table 23). All constructs exhibited satisfied criteria of reliability and convergent and discriminant validity. For all constructs, composite reliabilities (CR) ranged from 0.79 to 0.94, indicating the accurate composite reliabilities resulted from the avoided assumption of equal weighting of items. Average variance extracted (AVE) were greater than 0.50, meaning that 50 percent or more variance of the observed variables were to be accounted for variance of their own latent variables (Chin, 1998; Fornell & Larker, 1981). To claim discriminant validity among the constructs, the square root of the average variance extracted (AVE) should exceed the square of the correlations (see Table 24) among the latent variables, or AVE should be greater than MSV (see Table 23). This would mean that more variance was shared between the latent variables and the block of observed variables than with different observed variables of other latent variables (Chin, 1998).

Table 23. Convergent and Discriminant Validity

Construct	**CR**	**AVE**	**MSV**
Conscientiousness	0.89	0.623	0.308

Extraversion	0.80	0.503	0.274
Proactivity	0.90	0.646	0.401
Positive Affectivity	0.87	0.501	0.383
Transformative Leadership	0.94	0.509	0.331
LMX	0.90	0.600	0.588
TMX	0.79	0.656	0.588
Lack of Autonomy	0.83	0.502	0.187
Workload	0.79	0.576	0.095
Role Conflict	0.88	0.515	0.278
Role Ambiguity	0.93	0.680	0.278
Exhaustion	0.83	0.500	0.223
OCB	0.88	0.608	0.291

- Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Squared Variance (MSV)

Table 24. Correlation Among Individual-Level Constructs

Construct	CON	EXT	PR	PA	TL	LMX	TMX	LA	WOR	RC	RA	EX	OCB	Gender	Age
CON	**0.790**														
EXT	0.289**	**0.709**													
PR	0.502**	0.338**	**0.804**												
PA	0.485**	0.271**	0.544**	**0.708**											
TL	0.326**	0.337**	0.388**	0.435**	**0.713**										
LMX	0.524**	0.385**	0.543**	0.489**	0.537**	**0.774**									
TMX	0.478**	0.407**	0.538**	0.523**	0.467**	0.677**	**0.810**								
LA	-0.155**	0.019	-0.151	-0.053	-0.005	-0.090*	-0.048	**0.709**							
WOR	-0.040	0.055	0.054	0.041	0.079	0.101*	0.098*	0.298**	**0.759**						
RC	0.057	0.112**	0.104*	0.181**	0.280**	0.116**	0.195**	0.281**	0.270**	**0.718**					
RA	-0.127**	0.114**	-0.074	0.008	0.165**	0.011	0.068	0.388**	0.290**	0.472**	**0.825**				
EX	-0.254**	-0.052	-0.202**	-0.166**	-0.056	-0.223**	-0.206**	0.351**	0.305**	0.294**	0.323**	**0.707**			
OCB	0.311**	0.254**	0.316**	0.256**	0.218**	0.422**	0.440**	-0.058	0.033	0.018	-0.022	-0.395**	**0.780**		
Gender	0.025	-0.055	-0.064	-0.059	-0.109*	-0.051	-0.113**	0.053	-0.42	-0.125**	-0.035	-0.067	-0.030		
Age	0.051	0.001	0.065	0.087*	0.102*	0.085	0.107*	-0.29	0.068	0.117**	0.064	0.024	0.171**	-0.209**	
Tenure	0.140**	0.065	0.113**	0.125**	0.055	0.086*	0.096*	-0.036	-0.087*	-0.006	-0.063	-0.162**	0.246**	-0.046	0.271**

Notes:

- The square roots of the construct's AVE value are presented on the diagonal. Significance of Correlations: **P<0.01; *P<0.05 (N=529)
- CON = Conscientiousness; EXT = Extraversion; PR = Proactivity; PA = Positive Affectivity; TL = Transformative Leadership; LA = Lack of Autonomy; WOR = Workload; RC = Role Conflict; RA = Role Ambiguity; EX = Exhaustion.

Multicollinearity occurs when variables are too highly correlated. Multiple analyses were conducted to evaluate the threat of multicollinearity. The highest correlation was 0.677 between TMX and LMX (less than 0.70, see Table 24), the highest score of variance inflation factor (VIF) was 1.950, and the highest conditioning index was 18.537 (less than 30). Each of these statistics fall within an acceptable range (Tabachnick & Fidell, 2001), indicating that multicollinearity is not a threat to the results of this study.

5.5 Reliability and Validity Analysis of Group-Level Variables

The measurement model of Model 2 was evaluated for internal consistency, and convergent and discriminant validity. The results of the means, standard deviations, number of items, factor loadings, and reliabilities (Cronbach' Alpha (α)) of the constructs are shown in Table 25. All observed variables loaded on the first-order factors indicated values of factor loadings ranging from 0.539 to 0.825. As Chin's (1998) and Tabachnick and Fidell's (2001) guidelines, standardized factor loadings less than 0.50 were eliminated from the measurement model. For all constructs (second-order factors), internal consistency reliabilities (Cronbach' Alpha (α)) were greater than the recommended cut-off of 0.70 (Nunnally & Bernstein, 1994).

Table 25. Factor Loadings and Reliabilities of Group-Level Constructs

Construct (second-order latent factors)	Mean	Standard Deviation	No. of Items (observed variables)	Confirmatory Factor Loadings Range between observed variables and first-order latent factors	Reliability (alpha) α
Unit-Level OCB	4.53	0.99	13	0.539-0.825	0.884
System Quality	3.65	0.70	42	0.622-0.792	0.969
Service Quality	2.93	1.30	32	0.681-0.818	0.966
Information-Quality	3.21	0.99	36	0.598-0.775	0.968

The results of the correlations and standardized regression weights were used to calculate CR, AVE, and MSV for each construct (see Table 26). All constructs exhibited satisfied criteria of reliability and convergent and discriminant validity. For all constructs, CR ranged from 0.87 to 0.97, demonstrating the accurate composite reliabilities resulted from the avoided assumption of equal weighting of items. AVEs were greater than 0.50, meaning that 50 percent or more variance of the observed variables were to be accounted for variance of their own latent variables (Chin, 1998; Fornell & Larker, 1981). To claim discriminant validity

among the constructs, the square root of the AVE should exceed the square of the correlations (see Table 27) among the latent variables, or AVE should be greater than MSV (see Table 26). This would mean that more variance was shared between the latent variables and the block of observed variables than with different observed variables of other latent variables (Chin, 1998).

Table 26. Convergent and Discriminant Validity of Group-Level Constructs

Construct	CR	AVE	MSV
Unit-Level OCB	0.866	0.764	0.230
System Quality	0.956	0.813	0.449
Service Quality	0.953	0.772	0.230
Information-Quality	0.969	0.818	0.449

Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Squared Variance (MSV)

Table 27. Correlation Among Group-Level Constructs

Group-Level Construct	Unit-Level OCB	Service Quality	System Quality	Information Quality
Unit-Level OCB	**0.874**			
Service Quality	0.331**	**0.902**		
System Quality	0.480**	0.267**	**0.879**	
Information Quality	0.327**	0.670**	0.261**	**0.904**

The square roots of the construct's AVE value are presented on the diagonal. Significance of Correlations: **P<0.01; *P<0.05 (N=1112)

Multiple analyses were conducted to assess the threat of multicollinearity. The highest correlation was 0.670 between information quality and service quality (less than 0.70, see Table 27), the highest score of variance inflation factor (VIF) was 1, and the highest conditioning index was 9.237 (less than 30). Each of these statistics fall within an acceptable range (Tabachnick & Fidell, 2001), indicating that multicollinearity is not a threat to the results of this study.

5.6 Individual-Level Measurement and Structural Models

Tabachnick and Fidell (2001) defined both measurement and structural models. The measurement model includes the measured variables and the factors, where the measured variables (indicators) are connected with the factors (constructs) (Appendix E). The structural

model consists of the hypothesized relationships among the constructs, where paths connect the constructs with each other (Figure 22, see Appendix F). Numerous measures of model fit have been proposed to see whether the two models fit the data (how models are the fit between the sample of covariance matrix and the estimated population covariance matrix) by assessing different fit indexes. The next sub section discusses each type of fit index.

5.6.1 Fit Indexes

Maruyama (1998) categorized different fit indexes into the main three types: absolute, relative and adjusted indexes. The absolute fit indexes indicate the degree to which an estimated model closely fits the sample data. Some of the commonly used absolute fit indexes include root mean squared error of approximation (RMSEA), the goodness-of-fit Index (GFI), and the root mean square residual (RMR).

RMSEA is the most popular fit index and has been reported the number of times by researchers (Kenny, Kaniskan, & McCoach, 2015). Research on RMSEA cut-off points has distinguished between different values that are indicators of how closely the models with estimated parameters fit the population's covariance matrix (Byrne 2006). Hu and Bentler (1999) recommended that good-fitting models should yield RMSEA values of less than 0.06, while MacCallum, Browne, and Sugawara (1996) categorized fit quality based on three cut-off points of 0.01, 0.05, and 0.08, indicating excellent, good, and mediocre fit, respectively. A stricter threshold suggested by Browne and Cudeck (1992) was that RMSEA values of about 0.05 or less are indicative of a close model fit and RMSEA values of about 0.08 or less indicate reasonable error of approximation. They also do not recommend an RMSEA value of greater than 0.1.

Goodness-of-fit index ranges from 0 to 1, where 1 indicates a close or perfect fit. Chau (1997) recommended that good-fitting models yield GFI values of at least 0.90 or greater than 0.90, while other researchers also suggested GFI values ranging from 0.80 to 0.89 as

demonstrating reasonable fitting models (Lai & Li, 2005; Tarafdar, Qiang, Ragu-Nathan, & Ragu-Nathan, 2007). RMR is the third fit index and should be small for good-fitting models (Tabachnick & Fidell, 2001). RMR values less than 0.1 are desired to be taken into account for good-fitting models (Chau 1997). As it may sometimes be difficult to interpret an unstandardized residual since the scales of the variables affect the size of the residual, a standardized root mean square residual (SRMR) can be used interpret an unstandardized residual (Tabachnick & Fidell, 2001). The SRMR has a value of 0 to 0.1, where lower values are preferred. (Hu & Bentler, 1999) mentioned that values of about 0.08 or even less are desired.

Relative fit indexes, known as comparative fit indexes, include normed fit index (NFI), non-normed fit index (NNFI or Tucker Lewis Index (TLI)), incremental fit index (IFI), and comparative fit index (CFI) (Maruyama, 1998). Generally, the recommended ranges of all relative fit indexes for good-fitting models are between 0.90 and 1 (Chau, 1997; Hair, Anderson, Tatham, & Black, 1998; Tabachnick & Fidell, 2001). In addition, rules of thumb for good-fitting models are that cut-off values for CFI and TLI should be close to 0.95 or even higher (Hu & Bentler, 1999). Adjusted indexes, known as parsimonious fit indexes and labelled as adjusted goodness-of-fit index (AGFI), can be adjusted for the number of parameters estimated in a model. The most common recommended AGFI ranges for good-fitting models are greater than 0.80 (Chau, 1997; Segars & Grover, 1993).

Regarding which fit indexes should be reported in this research, researchers believe that fit indexes would be better picked from different categories, and thus have suggested a variety of optional/categorical fit indexes to readers and viewers. The recommended cut-offs for reasonable and good-fitting models are listed in Table 28. McDonald and Ho (2002) recommend that the most common fit indexes are the CFI, GFI, NFI, and the TLI. Hu and Bentler (1999) suggested a two-index presentation, always including SRMR with TLI,

RMSEA, and the CFI. Kline (2015) strongly believes in reporting the Chi-Square test, RMSEA, CFI, and the SRMR.

Table 28. Recommended cut-offs of goodness-of-fit indexes		
Goodness-of-fit Indexes	Recommended Cut-offs	
	Reasonable Fit	Perfect fit
Chi-Square/degrees of freedom	$1 \leq /df \leq 3$	$1 \leq /df \leq 2$
Standardized Root Mean Square Residual (SRMR)	$0 < SRMR < 0.1$	$SRMR \leq 0.08$
Incremental Fit Index (IFI)	$IFI \geq 0.9$	$IFI \geq 0.95$
Non-Normed Fit Index (NNFI) or Tucker-Lewis Index (TLI)	$TLI \geq 0.9$	$TLI \geq 0.95$
Comparative Fit Index (CFI)	$CFI \geq 0.9$	$CFI \geq 0.95$
Root Mean Square Error of Approximation (RMSEA)	$RMSEA \leq 0.08$ or $RMSEA \leq 0.06$	$RMSEA \leq 0.05$

These indices are reported in this thesis: df, SRMR, IFI, NNFI (TLI), CFI, and RMSEA. The Chi-Square is sensitive to the sample size and number of variables. Studies with large sample sizes rarely report a nonsignificant Chi-Square (nonsignificant Chi-Square indicating a perfect fit and conversely significant Chi-Square indicating a poor model) (Tabachnick & Fidell, 2001), so this research tends to use Chi-Square/df, where the Chi-Square/df of good-fitting models ranges between 1 and 3 (Kline, 2015) or 1 and 2 (Tabachnick & Fidell, 2001). However, there is no universal agreement on how Chi-Square/df can be used to assess how well a model fits data. Therefore, this study also reports other popular fit indexes, SRMR, IFI, NNFI, CFI, and RMSEA. SRMR is reported as the most sensitive index to models with misspecified factor covariance(s) or latent structure(s) (Hu & Bentler, 1999). IFI and NNFI (TLI) are chosen because they are relatively unaffected by sample size in which higher fit indexes can result from larger sample sizes (Gerbing & Anderson, 1992; Hu & Bentler, 1999). In addition, NNFI (TLI) is not distracted by the number of parameters of the model. Finally, CFI and RMSEA are the most frequently reported fit indexes by researchers (Tabachnick & Fidell, 2001). RMSEA is the most sensitive index to models with misspecified factor loadings and varies with the number of variables (Kenny & McCoach, 2003).

Comparing the measurement model fit indexes in Table 29 to the cut-offs recommended for the perfect-fitting models in Table 28, the data is in a good fit with the model. The results show that /df is 1.572, which falls between 1 and 2, SRMR yields a value of 0.044, which is less than 0.08, the values of IFI, TLI and CFI are 0.918,0.915, and 0.918, respectively, which are greater than 0.90, and the obtained value for RMSEA is 0.033, which is less than 0.05. The fit indexes derived from the structural model (see Table 29) fall in line with the acceptable ranges suggested in Table 28, indicating that the model reasonably fits the data. The results gained from the structural model present that /df is 1.596, SRMR reflects 0.054, the values of IFI, TLI, and CFI are 0.915, 0.911, and 0.914, respectively, and RMSEA is 0.034. Also, the obtained values for RMSEA show a correct specified factor loadings at the exploratory factor analysis (EFA) and an assumption of the appropriate number of variables in this research (Kenny & McCoach, 2003).

Table 29. Fit statistics

Model	Chi-Square	SRMR	IFI	NNFI(TLI)	CFI	RMSEA
Measurement Model	7481.125 with 4758 df (/df = 1.572)	0.044	0.918	0.915	0.918	0.033
Structural Model	7474.842 with 4683 df (/df = 1.596)	0.054	0.915	0.911	0.914	0.034

5.6.2 Common Method Variance Testing

To examine the extent to which common method biases influence behavioural research results, researchers have recommended appropriate procedural remedies during the design of studies and statistical remedies for different types of research settings (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Podsakoff & Organ, 1986). During the design of this study, we used several techniques so as to avoid, for example, social desirability. Those techniques are:

1- One of the major causes of common method variance is obtaining the measures of both predictor and criterion variables from the same sources or rater. As reported by Podsakoff et al. (2014), 68 percent of studies they reviewed on unit-level OCB and its influence on outcomes obtained the measures from different sources. On the other hand, Podsakoff et al. (2013) reported that 81 percent of studies they reviewed obtained the measures of individual-level OCB from the same source. In this study, OCB and its outcome were measured by two different sources. The measure of individual-level and unit-level OCB was obtained from both IS professionals and business employees, while the measure of the OCB outcome, IS effectiveness, was obtained from business employees. Collecting data from two sources (IS professionals and business employees) would neutralize the effect of common method bias on the covariation between constructs to be inflated (MacKenzie & Podsakoff, 2012).

2- We psychologically separated the measurements of predictors and criterion variables by using a cover story as presented in Table 30. Remedies for factors that might decrease respondents' motivation to respond questions accurately were conducted in the cover story. To increase respondents' motivation and psychological reactance to exert cognitive effort of information retrieval, and to avoid social desirability bias, respondents were communicated through the cover story. They were asked to share their thoughts, and informed on how valuable their opinions are, how their feedbacks are highly required for this study, how accurate responses provide an insight into this research, and how their responses are determinant and beneficial to them.

3- We protected respondent anonymity and reduced evaluation apprehension by ensuring respondents that their answers would remain anonymous and there would be no wrong or right answers. Respondents were asked to answer questions as honestly as possible

and their participation was solicited by promising rewards rather than threatening punishment.

4- We avoided using vague concepts, "double-barrelled" questions, and complicated syntax in the scales. We tried to keep questions more simple, specific, and concise.

5- We also avoided using bipolar numerical values and same endpoints in the scales formats. To separate the measures methodologically and proximally, we used different Likert anchors and formats, for example, even-numbered Likert-type scale formats used for some measures to avoid central tendency bias, or distinct scale anchors to afford different conditions to respondents.

Table 30. Procedural Remedies for Model 1	
Separation statements within the questionnaire	**Comments**
The goal of this study is to investigate the effect of interaction between IS/IT professionals and their non-IS colleagues on the effectiveness of IS/IT departments in global banks or any universal financial institutes.	Used before questions
Completion of the questionnaire affirms your consent and willingness to participate in this survey**.** All information will be kept confidential and anonymous. Information gathered will be used only for academic purposes.	Used before questions
A draw will be held where 2 respondents will win a prize of a gift card (2x$100)	Used before questions
Please read through each statement carefully and select the response that best describes you. There are no right or wrong answer.	Used before questions
Do not spend too much time on any one question. Usually your first reaction to each statement is a good guide.	Used before questions
The results of this study will be determinant to organizational and individual performance and help managers to provide a healthy workplace for you and your colleagues. So, your accurate answers will affect the results of this study.	Used before questions
Your personality can be always determinant to your task performance, so please deliberately select answers about your personality. Most of programmers are introvert!	Used before personality traits
The quality relationship you have with your colleagues and supervisor affect your performance as well organization, so please rate the quality of	Used between personality traits and TMX and LMX

relationship you have with your colleagues and supervisor and make sure your accurate responses will be determinant to experiencing better moments with your colleagues and supervisor. Do you know most kind and loyal people were born in December?	
The results of accurate responses to workload, lack of autonomy, role conflict, role ambiguity, and exhaustion will provide you and your colleagues with a healthier work environment. Do you know IS professionals experience more workloads than other professionals?	Before questions about IS working environment
Do you know that IS professionals spend 9 minutes of their working time per day assisting their colleagues?	Used between exhaustion and OCB

Statistical remedies recommended by Podsakoff et al. (2003) have been carried out in recent IS papers, such as Ahuja et al. (2007) and Ayyagari et al. (2011). One of the most widely statistical test used by IS researchers is Harman's single-factor test. This method examines how a single factor accounts for the majority of the covariance among the measures. In Model 1, the result of the Harman's single-factor test in an unrotated factor solution yielded the variance of 19.29 percent, which presents a value of less than 50 percent, showing that no dominant single factor explains significant covariance among variables. In addition, in a rotated factor solution, 18 factors were identified, with variances ranging from 1.3 percent to 21.9 percent (see Appendix D).

One of the disadvantages of Harman's single-factor test is that it is a diagnostic technique and rarely provides evidence that measures are free of common method bias. Because of that and following the recommendations of Podsakoff et al. (2003), an unmeasured latent method factor was modelled in this study for Model 1 to control for any systematic variance among the items (observed variables), which is independent of the variance among the constructs (latent variables). In this model, all items were loaded on their own constructs as well as on a latent common method variance factor. To minimize the disadvantages of this method, the model constrains the measurement factor loadings on the latent common variance factor to be equal (Podsakoff et al., 2003). The square of all measurement factor loadings on

the latent common variance factor indicates the percentage of the amount of the common method variance bias (Williams, Cote, & Buckley, 1989).

While researchers suggest that the commonly accepted percentage for common method bias variance is up to 25 percent (Williams et al., 1989), the unmeasured latent method factor of Model 1 reported 1 percent of common method bias, which is less than the recommended percentage. Furthermore, the measurement model was tested twice. First, the unconstrained measurement model was tested in terms of how the model fits data (Model A), and second, the constrained measurement model was built by adding the latent method factor (Model B). Significant method bias exists if the constrained model (Model B) fits data significantly better than the unconstrained model (Model A) (Widaman, 1985; Williams et al., 1989). This means that if introducing a latent method factor improves the model fit, common method bias accounts for most of the covariance observed in the variables. The results of these two tests are presented in Table 31.

Table 31. Method Bias Test

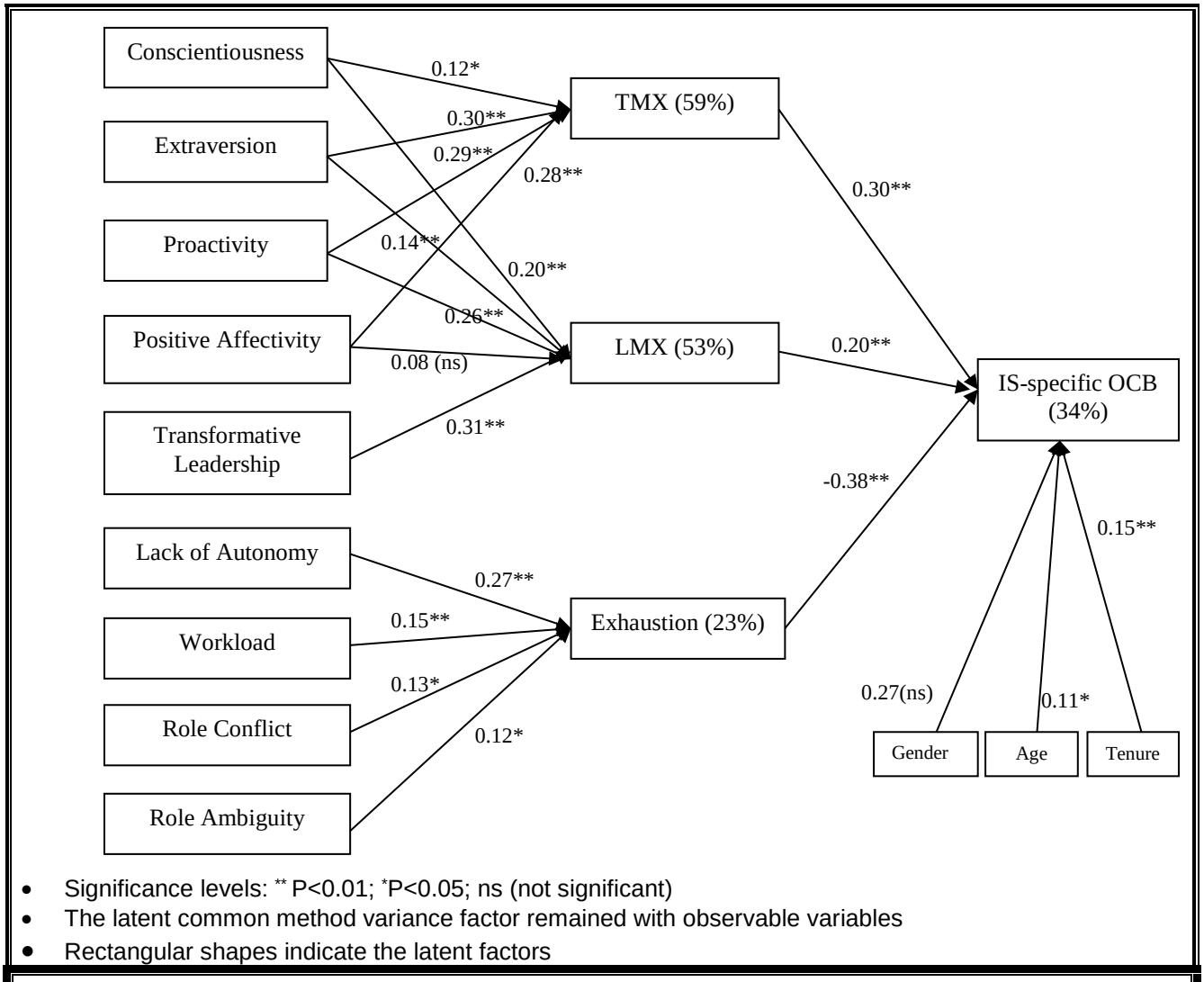
Model	Chi-Square	CFI	RMSEA	Comment
Model A: **All Items load on respective factors**	7481.125 with 4758 df	0.918	0.044	Significant method bias exists if Model B fits significantly better then Model A (Widaman, 1985). The null hypothesis of common method bias variance should not be rejected if the difference between CFIs (ΔCFI) is less than 0.01, indicating lack of method bias (Cheung & Rensvold, 2002).
Model B: **All items load on respective factors and also a latent method factor**	7467.083 with 4754 df	0.918	0.043	

Although the Chi-Square difference test has also been suggested to analyse which model should be accepted or rejected, this method is sample-size sensitive. Researchers have recommended a test obtained from differences in comparative fit indexes (CFI) (Cheung & Rensvold, 2002; Little, 1997). Common method bias can be said to be absent if the difference

in CFI is less than 0.05 (Little, 1997) or less than 0.01 (Cheung & Rensvold, 2002). The Chi-Square difference test was significant in this study, and the difference in CFIs from Table 31 yielded a value of 0.001, which is less than the recommended cut-offs. Overall, the results obtained from different tests for the presence of common method bias in this study lead to the conclusion that common method bias is not a serious threat to this study.

5.6.3 Results of Hypotheses Testing of Model 1

To evaluate the proposed hypotheses, the factor covariances were removed and structural paths were added to the structural model, while the latent method factor was retained in the structural model. Further, the results of the path coefficients shown in Figure 22 were used for testing hypotheses. For each hypothesis, the standardized estimates (β), the levels of significance, and the squared multiple correlations are reported in Figure 22. The model in Figure 22 indicates the effect of IS professionals' personality traits, IS leader's transformative leadership style, the negative IS job outcomes, and the quality relationship IS professionals have with their IS colleagues and leaders, on IS-specific OCB. The IS-specific OCBs conform to Organ's (1988) five-dimension OCB, including altruism, courtesy, civic virtue, sportsmanship, and conscientiousness. In addition to the five-dimension OCB model and based on the preceding discussions on advantages and disadvantages of OCB-I/O and Affiliation-Oriented Citizenship Behaviour (AOCB) models, other two structural models are proposed in Figure 23 and 24.



- Significance levels: ** P<0.01; *P<0.05; ns (not significant)
- The latent common method variance factor remained with observable variables
- Rectangular shapes indicate the latent factors

Figure 22. Structural Model of five-dimension OCB Model with Results

One of the objectives of this study was to investigate the determinants of IS professionals' IS-specific OCBs. The study argued that the high-quality relationships between IS professionals and their IS leaders promote IS-specific OCBs that IS professionals exhibit. Indeed, IS professionals who build the high-quality relationships with their IS colleagues and leaders display IS-specific OCBs within IS departments. This study then asserted that the high-quality relationships within IS departments are subject to IS professionals' personality traits, such as conscientiousness, extraversion, proactivity, and positive affectivity, and IS leaders' leadership styles, such as transformative leadership style. Altogether, IS professionals based

on their personalities and IS leaders with transformative leadership style are engaged in displaying IS-specific OCBs when the levels of quality relationships within the IS departments are built. Another objective was to explore the effect of IS job characteristics on the likelihood of IS-specific OCBs occurrence. This study found out that IS professionals who experience IS work exhaustion barely show such behaviours due to involving in negative aspects of IS jobs, such as the high level of workload, role ambiguity, and role conflict, and the lack of autonomy. Overall, IS professionals who are overburdened and burnt out due to incurred IS pressures, and overwhelmingly experience the limited levels of freedom to carry out their IS tasks, are not willing to engage in such positive, discretionary behaviours. Table 32 summarizes the results of the hypotheses testing.

Table 32. Summary of the Proposed Hypotheses

Hypotheses	**Supported?**
H1: The conscientiousness of IS professionals is associated with the quality of the relationships within their IS departments. ($\beta = 0.12$, $P = 0.022$)	Yes
H2: The conscientiousness of IS professionals is associated with the quality of the relationships with their leader in the IS departments ($\beta = 0.20$, $P = 0.000$).	Yes
H3: The extraversion of IS professionals is associated with the quality of the relationships within IS departments ($\beta = 0.30$, $P = 0.000$).	Yes
H4: The extraversion of IS professionals is associated with the quality of the relationships with their leader in the IS departments ($\beta = 0.14$, $P = 0.001$).	Yes
H5: The proactivity of IS professionals is associated with the quality of the relationships within IS departments ($\beta = 0.29$, $P = 0.000$).	Yes
H6: The proactivity of IS professionals is associated with the quality of their relationship with their leader of the IS department ($\beta = 0.26$, $P = 0.000$).	Yes
H7: The positive affectivity of IS professionals is associated with the quality of the relationships within IS departments ($\beta = 0.28$, $P = 0.000$).	Yes
H8: The positive affectivity of IS professionals is associated with the quality of their relationship with their leader of the IS department ($\beta = 0.08$, $P = 0.135$).	No
H9: Transformative IS leadership is associated with the quality of relationships between IS leaders and their members within IS departments ($\beta = 0.31$, $P = 0.000$).	Yes
H10: IS professionals experiencing higher levels of IT role conflicts will report higher IS work exhaustion ($\beta = 0.13$, $P = 0.020$).	Yes
H11: IS professionals experiencing higher workloads will report higher IS work exhaustion ($\beta = 0.15$, $P = 0.003$).	Yes
H12: IS professionals experiencing lower levels of autonomy will report higher IS work exhaustion ($\beta = 0.27$, $P = 0.000$).	Yes

H13: IS professionals who experience higher levels of IT role ambiguity will report higher levels of work exhaustion (β = 0.12, P = 0.045).	Yes
H14: IS professionals experiencing higher levels of IS work exhaustion will report lower IS-specific OCB (β = - 0.38, P = 0.000).	Yes
H15: the quality of relationships between IS professionals within the IS departments is associated with IS-specific OCB (β = 0.30, P = 0.000).	Yes
H16: the quality of relationships between IS leaders and IS professionals within the IS departments is associated to IS-specific OCB (β = 0.20, P = 0.000).	Yes

Predictors of IS-specific OCB

In this study, TMX, LMX, and IS work exhaustion are proposed as determinants of IS-specific OCB. The paths between TMX, LMX, and IS work exhaustion, and IS-specific OCB were extremely significant ($p < 0.01$). TMX and LMX had a positive relationship with IS-specific OCB (β = 0.30 and 0.20 respectively), while IS work exhaustion was in a negative relationship with IS-specific OCB (β = - 0.38). 34 percent of the variance in IS-specific OCB can be explained by TMX, LMX, and IS work exhaustion, supporting H14, H15, and H16 and the proposition that the quality of relationship within IS departments lead to IS-specific OCBs and exhausted IS professionals are unlikely to display IS-specific OCBs in their workplace. In addition, the effect of IS work exhaustion and TMX on IS-specific OCB is stronger than LMX.

Predictors of IS Work Exhaustion

Both lack of autonomy and workload were found to be strongly significant ($p < 0.01$) and positively correlated with IS work exhaustion (β = 0.27 and 0.15 respectively). Also, the link between both role ambiguity and role conflict, and IS work exhaustion were significant ($p < 0.05$) and positively related to IS work exhaustion (β = 0.12 and 0.13 respectively), supporting H10 and H11, H12, and H13. All predictors contribute to 23 percent of the explained variance in IS work exhaustion, and the impact of lack of autonomy is stronger than other determinants.

Predictors of TMX

Conscientiousness yielded a significant relationship ($P < 0.05$) and was positively associated with TMX ($\beta = 0.12$), while other predictors had an extremely significant correlation with TMX. Predictors, such as extraversion, proactivity, and positive affectivity, were found to be positively ($\beta = 0.30$, 0.29 and 0.28 respectively) and significantly related ($p < 0.01$) to TMX, supporting H1, H3, H5 and H7. All predictors contribute to 59 percent of the explained variance in TMX, and the impact of conscientiousness on TMX is less than extraversion, proactivity, and positive affectivity.

Predictors of LMX

The results indicated that the paths from all predictors, such as conscientiousness, extraversion, and proactivity to LMX were extremely significant ($P < 0.01$), except the relationship between positive affectivity and LMX that was insignificant ($\beta = 0.08$, $P > 0.05$). Hence, H8 is not supported. Conscientiousness, extraversion, and proactivity yielded a positive relationship with LMX ($\beta = 0.20$, 0.14, and 0.26 respectively). Besides IS professionals' personality traits, IS leaders' transformative leadership style was taken into account as a predictor of LMX. The results showed that the transformative IS leadership positively and significantly led to LMX ($\beta = 0.30$, $P < 0.01$). IS Professionals' personality traits together with IS leadership style explains 53 percent of the variance in LMX, supporting H2, H4, H6, and H9. To compare the levels of effect of different predictors on LMX, transformative IS leadership has a stronger impact on LMX than personalities, such as conscientiousness, extraversion, and proactivity.

William and Anderson (1991) have suggested a two-factor model, OCB-I/O. In this study, OCB-I captured analogous dimensions, including altruism and courtesy, from Organ's five-dimension OCB model and OCB-O included corresponding dimensions, such as civic virtue, sportsmanship, and conscientiousness. To implement William and Anderson's (1991) conceptualization of OCB-I and OCB-O, a 5-dimension OCB construct in the structural model in Figure 22 was removed and replaced by the two constructs, OCB-I and OCB-O in Figure 23. Regarding as to how OCB construct should be treated, OCB-I was considered as a second-order construct, and its dimensions, such as altruism and courtesy, as first-order constructs. Following that, OCB-O was accounted as second-order factor, and its dimensions, including civic virtue, sportsmanship, and conscientiousness, as first-order construct. The results of the fit indexes are embodied in Table 33, and the results of the path coefficients (β), the levels of significance, and the squared multiple correlations are reported in Figure 23.

Table 33. Fit statistics

Model	**Chi-Square**	**SRMR**	**IFI**	**NNFI(TLI)**	**CFI**	**RMSEA**
Structural Model	7407.324 with 4681 df (/df = 1.582)	0.0562	0.917	0.913	0.916	0.033

Comparing the resulting fit indexes of the structural model of OCB-I/O model in Table 33 with the cut-offs suggested in Table 28, the data is a reasonable fit with the model.

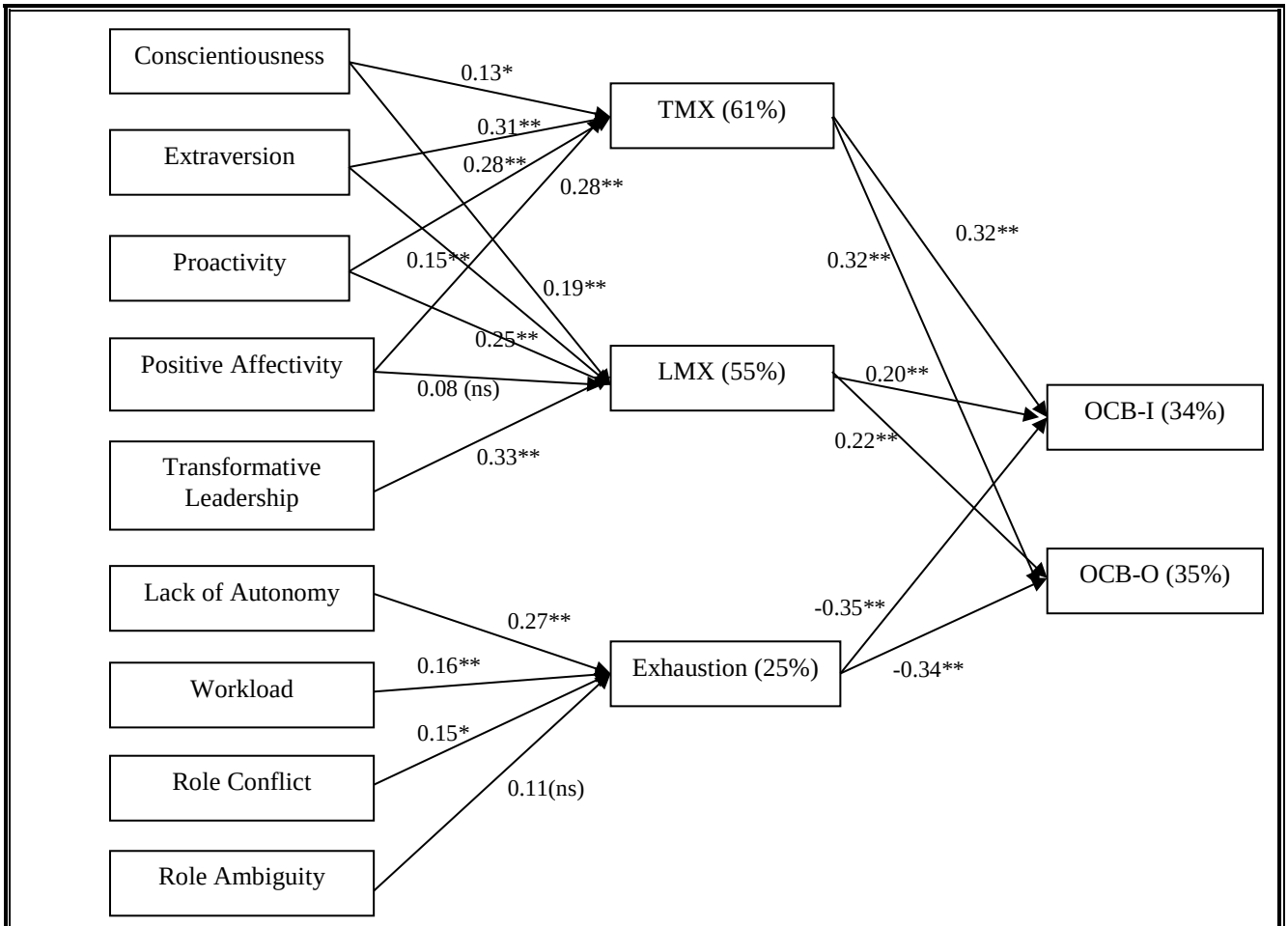


Figure 23. Structural Model of OCB-I/OCB-O Model with Results

Predictors of IS-specific OCB

In this study, TMX, LMX, and IS work exhaustion are proposed as predictors of IS-specific OCB divided into forms of OCB-I/O. The links between TMX, LMX, and IS work exhaustion, and OCB-I/O were extremely significant ($p < 0.01$). TMX and LMX had a positive relationship with OCB-I ($\beta = 0.32$ and 0.20 respectively), while IS work exhaustion was in a negative relationship with OCB-I ($\beta = -0.35$). 34 percent of the variance in OCB-I can be explained by TMX, LMX, and IS work exhaustion, indicating that the quality of relationship within IS departments lead to beneficiaries of IS-specific OCBs directed by a group of IS professionals, and IS professionals who feel exhausted or overburdened are not willing to

display such behaviours in their workplace. IS-specific OCBs exhibited by IS teams, which benefit the IS department and organization, are subject to TMX, LMX, and IS work exhaustion. The results showed that TMX and LMX had a positive association with OCB-O ($\beta = 0.32$ and 0.22 respectively), and IS work exhaustion negatively led to OCB-O ($\beta = -0.34$). The interpretation of obtained results of OCB-O determinants clarifies that the quality relationship within IS departments and IS professionals' levels of work exhaustion promote positive behaviours that directly benefit the organization and IS department. The variance in OCB-O is 35 percent explained by the three determinants.

Predictors of IS Work Exhaustion

The lack of autonomy and workload had a very significant relationship with IS work exhaustion ($P < 0.01$) and the results reflected a positive relationship ($\beta = 0.27$ and 0.16 respectively). The path between role ambiguity and IS work exhaustion was not found to be significant ($\beta = 0.11$, $P > 0.05$). In contrary, although the impact of role conflict on work exhaustion was less significant than the lack of autonomy and workload, role conflict was positively related to work exhaustion ($\beta = 0.15$). 25 percent of the variance in IS work exhaustion is explained by the lack of autonomy, workload, and role conflict. Similar to results derived from the previous model (five-dimension OCB model), the effect of the lack of autonomy is stronger than other three determinants.

Predictors of TMX

Conscientiousness yielded a significant relationship ($P < 0.05$) and was positively associated with TMX ($\beta = 0.13$), while other predictors had an extremely significant correlation with TMX. Predictors, such as extraversion, proactivity, and positive affectivity, were found to be positively ($\beta = 0.31$, 0.28 and 0.28 respectively) and significantly related ($p < 0.01$) to TMX, indicating that IS professionals with such personalities are able to build a high-quality relationship with their colleagues in the IS departments. All predictors contribute to 61 percent

of the explained variance in TMX, and the impact of conscientiousness on TMX is less than extraversion, proactivity, and positive affectivity.

Predictors of LMX

The results indicated that the paths from all predictors, such as conscientiousness, extraversion, and proactivity to LMX were extremely significant ($P < 0.01$), except the relationship between positive affectivity and LMX that was insignificant ($\beta = 0.08$, $P > 0.05$). It means that IS professionals with attributes, such as enthusiasm, alertness, and joviality, are not able to exchange social aspects, including respect, loyalty, understanding, and trust, with their leader. Conscientiousness, extraversion, and proactivity yielded a positive relationship with LMX ($\beta = 0.19$, 0.15, and 0.25 respectively). In additional to IS professionals' personality traits, IS leaders' transformative leadership style was taken into account as a predictor of LMX. The results showed that the transformative IS leadership positively and significantly led to LMX ($\beta = 0.33$, $P < 0.01$). IS Professionals' personality traits together with IS leadership style explains 55 percent of the variance in LMX. To compare the levels of effect of different predictors on LMX, transformative IS leadership has a stronger impact on LMX than personalities, such as conscientiousness, extraversion, and proactivity.

Although the significant levels and path coefficients between five-dimension OCB model in Figure 22 and the two-factor model in Figure 23 are roughly similar to each other, the results of the two-model OCB (OCB-I/O) reflect that role ambiguity had no significant relationship with IS work exhaustion.

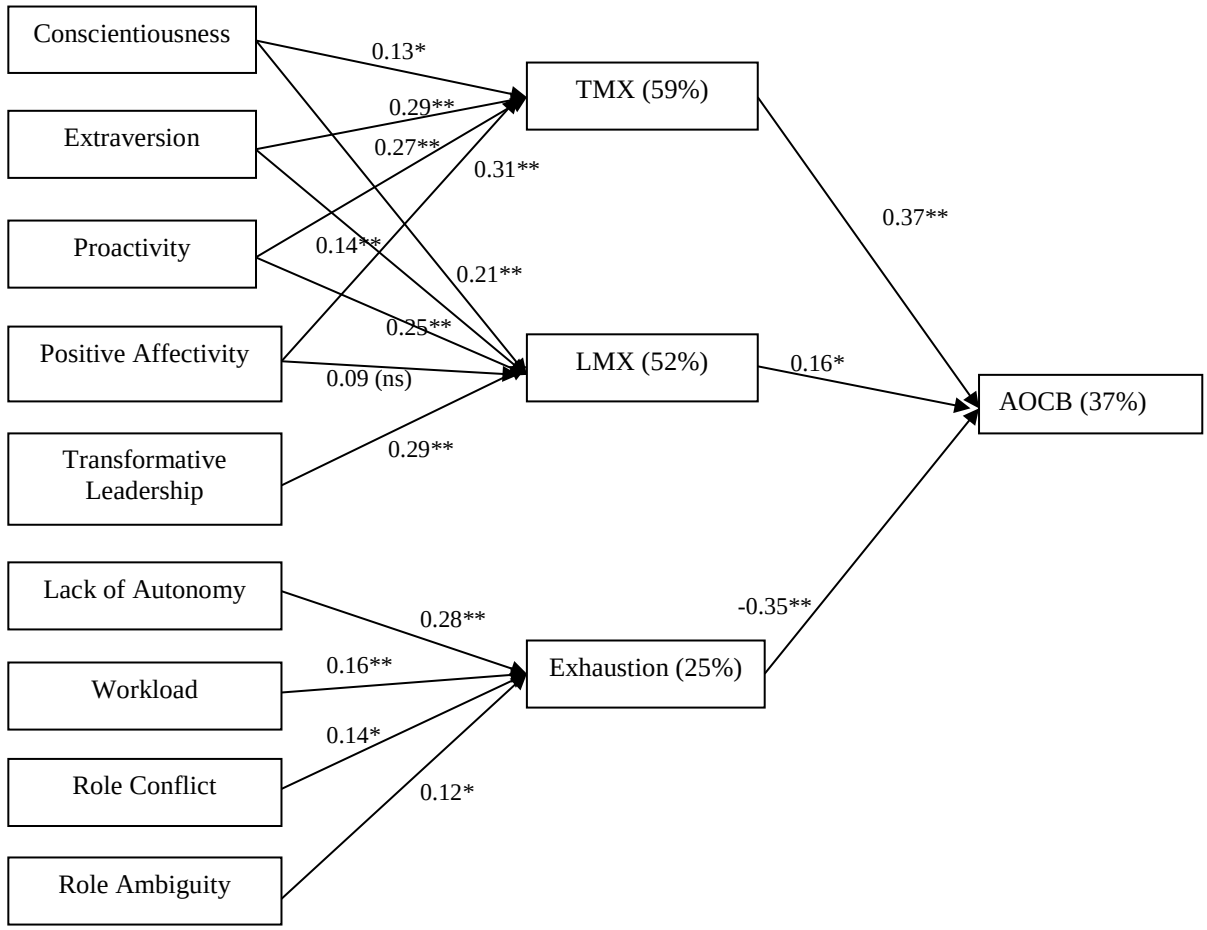
Based on the preceding discussions in the literature review, the OCB-I/O model focuses alone on the intended beneficiary, while AOCB/COCB model categorises OCBs based on the essential nature of the behaviours to make boundaries between them (Van Dyane et al., 1995). In fact, behaviours in the AOCB/COCB model are classified based on their properties that may be associated with why/how they influence unit performance. In other words, all

behaviours in AOCB/COCB model share a common theme which is an intrinsic property of the behaviour itself (Podsakoff et al., 2014) (see Table 3). Altruism, courtesy, and sportsmanship are affiliation-oriented OCB, and civic virtue is challenging-oriented OCB if this behaviour refers to voice; if not, this behaviour refers to affiliation-oriented OCB. In this study, civic virtue does not refer to challenging-oriented OCB. Conscientiousness is neither affiliation nor challenging-oriented OCB. Therefore, affiliation-oriented OCB is replaced with five-dimension OCB in the structural model in Figure 24, and considered as a second-order construct with altruism, courtesy, sportsmanship, and civic virtue as first-order constructs. The results of the fit indexes are presented in Table 34, and the results of the path coefficients (β), the levels of significance, and the squared multiple correlations are reported in Figure 24.

Table 34. Fit statistics

Model	Chi-Square	SRMR	IFI	NNFI(TLI)	CFI	RMSEA
Structural Model	6849.430 with 4211 df (/df = 1.627)	0.0558	0.914	0.910	0.914	0.034

Comparing the resulting fit indexes of the structural model of affiliation-oriented OCB model in Table 34 with the cut-offs recommended in Table 28, the data is a reasonable fit with the model. Also, the results gained from affiliation-oriented model in Figure 24, including the levels of significant and path coefficients are close to results obtained from five-dimension OCB model in figure 22. The only important difference between results refers to the relationship between TMX and affiliation-oriented OCB ($\beta = 0.38$).



- Significance levels: ** P<0.01; *P<0.05; ns (not significant)
- Rectangular shapes indicate the latent factors

Figure 24. Structural Model of Affiliation-Oriented Citizenship Behaviour (AOCB) Model with Results

5.6.4 Control Variables

Gender, age, and tenure were tested as controls for IS-specific OCB. The results are shown in Figure 22. The results delineated that the relationship between gender and OCB was not significant (P > 0.05) so that gender would not be a determinant of IS-specific OCB construct in this study. Regardless of an insignificant correlation between gender and OCB, the results of the correlation, where male=0 and female=1, reflected that in contrast to males,

females had a positive relationship with OCB ($\beta = 0.029$), indicating that females were more inclined to engage in carrying out OCBs than males. Age had a significant relationship ($P < 0.05$) and yielded a positive relation with IS-specific OCB ($\beta = 0.11$). As age was a categorical variable (see Table 8), dummy variables were created to elaborate the effect of the levels of significance and path coefficient of each age category on IS-specific OCB. The results indicated that ages between 20 and 30 were significantly and negatively related to such OCB behaviours ($P < 0.05$, $\beta = -0.12$), ages between 30 and 40 had a significant and positive relation with OCBs ($P < 0.05$, $\beta = 0.18$), and ages greater than 50 had a positive relation with OCBs ($\beta = 0.073$) but the relation was slightly significant ($P = 0.08$). the interpretation of the obtained results is that IS-specific OCBs are not of interest to young IS professionals who are between 20 and 30 years old, but to more mature and elderly IS professionals. Tenure was also in a positive and very significant association with IS-specific OCBs ($P < 0.01$, $\beta = 0.15$). Creating dummy variables form tenure helped deliberately analyse different tenure categories (see Table 8). First, the tenure of almost two years was significant ($P < 0.05$), but reflected a negative relationship with OCBs ($\beta = - 0.15$). Next, the tenure between 2 and 5 years was not significant and yielded a negative effect on OCBs. Finally, the tenure between 5 and 10 years was significant ($P < 0.05$) and presented a positive impact on OCBs ($\beta = 0.11$). It indicates that the longer IS professionals have been with an organization, the more likely they are to engage in positive behaviours, such as assisting their IS peers with work-related problems, attending unnecessary meetings, avoiding their IS peers to make mistakes by sharing prior experiences,

tolerating inconveniences without complaining, and being conscientious to organizational rules even left unattended.

5.7 Unit-Level Measurement and Structural Models

Similar to individual-level measurement and structural model, a group-level measurement and structural model was defined. The measurement model contains an exogenous construct, a 3-dimension OCB and the endogenous constructs, including a 7-dimension information quality, 6-dimension system quality, 5-dimension service quality, where all endogenous constructs are correlated with the exogenous construct and observed variables are linked to their own constructs (Appendix G). In the structural model, all correlations between constructs were replaced with paths from the exogenous variable to the endogenous ones (Figure 25, see Appendix H).

The resulting fit indexes of the measurement model are reported in Table 35. Comparing the measurement model fit indexes in Table 35 to the cut-offs recommended for the perfect-fitting models in Table 28, the model reasonably fits the data. The results indicate that /df is 2.256, which falls between 1 and 3, SRMR yields a value of 0.041, which is less than 0.08, the values of IFI, TLI and CFI are 0.912,0.909, and 0.912, respectively, which are greater than 0.90, and the obtained value for RMSEA is 0.034, which is less than 0.05. The fit indexes obtained from the structural model are also shown in Table 35 and indicate a reasonable-fitting model based on a comparison with acceptable values of different fit indexes reported in Table

28. The results gained from the structural model reflect that /df is 2.304, SRMR reflects 0.053, the values of IFI, TLI, and CFI are 0.908, 0.905, and 0.908, respectively, and RMSEA is 0.034. In addition to the prior interpretation of fit indexes, the value of RMSEA is as good enough as the required one showing a correct specified factor loadings at the exploratory factor analysis (EFA) and an assumption of the appropriate number of variables in this research (Kenny & McCoach, 2003).

Table 35. Fit statistics

Model	Chi-Square	SRMR	IFI	NNFI(TLI)	CFI	RMSEA
Measurement Model	11270.740 with 4996 df (/df = 2.256)	0.041	0.912	0.909	0.912	0.034
Structural Model	11525.909 with 5003 df (/df = 2.304)	0.053	0.908	0.905	0.908	0.034

5.7.1 Common Method Variance Testing for Unit-Level Model

In section 5.6.2, similar procedural remedies and statistical remedies during the design of this study are discussed for Model 2. The cover story used to psychologically separate the measurements of predictors and criterion variables are presented in Table 36. In addition to the procedural remedies, the Harman's single-factor test was conducted and an unmeasured latent method factor was used in both unit-level measurement and structural model.

Table 36. Procedural Remedies for Model 2

Separation statements within questionnaire	Comments
The goal of this study is to investigate the effect of interaction between IS/IT professionals and their non-IS colleagues on the effectiveness of IS/IT departments in global banks or any universal financial institutes.	Used before questions
Completion of the questionnaire affirms your consent and willingness to participate in this survey. All information will be kept confidential and anonymous. Information gathered will be used only for academic purposes.	Used before questions
A draw will be held where 2 respondents will win a prize of a gift card (2x$100)	Used before questions

Please read through each statement carefully and select the response that best describes you. There are no right or wrong answer.	Used before questions
Do not spend too much time on any one question. Usually your first reaction to each statement is a good guide.	Used before questions
The results of this study will be determinant to the effectiveness of IS departments in delivering the quality of IS services, system, and information to other departments. So, your accurate answers will affect the results of this study.	Used before questions
The next section focuses on the effect of being a good corporate citizen on the performance of your organization.	Used before unit-level OCB
You are in a half way of the survey… Thank YOU for your patience as the results of this research are important to the future of your organization.	Used between information and system construct because the measures had a similar anchor points and to motivate respondents as it was a lengthy questionnaire.
You have almost finished 90 percent of the survey… Thank you for helping in this non-profit research. Only the quality of service remains in the next questions…Thank YOU!! For helping us better understand the services that must be delivered to you!!	Used between system and service construct because the measures had a similar anchor points and to motivate respondents as it was a lengthy questionnaire.

The result of the Harman's single-factor test in an unrotated factor solution indicated the variance of 25.64 percent, which presents a value of less than 50 percent, reflecting that no dominant single factor explains significant covariance among variables. The latent method factor was added to the measurement model and connections between the latent method factor and each observed variable were drawn to measure the percentage of the amount of the common method variance bias. As the square of all measurement factor loadings on the latent common variance factor indicates the percentage of the amount of the common method variance bias (Williams et al., 1989), the result showed a value of 45 percent that exceed 25 percent of the commonly accepted percentage for common method bias variance (Williams et al., 1989). Thus, in order to identify the effect of common method bias variance, the difference between CFIs of the measurement model with and without the latent common factor was analysed and then, the latent common factor was retained in the structural model to avoid the inflated or deflated coefficient estimates (β) (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

To do so, the measurement model was tested twice. First, the unconstrained measurement model was tested in terms of how the model fits data (Model A), and second, the constrained measurement model was built by adding the latent method factor (Model B). Significant method bias exists if the constrained model (Model B) fits data significantly better than the unconstrained model (Model A) (Widaman, 1985; Williams et al., 1989). This means that if introducing a latent method factor improves the model fit, common method bias accounts for most of the covariance observed in the variables. The results of these two tests are presented in Table 37.

Table 37. Method Bias Test

Model	Chi-Square	CFI	RMSEA	Comment
Model A: All Items load on respective factors	11270.740 with 4996 df	0.912	0.034	Significant method bias exists if Model B fits significantly better then Model A (Widaman, 1985). The null hypothesis of common method bias variance should not be rejected if the difference between CFIs (ΔCFI) is less than 0.05 or 0.01, indicating lack of method bias (Cheung & Rensvold, 2002; Little 1997).
Model B: All items load on respective factors and also a latent method factor	11157.718 with 4999 df	0.913	0.033	

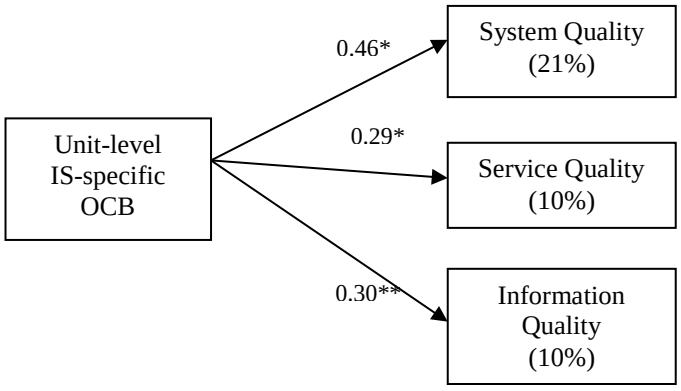
The results presented in Table 37 show that the ratio of chi-square difference per single degree of freedom is less than 3 and the difference in CFIs is 0.00, which is less than the recommended values of 0.05 (Little, 1997) or 0.01(Cheung & Rensvold, 2002). These results provide support that common method bias was not a severe validity threat to this study.

5.7.2 Results of Hypotheses Testing of Model 2

To assess the proposed hypotheses, the factor covariances were removed and structural paths were added to the structural model, while the latent method factor was retained in the structural model. Further, the results of the path coefficients shown in Figure 25 were used for

testing hypotheses. For each hypothesis, the standardized estimates (β), the levels of significance, and the squared multiple correlations are reported in Figure 25.

The model demonstrates the impact of inter-departmental IS-specific OCBs between IS professionals in the IS departments and non-IS employees from other departments on the quality of IS system, IS service, and IS information. The overall results convey the indication that unit-level IS-specific OCBs directed by the IS departments prompt the quality of IS systems to be produced for, the quality of IS services to be delivered to, and the quality of IS information to be shared with business employees across organizations.



- Significance levels: ** P<0.01; *P<0.05;
- The latent common method variance factor remained with observable variables
- Rectangular shapes indicate the latent factors

Figure 25. Structural Model of unit-level three-dimension OCB with Results

Table 38. Summary of the Proposed Hypotheses	
Hypotheses	**Supported?**
H20: Unit-level IS-specific OCBs directed by IS professionals in IS departments affect the system quality of IS departments (β = 0.46, P = 0.002).	Yes
H21: Unit-level IS-specific OCBs directed by IS professionals in IS departments affect the service quality of IS departments (β = 0.29, P = 0.000).	Yes

H22: Unit-level IS-specific OCBs directed by IS professionals in IS departments affect the information quality of IS departments ($\beta = 0.30$, $P = 0.000$).	Yes

In the preceding discussions, the determinants of the IS-specific OCBs within the IS departments were delineated by interpreting results obtained from the individual model. One of the objectives of this study was to examine the IS-specific OCBs directed by IS departments towards non-IS departments as determinants of the IS department effectiveness. In the other words, this study aimed at investigating the effect of unit-level IS-specific OCBs on the quality of three dimensions of IS department effectiveness: system, service, and information. In fact, IS groups additionally assist business groups in solving technical problems on existing IS systems, having access to emergency IS services, and gaining IT-related knowledge, thereby leading to the effective functioning of IS departments. Besides, by promoting such behaviours between IS and non-IS departments, IS groups as a focal source of technical knowledge dissemination enable business employees to comprehend their IS system's ability and strength, and embedded IS information. Later on, it is likely to affect business employees' perception of an effective IS system, IS service, and IS information. Table 38 summarizes the results of the hypotheses testing.

Predictor of IS Department Effectiveness

First, the path between unit-level IS-specific OCBs and IS system quality was extremely significant ($p < 0.01$) and had a positive relationship ($\beta = 0.46$). 21 percent of the variance in the IS system quality can be explained by such behaviours, supporting H20 and the proposition that unit-level IS-specific OCBs directed by IS professionals in IS departments affect the system quality of IS departments. Second, unit-level IS-specific OCBs was significantly associated to the IS service quality ($\beta = 0.29$, $P < 0.01$) and explained 10 percent of the variance in the IS service quality, supporting H21 and the proposition that unit-level IS-

specific OCBs directed by IS professionals in IS departments affect the service quality of IS departments. Third, unit-level IS-specific OCBs yielded a significant relationship ($P < 0.01$) and was positively linked to the information quality ($\beta = 0.30$). Unit-level IS-specific OCBs contribute to 10 percent of the explained variance in the information quality, supporting H22 and the proposition that unit-level IS-specific OCBs directed by IS professionals in IS departments affect the information quality of IS departments. Among the relationships between unit-level IS-specific OCBs and the dimensions of the IS department effectiveness, the system quality showed a stronger relationship with IS-specific OCBs.

In the last two sections, SEM was used to deal with modelling covariances among factors and variances between factors in both the individual and group-level models. In the next section, multilevel modelling techniques are applied to measure the effect of individual-level IS-specific OCBs on the unit-level outcomes, such as the quality of system, service, and information (Podsakoff et. al., 2014). Hence, multilevel SEM was used to deal with the analysis of clustered data and attempts to partition observed variance into within and between-clusters components. This study employed Mplus version 7 to run a multilevel SEM to analyse within-group (individual level) and between-group (group level) variances and covariances, and to evaluate the hypothesized effect of the individual-level IS-specific OCBs on the unit-level outcomes.

5.8 Multi-Level Analysis

In the multilevel SEM, all observed variables exist at both the individual and the group level. The observed variables at the individual level become latent variables at the group level, which represent the group-level variation of the random intercepts as second-level latent variables that capture the variation in the means of the observed individual level variables (Hox, 2013). Therefore, the multilevel model of this study (see figure 26) contains within and between parts, where the within part of the multilevel model includes IS-specific OCBs, that

are rated by IS professionals and analogous to altruism, courtesy, civic virtue, sportsmanship, and conscientiousness, and that are the second-level latent variables in the between part of the multilevel model. To elaborate the within and between part of the multilevel model, IS-specific OCB and its dimensions are considered as a second-order latent factor and the first-order latent factors in the within part, and the unit-level system, service, and information are latent factors in the between part.

The independent latent factors in the within part include the IS-specific OCB and its dimensions, while the system, service, and information quality latent factor, rated by business employees, are the three dependent variables in the between part. Therefore, to obtain unit-level IS-specific OCBs, IS and business responses were aggregated to estimate the respective scores for each participating organization (Klien & Kozlowski, 2000). To ensure the existence of between part in the model, the three group reliability indexes, consisting of within-group agreement index (r_{wg}) and interclass correlations, ICC_1 and ICC_2, were computed (Podsakoff et al., 2014). Building on James, Demaree, and Wolf's (1984) assumptions of within-group interrater reliability, within-group agreement index (r_{wg}) indicates the degree to which responses to a measurement scale by group members of the same organizations converge and judges agree on a set of judgments. The r_{wg} value indicates estimated interrater reliability for a single class, where the individual level data are IS professionals' mean scores on items measuring IS-specific OCBs within IS departments and for a single team, where agreement among IS departments' mean scores on items measuring unit-level IS-specific OCBs. Indeed, the value of r_{wg} is deemed to be within-IS department agreement as a key consideration of unit-level constructs (IS-specific OCBs) of which data are gathered from individuals (IS professionals).

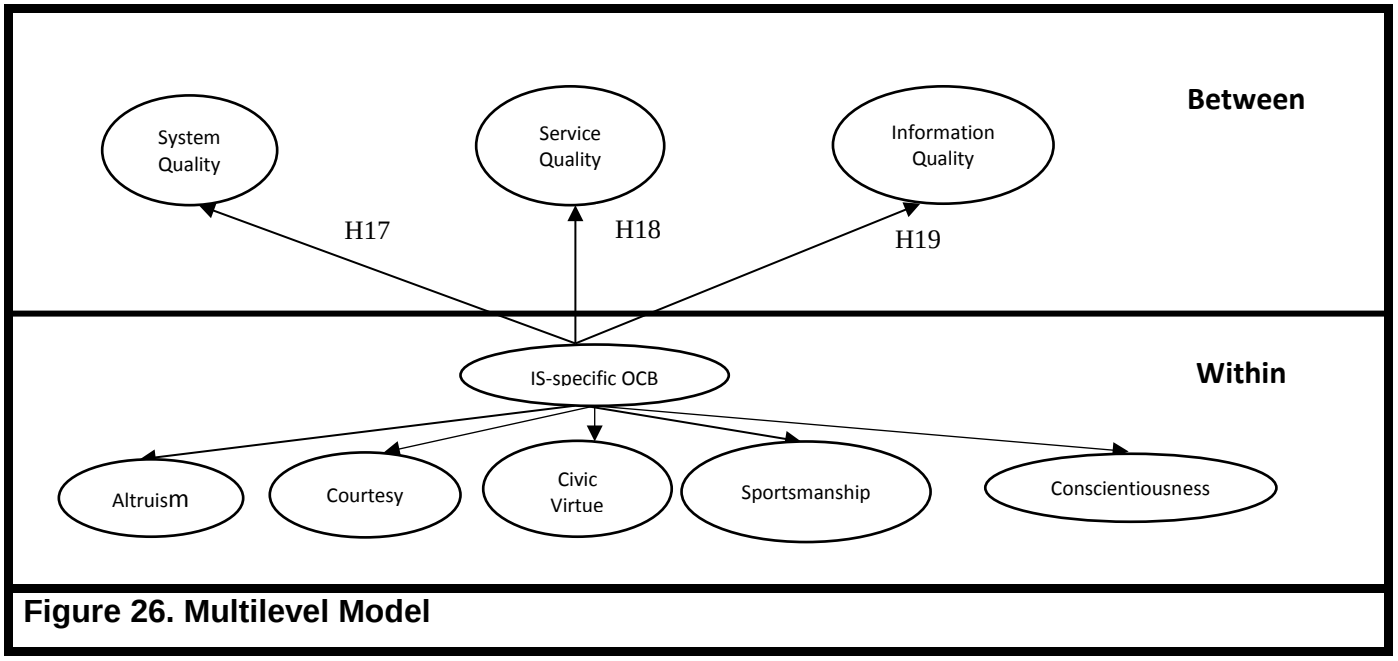


Figure 26. Multilevel Model

The ICCs of the variables are to determine how much of the variance of a measure is within classes versus between classes and represent the ratio of between-group (group level in the multilevel model) to within-group (individual level in the multilevel model) variance (Nezlek, 2011). If ICCs are all small, then the between-group variance is small and there may be no need for a complex group level model (Hox, 2013). Therefore, small values of ICCs are the indication that groups do not vary very much and there is no need to use a multilevel analysis due to groups do not differ from each other in a meaningful way (Nezlek, 2011). Specifically, the ICC_1 compares between-group variance against within-group variance to reveal the ratio of variance in the individual responses accounted for the between-group difference; ICC_2 instead reflects the reliability of the group-level means (Bliese, 2000).

The r_{wg} values of altruism, courtesy, civic virtue, sportsmanship, and conscientiousness were 0.92, 0.91, 0.90, 0.91, and 0.92, respectively, thereby exceeding the acceptable cut-offs of 0.70 (Bliese, 2000). From our analysis of the between-group variance and group-level mean reliability, the following results were obtained: $ICC_1 = 0.11$ and $ICC_2 = 0.67$ (F= 3.07, p-value = 0.000) for altruism; $ICC_1 = 0.11$ and $ICC_2 = 0.66$ (F= 2.94, p-value = 0.000) for courtesy;

ICC_1 = 0.08 and ICC_2 = 0.58 (*F*= 2.36, *p*-value = 0.000) for civic virtue; ICC_1 = 0.07 and ICC_2 = 0.57 (*F*= 2.34, *p*-value = 0.000) for sportsmanship; and ICC_1 = 0.11 and ICC_2 = 0.66 (*F*= 2.94, *p*-value = 0.000) for conscientiousness. The ICC1values ranged from 0.07 to 0.11, implying that 7 to 11 percent of the variance at the within group-variables account for the between-group variables. The ICC2 values all exceed the minimum value of 0.50 (Klien & Kozlowski, 2000) and 0.60 (Bliese, 2000). Although all OCB dimensions had an acceptable value of ICC_2 based on Klien and Kozlowski's (2000) suggested cut-off, ICC_2 of some OCB dimensions was slightly lower than Bliese's (2000) recommended cut-off of 0.60. The relatively lower ICC_2 values reflect a difficulty to detect emergent relationships using group means (Bliese, 2000). In this study, it was, however, considered acceptable mainly because the underlying aggregation could be theoretically justified by OCB theories, and the average r_{wg} was sufficiently high (Liao & Chuang 2007; Yen et al., 2015). Since the between-group variances were considerable, an investigation of the between structure was warranted and the aggregation to the between-group part was justified (Bliese 2000).

5.8.1 Fit Indexes

A five first-order-factor CFA with 24 categorical observed variables was tested using Mplus version 7 (Muthen & Muthen, 1998-2012). Alternative fit indexes were examined to determine whether the fit was adequate. The chi-square value was significant, X^2 = 767.354, *p*-value= 0.000. The results indicated that /df is 1.363, which falls between 1 and 2 (see Table 39).The value of Akaike's Information Criterion (AIC) was 30619.499, showing the correct number of components in finite mixture models, while the value of Bayesian Information Criterion (BIC) was 31331.475 as a good indicator for class enumeration over the rest that picked the correct model most consistently in the finite mixture structure equation model (Nylund, Asparouhov, & Muthen, 2007). Other fit indexes were also reported in Mplus. Comparing the measurement model fit indexes in Table 39 to the cut-offs recommended for

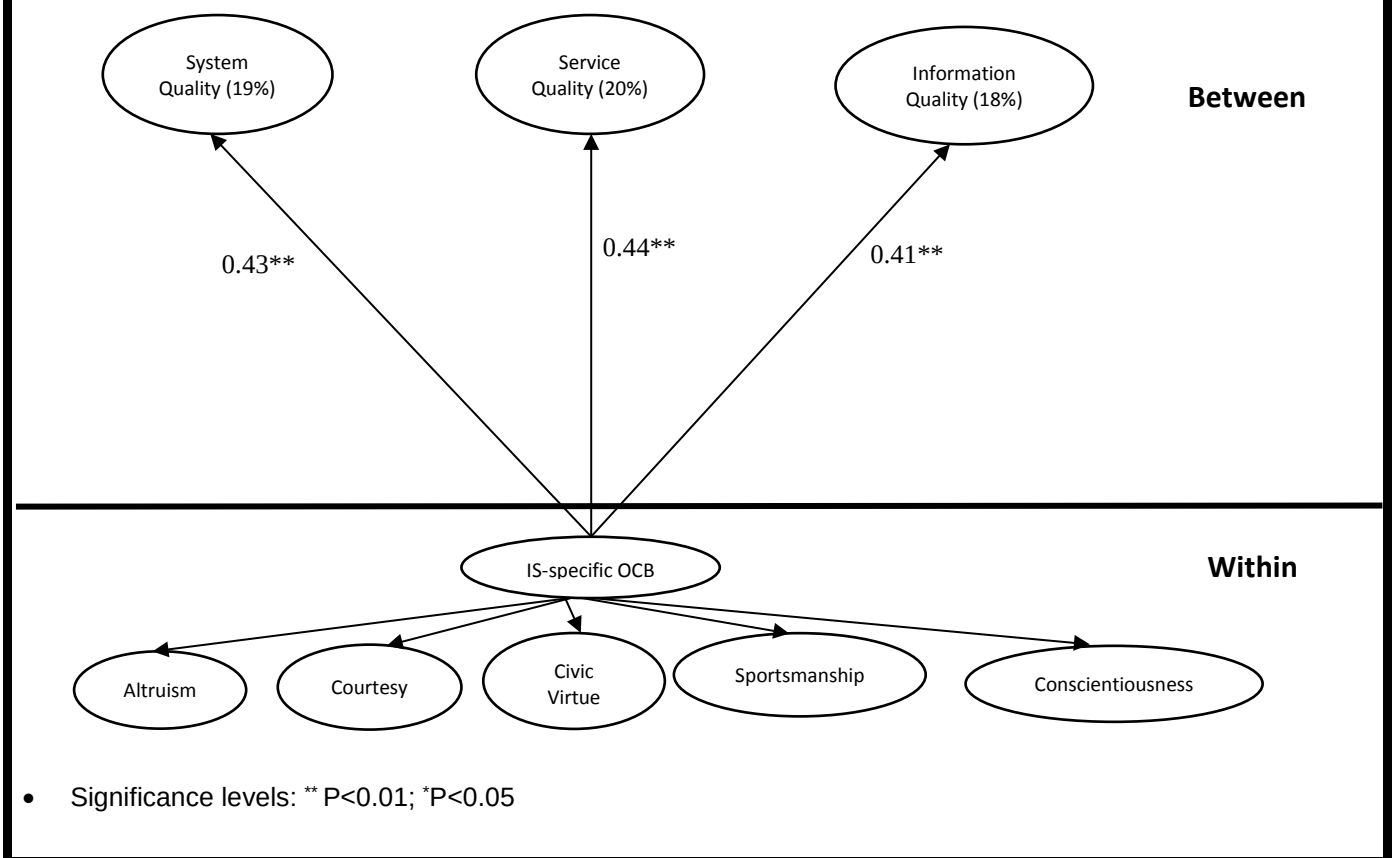
the perfect-fitting models in Table 28, the model perfectly fits the data. SRMR yields a value of 0.040 for the within part, which is less than 0.08 and 0.117 for the between part, which is slightly more than 0.08. The values of TLI and CFI are 0.975 and 0.977, which are greater than 0.95. The obtained value for RMSEA is 0.018, which is less than 0.05. The fit indexes obtained from the multilevel SEM are shown in Table 39 and indicate a perfect-fitting model based on a comparison with acceptable values of different fit indexes reported in Table 28.

Table 39. Fit statistics

Model	Chi-Square	SRMR	NNFI(TLI)	CFI	RMSEA
Multilevel Model	767.354 with 563 df (/df = 1.363)	0.040 (Within part) 0.117 (Between Part)	0.975	0.977	0.018

5.8.2 Results of Hypotheses Testing

Mplus provides different types of standardized estimates, STDYX standardization, STDY standardization, and STD standardization. STDYX standardizes the variables according to the variances of both the latent and the observed variables; STDY uses only the variances of the observed variables; and STD uses only the variances of the latent variables. Each of these standardized solutions has a different sampling distribution and gives a different level of significance and standardized estimate based on the characteristics of the data. Importantly, the STDYX solution is comparable with the standardized coefficients or completely standardization solution reported in other structural equation modelling programs (Kelloway, 2014). The results of the path coefficients shown in Figure 27 were used for testing hypotheses. For each hypothesis, the standardized estimates (β), the levels of significance, and the squared multiple correlations are also reported. Additional details, specifically the factor loadings, the residual variances, and R-square, at within and between level are presented in Appendix I.



- Significance levels: ** P<0.01; *P<0.05

Figure 27. Multilevel Model's Hypotheses Results

The effect of the group-level IS-specific OCBs on the IS department effectiveness was examined in the previous analysis (Section 5.7). Besides group-level analysis, the previous subsection tended to explore the effect of IS-specific OCBs across the organization in which for example, an IS professional help their inexperienced IS colleagues with technical ambiguities within the IS department and help to spread out the best IT practices between the IS department and distinct business departments. A multilevel analysis was conducted in this study to measure the effect of cross-level IS-specific OCBs on the quality of IS system, service, and information delivered to business employees throughout the organization. Table 40 summarizes the results of the hypotheses testing.

Table 40. Summary of the Proposed Hypotheses	
Hypotheses	**Supported?**
H17: Individual-level IS-specific OCBs directed by IS professionals affect the unit-level system quality of IS departments ($\beta = 0.43$, $P = 0.005$).	Yes
H18: Individual-level IS-specific OCBs directed by IS professionals affect the unit-level service quality of IS departments ($\beta = 0.44$, $P = 0.006$).	Yes
H19: Individual-level IS-specific OCBs directed by IS professionals affect the unit-level information quality of IS departments ($\beta = 0.41$, $P = 0.010$).	Yes

Within-Level Predictor of Unit-Level IS System, Service, and Information constructs

The IS-specific OCBs within the IS department were assessed as determinants of the quality of IS system, service, and information. First, the path between individual-level IS-specific OCBs and IS system quality was extremely significant ($p < 0.01$) and had a moderate and positive relationship ($\beta = 0.43$). 19 percent of the variance in the IS system quality can be explained by such behaviours, supporting H17 and the proposition that individual-level IS-specific OCBs directed by IS professionals in IS departments affect the system quality of IS departments. Second, individual-level IS-specific OCBs was significantly and moderately correlated with the IS service quality ($\beta = 0.44$, $P < 0.01$) and explained 20 percent of the variance in the IS service quality, supporting H18 and the proposition that individual-level IS-specific OCBs directed by IS professionals in IS departments affect the service quality of IS departments. Third, individual-level IS-specific OCBs reflected a significant relationship ($P < 0.01$) and was positively associated to the information quality ($\beta = 0.41$). Individual-level IS-specific OCBs contribute to 18 percent of the explained variance in the information quality, supporting H19 and the proposition that individual-level IS-specific OCBs directed by IS professionals in IS departments affect the information quality of IS departments.

Overall, this study used the individual-referent-shift and unit-referent-shift models for aggregating judgements of OCBs, which the latter avoided biases that might be created by low and high OCB performers and would be truly representative of the IS unit as a whole. The impact of individual-level IS-specific OCB construct on the unit-level system, service, and information constructs rated from different sources shows robust results and a fairly decent job of controlling for the common method biases. It is consistent with recommendations by Podsakoff et al. (2014) that the best way of controlling for the common method biases is to obtain the measures of the predictor and criterion constructs from different sources.

5.9 Summary

This chapter provided a statistical report for supporting hypotheses and eventually answering research questions. First, the research findings demonstrated empirical evidence that IS-specific OCBs occurred across departments are strong predictors of the IS departments effectiveness. Next, the research results also supported assumptions that promoting the quality relationships within the IS departments dampen the negative sides of the IS jobs, and as opposite to this, consolidate the IS-specific OCB exhibitions among IS professionals. Finally, this research highlighted some dispositional factors of IS professionals and IS leaders. Despite one hypothesis (H8) that failed to reach a significant level, the rest of hypotheses received an empirical support from the different levels of data analyses. This study employed a multilevel approach to evaluate cross-level effects of IS-specific OCBs on effective functioning of the IS departments. To shed a light into potentials and benefits that this study may contribute, the next chapter focuses on interpretations of the research findings of this chapter.

CHAPTER 6: DISCUSSION AND IMPLICATIONS

6.1 Overview

This chapter presents the conclusions of this study. First, the results gained from the predictors of IS-specific OCBs and the consequences of IS-specific OCBs are discussed. Then, theoretical and practical contributions of this study are comprehensively explained, along with the limitations and suggestions for future research. Finally, the conclusion section summarizes the overarching results of this thesis.

6.2 Discussions on Personalities and the Quality of Relationships within IS Departments

The present study had four primary goals. The first goal was to explore how high-quality within-group relationships occur in the IS departments or IS groups. Thus, this study assessed the impact of distinctive IS professionals' personalities and IS leaders' transformative leadership style on the high-quality relationships among IS professionals and between IS professionals and their IS leaders (e.g., CIOs or CTOs) within IS departments or IS groups. Given that IS professionals' personalities (e.g., extraversion, conscientiousness) are antecedent to the creation of within-group interaction (Lounsbury et al., 2007), this study as one of the few studies in the IS context tested the propositions of the effects of four IS professionals' personalities, e.g., extraversion, conscientiousness, proactivity, and positive affectivity, on the development of high-quality relationships among IS professionals and between IS professionals and their IS leaders. The results of this study indicated that IS professionals with extraversion, conscientiousness, proactivity, and positive affectivity willingly set a high-quality relationship with their IS peers and IS leaders. Indeed, IS professionals with these personalities are able to build a high-quality relationship with their peers, portrayed as to how

best to share constructive suggestions, streamline workflow, solve IT problems, facilitate meetings and discussions and recognize technical potentials of their peers. The results of this study reflected that extravert IS professionals, who are warm, gregarious, assertive, active, excitement seeking, and positive, have more tendency in initiating a high-quality relationship with other IS peers, whereas conscientious IT professionals, who are competent, ordered, dutiful, achievement-striving, self-disciplined, and deliberate, are less likely to contribute to the quality member-member relationships within the IS groups.

Despite overlooked IS research on how high-quality relationships can be built between IS professionals and their leaders, non-IS researchers have long recognized the development of the quality leader-member relationships within teams (Ilies et al., 2007; Nahrgang et al., 2009). Our findings are consistent with the results gained from empirical studies in the non-IS literature and imply that IS professionals with these personalities, except positive affectivity, initiate quality relationships with their CIOs or CTOs. Quality relationships are portrayed as having mutual understanding, confidence in each other's ability and strength, and efforts on solving problems together. Comparing the effect of disparate personalities on the quality leader-member relationships, proactive IT professionals, who are looking for better ways of doing things and do not get disappointed when confronting obstacles, are more inclined to initiate the relationships with their IS leaders.

The difference between conscientiousness and extraversion is conceptually and empirically pointed out in the IS and non-IS studies (Barry & Stewart, 1997; Lounsbury et al., 2007; McCrae & Costa, 2003), as expected in this study, extraversion is a more important personality than conscientiousness. Extraversion conveys teammates' idea and views, prompts communications easily in group settings, takes initiatives for interaction in leaderless discussion groups, and willingly joins group discussions and associations. On contrary, IS professionals with conscientiousness within IS groups are more highly likely to be recognized

by IS leaders than extraversion and have a stronger impact on the quality of leader-member relationships.

In addition to distinct IT professionals' personalities, IS leaders' transformative leadership behaviours were found in this study to develop the quality of leader-member relationships in the IS groups. Comparing all predictors of the quality leader-member exchange proposed in the research models, IS leaders' transformative leadership style has more influence on building the quality within-IS group interaction than personalities of IS professionals. An IS leader's transformative leadership style contributes to the quality of relationships in IS groups by having the intrinsic responsibility to maintain a culture of collaboration within and between IS groups, fostering development and improving IS group solving problem. Also, IS leaders with transformative style are able to influence attitudes and behaviours of IS professionals to engage in more technical and non-technical activities. Approaches of transformative IS leaders considered in this study are: instilling pride, confidence and respect in IS professionals, emphasizing and sharing the importance of having a collective sense of IT visions, missions, and objectives, spending time on teaching and coaching, seeking different perspectives and considering abilities and distinctive aspirations from IS professionals, and talking optimistically about the future. Although research on the effects of the transformative leadership style of CIOs on the quality of within-IS group relationships has not been conducted, the findings of this study are complementary to those studies conducted on how demand-side leadership by CIOs improves communication and coordination among IT professionals by empowering them to add value to the organization (Chen et al., 2010). For example, a CIO with a smaller power distance or a high structural power more frequently consults with his/her IS professionals and business executives (Armstrong & Sambamurthy, 1999; Chen et al., 2010; Karimi, Gupta, & Somers, 1996).

6.3 Discussions on Determinants of IS Work Exhaustion

The second objective of this study was to examine the levels of IS work exhaustion perceived by IS professionals in their workplace. This study developed the extant job burnout models for IS professionals, which emphasized work exhaustion as one of the dimensions of job burnout theory. The research models presented in this study considered the determinants of IS work exhaustion, including the lack of autonomy, workload, role ambiguity, and role conflict, and their effects on the IS work exhaustion. The findings of this study reported that exhausted IS professionals incur a high level of the lack of autonomy, workload, role ambiguity, and role conflict. In the three research models proposed at the individual level in this study, the lack of autonomy prompted IS professionals to have more influence on work exhaustion than other predictors. In more details, IS professionals whose suggestions are not accounted and participations on decision makings are not sought by their managers, feel exhausted more than when they encounter the levels of workload, role ambiguity, and role conflict.

6.4 Discussions on the Antecedents of IS-specific OCBs

As a few studies have focused on the determinants of OCB in the IS context, the third goal of this study was to investigate the antecedents of IS-specific OCBs and how these behaviours can be encouraged or hindered in the IS context. Therefore, this study considered the quality relationships among IS professionals and between IS professionals and their IS leaders in IS groups as the predictors felt internally by IS professionals and the perceived IS work exhaustion and its predictors as the antecedents felt externally by IS professionals. The three research models were proposed to examine the three categories of OCBs based on organ's original definition of five-dimension OCB, Williams and Anderson's intended beneficiary of OCB-I/O, and Van Dyne and LePine's essential nature of AOCB/COCB behaviours by assessing the effects of externally-and internally-felt predictors on disparate types of OCBs.

The findings derived from the three research models based on these distinct categories of OCBs indicated that the perceived IS work exhaustion hinders the occurrence of IS-specific OCBs and the quality of within-group relationships promote such behaviours to occur. With regards to the interpretation of the effects of IS-specific OCB predictors, IS professionals display OCBs if they have a quality relationship within their IS departments and do not exhibit IS-specific OCBs when they are under pressure of the lack of autonomy, the levels of workload, role ambiguity, and role conflict. Specifically, the quality relationships within IS departments enhance direct benefits of IS-specific OCBs to each IS professionals (OCB/I), for example upskilling new IS professionals, and the organization (OCB/O), for instance OCB-enable IT contributions to business successes, while IS work exhaustion inhibits such positive behaviours to occur. As the intended beneficiaries of OCBs towards groups are discussed by Chen et al. (2005) and Choi and Sy (2010), the findings of this study can be interpreted in a way that IS-specific OCBs directed towards IS-business groups enhance the direct benefits of these behaviours for the IS department, for example IS department effectiveness in this study. Likewise, quality relationships within IS departments promote affiliation-oriented OCB, including cooperation between IS teammates, orientation of IS newcomers, IS team work involvement, and knowledge-sharing within IS teams, while IS work exhaustion caused by insufficient IS staff and resources, unrealistic deadlines and target dates limit affiliation-oriented OCB.

6.5 Discussion on the Consequences of IS-specific OCBs

A review on the IS-specific OCB literature witnesses that the consequences of these behaviours have received less amount of attention. Therefore, the fourth goal was aimed at providing empirical evidence of the effects of IS-specific OCBs on the IS departments effectiveness. In doing so, the effects of IS-specific OCBs at individual and unit levels on unit-level quality of IS system, service, and information were assessed. The findings of the two-level research

models showed that IS professionals who direct IS-specific OCBs towards their teammates within the IS departments and their non-IS peers, enhance the effective functioning of the IS departments by producing the quality of IS systems, delivering the quality of IS services, and sharing the quality of IS information. The findings demonstrate that the effect of unit-level IS-specific OCBs on the perceived quality of IS systems is slightly greater than the impact of IS-specific OCBs on the quality of service and information at both individual and unit level. The implication is that IS departments direct a set of IS-specific OCBs towards distinct business departments so that business employees are highly likely to perceive that the designed and developed IS systems streamline their task accomplishment, improve their communication and knowledge sharing with external constituencies, improve business operations efficiency, facilitate knowledge assimilation and dissemination, and contribute to innovation and collective group learning.

In addition to these perceived characteristics of IS systems, the results also show that IS-specific OCBs directed by the IS department enable business employees to portray their IS systems as reliable, accessible, easy to use and learn, well integrated and responsive to meet changing needs. In contrast, the impact of individual level of IS-specific OCBs on the quality of service and information perceived by business employees is stronger than unit-level IS-specific OCBs. The interpretations of the results explicate that IS professionals who individually engage in different IS-specific OCBs make business employees perceive that the delivered IS services are responsive and flexible and their IS professionals possess sufficient soft and hard skills to deliver services, for instance conducting effective informal and formal trainings. Furthermore, this research reports that business employees agreed that the shared information becomes accessible, flexible, useful, reliable, presentational, and understandable if such IS-specific OCBs are performed by their IS professionals.

The prior sections reported that strong support was obtained for individual-level, unit-level, and multilevel research models. In addition to providing empirical support for the hypothesized research models, the results also suggest some theoretical and practical contributions.

6.6 Implications for Theory

This study has several theoretical contributions. First, a large number of studies have explored the effect of OCBs on unit or organizational-level outcomes (e.g. organizational effectiveness, customer satisfaction, or unit-level turnover) in marketing or financial contexts (see Appendix B) (Podsakoff et al., 2009). However, a very less number of research have examined this effect in the IS field (Hsu et al., 2015; Yen et al., 2015; Yoon 2009). This research develops the two hypothesized research models at multilevel to broaden the understanding on consequences of the impact of the individual and unit-level OCBs on the unit-level organizational outcome in the IS context. The research findings contribute to the literature of the impact of OCBs on subjective overall group/team/department effectiveness by measuring OCBs in distinct IS groups/teams/departments. Consequently, the results derived from the two frameworks provide support for the theory that IS-specific OCBs are significant determinant of the IS department effectiveness. Indeed, this research portrays social influence processes revealed as formal and informal activities that IS professionals carry out to assist their IS and non-IS staff, thus resulting in business employees' perception of received quality of technical and non-technical services, shared information, and designed IS systems. The findings highlight the values of multilevel approaches that demonstrate how IS-specific OCBs at individual and unit levels expand a social milieu from within IS departments to between departments, which jointly provide a full insight into the effective functioning of the IS department.

Several IS scholars have used the distinct dimensions of IS system, service, and information quality, following Delone and McLean's IS success model, to measure the

effectiveness of an IS function (Chang & King 2005; Laumber et al., 2017; Nelson et al., 2005). This study provided strong empirical evidence that Chang and King's (2005) functional scorecard should be updated with measures developed subsequent to Delone and McLean's original review of the three major dimensions of IS function effectiveness: systems performance, service performance, and information effectiveness. The measurements used included all IS activities, considered to be 18 subdimensions of the three major dimensions. As this measurement is in its early stages of scale development and there have been no enough robust results to empirically support this measurement, the results of this study provide strong evidence by analysing the collected data of a great number of respondents from multinational banks and insurance companies. Compared to Chang and King's (2005) work, this study could hold more items within the measurement and structural models and empirically support the reliability, and convergent and discriminant validity of the constructs. It would grant a clearer road map to IS scholars for evaluating the strengths and weaknesses of the IS function.

Second, this study considered the three categories of the OCB antecedents: leader-member exchange (LMX), team-member exchange (TMX) and work exhaustion. While only a few IS studies have hypothesized the impact of the various antecedents on OCB in one research model, the three research models proposed at individual level in this study consider the OCB antecedents and their relationships with different types of OCBs based on Organ's original definition of five-dimension OCB, Williams and Anderson's intended beneficiary of OCB-I/O, and Van Dyne and LePine's essential nature of affiliation-oriented OCB and challenge-oriented OCB. The purpose of this would be that OCBs are argued to have somewhat different relationships with antecedents at both individual and unit levels of analysis (Podsakoff et al., 2014), whereas the LePine et al. (2002) and Hoffman et al. (2007) meta-analyses reflect that there was little support for differential relationships between different types of OCBs (e.g., five-dimension OCB and OCB-I/O) and their individual-level antecedents. Therefore, this

research provides the empirical results aligned with LePine et al. (2002) and Hoffman et al. (2007) results that the relationships between the antecedents and the three types of OCBs are relatively similar.

Third, this study provides theoretical clarification of LMX and TMX as social exchange-based constructs in the IS field. This study allows the difference between LMX and TMX to be distinguished in the IS department as the relationship between the IS leader and IS professionals, and relationships among IS professionals within an IS team. The findings support the perspective that TMX and LMX positively related to OCB and bring more clarity into what is known about teams by defining that a team member's perception of the quality of social exchange throughout the team is more important than one's perception of quality dyadic relationships with individual member. It means how quicker an IS team' goals, norms, spirit, and viewpoints can be spread out through the quality relationships within the IS team than a dyadic relationship between two IS professionals. Importantly, the results also stress that TMX overpowers LMX regarding incremental validity (standardized regression weights) and relative weight (square multiple correlations) as TMX has a stronger effect on OCB and explain more variance in OCB than LMX. The findings add values to Banks' et al. (2013) meta-analysis that TMX demonstrates incremental validity above and beyond LMX in predicting OCB, but also greater relative weight when predicting OCB. It implies that quality social exchanges among IS professionals are more likely to contribute to promoting OCBs than quality social exchanges between an IS leader and IS member. Indeed, IS professionals perform more OCBs with their colleagues than with their managers because IS team members share constructive suggestions with their IS colleagues, streamline workflow within the IS team, solve their colleagues' IT problems, facilitate meetings and discussions and recognize technical potentials of their IS colleagues. Even, better accessibility of the IS leader to specific resources, information, and opportunities necessary for OCBs and more unique power of the IS leader of being able to

reward and punish IS members cannot overweight the valued levels of social and emotional support between IS professionals.

Forth, this study suggests disparate IS team members' dispositional factors, consisting of extraversion, conscientiousness, proactivity, and positive affectivity as the determinants of both TMX and LMX, and IS leaders' transformative leadership behaviour as the determinant of LMX. The empirical results provide support for the theories that with the exception of positive affectivity, other personalities support the quality of LMX and TMX. Following that, extraversion is more strongly related to TMX, whereas affectivity more strongly predicts LMX. Besides the dispositional factors, transformative leadership style is identified in this study as the strongest determinant of LMX. The literature is reviewed on various leadership behaviours in which transformative leadership behaviours have been found to predict the performance of OCBs, while transactional leader behaviours are more related to the performance of in-role behaviours (Carter et al., 2013; Poadsakoff et al., 1990; Podsakoff et al., 2000). In view of the fact that transformative leadership behaviours lead to OCBs through a systematic process due to the different nature of transformational leader behaviours themselves (Carter et al., 2013; Poadsakoff et al., 1990), this study define the systematic process within an IS team based on how IS-specific OCBs can be promoted when IS leaders' transformative behaviours stimulate IS team members to engage in more quality of relationships with their IS leader. Hence, the empirical results provide some support that the quality LMX is created within an IS team when:1) recognition of IS team members' existing IT capabilities to support IS projects implementation success and business operations is obtained; 2) an IS leader effectively conveys IT objectives, vision, and mission to IS professionals; 3) a signal of high performance expectations of an IS leader flows through IS teams; 4) an IS leader shows concern for personal needs and feelings of his/her IS team members; and 5) an IS leader encourages his/her IS team members to rethink the way they perform their duties. As a result of managerial productivity

resulting from the systematic process, transformative IS leaders have sufficient time, energy, and resource to combine current IT competencies with other complementary non-IT strategic resources and capabilities to create new strategic opportunities for business innovations. Consistent with Chen' et al. (2010) conclusions of the effect of IS leaders' transformative behaviours on organizational outcomes, the perspective our research builds will contribute to firm efficiency, strategic growth, and competitive advantage.

Fifth, this study extended the existing research models of job burnout for IS professionals using work exhaustion as a determinant of OCB. Work exhaustion was found in this study to reduce the level of OCBs among IS professionals. In fact, the research model manifests how the effect of work exhaustion detract from the positive effects of LMX and TMX on OCB. This provides a theoretical insight into reasons why the levels of OCBs are lower in IS departments than other departments. Work exhaustion and its predictors, including the lack of autonomy, workload, role ambiguity, and role conflict, describe job characteristics of IS professionals. The results are consistent with prior findings in the literature (Shih et al., 2013; Moore 2000; Moore & Love, 2005) that exhausted IS professionals endure the pressures arising from insufficient IS professionals and resources, unclear IT objectives, vision, and mission, a large number of IT problems and business requests, and unrealistic deadline and target dates set in IS projects.

Finally, this study tended to provide some clarity to OCB's concepts and definitions that have evolved since Organ's (1988) "good soldier syndrome". While Organ (1997) clarified the confused state of overlap between OCB and other constructs of extra-role behaviours, and distinguished the boundary between OCB and in-role behaviours by defining OCB as analogous to Motowildo's contextual performance, the boundary of OCB still remains unexplored. This study endeavoured to provide a more comprehensive discussion for interpreting the reconceptualization of OCB by comparing and contrasting extant discussions

in the literature (George & Brief, 1992; Moorman & Blakely, 1995; Motowildo, 2000; Organ, 1997; Podsakoff et al., 2014).

Also, after exploring the different types of OCBs that IS professionals perform, we defined IS-specific OCBs and drew upon the IS literature to conceptually describe OCB examples that occurred within IS departments and across the organization. For instance, IS helping and knowledge-sharing behaviours are examples of helping behaviours (e.g., altruism, courtesy, peacekeeping, and cheerleading), while initiative-taking is analogous to the civic virtue and sportsmanship aspects of OCB. Organ (1997) stressed that OCBs should be considered across jobs, not the roles discussed between a leader and his or her subordinates. In the IS field, these behaviours can be in-role or extra-role behaviours, depending on the job description of the IS professionals. For example, the extra time and effort that software developers expend on redocumenting legacy systems, refactoring their architecture, or translating programmes to a modern programming language, can be either in-role or extra-role behaviours, depending whether or not these activities were discussed between the software developers and the organization.

Following from the boundary spanning perspective, IS-specific OCBs can be distinguished from OCBs in at least two specific ways: 1) IS professionals are referents of IS-specific OCBs; and 2) non-IS and IS colleagues are recipients of IS-specific OCBs. IS professionals disseminate IT-related knowledge, hands-on training, and personalized information beyond the call of their duty to their business and IS peers. IS professionals span various business departments to enhance the IT competence of their business employees as well as their IS colleagues. This study strengthens the understanding of IS roles as boundary spanners: IS professionals display IS-specific OCBs to perform their roles in making technical and non-technical knowledge flow more effectively around and across organizations.

Overall, it is important to note that this study focuses on technical and non-technical activities that IS professionals carry out, which are unrecognized, explicitly unrewarded, and unenforceable job requirements, or part of their contextual performance. The suggested research model illustrates the importance of OCBs in enhancing the IS department effectiveness while IS professionals tackle incurred pressures arising from reactions to technology updates to prevent their professional obsolescence (Tsai, Compeau, & Haggerty, 2007). Along with this, the lack of autonomy, levels of workload, IT ambiguities, and IT conflicts are unveiled as major pressures that can result in a work spill-over in which IS professionals need to undertake more job complex and expanded responsibilities (Moore 2000; Moore & Love, 2005). As IS professionals are only focal sources of technical knowledge, it would be more difficult for them to communicate about IT issues with others beyond their job description across the organization and even to perform such IS responsibilities as part of their contextual performance for instances: training, supervision, and quality control tasks (Moore 2000a; Slaughter & Ang, 1996). The results of this study show that these incurred pressures reduce the likelihood of the occurrence of IS-specific OCBs. To battle with this phenomenon, the research model underscores the importance of LMX and TMX theories in giving new alternatives and neutralizing the negative effects that the nature of IS jobs impose.

Through the lens of social exchange theory (SET), positive work behaviours (e.g., OCBs) and exchange quality relationships within teams (e.g., TMX and LMX) have been examined as essential constituents of social exchange theory. Drawing on SET, this study explicates OCBs as reciprocating responses enacted through quality social exchange relationships in response to a leader's or co-worker' initial treatments (Cropanzano, Anthony, Daniels, & Hall, 2017). The interpretation of results of this study provides a better insight into SET by discussing that OCBs emerges when team members receive supervisory or peer support from their leaders or teammates. On the other hand, OCBs are undermined when the quality of economic exchanges

transcend the quality of social exchanges so that leaders and team members are less likely to initiate supportive actions within and between teams. This study indicates that team members are confronted with the high levels of pressures arising from the lack of autonomy, workloads, role ambiguities, and role conflicts that would push the quality social exchange relationships towards low quality economic exchange relationships, resulting in less reciprocating responses with OCBs. The lack of leader' recognition and support of the incurred pressures and the absence of propensity among team members to build quality social relationships with others because of the high levels of responsibilities or the lack of time cause team members not to engage in OCBs. This study enlightens how the quality of social exchange relationships can be built within an IS units by elaborating on various IS professionals' personalities and an IS leader's transformative leadership style to mitigate the incurred pressures that can restrict the quality of social exchange relationships to be built.

Lastly, this study also contributes to pre- and post-adoption literature in which most of studies often limit their focus to actions of managers and users without examining the role of IS professionals in supporting and motivating IS use (Venkatesh et al., 2003). By clarifying the centrality of the role of IS professionals in IS units, the current study expands an understanding that additional assistance and support of IS professionals impact IS project implementation success when users' perception of usefulness and ease of use of the adopted IS systems is shaped by IS-specific OCBs. In addition, this assistance leads to IS infusion in which IS professionals direct IS-specific OCBs towards users, encouraging them to use IS at a deeper level (Kia, Singh, & Olesen, 2016). The next section focuses on practical implications of this study.

6.7 Implications for Practice

Investments in IT projects have been increasing to reduce costs and improve decision-making, productivity, sales, profits, market efficiency, customer welfare, creation jobs and

economic development (Petter et al., 2008). A top concern for business executives has been to estimate the impact of IS on business profitability or the return on investments, and to distinguish contribution of IS to individual, group, and organizational successes (Petter & McLean, 2009; Urbach et al., 2009). Consequently, how expenditures and investments on IS should be made is a key issue debated by top management, with no guarantee that these decisions will be successful, as evidenced by the large number of failed and abandoned IT projects (Ewusi-Mensah, 1997; Roberts et al., 2004).

The success of the IS function depends on how IS and business employees are aligned in terms of IT's impact on the business' strategic direction, operations, and its relationships with business units. The study provides top IT-business managers with a suggestion for enhancing different ways of linkage between IS and business units. The results point to the importance of creating scenarios to encourage frequent occurrence of IS-specific OCBs between IS professionals and business employees. This will reduce miscommunication, increase their level of shared knowledge, and provide more effective systems, IT services, and IT-specific information for business units. Broadly, the goal will be to shift away from conceptualizing "IT-business alignment" as a rigid, structured activity toward a more organic, free-flowing process throughout the organization. The model of IS-specific OCB proposed provides new ways of what was acknowledged by Basselier and Benbasat (2004) that will enhance IS professionals' organization-specific knowledge, help them expand their network with business users and improve their soft skills, such as interpersonal communication and leadership skills. The prevalence of IS-specific OCBs across organizations improves an insightful understanding of what social aspects of IT-business mean at individual and unit levels that will lead to IT contributions to business successes, such as sustaining a competitive advantage (Basselier & Benbasat, 2004; Bassellier et al., 2001), developing a set of soft skills of IT professionals (Joseph, Ang, Chang, & Slaughter, 2010; Sawyer et al., 1998), improving

the quality of knowledge brokering and IT boundary spanning activities (Pawlowski ae al., 2004), enhancing the likelihood of IS project implementation success (Bassellier et al., 2001; Curtis et al., 1988; Keil et al., 2013; Skulmoski & Hartman, 2010; Tarafdar & Gordon 2007; Walz et al., 1993) and enhancing the knowledge sharing in the use of IT-enabled work systems (Jasperson et al., 2005).

By studying the role of IS professionals in IS function effectiveness, this study highlights the need to consider the actions of the various actors in the social context surrounding information systems and their value. As IS professionals analyse, plan, deploy, maintain or retire systems, their activities can influence the perceptions that business employees have of individual systems and the overall portfolio. Business employees make decisions to invest further time and effort in using the outcomes of their IS departments based on the availability of support in the organization, beyond the encouragement of their managers. Studies of IT value attempt to incorporate such possibilities by using real options analysis (Jasperson et al., 2005). However, this approach, while complex and robust, is often limited to incorporating the decisions of managers and business employees, setting aside the role of IS professionals. This paper provides evidence that the long-term value that organizations receive from their IT investment decisions is strongly influenced by the actions of their IS professionals in supporting the learning of their business employees.

As potential determinants of project success, personality traits and soft skills have received considerable attention, and more research has been carried out on project success than technical skills (Creasy & Anantatmula 2013). The findings of this study unveil an approach for organizations that IS professionals' personality traits and IS leaders' leadership styles boost a chance that discretionary, positive behaviours can be exposed in IS project-specific activities. Broadly, IS leaders can build on specific personalities and behaviours to ensure the IS project success and should direct their focus toward effective ways of IS professional selection for IS

projects. This focus should be also directed toward IS leader selection, training, coaching, and problem solving prior to IS projects being launched.

IS professionals are usually confronted with stressful situations resulting from the fast speed-to-market nature of IT products and a need to upskill and update themselves with new features embedded into systems or applications (Akgün, Byrne, Lynn, & Keskin, 2007; Tsai et al., 2007). These situations become worse because of the pervasiveness of technology in organizational tasks, routines, and processes, leading to IS professionals being overburdened with IT ambiguities and conflicts inside and outside their departments. Such a scenario may increase the workload of IS professionals, preventing them from engaging in quality relationships with their colleagues and managers, and undermining their collective actions and resolutions. Also, IS professionals may find it difficult to allocate time, effort and attention to engage in valuable behaviours in addition to their regular work and the need to update themselves. This research presents a framework and provides empirical evidence that can be useful for IS managers to understand how to mitigate the negative effects of the nature of IS jobs for IS professionals. In doing so, IS managers can build quality emotional and social interaction within IS teams, allocating sufficient time, resources, and manpower to IS projects, surpassing team training and learning to increase knowledge, skills, and self-confidence, and helping IS professionals to face and overcome problems and seeking out their ideas in management decisions and important decisions about job-related matters. Ideally, these outcomes can be exposed if IS managers effectively direct IS-specific OCBs to contribute to the IS department effectiveness. Examples developed from Podsakoff et al. (1997) discuss that IS-specific OCBs contribute to the effective functioning of IS department effectiveness by: 1) enhancing IS productivity. IS professionals, who help their IS colleagues in IT updates and issues, for example catching up with updated features of software applications or with a more effective way of troubleshooting, and helping spread IT best practices throughout the business

departments, may quickly prompt IS professionals to become more productive (Deng et al., 2015); 2) improving managerial productivity. IS professionals, who engage in civic virtue share valuable and innovative suggestions and feedback, and who engage in courtesy prevent creating problems for IS and non-IS colleagues. For example, communicating and coordinating with others on sharing know-how and know-why during IS project implementation avoid IS leaders to fall into a pattern of crisis management (Yen et al., 2008); 3) freeing up resources for more productive purposes. IS professionals who exhibit IT helping behaviours allow CIOs and CTOs to focus more on higher-level managerial tasks, consisting of IS strategic planning, IT-business alignment, and IT portfolio management. These behaviours also reduce organizational costs and the need to devote organizational resources to the formal training and orienting of inexperienced IS employees and business employees with less technical knowledge and skills (Rice et al., 1999).

Likewise, less managerial supervision is required if IS professionals exhibit conscientiousness, permitting IS leaders to assign more tasks to them, which frees up more of IS leaders' time. In another fashion, IS professionals who carry out sportsmanship (e.g., maintaining positive attitudes over IT issues arising from insufficient information and data during IS project implementation (Deng & Wang, 2014; Yen et al., 2008) free IS leaders from having to spend a lot of time on tackling petty complaints; 4) reducing the need to devote scare resources to purely maintenance functions. The by-product of IT helping behaviours enhances IS and non-IS team spirit, morale, and cohesiveness, avoiding IS professionals, IS leaders and business managers to spend energy and time on team maintenance functions. Similarly, by-product of courtesy directed towards IS colleagues within the IS department and business employees across business units reduces intra and inter group conflicts which diminishes the time spent on conflict management activities; 5) streamlining coordination activities within the IS department and across business units. IS professionals (e.g., IT boundary spanners or

knowledge brokers) with civic virtue voluntarily attend and participate in meetings with their IS colleagues and business units, which facilitates coordinating efforts within the IS department and business units. Courtesy within the IS department and between IS and business departments indicates that IS professionals share IT-related knowledge and expertise with their IS teammates and business employees across the organization, reducing the likelihood of the occurrence of problems that otherwise would take time and effort to resolve (Deng & Wang, 2014); 6) enabling the enhancement of an organization's ability to adapt to environmental changes. IS professionals who display IS-specific OCBs aid the dissemination of information in meetings, work times, social events, and leisure times, thereby speeding up learning new skills and how to respond to environmental changes; and 7) reducing the impact of stress creators. For instance, IS professionals exhibit IT helping behaviours within IS teams to assist their peers with the level of workloads (Lee & Lee, 2010).

6.8 Limitations

The present study includes several noteworthy features, consisting of multi-source, multilevel analysis based on international data. These features also offer both limitations and highlights for future research. Before offering potential avenues for future research, we present the limitations of our research. First, as a cross-sectional design, there may be a lower level of certainty in our conclusions, compared to a longitudinal design that is better able to demonstrate causality in the relationships between the predictor and outcome variables. Second, this study elaborates how IS-specific OCBs occur through quality relationship within IS departments, leading to attaining a set of IT capabilities that prompt IS professionals to effectively design systems, deliver services, and share information with business departments. This study does not control for the effect of users' computer self-efficacy (e.g., using a software package for data analysis) on IS-specific OCBs and IS department effectiveness. Evaluating the effects of users' computer self-efficacy in similar contexts may be of interest to other scholars. Third,

another limitation is that this study did not measure transactional leadership style, but rather assessed transformational leadership style due to its core relevance for processes of the occurrence of OCBs (Carter et al., 2013). It is worthwhile to determine the differentiation of the effects of both styles, defined in the IS context as supply-side and demand-side IS leadership, on IS-specific OCBs.

6.9 Future Research

While this paper investigates the positive effect of IS-specific OCBs, IS scholars should also undertake further research on any possible 'dark side' of IS-specific OCBs. It is foreseeable that IS professionals may perform more OCBs and overlook their own task performance (Deng et al., 2014). Performing the discretionary behaviours detailed in this paper may also have detrimental effects on individuals in terms of their progress towards their work goals (Koopman, Lanaj, & Scott, 2016), the long-run development of their careers, and task performance (Bergeron, 2007; Rapp, Bachrach, & Rapp, 2013; Rubin, Dierdorff, & Bachrach, 2013). Future researchers could examine how IS professionals trade off the benefits and costs when deciding whether or to what extent they should carry out IS-specific OCBs. So as to effectively discover the differences in motivations, self-interest and decision-making processes that IS professionals' undergo under distinct situations, a qualitative study is recommended for future research. Also, future research should incorporate mediating and moderating mechanisms to explain why OCBs should improve organizational effectiveness (Podsakoff et al., 2014; Podsakoff et al., 2000). As a few studies have investigated these mechanisms, future research should pay more attention on theoretical mechanisms to underlie how and why OCBs influence unit-level organizational outcomes.

Technology has transformed employees' traditional workplaces, with their physical boundaries, into virtual workplace, where employees interact with each other through information and communication technology. A challenge here is whether the appropriate level

and extent of IS support needed for IS function effectiveness can be provided virtually. IS researchers have suggested online IT helping behaviours as part of IS-specific OCB (Lee & Lee, 2010), and future researchers could examine how the location (local/distant) and type (online/face-to-face) of IS-specific OCB affect IS function effectiveness other relevant outcomes.

Another environmental change that is relevant in this context is the shift towards IT outsourcing and more broadly, the growth in the use of cloud-based systems. Both of these changes represent occasions where organizations become more reliant on vendors for providing support for IT systems used internally. These changes have led to organizations employing fewer IS professionals in roles such as infrastructure management, technology deployment, application development, and maintenance (Bailey & Becker, 2014). The move away towards a greater proportion of IT support coming from external, as opposed to internal, sources has ramifications for the model presented in this paper. This is because most of the interaction between internal users and IS professionals employed by vendors takes place in formal channels (Sultan, 2010), limiting the scope for discretionary behaviours to occur. Moreover, the incentives for vendor-employed IS professionals to engage in IS-specific OCB are limited, as it is likely that they would not have enough commitment to target organizations and would probably less know about their organizational strategy, structure and culture to maximize the value of their IT investments.

Therefore, one question for future researchers to consider is the applicability of this model to contexts where external IT support for users is more dominant. What other sources of knowledge and skills would users rely upon in such situations? Would they attempt to build deeper bonds with vendor-employed IS staff, so as to establish a channel they could rely on when faced with uncertain situations? Another issue is whether the dominance of externally-sourced IS professionals affects the morale, commitment and satisfaction of the remaining

internal IS staff. The IS professionals who remain in an organization after it has shifted to a cloud computing environment or outsourced the majority of its IS functions may have little motivation to display IS-specific OCBs towards their users. This may potentially lead to a negative spiral, where poor IS-business relationships reduce the perceived usefulness of IS investments, further engendering a move towards the use of IS vendors. Researchers should undertake to study how IS-specific OCB occurs among the IS professionals who remain in such organizations, and whether the newly-appointed external IS professionals view the provision of such discretionary behaviours as part of the service they are providing.

6.10 Conclusion

Our study is the one of a few empirical studies focusing on OCBs in the IS context. We examine IS-specific OCBs that underlie causes of success for organizations of how to have an effective IS department. This study investigates how to consolidate across interactions and cross-domain knowledge between IS and business units by leveraging IS-specific OCBs IS professionals carry out, which has been a critical challenge underpinning arguments on an effective IT-business alignment in organizations. We take on a multilevel approach to analyse the effect of individual levels of IS-specific OCBs as well as unit levels of these behaviours on the effectiveness of IS departments. Our approach is methodologically advantageous as we collected the responses from both business and IS employees and created a matched sample from each participating organization to be used by multilevel SEM, which offers a greater understandability than do regression-basis analysis methods. We also look into theoretical underpinnings of important antecedents of IS-specific OCBs and how they foster or dampen the occurrence of these behaviours.

This study began with the research motivation and the overlooked area of IS-specific OCBs in the IS literature. Then, a review on the relevant literature led to the emergence of this study's research objectives and two research questions. Next, a more comprehensive

review on the IS literature and theories from management literature was carried out to develop a multilevel conceptual research model, along with 22 research hypotheses. Of the 16 hypotheses identified at individual level, 15 hypotheses were significantly supported and only one hypothesis did not receive a significant support from the structural equation modelling testing. All six hypotheses hypothesized at the unit level and cross level received support. Overall, the research findings report that IS-specific OCB is determined by the quality of relationships between IS professionals, and between IS leaders and IS professionals. Moreover, this quality relationship within the IS department is affected by different IS professionals' personalities as well as IS leaders' transformative leadership behaviours. In addition to this, the results show that IS-specific OCBs is negatively predicted by work exhaustion arising from the lack of autonomy, workload, role ambiguity, and role conflict. Importantly, the research model tested the consequence of IS-specific OCBs and the findings reflected that IS-specific OCBs enhance the quality of designed systems, produced information, and delivered services towards business units by an IS department.

Lastly, this study has theoretical and practical implications. The interpretation of the findings help organizations beware of the lack of IS-specific OCBs and encourage them to sanction the lack of these behaviours. Furthermore, the constraints of this study is discussed and issues for future research are highlighted.

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APPENDIX A: SUMMARY OF DISTINCT OCB DIMENSIONS

Various Conceptualizations of the OCB
Smit, Organ and Near (1983) - Two-dimensional OCB • **Altruism-** behaviours that are intentionally aimed at helping a specific person in face-to-face situations (pp. 657). • **Generalized Compliance-** conscientiousness that does not immediately aid one specific person, but indirectly helps others in the system (pp.657).
Borman and Motowoldo (1993) - Five-dimension voluntary behaviours • **Helping and cooperating with other employees-** encompasses behaviours that assist/help co-workers or customers (pp. 82). • **Voluntarily completing task activities-** that are not formally part of own job, such as suggesting organizational improvements and taking on extra responsibilities (pp. 82). • **Persisting with enthusiasm and extra effort-** that are necessary to complete task activities successfully (e.g. perseverance, conscientiousness, or extra effort on the job) (pp.82). • **Following organizational rules and procedures-** refer to following orders and regulations and respect for authority (e.g. complying with organizational values and policies, conscientiousness, or meeting deadlines) (pp. 82). • **Endorsing, supporting, and defending organization objectives-** include organizational loyalty that concerns for unit objectives (e.g. staying with the organization during hard times and representing the organization favourably to outsiders) (pp. 82).
Organ (1988, 1989), Podsakoff, MacKenzie, Moorman, and Fetter (1990), Podsakoff, Ahearne, and Mackenzie (1997) and Morrison (1994) - Five-dimension OCB • **Altruism-** voluntary actions that help another person with a work problem (e.g. instructing a new employee on how to use equipment, helping co-workers catch up with a backlog of work, fetching materials that a peer needs and cannot procure on his own) (pp.96). • **Courtesy-** subsumes all of those foresightful gestures that help someone else prevent a problem (e.g. touching base with people before committing to actions that will affect them, providing advance notice to someone who needs to know schedule work (pp. 96). • **Civic virtue**- is responsible, constructive involvement in the political process of the organization (e.g. expressing opinions, reading one's email, attending meetings, and keeping abreast of larger issues involving the organization) (pp. 96). • **Conscientiousness-** is a pattern of going well beyond minimally required levels of attendance, punctuality, conserving resources or related matters of internal maintenance (pp. 96). • **Sportsmanship-** a citizen-like posture of tolerating the inevitable inconveniences and impositions of work without whining and grievances (pp.96).
Podsakoff, MacKenzie, Paine and Bachrach (2000) - Seven-dimension OCB **Helping behaviours-** include voluntarily helping co-workers with and preventing the occurrence of work-related problems (pp. 516). • **Sportsmanship-** employees do not complain when they are inconvenienced by others and also maintain a positive attitude even when things do not go their way, are not offended when co-workers do not follow their suggestions, are willing to sacrifice their personal interest for the good of the work group, and do not take rejection of their ideas personally (pp. 517). • **Organizational loyalty-** consists of promoting the organization to outsiders, protecting and defending it against external threats, and remaining committed to it even under adverse conditions (pp. 517). • **Organizational compliance-** is a person's internalization and acceptance of the organization's rules, regulations, and procedures, which results in a scrupulous adherence to them, even when no one observes or monitors compliance (pp. 517). • **Individual initiative-** entails engaging in task-related behaviours at a level that is so far beyond minimally required or generally expected levels that it takes on a voluntary flavor (e.g. voluntary acts of creativity and innovation designed to improve one's task or the organization's performance, persisting with extra enthusiasm and effort to accomplish one's job, volunteering to take on extra responsibilities, and encouraging others in the organization to do the same) (pp. 524).

- **Civic virtue-** demonstrates a macro-level interest in, or commitment to, the organization as a whole, and presents a willingness to participate actively in its governance (e.g. attending meetings, engaging in policy debates, articulating one's opinion about what strategy the organization must follow, etc.), monitors its environment for threats and opportunities (e.g. keeping up with changes in the industry that might affect the organization), and looks out for its best interests (e.g. reporting fire hazards or suspicious activities, locking doors, etc.), even at personal cost (pp.525).
- **Self-development-** involves voluntary behaviours employees engage in to improve their skills, knowledge, and abilities (pp.525).

Coleman and Borman (2000) - Three-dimension OCB or citizenship performance

- **Interpersonal citizenship performance-** includes two subdimesnions: (1) interpersonal altruism that entails behaviours that assist and support organization members; (2) interpersonal conscientiousness that consists of assisting and supporting the performance of organization members through cooperative and facilitative efforts that go beyond expectations (pp.35).
- **Organizational Citizenship Performance-** comprises two subdimensions: (1) organizational Organizational allegiance/Loyalty- assisting and supporting the organization by demonstrating a personal commitment to the organization; (2) Organizational Compliance- conforming and adhering to organizational rules, policies, and procedures, demonstrating impersonal behavioural commitment to the organization and organizational objectives (pp.35).
- **Job/Task Conscientiousness-**captures extra efforts that go beyond role requirements, demonstrating dedication to the job, persistence, and the desire to maximize one's own job performance (pp. 35).

Graham (1991) - Three-dimension OCB

- **Organizational Obedience-** means an orientation toward organizational structure, job descriptions, and personnel policies that recognizes and accepts the necessity and desirability of a rational structure of rules and regulations" (e.g. the extent to which employees are respectful to organizational rules and regulations, punctual to attend their job, responsible for organizational resources and aware of delivering high-quality work) (pp. 255)
- **Organizational Loyalty-** refers to identification with and allegiance to organizational leaders and the organization as a whole serving the interests of an organization as a whole, transcending the parochial interests of individuals, work groups, and departments" (e.g. employees' willingness to reveal a positive image of their organization to outsiders, defend their organization against threats and critiques, and cooperate with their co-workers to serve the interests of the whole) (pp. 255).
- **Organizational Participation-** is an interest in organizational affairs guided by ideal standards of virtue, validated by keeping informed, and expressed through full and responsible involvement in organizational governance"(e.g. attending non-required organizational meetings, sharing information with others, and being willing to deliver bad news or support an unpopular view to combat groupthink) (pp. 255).

Van Dyne, Graham, and Dienesch (1994) - Three-dimension OCB

- **Organizational obedience-** involves respect for orderly structures and processes and portrays responsible citizens who recognize rational-legal authority and obey the law (e.g. rarely wasting time while at work, producing as much as capable of at all times, or follows work rules and instructions with extreme care) (pp. 781).
- **Organizational Loyalty-** expands parochial welfare functions to include serving the interests of the community as a whole and the values it embodies (e.g. volunteers for overtime work when needed or maintaining confidentiality of information) (pp. 781).
- **Organizational Participation-** entails active and responsible involvement in community self-governance in whatever ways are possible under the law. Organizational participation is divided into three subcategories**, Social**, **Advocacy**, and **Functional Participation.** These behaviours are briefly discussed as interpersonal, affiliative, controversial, and task-related behaviours directed towards benefiting peers' social life in workplace, reflecting a potential of appropriate changes and participating in the functioning of the organization, for instance: sharing ideas for new projects or improvements widely, encouraging others to speak up at meetings, and keeping well-informed where opinion might benefit organization (pp. 781).

Graham (1989), Moorman and Blakelly (1995), and Moorman, Blakely, and Niehoff (1998) - Four-dimension OCB

- **Interpersonal helping-** holds concepts of helping co-workers within work groups when needed (e.g. frequently adjusting his/her work schedule to accommodate other employees' requests for time-off and always going out of the way to make newer employees feel welcome in the work group).
- **Individual initiative-** describes communications with co-workers in the workplace to improve individual and group performance (e.g. often motivating co-workers to express their ideas and opinions and frequently communicate with teammates on how the group can improve).
- **Personal industry-** illustrates the performance of specific tasks beyond the call of duty (e.g. performing his/her job duties with unusually few errors and extra-special care).
- **Loyal boosterism**-describes the promotion of the organizational image to outsiders (e.g. defending the organization when other employees or outsiders criticize it and showing pride when representing the organization in public).

George and Brief (1992) and George and Jones (1997) - Five-dimension OCB

- **Helping co-workers-** involves all voluntary behaviours that appear in no job description displayed by employees for the purpose of assisting others with their assigned tasks (e.g. calling attention to a potential error, sharing supplies, and helping someone behind in their work) (George and Brief 1992, pp 311). Helping co-workers include behaviours ranging from helping co-workers with a heavy work load and sharing resources to calling attention to errors and omissions and providing instructions in the use new technology when one is not required to do so (George and Jones 1997, pp 154-155).
- **Protecting The Organization-**consists of behaviours that halt damages to others, reduce the risks of damage, loss, or destruction towards co-workers and organization (e.g. reporting a fire hazard, theft, or vandalism) (pp 311).
- **Making Constructive Suggestions-** include voluntary behaviours exhibited by employees in order to innovatively do their assigned task or create suggestions for improving the functioning of the organization (George and Brief 1992, pp 311). Such voluntary behaviours range from the relatively mundane (a more efficient way to handle paper work) to the more monumental (recognition of an entire unit to better serve a changing customer base) ...employees who engage in this form of organizational spontaneity go one step further and try to find ways to improve individual, group, or organizational functioning (George and Jones 1997, pp 155).
- **Developing Oneself-** entails employees voluntarily seeking to improve the knowledge, expertise, skills, and abilities to accomplish better their current jobs, or to voluntarily enrich their experience for responsible positions within the organization (e.g. employees groom themselves by taking training programs at their own expense and on their own time to be useful for their organization in case of facing a shortage of managerial talent).
- **Spreading Goodwill-**refers to a bunch of behaviours that employees exhibit to advertise their organizations for such fair or equitable treatments or for such good services and products they produce (e.g. employees let their acquaintances know what a good product their firm sells) (George and Brief 1992, pp 311). Spreading goodwill is the means by which employees voluntarily contribute to organizational effectiveness through efforts to represent their organizations to wider communities in a beneficial light. Whether describing one's organization as supportive and caring or describing an organization 's good and services as being high quality and responsive to customers' needs , instances of spreading goodwill contribute to organizational effectiveness by ensuring that organization obtain needed sources from various stakeholder groups (George and Jones 1997, pp 155).

Van Scotter and Motowidlo (1996) - Two-dimension contextual performance

- **Interpersonal facilitation-** refers deliberate behaviours that improve morale, encourage cooperation, remove barriers to performance, or assist co-workers perform their task-oriented job activities. In addition, interpersonal facilitation helps maintain the interpersonal and social context needed to support effective performance in an organizational setting (pp. 526).
- **Job dedication-** refers to self-disciplined behaviours, such as working hard, taking initiative to solve a problem at work, and following rules to support organizational objectives, and consists of motivational foundation for job performance that prompt employees to display such behaviours with the deliberate intention of promoting the organization's best interests (pp. 526).

Williams and Anderson (1991) - OCB-I and OCB-O

- **OCB-I-** behaviours that directly and immediately benefit specific individuals and indirectly contribute to the organization (e.g. helps co-workers who have been absent and takes a personal interest in other employees) (pp. 602).
- **OCB-O-** behaviours that benefit the organization in general (e.g. gives advance notice when unable to come to work and adheres to informal rules devised to maintain order)(pp.601-602).

Van Dyne and LePine (1998) – AOCB and COCB

- **Affiliation-oriented citizenship behaviours-** are interpersonal, cooperative, and other-oriented behaviours that tend to strengthen or maintain relationships with others (e.g. *Helping*- is cooperative behaviours that builds harmonious interpersonal relationships) (pp-108).
- **Challenging-oriented citizenship behaviours-** are change-oriented and emphasizes ideas and issues that challenge status quo (e.g. *Voice*- makes innovative suggestions for change and recommending modifications to standard procedures even when others disagree) (pp-108).

Dekas, Bauer, Welle, Kurkoski, and Sullivan (2013) - OCB-KW (knowledge workers) Scale

- **Employee sustainability-**entails workers participating in activities that maintain and improve one's own health and well-being, or that support others' efforts to maintain their health and well-being (e.g. makes others feel comfortable to be themselves at work) (pp. 227-228).
- **Social Participation-** include participating in social activities during the workday that are not directly related to core job tasks (e.g. get to know each other on a personal basis) (pp. 228-229).
- **Civic Virtue-** is adapted from Organ (1988), but modified for knowledge workers at Google (e.g. takes part in Google-sponsored knowledge-sharing opportunities, such as brown-bags, talks, or training courses) (pp. 227-228).
- **Voice-** is adapted from Van Dyne and LePine (1998) (e.g. encouraging the group of knowledge workers to voice their opinions regarding issues that affect the group) (pp. 227-228).
- **Helping-** is adapted from Organ (1988) (e.g. helping team members write a macro) (pp. 227-228).
- **Knowledge Sharing-**is behaviours that prompt knowledge workers to share knowledge or expertise with others (e.g. conversing with non-engineers to explain engineering topics or teaching software to others) (pp. 229).
- **Individual Initiative-** is adopted from Organ's (1988) conscientiousness (e.g. cleaning up existing code) (pp. 229).
- **Administrative Behaviours-** encompasses all behaviours pertaining to planning, organizing, controlling, or supervising any aspect of the organization's operations and mission, and maintaining work-related resources (e.g. taking care of details of 'events' that would otherwise go undone) (pp. 229).

APPENDIX B: SUMMARY OF EMPIRICAL STUDIES OF THE IMPACT OF OCB ON DISTINCT UNIT-LEVEL OUTCOMES

Unit-level Outcomes		OCB and Effectiveness or Performance	Sample Size	Reference
Unit/team/organizational measures	Subjective overall group/team/organizational performance and/or effectiveness	Within-group contextual OCBs (rated by coworkers), including interpersonal, organizational and job/task citizenship performance, allow departments to adapt more to environmental changes. Employees exhibit OCBs to adapt to the structure of their work environment, prompting departments to effectively meet their stated deadlines organizational objectives and goals (rated by supervisors).	A sample of 78 firms in the U.S.	DeGroot and Brownlee (2006)
		Within-between group OCBs (rated by supervisors), defined as group behaviours that enhance the social and psychological environment with other work groups and in the organization as a whole, lead to the extent to which units are competent at effectively accomplishing jobs. Group performance is evaluated by the supervisor of each work unit.	A sample of 148 work groups in the Hong Kong of a multinational bank (a total of 743 employees)	Chen, Lam, Naumann, & Schaubroeck (2005)
		Group-level OCBs (rated by group members), such as helping behaviours, conscientiousness, initiative, and civic virtue, are positively associated with group job performance in which group members of different groups get their jobs done very effectively. Group performance is evaluated by group leaders.	A sample of 62 work groups, including 248 individuals recruited from a variety of industries in the U.S.	Choi &Sy (2010)
	Subjective group "in-role" or "task" performance	Within-group OCBs (rated by managers), such as affiliation- and challenge-oriented behaviours, prompt group members comply with company standards for service rated by company's corporate training staff	A sample of 150 limited-menu restaurant in the U.S.	Mackenzie, Podsakoff, & Podsakoff (2011)

	Employee turnover (annual turnover %)	OCBs negatively affect employee turnover through work group task performance, measured by the projected annual percentage of turnover among the restaurant employees based on year-to-date turnover.		
	Subjective military combat unit effectiveness	Unit-level OCBs (self-report OCB), such as unit-level helping behaviours, positively affect soldiers' effectiveness in terms of their physical fitness, award rate, and M16 score	A sample of 31 military units (a total of 2403 soldiers)	Ehrhart, Bliese, & Thomas (2006)
	Subjective team project grades	Aggregated OCBs (rated by peers), such as individual-level helping behaviours, lead to students' performance regarding their achieved scores from course instructors. Group performance is measured by the total number of points earned by the group on three group assignments (maximum possible score is 200).	A sample of 176 student groups (a total of 815 business school undergraduate students)	Ng & Van Dyne (2005)
	Total number of tasks completed	Group-level OCBs (rated by peers) exhibited by virtual team members within-between virtual teams are moderated by task interdependence and then lead to teams' performance based on the total number of correctly completed tasks.	A sample of 64 three-person teams including 192 final-year graduate psychology students at a large public university in Spain	Rico, Bachrach, Sanchez-Manzanares, & Collins (2011)
	Objective measure of quantity produced	Group-level OCBs (rated by peers), such as helping behaviours, sportsmanship and civic virtue are positively related to the quantity of work crew performance based on the amount of paper produced as a percentage of total machine capacity for the year.	A sample of 218 member of 40 work crews in a paper mill producing bond and catalog paper in the U.S.	Podsakoff, Ahearne, & MacKenzie (1997)

	Employee turnover (annual quit rate)	Service-oriented OCBs (rated by supervisor) are negatively related to employee turnover (the number of hotel employees who voluntarily leave hotel) when this relationship is moderated by unemployment rate.	A sample of 405 supervisors and 81 human resource managers to rate service-oriented OCB, and turnover rate and productivity from 86 hotels located in 12 cities the People's Republic of China	Sun, Aryee, & Law (2007)
	Subjective Information Security Policy (ISP) effectiveness	Department-level extra-role behaviours improve ISP effectiveness. IS effectiveness refers to how well an organization's ISP supports its overall security. Behaviours, such as making innovative suggestions, training other employees regarding the importance of information leakage that might happen when they fail to log out after accessing their email accounts on public computers, or helping other employees in the work group learn about security policies, improve overall security within departments.	A sample of 78 IS department managers to rate both ISP effectiveness and extra-role behaviours in different companies in Taiwan	Hsu, Shih, Hung, & Lowry (2015)
Improving business process measures	Product quality (percentage of paper produced that was either rejected by the mill's quality control personnel or the customer)	OCBs (e.g., helping behaviours) are positively related to the quality of work crew performance, implying that helping each other by giving time to crew members who have work-related problem, sharing knowledge and expertise with each other, taking steps to try to prevent problem with each other, and touching base with each other before taking actions may affect other crew members to be more productive in terms of production quality.	A sample of 218 member of 40 work crews in a paper mill producing bond and catalog paper in the U.S.	Podsakoff, Ahearne, & MacKenzie (1997)
	Meeting service delivery benchmarks	Unit-level OCBs (rated by restaurant employees), including organizational obedience, loyalty, and participation, result in more effective service delivery to	A sample of 141 employees working in 49 restaurants from well-known	Bienstock, DeMoranville, & Smith (2003)

		organizational standards and enhanced customer perceptions of service quality. Customers evaluate customer service quality regarding the quality of service, food, and cleanliness for restaurants.	fast food franchise in the U.S.	
Customer measures	Customer satisfaction	Department-level customer-focused OCBs (rated by department managers) are positively associated with unit customer satisfaction and result in the levels of customers' satisfaction with people, place, product, and price (e.g., the freshness of fruit or fish as appropriate).	A sample of 56 supermarket departments in stores of a supermarket chain in the U.S.	Schneider, Ehrhart, Mayer,Saltz, & Niles-Jolly (2005)
Financial measures	Profitability	Indirect effects of affiliation- and challenge-oriented OCBs on profit as a percentage of sales (e.g., how much a restaurant makes per dollar of sales) through work group task performance.	A sample of 150 limited-menu restaurant in the U.S.	Mackenzie, Podsakoff, & Podsakoff (2011)
		Team citizenship behaviours (e.g., helping behaviours, sportsmanship, and civic virtue) (rated by team supervisors) are hypnotized to mediate the relationship between ambient sexual harassment and team financial performance. The	A sample of 203 employees in 27 teams and their 27 supervisors in food industry in the U.S.	Raver and Gelfand (2005)

		financial performance includes units' year-to-date profits/losses.		
	Sales and/or revenue	Team-level OCBs (e.g., helping behaviours) (data collected from team perceptions) are positively influence sales team objective performance. Team performance is measured as the percentage of sales quota the team achieved.	A sample of 185 pharmaceutical sales teams	Ahearne, MacKenzie, Podsakoff, Mathieu, & Lam (2010)
		Indirect effects of affiliation- and challenge-oriented OCBs on the total amount of sales dollars for each restaurant on a year-to-date basis.	A sample of 150 limited-menu restaurant in the U.S.	Mackenzie, Podsakoff, & Podsakoff (2011)
		Department-level customer-focused OCBs lead to unit sales through unit customer satisfaction. Sales team performance is a standardized quarter sales score adjusted for department size and type.	A sample of 56 supermarket departments in stores of a supermarket chain in the U.S.	Schneider, Ehrhart, Mayer,Saltz, & Niles-Jolly (2005)
		Service-oriented OCBs (e.g., sharing tacit knowledge, participating in decision-makings,	A sample of 405 supervisors and 81 human resource	Sun, Aryee, & Law (2007)

		or suggesting improvements) are significantly related to hotel productivity of the most recent estimates of annual sales.	managers to rate service-oriented OCB, and turnover rate and productivity from 86 hotels located in 12 cities the People's Republic of China	
		Prosocial behaviours, customer-service behaviours or helping behaviours directed at customers (e.g., how helpful employees are in the store towards customers), enhance group sales performance in terms of the number of sales in stores.	A sample of 33 stores belonging to a national retail organization.	George & Bettenhausen (1990)

APPENDIX C: MEASUREMENT SCALES

Conscientiousness (Costa & McCrae, 1992) [*Scale Range:* -2 = *Very Undesirable*; 2 = *Very Desirable*]
Competence: Capable, confident, well-prepared; takes pride in common sense and prudence
Order: Well-organized, tidy, methodical; exacting and fastidious
Dutifulness: Upright and scrupulous, a stickler for rules, can be moralistic
Achievement-Striving: Ambitious, strives for excellence, has high standards; may be "workaholic"
Self-Discipline: Persistent, productive, does not procrastinate, tends to push self
Deliberation: Cautious, thoughtful, makes careful plans; may lack spontaneity
Extraversion [*Scale Range:* -2 = *Very Undesirable*; 2 = *Very Desirable*]
Warmth: Friendly, talkative, eager to interact on a personal level with many others
Gregariousness: Likes to be around people, sociable; finds it hard to be or work alone
Assertiveness: Forceful and assertive, assumes positions of leadership, likes to be in charge
Activity: Energetic, lively, high activity level; may find sedentary work unappealing
Excitement Seeking: Seeks excitement, adventurous and daring, takes unnecessary risks for thrills
Positive Emotions: Cheerful, high-spirited, buoyant in mood; laughs readily
Proactivity (Bateman & Crant, 1993) *Scale Range: 1 = Strongly Disagree; 5 = Strongly Agree*
If I see something I do not like, I fix it
No matter what the odds, if I believe in something I will make it happen
I love being a champion for my ideas, even against others' opposition
I am always looking for better ways to do things
If I believe in an idea, no obstacle will prevent me from making it happen
I excel at identifying opportunities
Positive Affect (Watson, 1988) *Scale Range: 1 = Strongly Disagree; 5 = Strongly Agree*
Interested
excited
strong
enthusiastic
proud
alert
inspired
determined
attentive
active
Transformative Leadership (Avolio & Bass, 2004) [*Scale Range: 1 = Never; 5 = Always*]
My supervisor instils pride in me for the being associated with him/her.
My supervisor goes beyond self-interest for the good of the group.
My supervisor acts in ways that builds my respect.
My supervisor displays a sense of power and confidence.
My supervisor talks about his/her most important values and believes.
My supervisor specifies the importance of having a strong sense of purpose.
My supervisor considers the moral and ethical consequences of decisions.
My supervisor emphasises the importance of having a collective sense of mission.
My supervisor spends time teaching and coaching.
My supervisor treats me as an individual rather than just as a member of a group

My supervisor considers me as having different needs, abilities, and aspirations from others.
My supervisor helps me to develop my strengths.
My supervisor re-examines critical assumptions to question whether they are appropriate.
My supervisor seeks differing perspectives when solving problems.
My supervisor gets me to look at problems from many different angles.
My supervisor suggests new ways of looking at how to complete assignments.
My supervisor talks optimistically about the future.
My supervisor talks enthusiastically about what needs to be accomplished.
My supervisor expresses confidence that goals will be achieved.
My supervisor articulates a compelling vision of the future.
Leader-Member Exchange (Graen and Uhl-Bien, 1995) [*Scale Range: 1 = Rarely; 5 = Very Often]*
Do you know where you stand with your leader. do you usually know how satisfied your leader is with what you do? (Does your member usually know)
Scale Range: 1 = Not A Bit; 5 = A Great Deal
How well does your leader understand your job problems and needs? (How well do you understand)
Scale Range: 1 = Not At All; 5 = Fully
How well does your leader recognize your potential? (How well do you recognize)
Scale Range: 1 = None; 5 = Very High
Regardless of how much formal authority he/she has built into his/ her position, what are the chances that your leader would use his/ her power to help you solve problems in your work? (What are the changes that you would)
Again, regardless of the amount of formal authority your leader has, what are the chances that he/she would "bail you out," at his/ her expense? (What are the chances that you would)
Scale Range: 1 = Strongly Disagree; 5 = Strongly Agree
I have enough confidence in my leader that I would defend and justify his/ her decision if he/she were not present to do so? (Your member would)
Scale Range: 1 = Extremely Ineffective; 5 = Extremely Effective
How would you characterize your working relationship with your leader? (Your member)
Team-Member Exchange (Seers et al. 1995) [*Scale Range: 1 = Rarely; 5 = Very Often]*
How often do you make suggestion about better work methods to other team members?
Do other members of your team usually let you know when you do something that makes their jobs easier (or harder)?
How often do you let other team members know when they have done something that makes your job easier (or harder)?
how well do other members of your team recognize your potential?
How well do other members of your team understand your problems and needs?
How flexible are you about switching job responsibilities to make things easier for other team members?
In busy situation, how often do other team members ask you to help out?
In busy situations, how often do you volunteer your efforts to help others on your team?
How willing are you to help finish work that had been assigned to others?
How willing are other members of your team to help finish work that was assigned to you?
The Lack of Autonomy (Mohr 1971) and (Hrebiniak 1974) [Scale Range: 1 = Strongly Disagree; 7 = Strongly Agree]
If I had a suggestion for improvement to make, it would be difficult for me to get a hearing on it from my manager.
When some important matter comes up that concerns me, my manager seeks out my ideas before a decision is made. ®
All in all, I have very little influence in management decisions that affect me in important ways.
I get few opportunities, if any, to participate in management decisions that affect significant aspects of my job.

Our manager is inclined to accept the opinions of workers in important decisions about job-related matters. ®
Workload (Kirmeyer and Dougherty, 1988) [*Scale Range: 1 = Strongly Disagree; 7 = Strongly Agree]*
I feel that the number of requests, problems, or complaints I deal with is more than expected.
I feel that the amount of work I do interferes with how well it is done.
[Scale Range: 1 =Daily; 7 = Once a Year or Less]
I feel busy or rushed. ®
I feel pressured. ®
Role Ambiguity (Rizzo et al. 1970) *[Scale Range: 1 =Strongly Disagree; 7 = Strongly Agree]*
I feel certain about how much authority I have. ®
Clear, planned goals and objectives exist for my job. ®
I know that I have divided my time properly. ®
I know what my responsibilities are. ®
I know exactly what is expected of me. ®
Explanation is clear of what has to be done. ®
Role Conflict (Rizzo et al. 1970) *[Scale Range: 1 = Strongly Disagree;7 =Strongly Agree]*
I have to do things that should be done differently.
I receive an assignment without the manpower to complete it.
I have to "buck" a rule or policy in order to carry out an assignment.
I work with two or more groups who operate quite differently.
I receive incompatible requests from two or more people.
I do things that are apt to be accepted by one person and not accepted by others.
I receive an assignment without adequate resources and materials to execute it.
I work on unnecessary things.
Work Exhaustion (Scheufeli et al. 1995) [*Scale Range: 1 = strongly disagree; 7 =Strongly agree]*
I feel emotionally drained from my work.
I feel used up at the end of the work day.
I feel fatigued when I get up in the morning and have to face another day on the job.
I feel burned out from my work.
Working all day is really a strain for me.
Organizational Citizenship Behaviours (OCB) (Podsakoff et al. 1990) [*Scale Range: 1 = strongly disagree; 7 =Strongly agree]*
Altruism
As an IS/IT professional, I … *help other IS/IT peers who have been absent*.
help other IS/IT peers who have heavy work loads
help orient new IS/IT peers even through it is not required.
willingly help other IS/IT peers who have work related problems.
am always ready to lend a helping hand to those around me.
Courtesy
take steps to try to prevent problems with other IS/IT workers.
am mindful of how my behaviour affects other people's jobs.
do not abuse the rights of others.
try to avoid creating problems for IS peers.
consider the impact of my actions on IS peers.
Civic Virtue
attend meetings that are not mandatory, but are considered important.

attend functions that are not required, but help the company image.
keep abreast of changes in the organization. (or, keeping up with changes)
read and keep up with organization announcements, memos, and so on.
Sportsmanship
consume a lot of time complaining about trivial matters. ®
always focus on what's wrong, rather than the positive side. ®
tend to make "mountains out of molehills". (or, blowing problems out of proportion). ®
always find fault with what the organization or IS department is doing. ®
am the classic "squeaky wheel" that always needs greasing. (or, complaining about things). ®
Conscientiousness
attend at work, which is above the norm.
do not take extra breaks.
obey company rules and regulations even when no one is watching.
am one of the most conscientious employees.
believe in giving an honest day's work for an honest day's pay.
Unit-level Organizational Citizenship Behaviours (OCB) (Podsakoff et al. 1997) [*Scale Range: 1 = strongly disagree; 7 =Strongly agree]*
Helping Behaviours
Information systems professionals … *… help bank employees out if they fall behind in their work.*
… willingly share their expertise with bank employees from other departments.
… try to act like peacemakers when other bank employees have disagreements.
… take steps to try to prevent problems with bank employees.
… willingly give of their time to help bank employees who have work-related problems.
… touch base with bank employees before initiating actions that might affect them.
… encourage bank employees when they are down.
Civic Virtue
… provide constructive suggestions about how bank employees can improve their effectiveness.
… are willing to risk disapproval to express their beliefs about what's best for the organization.
… attend and actively participate in team meetings.
Sportsmanship
… always focus on what is wrong with our situation, rather than the positive side. ®
… consume a lot of time complaining about trivial matters. ®
… always find fault with what bank employees are doing. ®
The Quality Information (Chang & King, 2005) *[Scale Range: 1 = Hardly at all; 5 =To a great extent. If a statement is not applicable, circle 0.]*
Intrinsic Quality Information
Interpretable
Understandable
Complete
Clear
Concise
Accurate
Secure
Contextual Quality of Information
Important
Relevant
Usable

Presentational Quality of Information
Well organized
Well defined
Accessibility of Information
Available
Accessible
Up-to-date
Received in a timely manner
Reliability of Information
Reliable
Verifiable
Believable
Unbiased
Flexibility of Information
Can be easily compared to past information
Can be easily maintained
Can be easily changed
Can be easily integrated
Can be easily updated
Can be used for multiple purposes
Meets all your requirement
Usefulness of Information
The amount of information is adequate.
It is easy to identify errors in information.
It helps you discover new opportunities to serve customers.
It is useful for defining problems.
It is useful for making decisions.
It improves your efficiency.
It improves your effectiveness.
It gives your company a competitive edge.
It is useful for identifying problems.
The Quality Service
IS Training
The training programs offered by the information systems/technology (IS/IT) department are useful.
The variety of training programs offered by the IS/IT department is sufficient.
The IS/IT department's services are cost-effective.
The training programs offered by the IS/IT department are cost-effective.
The IS/IT department's services are valuable.
The IS/IT department's services are helpful.
Responsiveness of Services
does the IS/IT department respond to your service requests in a timely manner?
does the IS/IT department complete its services in a timely manner?
is the IS/IT department dependable in providing services?
does the IS/IT department have your best interest at heart?
does the IS/IT department give you individual attention?
Flexibility of Information

does the IS/IT department have sufficient capacity to serve all its users?
can the IS/IT department provide emergency services?
does the IS/IT department provide a sufficient variety of services?
does the IS/IT department have sufficient people to provide services?
does the IS/IT department extend its systems/services to your customers/suppliers?
Intrinsic Quality of Service Provider
Provide services for you promptly.
Are dependable.
Are efficient in performing their services.
Are effective in performing their services.
Have the knowledge and skill to do their job well
Are reliable.
Instil confidence in you.
Are helpful to you.
Solve your problems as if they were their own.
Understand your specific needs.
Are willing to help you.
Help to make you a more knowledgeable computer user.
Interpersonal Quality of Service Provider
Are polite.
Are sincere.
Show respect to you.
Are pleasant to work with.
The Quality System
Impact on Job
Make it easier to do your job.
Improve your job performance.
Improve your decisions.
Give you confidence to accomplish your job.
Increase your productivity.
Increase your participation in decisions.
Increase your awareness of job-related information.
Improve the quality of your work product.
Enhance your problem-solving ability.
Impact on External Constituencies
Help you manage relationships with external business partners.
Improve customer satisfaction.
Improve customer service.
Enhance information sharing with your customers/suppliers.
Help retain valued customers.
Help you select and qualify desired suppliers.
Impact on Internal Processes
Speed product delivery.
Help you manage inbound logistics.
Improve management control.
Streamline work processes.

Reduce process costs.
Reduce cycle times.
Impact on Knowledge and Learning
Provide you information from other areas in the organization.
Facilitate collaborative problem solving.
Facilitate collective group decision making.
Facilitate your learning.
Facilitate collective group learning.
Facilitate knowledge transfer.
Contribute to innovation.
Facilitate knowledge utilization.
Intrinsic Systems Quality
do your organization's IS/IT systems have fast response time?
do your organization's IS/IT systems have minimal downtime?
are your organization's IS/IT systems well-integrated?
are your organization's IS/IT systems reliable?
are your organization's IS/IT systems accessible?
Systems Usage Characteristics
do your organization's IS/IT systems meet your expectations?
are your organization's IS/IT systems cost-effective?
are your organization's IS/IT systems responsive to meet your changing needs?
are your organization's IS/IT systems flexible?
are your organization's IS/IT systems easy to use?
are your organization's IS/IT systems easy to learn?
is your company's intranet easy to navigate?
is it easy to become skilful in using your organization's IS/IT systems?

® denotes scale items that are reverse-scored.

APPENDIX D: TOTAL VARIANCE EXPLAINED

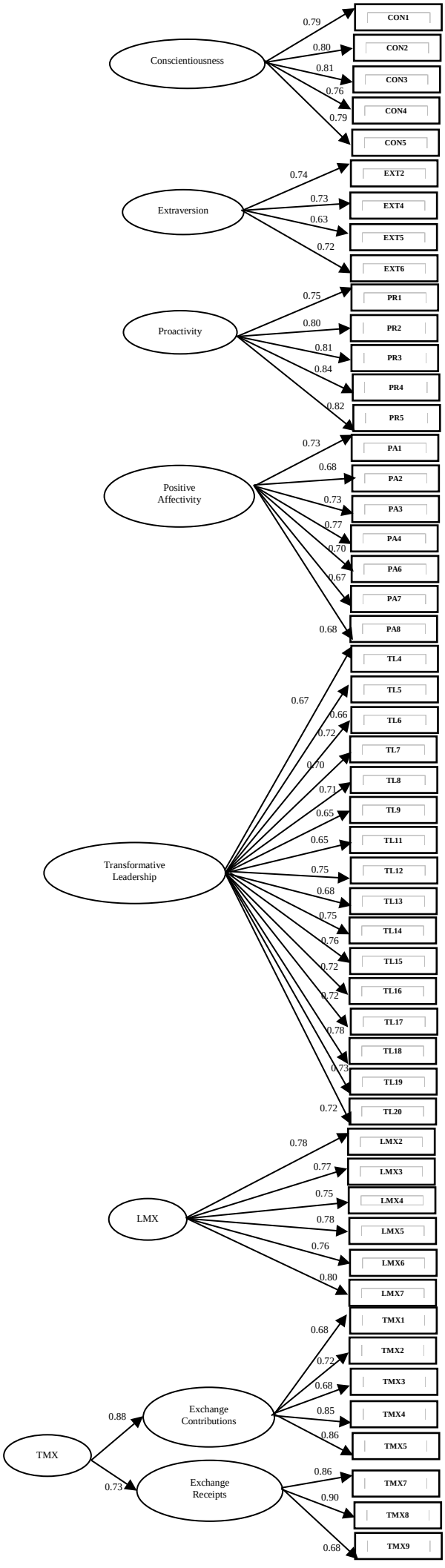
Model 1: Factors	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	21.920	19.927	19.927	21.260	19.327	19.327	13.644
2	10.380	9.437	29.364	9.961	9.056	28.383	12.207
3	7.296	6.633	35.996	6.988	6.353	34.736	6.964
4	4.578	4.162	40.158	4.111	3.737	38.473	9.248
5	3.070	2.791	42.949	2.289	2.081	40.554	7.119
6	2.686	2.442	45.390	2.429	2.209	42.762	10.290
7	2.608	2.370	47.761	2.009	1.826	44.588	12.111
8	2.311	2.101	49.862	1.878	1.707	46.295	10.573
9	2.276	2.069	51.930	2.008	1.825	48.120	6.754
10	2.095	1.905	53.835	1.609	1.462	49.583	9.923
11	1.903	1.730	55.565	1.791	1.628	51.211	10.318
12	1.849	1.681	57.247	1.385	1.259	52.470	13.580
13	1.756	1.597	58.843	1.447	1.315	53.785	8.714
14	1.700	1.546	60.389	1.443	1.312	55.097	4.899
15	1.554	1.413	61.802	1.177	1.070	56.167	7.461
16	1.454	1.322	63.124	1.221	1.110	57.278	12.634
17	1.339	1.218	64.342	1.006	0.914	58.192	3.369
18	1.300	1.182	65.524	1.027	0.934	59.126	8.844
Model 2: Factor	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**
1	25.985	33.314	33.314	25.526	32.725	32.725	18.361
2	3.498	4.485	37.799	3.052	3.912	36.638	9.901
3	2.717	3.484	41.283	2.263	2.901	39.539	16.219
4	2.012	2.579	43.862	1.536	1.969	41.508	14.385
5	1.896	2.431	46.293	1.448	1.856	43.364	15.525
6	1.824	2.338	48.631	1.488	1.908	45.272	16.845
7	1.486	1.906	50.537	1.010	1.295	46.567	16.624
8	1.412	1.810	52.347	0.894	1.146	47.713	11.138
9	1.357	1.740	54.087	0.939	1.204	48.918	15.356
10	1.234	1.582	55.669	0.917	1.175	50.093	17.908
11	1.170	1.500	57.169	0.673	0.863	50.956	16.872
12	1.101	1.412	58.581	0.608	0.780	51.736	2.059
13	1.028	1.318	59.899	0.713	0.915	52.650	8.312
14	0.982	1.259	61.158	0.548	0.703	53.353	12.384
15	0.947	1.214	62.372	0.516	0.662	54.015	15.221
16	0.934	1.198	63.569	0.468	0.601	54.616	10.411
17	0.886	1.136	64.705	0.449	0.576	55.191	14.164
18	0.847	1.086	65.791	0.393	0.504	55.695	9.792

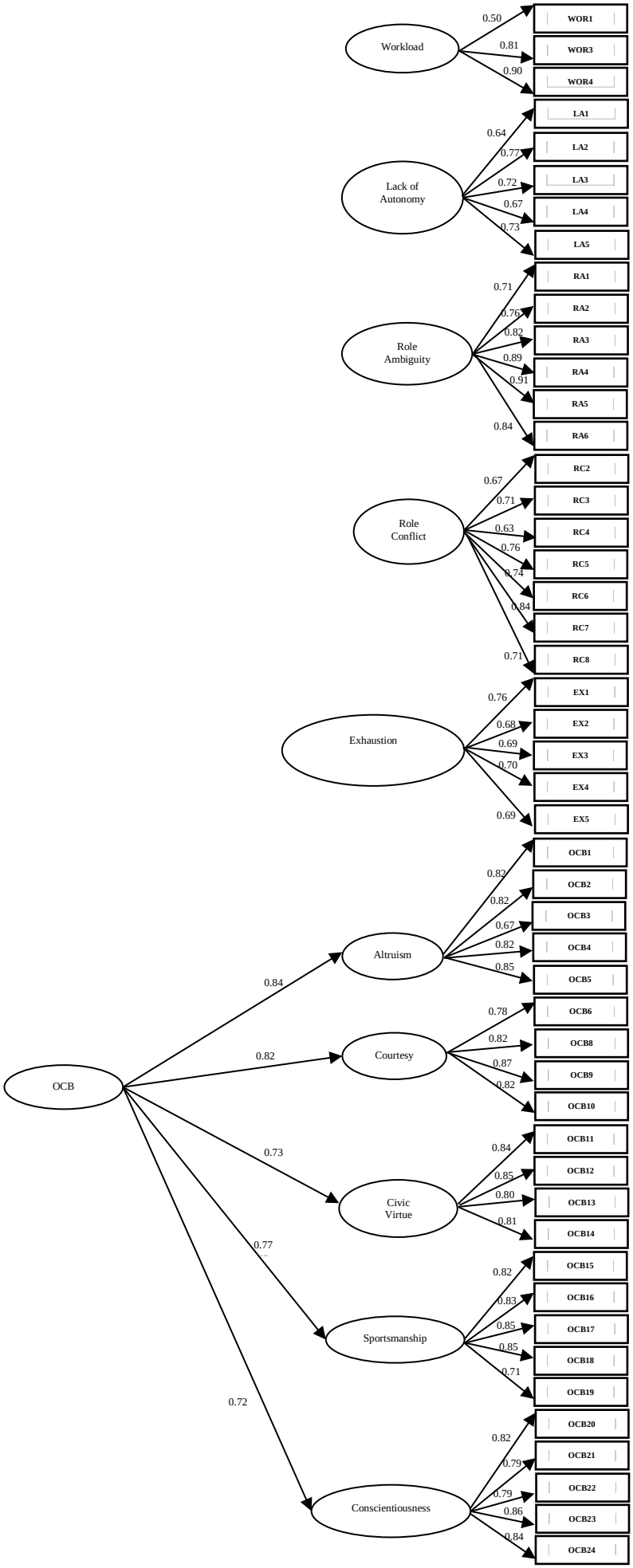
APPENDIX E

Covariance		
Variable		Estimate
Con	EXT	0.224
Con	PA	0.303
Con	PR	0.528
Con	TL	0.198
Con	EX	-0.193
Con	TMX	0.207
Con	LMX	0.315
Con	LA	-0.144
Con	RA	-0.131
Con	RC	0.037
Con	WOR	-0.059
Con	OCB	0.238
EXT	OCB	0.165
EXT	EX	-0.049
EXT	TMX	0.171
EXT	LMX	0.213
EXT	LA	-0.004
EXT	RA	0.073
EXT	RC	0.046
EXT	WOR	0.002
EXT	PR	0.311
EXT	PA	0.143
EXT	TL	0.168
PR	PA	0.417
PR	TL	0.295
PR	OCB	0.316
PR	EX	-0.224
PR	TMX	0.307
PR	LMX	0.436
PR	LA	-0.213
PR	RA	-0.099
PR	RC	0.114
PR	WOR	0.008
PA	OCB	0.15
PA	EX	-0.108
PA	TMX	0.182
PA	LMX	0.235
PA	LA	-0.057
PA	RA	0.004
PA	RC	0.162
PA	WOR	-0.011
OCB	TL	0.13
EX	TL	-0.024

TMX	TL	0.16
LMX	TL	0.282
LA	TL	-0.007
RA	TL	0.155
RC	TL	0.269
WOR	TL	0.026
PA	TL	0.221
LMX	LA	-0.073
LMX	RA	0.038
LMX	RC	0.12
LMX	WOR	0.069
LMX	OCB	0.255
LMX	EX	-0.132
LMX	TMX	0.233
TMX	OCB	0.184
TMX	EX	-0.091
TMX	LA	-0.037
TMX	RA	0.042
TMX	RC	0.106
TMX	WOR	0.022
RA	OCB	-0.017
RA	EX	0.307
RA	LA	0.443
RC	OCB	0.029
RC	EX	0.347
RC	LA	0.394
RC	RA	0.736
WOR	OCB	0.048
WOR	EX	0.274
WOR	LA	0.312
WOR	RA	0.293
WOR	RC	0.326
LA	OCB	-0.059
LA	EX	0.312
EX	OCB	-0.287

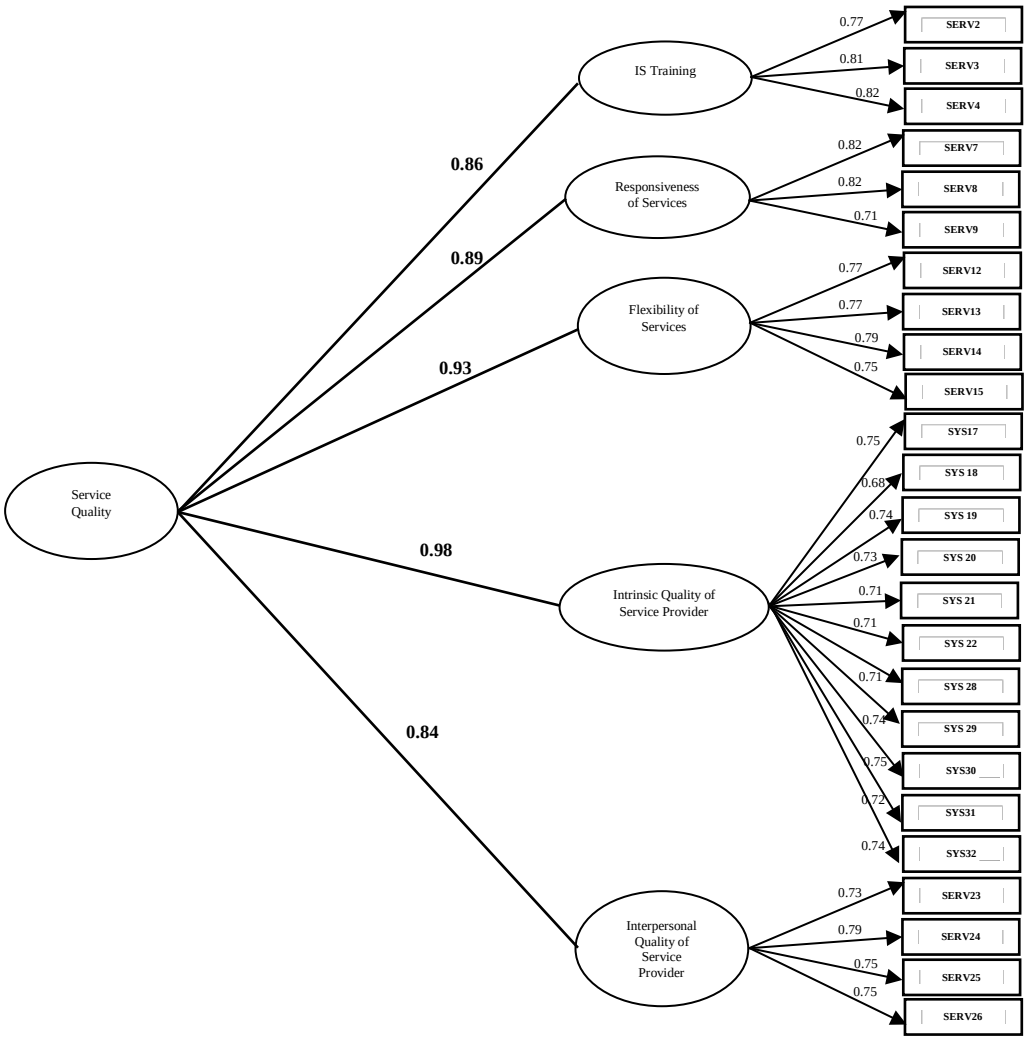
- CON = Conscientiousness; EXT = Extraversion; PR = Proactivity; PA = Positive Affectivity; TL = Transformative Leadership; LA = Lack of Autonomy; WOR = Workload; RC = Role Conflict; RA = Role Ambiguity; EX = Exhaustion.

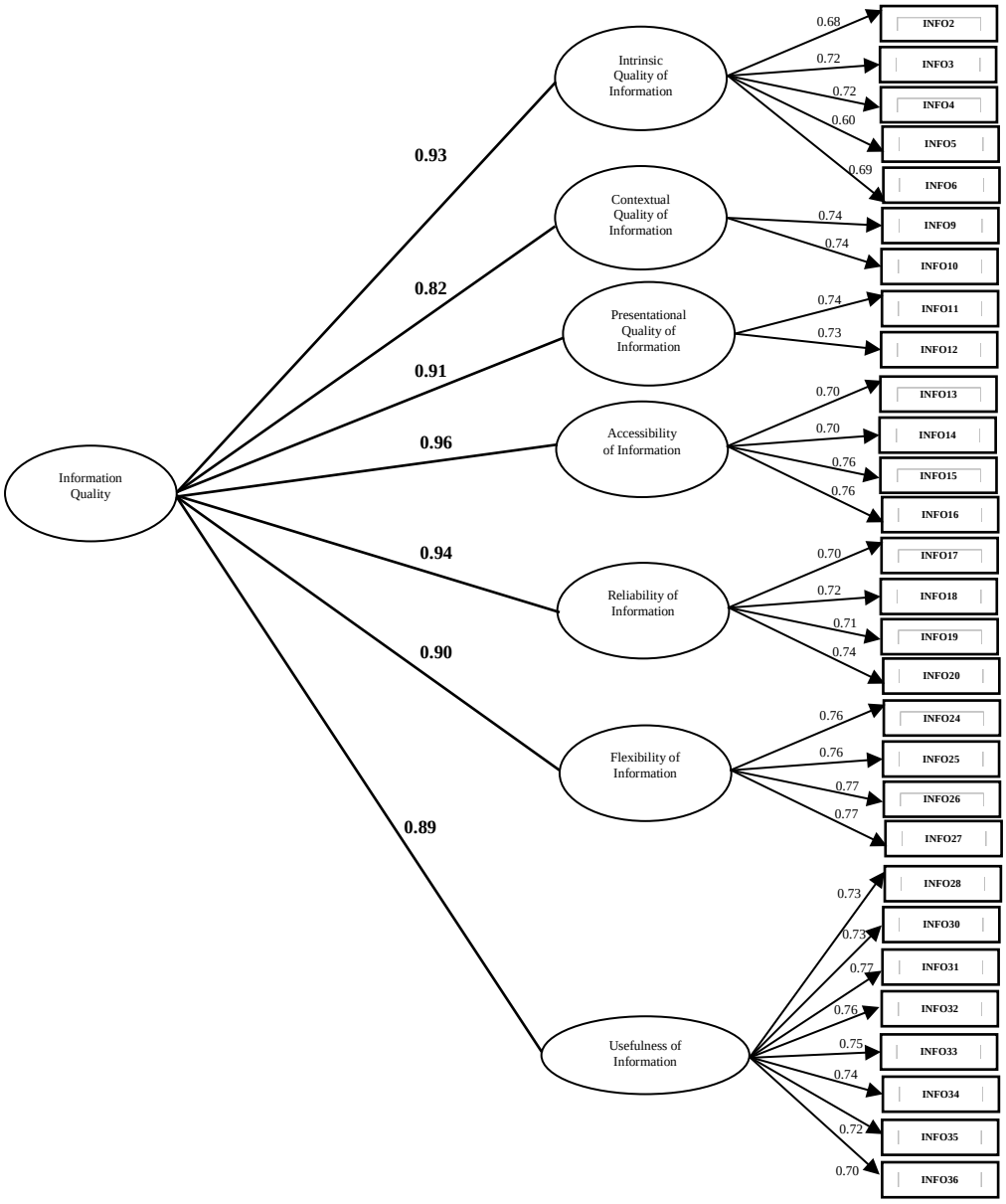

Conscientiousness
0.79
0.80
0.81
0.76
0.79
CON1
CON2
CON3
CON4
CON5
Extraversion
0.74
0.73
0.63
0.72
EXT2
EXT4
EXT5
EXT6
Proactivity
0.75
0.80
0.81
0.84
0.82
PR1
PR2
PR3
PR4
PR5
Positive Affectivity
0.73
0.68
0.73
0.77
0.70
0.67
0.68
PA1
PA2
PA3
PA4
PA6
PA7
PA8
Transformative Leadership
0.67
0.66
0.72
0.70
0.71
0.65
0.65
0.75
0.68
0.75
0.76
0.72
0.72
0.78
0.73
0.72
TL4
TL5
TL6
TL7
TL8
TL9
TL11
TL12
TL13
TL14
TL15
TL16
TL17
TL18
TL19
TL20
LMX
0.78
0.77
0.75
0.78
0.76
0.80
LMX2
LMX3
LMX4
LMX5
LMX6
LMX7
TMX
0.88
0.73
Exchange Contributions
Exchange Receipts
0.68
0.73
0.68
0.85
0.86
0.86
0.90
0.68
TMX1
TMX2
TMX3
TMX4
TMX5
TMX7
TMX8
TMX9


Workload
Lack of Autonomy
Role Ambiguity
Role Conflict
Exhaustion
OCB
Altruism
Courtesy
Civic Virtue
Sportsmanship
Conscientiousness
WOR1
WOR3
WOR4
LA1
LA2
LA3
LA4
LA5
RA1
RA2
RA3
RA4
RA5
RA6
RC2
RC3
RC4
RC5
RC6
RC7
RC8
EX1
EX2
EX3
EX4
EX5
OCB1
OCB2
OCB3
OCB4
OCB5
OCB6
OCB8
OCB9
OCB10
OCB11
OCB12
OCB13
OCB14
OCB15
OCB16
OCB17
OCB18
OCB19
OCB20
OCB21
OCB22
OCB23
OCB24

APPENDIX F

APPENDIX G


Service Quality
IS Training
Responsiveness of Services
Flexibility of Services
Intrinsic Quality of Service Provider
Interpersonal Quality of Service Provider
0.86
0.89
0.93
0.98
0.84
0.77
0.81
0.82
0.82
0.82
0.71
0.77
0.77
0.79
0.75
0.75
0.68
0.74
0.73
0.71
0.71
0.71
0.74
0.75
0.72
0.74
0.73
0.79
0.75
0.75
SERV2
SERV3
SERV4
SERV7
SERV8
SERV9
SERV12
SERV13
SERV14
SERV15
SYS17
SYS 18
SYS 19
SYS 20
SYS 21
SYS 22
SYS 28
SYS 29
SYS30
SYS31
SYS32
SERV23
SERV24
SERV25
SERV26


Information Quality
0.93
0.82
0.91
0.96
0.94
0.90
0.89
Intrinsic Quality of Information
Contextual Quality of Information
Presentational Quality of Information
Accessibility of Information
Reliability of Information
Flexibility of Information
Usefulness of Information
0.68
0.72
0.72
0.60
0.69
0.74
0.74
0.74
0.73
0.70
0.70
0.76
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0.73
0.77
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0.75
0.74
0.72
0.70
INFO2
INFO3
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INFO6
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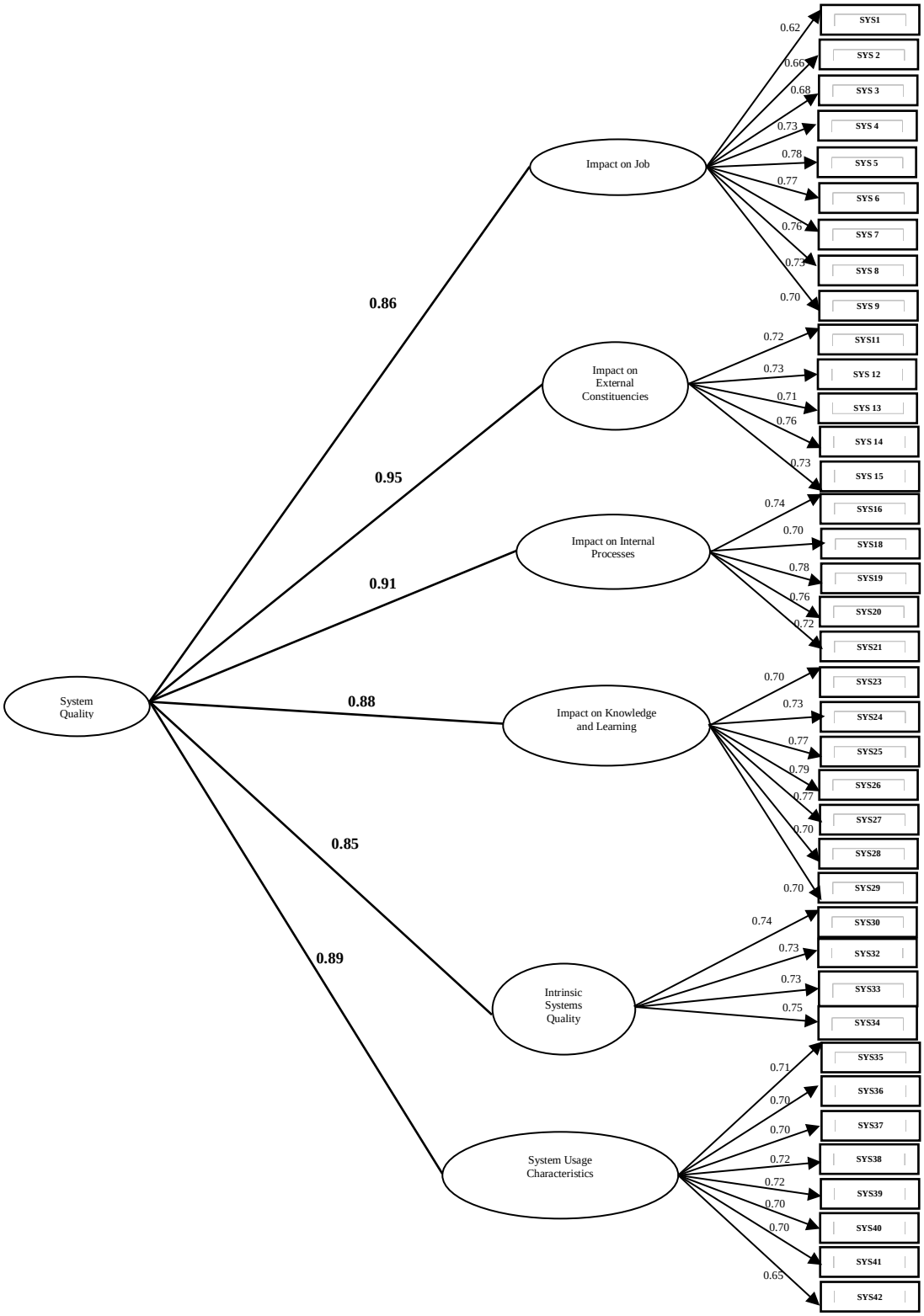
INFO34
INFO35
INFO36


System Quality
0.86
0.95
0.91
0.88
0.85
0.89
Impact on Job
Impact on External Constituencies
Impact on Internal Processes
Impact on Knowledge and Learning
Intrinsic Systems Quality
System Usage Characteristics
SYS1
SYS 2
SYS 3
SYS 4
SYS 5
SYS 6
SYS 7
SYS 8
SYS 9
SYS11
SYS 12
SYS 13
SYS 14
SYS 15
SYS16
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SYS38
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SYS40
SYS41
SYS42
0.62
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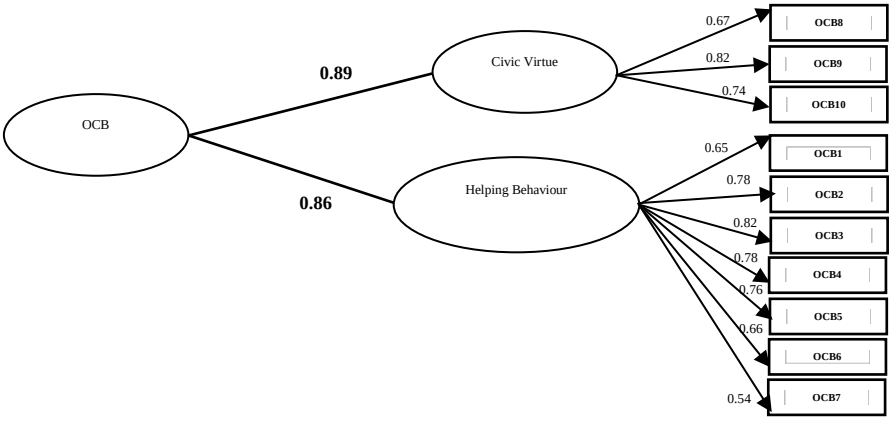

Covariance		
Variable		**Estimate**
Service Quality	System Quality	0.16
Service Quality	Information Quality	0.67
System Quality	Information Quality	0.15
OCB	Service Quality	0.34
OCB	System Quality	0.26
OCB	Information Quality	0.33

APPENDIX H


Information Quality
0.83**
0.82**
0.81**
0.85**
0.84**
0.90**
0.78**
0.30**
Intrinsic Quality of Information
Contextual Quality of Information
Presentational Quality of Information
Accessibility of Information
Reliability of Information
Flexibility of Information
Usefulness of Information
0.67
0.72
0.72
0.59
0.68
0.74
0.72
0.74
0.72
0.70
0.70
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INFO2
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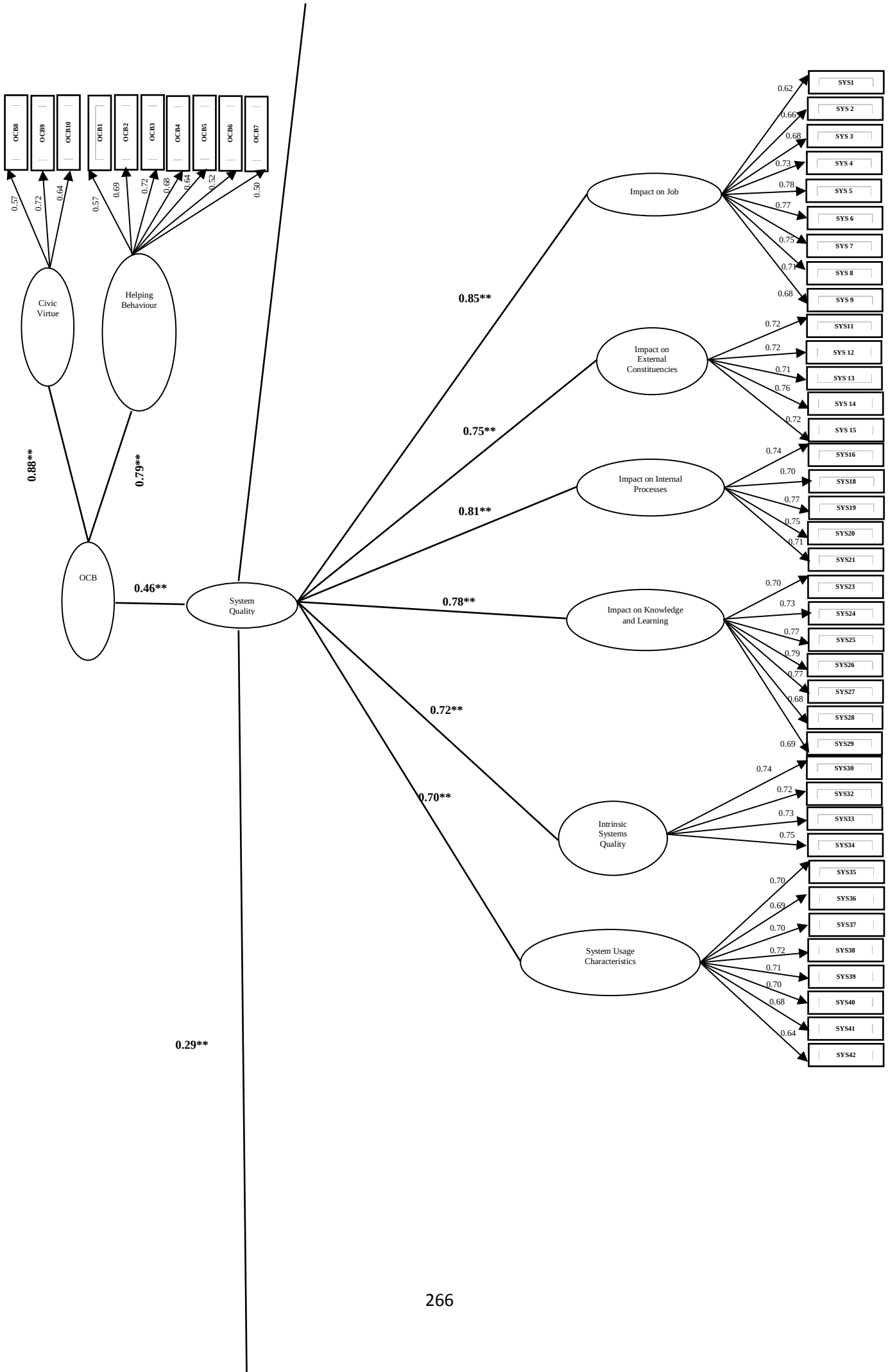
INFO36


OCB8
OCB9
OCB10
OCB1
OCB2
OCB3
OCB4
OCB5
OCB6
OCB7
0.57
0.72
0.64
0.57
0.69
0.72
0.68
0.64
0.52
0.50
Civic Virtue
Helping Behaviour
0.88**
0.79**
OCB
0.46**
System Quality
0.29**
0.85**
0.75**
0.81**
0.78**
0.72**
0.70**
Impact on Job
Impact on External Constituencies
Impact on Internal Processes
Impact on Knowledge and Learning
Intrinsic Systems Quality
System Usage Characteristics
SYS1
SYS 2
SYS 3
SYS 4
SYS 5
SYS 6
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SYS 8
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SYS 12
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SYS 15
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SYS42
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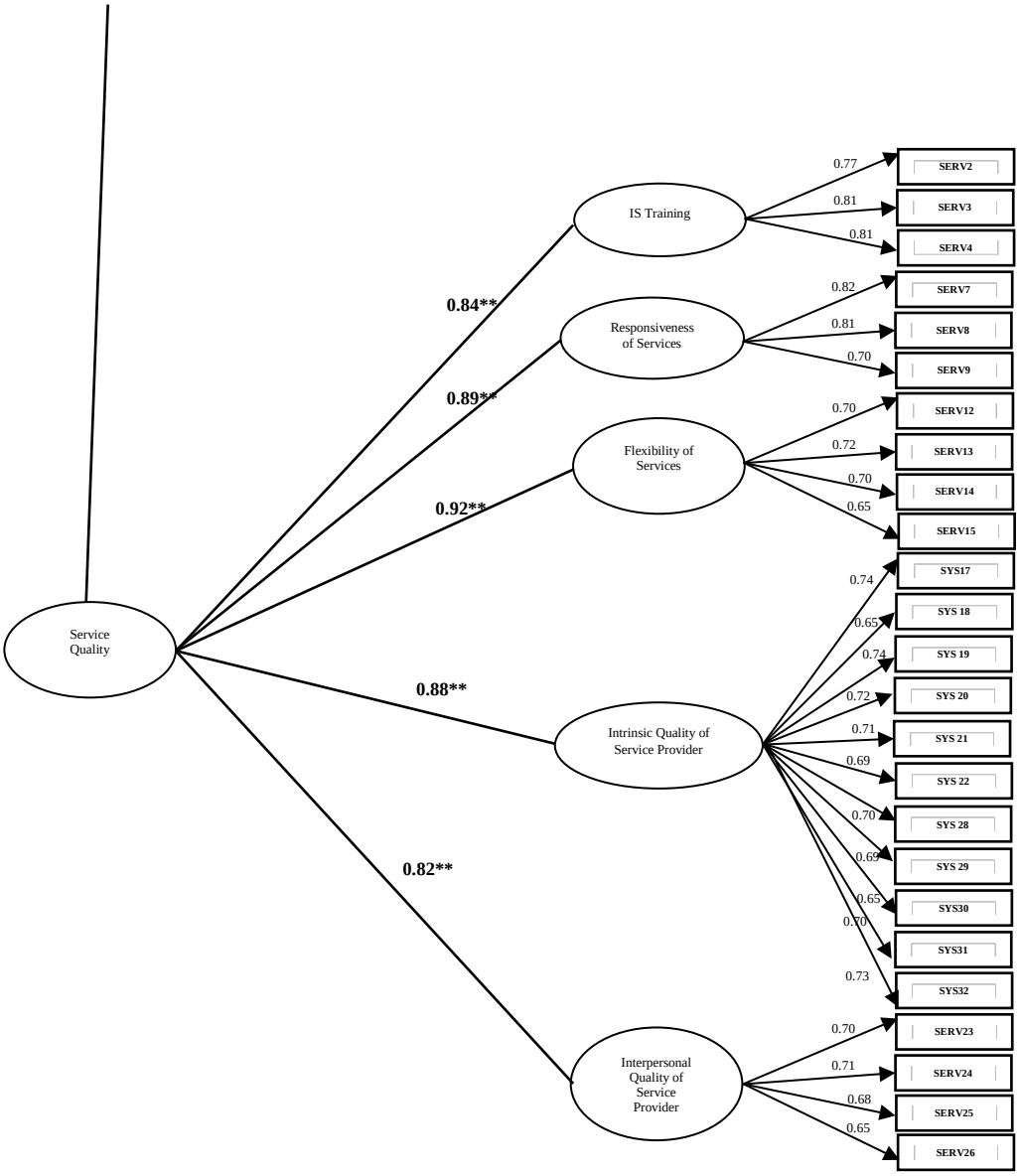
Service Quality
0.84**
0.89**
0.92**
0.88**
0.82**
IS Training
Responsiveness of Services
Flexibility of Services
Intrinsic Quality of Service Provider
Interpersonal Quality of Service Provider
0.77
0.81
0.81
0.82
0.81
0.70
0.70
0.72
0.70
0.65
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SERV2
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SERV15
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SYS 22
SYS 28
SYS 29
SYS30
SYS31
SYS32
SERV23
SERV24
SERV25
SERV26

APPENDIX I

Factor Loadings, Residual Variances, and R-square				
	Estimate	**S.E.**	**Est./S.E.**	**P-Value**
Within Level				
Altruism BY				
OCB1	0.825	0.017	48.604	0.000
OCB2	0.808	0.018	44.574	0.000
OCB3	0.676	0.026	26.401	0.000
OCB4	0.826	0.017	48.581	0.000
OCB5	0.848	0.015	55.727	0.000
Courtesy BY				
OCB6	0.801	0.019	42.247	0.000
OCB7	0.624	0.029	21.306	0.000
OCB8	0.813	0.018	45.313	0.000
OCB9	0.850	0.016	53.835	0.000
OCB10	0.824	0.017	47.471	0.000
Civic Virtue BY				
OCB11	0.825	0.018	46.997	0.000
OCB12	0.847	0.016	51.359	0.000
OCB13	0.790	0.020	39.515	0.000
OCB14	0.803	0.022	36.578	0.000
Sportsmanship BY				
OCB15	0.821	0.017	47.989	0.000
OCB16	0.825	0.017	48.792	0.000
OCB17	0.846	0.016	54.452	0.000
OCB18	0.837	0.016	52.605	0.000
OCB19	0.677	0.026	25.864	0.000
Conscientiousness BY				
OCB20	0.818	0.017	47.551	0.000
OCB21	0.794	0.019	42.186	0.000
OCB22	0.786	0.019	40.663	0.000
OCB23	0.848	0.015	55.758	0.000
OCB24	0.838	0.016	53.001	0.000
OCB BY				

Altruism	0.846	0.022	38.819	0.000
Courtesy	0.810	0.024	34.469	0.000
Civic Virtue	0.739	0.028	26.215	0.000
Sportsmanship	0.746	0.027	28.003	0.000
Conscientiousness	0.722	0.028	25.712	0.000
Residual Variances				
OCB1	0.319	0.028	11.410	0.000
OCB2	0.348	0.029	11.877	0.000
OCB3	0.543	0.035	15.665	0.000
OCB4	0.318	0.028	11.323	0.000
OCB5	0.281	0.026	10.887	0.000
OCB6	0.359	0.030	11.820	0.000
OCB7	0.611	0.037	16.707	0.000
OCB8	0.339	0.029	11.614	0.000
OCB9	0.277	0.027	10.336	0.000
OCB10	0.322	0.029	11.251	0.000
OCB11	0.319	0.029	11.021	0.000
OCB12	0.283	0.028	10.128	0.000
OCB13	0.375	0.032	11.876	0.000
OCB14	0.355	0.035	10.070	0.000
OCB15	0.327	0.028	11.639	0.000
OCB16	0.319	0.028	11.431	0.000
OCB17	0.284	0.026	10.777	0.000
OCB18	0.300	0.027	11.247	0.000
OCB19	0.541	0.035	15.255	0.000
OCB20	0.332	0.028	11.799	0.000
OCB21	0.369	0.030	12.352	0.000
OCB22	0.382	0.030	12.581	0.000
OCB23	0.280	0.026	10.865	0.000
OCB24	0.298	0.027	11.235	0.000
Altruism	0.284	0.037	7.712	0.000
Courtesy	0.344	0.038	9.020	0.000
Civic Virtue	0.454	0.042	10.901	0.000
Sportsmanship	0.444	0.040	11.167	0.000
Conscientiousness	0.479	0.041	11.802	0.000

Between Level				
Altruism BY				
OCB1	1.000	0.032	31.721	0.000
OCB2	0.998	0.029	33.886	0.000
OCB3	0.990	0.878	1.128	0.260
OCB4	0.997	0.053	18.728	0.000
OCB5	1.000	0.034	29.304	0.000
Courtesy BY				
OCB6	0.854	0.137	6.229	0.000
OCB7	0.890	0.133	6.694	0.000
OCB8	0.998	0.062	16.187	0.000
OCB9	1.000	0.062	16.247	0.000
OCB10	0.991	0.066	15.067	0.000
Civic Virtue BY				
OCB11	0.960	0.076	12.631	0.000
OCB12	0.983	0.070	13.958	0.000
OCB13	0.980	0.062	15.697	0.000
OCB14	1.003	0.282	3.553	0.000
Sportsmanship BY				
OCB15	0.999	0.046	21.776	0.000
OCB16	0.994	0.024	40.650	0.000
OCB17	0.921	0.062	14.943	0.000
OCB18	1.000	0.014	73.592	0.000
OCB19	0.992	0.093	10.708	0.000
Conscientiousness BY				
OCB20	1.000	0.104	9.589	0.000
OCB21	0.996	0.069	14.352	0.000
OCB22	0.999	0.055	17.996	0.000
OCB23	0.998	0.037	26.968	0.000
OCB24	1.000	0.037	26.994	0.000
OCB BY				
Altruism	1.000	0.084	11.889	0.000
Courtesy	0.999	0.044	22.733	0.000
Civic Virtue	0.989	0.132	7.470	0.000
Sportsmanship	1.000	0.042	23.950	0.000

Conscientiousness	0.995	0.061	16.211	0.000
Residual Variances				
Information Quality	0.830	0.131	6.317	0.000
Service Quality	0.806	0.141	5.733	0.000
System Quality	0.811	0.136	5.966	0.000
OCB1	0.001	0.063	0.013	0.990
OCB2	0.004	0.059	0.065	0.948
OCB3	0.020	1.738	0.012	0.991
OCB4	0.007	0.106	0.062	0.951
OCB5	0.001	0.068	0.008	0.994
OCB6	0.270	0.234	1.155	0.248
OCB7	0.207	0.237	0.876	0.381
OCB8	0.003	0.123	0.024	0.981
OCB9	0.000	999.000	999.000	999.000
OCB10	0.019	0.130	0.143	0.886
OCB11	0.079	0.146	0.541	0.589
OCB12	0.034	0.138	0.247	0.805
OCB13	0.040	0.122	0.328	0.743
OCB14	-0.006	999.000	999.000	999.000
OCB15	0.003	0.092	0.028	0.978
OCB16	0.012	0.049	0.237	0.813
OCB17	0.152	0.114	1.338	0.181
OCB18	0.001	0.027	0.026	0.979
OCB19	0.017	0.184	0.091	0.927
OCB20	0.001	0.208	0.003	0.998
OCB21	0.007	0.138	0.051	0.959
OCB22	0.002	0.111	0.022	0.983
OCB23	0.003	0.074	0.046	0.963
OCB24	0.001	0.074	0.011	0.991
Altruism	0.001	0.168	0.004	0.997
Courtesy	0.003	0.088	0.032	0.975
Civic Virtue	0.022	0.262	0.083	0.934
Sportsmanship	0.000	999.000	999.000	999.000
Conscientiousness	0.010	0.122	0.085	0.932
R-SQUARE				

Within Level				
Observed Variable	**Estimate**	**S.E.**	**Est./S.E.**	**P-Value**
OCB1	0.681	0.028	24.302	0.000
OCB2	0.652	0.029	22.287	0.000
OCB3	0.457	0.035	13.201	0.000
OCB4	0.682	0.028	24.291	0.000
OCB5	0.719	0.026	27.863	0.000
OCB6	0.641	0.030	21.123	0.000
OCB7	0.389	0.037	10.653	0.000
OCB8	0.661	0.029	22.656	0.000
OCB9	0.723	0.027	26.917	0.000
OCB10	0.678	0.029	23.735	0.000
OCB11	0.681	0.029	23.499	0.000
OCB12	0.717	0.028	25.680	0.000
OCB13	0.625	0.032	19.758	0.000
OCB14	0.645	0.035	18.289	0.000
OCB15	0.673	0.028	23.994	0.000
OCB16	0.681	0.028	24.396	0.000
OCB17	0.716	0.026	27.226	0.000
OCB18	0.700	0.027	26.303	0.000
OCB19	0.459	0.035	12.932	0.000
OCB20	0.668	0.028	23.776	0.000
OCB21	0.631	0.030	21.093	0.000
OCB22	0.618	0.030	20.332	0.000
OCB23	0.720	0.026	27.879	0.000
OCB24	0.702	0.027	26.500	0.000
Latent Variable	**Estimate**	**S.E.**	**Est./S.E.**	**P-Value**
Altruism	0.716	0.037	19.409	0.000
Courtesy	0.656	0.038	17.235	0.000
Civic Virtue	0.546	0.042	13.107	0.000
Sportsmanship	0.556	0.040	14.001	0.000
Conscientiousness	0.521	0.041	12.856	0.000
Between Level				
Observed Variable	**Estimate**	**S.E.**	**Est./S.E.**	**P-Value**
Information Quality	0.170	0.131	1.290	0.000

Service Quality	0.194	0.141	1.382	0.000
System Quality	0.189	0.136	1.390	0.000
OCB1	0.999	0.063	15.861	0.000
OCB2	0.996	0.059	16.943	0.000
OCB3	0.980	1.738	0.564	0.573
OCB4	0.993	0.106	9.364	0.000
OCB5	0.999	0.068	14.652	0.000
OCB6	0.730	0.234	3.115	0.002
OCB7	0.793	0.237	3.347	0.001
OCB8	0.997	0.123	8.094	0.000
OCB9	Undefined			
OCB10	0.981	0.130	7.533	0.000
OCB11	0.921	0.146	6.316	0.000
OCB12	0.966	0.138	6.979	0.000
OCB13	0.960	0.122	7.849	0.000
OCB14	Undefined			
OCB15	0.997	0.092	10.888	0.000
OCB16	0.988	0.049	20.325	0.000
OCB17	0.848	0.114	7.471	0.000
OCB18	0.999	0.027	36.796	0.000
OCB19	0.983	0.184	5.354	0.000
OCB20	0.999	0.208	4.795	0.000
OCB21	0.993	0.138	7.176	0.000
OCB22	0.998	0.111	8.998	0.000
OCB23	0.997	0.074	13.484	0.000
OCB24	0.999	0.074	13.497	0.000
Latent Variable	**Estimate**	**S.E.**	**Est./S.E.**	**P-Value**
Altruism	0.999	0.168	5.945	0.000
Courtesy	0.997	0.088	11.366	0.000
Civic Virtue	0.978	0.262	3.735	0.000
Sportsmanship	Undefined			
Conscientiousness	0.990	0.122	8.105	0.000