Investigating the Determinants of Training Transfer in Enterprise Systems

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ATTESTATION

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

The following peer-reviewed publications relate to work undertaken for this thesis:

- Arasanmi, C., Wang, W., & Singh, H. (2012). Motivational determinants of training utilisation in enterprise systems. Americas Conference of Information Systems (AMCIS) Proceedings, Washington, DC, USA.
- Arasanmi, C., Wang, W., Singh, H., & Ekundayo, S. (2011). What motivates end-users to transfer gained knowledge from enterprise systems training? Pacific Asia Conference on Information Systems (PACIS) Proceedings, Brisbane, Australia. (Nominated for Best Conference Paper Award.)
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BOOK CHAPTER

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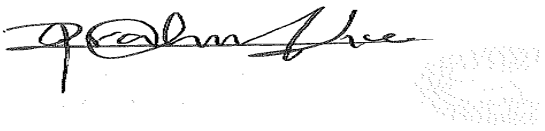
Author's signature: 

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ABSTRACT

The advent of information systems (IS) has improved the face of the global business environment. Faced with increasing competition, expanding markets and rising customer expectations, companies have sought to improve their business processes and operations by investing in a variety of ISs. Although many companies have adopted complex large-scale application software packages called enterprise systems (ES), about 70% of ES implementation projects have not achieved their projected returns. Research has attributed this problem to training-related issues among others, particularly end-users' transfer problem in the workplace.

ES success depends largely upon end-users' use of the system, through the transfer of the skills learned from the ES training. However little is known about the factors that motivate ES training transfer. This study investigates the determinants of training transfer through the development of a research framework for understanding transfer mechanisms among ES users. The influence of end-users' characteristics, training design characteristics and social support on training transfer, and training motivation as a central component in the transfer process is investigated.

An online survey method was employed to collect data from ES end-users who had previously participated in ES training. One hundred and seventy responses of useable data were received for analysis. The research model was empirically tested with partial least squares structural equation modelling (PLS-SEM). SmartPLS 2.0M3 was used to validate the research model and the test of the research hypotheses.

Findings reveal that end-users' characteristics, social factors, and training design influence end-users' training motivation and transfer in the ES environment. Furthermore, end-users' computer self-efficacy, mastery orientation, training motivation and perceived ease-of-use are shown to positively influence end-users' training transfer. In addition, social factors such as supervisory support and peer support were found to positively predict end-users' training motivation and training transfer, respectively.

The significant explanatory power of the theoretical model developed in this study has important implications for both theory and practice. The findings from this study can help organisations in understanding how attitude, social support, and training design issues, especially technology design, can affect ES training transfer. Having a clear understanding

of how these determinants influence end-users' training transfer will help organisations to address transfer problems. This research advances the understanding of positive transfer and how transfer strategies can be designed in ES.

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LIST OF ABBREVIATIONS

AUT	Auckland University of Technology
AUTEC	Auckland University of Technology Ethics Committee
AVE	average variance expected
CB-SEM	covariance based structural equation modelling
CR	composite reliability
CSE	computer self-efficacy
DTPB	decomposed theory of planned behaviour
ES	enterprise systems
ESTM	end-users' training motivation
IS	information systems
KMO	Kaiser Meyer-Olkin
LMX	leader-member exchange
MO	mastery orientation
PBC	perceived behavioural control
PEOU	perceived ease-of-use
PLS	partial least squares
PS	peer support
SEM	structural equation modelling
SI	system interface
SS	supervisor support
TPB	theory of planned behaviour
UTL	utilisation

CHAPTER 1: INTRODUCTION

1.1. Background to the Study

In response to the challenges of increased competition, expanding markets, and rising customer expectations, companies have sought to improve their business processes and speed of operations by investing in various types of information systems (IS) (Umble, Haft, & Umble, 2003). Recent decades have seen the emergence and increasing popularity of enterprise systems (ES), which are large-scale application software packages that support business processes, information flows, reporting, and data analytics in complex organisations.

ES are complex off-the-shelf information technology (IT) solutions that promise to meet the information needs of an organisation. ES allow separate and different business processes to be integrated into one compact software system using what ES vendors consider "best practices" (Bradley & Lee, 2007). ES include a number of software applications known as enterprise resources planning systems (ERP), supply chain management (SCM), and customer relationship management (CRM). ES permit the integration of different ISs into a single information solution. The integration of the functional units in a database promotes seamless cooperation and coordination, which distinguishes ES from previous IT solutions. ES modules support various organisational functions, such as sales and marketing, finance and accounting, human resources (HR), material and supply chains management, and many more job classifications. It is however noted in the literature that ES is a complex technology (Amoako-Gyampah & Salam, 2004), and end-user training is used as an important phase of ES implementation to facilitate the use of the technology.

End-user training involves the systematic acquisition and development of relevant knowledge, skills and attitudes for better performance, provided that the learned skills in training are transferable to the job environment (Baldwin & Ford, 1988). It is an effective strategic intervention for updating end-users' knowledge and skills (Rowold, 2007; Umble et al., 2003) and is therefore a pervasive method of enhancing individuals' performance in the workplace (Arthur, Bennett, Edens, & Bell, 2003, Gupta & Bostrom, 2006).

ES training is the process of teaching ES end-users how to use ES efficiently in their day-to-day activities (Chien & Hu, 2009) and involves the transmission of the necessary skills and knowledge to end-users (Marler, Linag, & Dulebohn, 2006). It allows end-users to acquire a level of comfort in the use of the ES in their work environment. IS research has recognised the importance of training to end-users' ES performance, yet the quandary of how to effectively measure training outcomes remains. One way of measuring training effectiveness in an organisation is by focussing on how end-users transfer what has been learned in the training environment to the work environment. It is equally important to understand the motivational factors that enhance end-users' transfer in the work environment.

Training transfer is the extent to which the learning from a training environment transfers to the work environment and leads to meaningful changes in work performance (Baldwin & Ford, 1988; Kowslowski, Brown, Weissbein, Cannon-Bowers, & Salas, 2000). Training transfer is the ultimate goal of training and unless new knowledge and skills acquired in the training setting translate into new or improved job skills, the investment in training is wasted (Clark, 2003 p. 136). This suggests that training is meaningful when end-users take information and skills learned in training episodes and apply them to situations at their workplace. Thus, training transfer enhances the assessment of the link between training outcome and organisational objectives, because training transfer is the primary leverage point by which training influences organisational effectiveness (Kowslowski et al., 2000). It can therefore be concluded that end-users' training transfer is the goal of organisational-based training.

1.2. Rationale for the Study

End-user training is acknowledged as a key ingredient for the successful implementation of ISs (Gallivan, Spitler, & Koufaris, 2005) because end-users' understanding and "buy-in" are crucial (Umble et al., 2003). However, research suggests that end-users sometimes fail to use acquired skills in work environments (Amoako-Gyampah & Salam, 2004; Baldwin & Ford, 1988; Shayo & Olfman, 1994). In the event of end-users' failure to apply learning on the job, the investment in training could be considered a waste (Baldwin & Ford, 1988; Holton & Baldwin, 2003). The effective use of skills on the job may depend on a number of factors (Colquitt, LePine, & Noe, 2000; Marler et al., 2006). The presence or absence of such factors can either facilitate or inhibit transfer to the work environment.

Understanding how end-users utilise acquired skills in ES depends on important interacting predictors such as individual, social and training design factors (Baldwin & Ford, 1988). An analysis of the motivational determinants of end-users' transfer in ES will help in identifying enhancing strategies to minimise transfer problems in the ES environment.

1.3. Research Problem

Considerable research has focused on the analysis of training in ISs (e.g. Bedard, Jackson, Ettredge, & Johnstone, 2003; Marler et al., 2006). This shows the importance of training in gaining IS acceptance among end-users (Bradley & Lee, 2007). Many studies have looked at the influence of training, effective training methods, identification and categorisation of best practices, and outcomes of training (Amoako-Gyampah & Salam, 2004; Bradley & Lee, 2007; Choi, Kim, & Kim, 2007; Esteves, 2013; Gupta & Bostrom, 2006; Rajagopalan, York, Doane, & Tanniru, 2007). While these studies underline the importance of training in ISs, the literature is limited by its focus on the affective level outcomes of training (satisfaction, self-efficacy, motivations, and perception of ease-of-use). There is little theoretical development on the use of individual-level training outcomes, such as skills and knowledge accountability in task performance.

Even though training intervention, training strategy, and best training practices positively affect end-users' satisfaction and self-efficacy, there is still the problem of training transfer in ISs, particularly the failure of end-users to transfer IT skills and learning behaviours in task situations (Jasperson, Carter, & Zmud, 2005; Compeau, Olfman, Sein, & Webster, 1995). The evidence suggests further that end-users' resistance behaviours in applying learned skills jeopardise the success of ES training (Amoako-Gyampah & Salam, 2004). End-users' failure to apply learning is not desirable, since ES implementation requires a critical mass of knowledge and skills that must be transferred (Umble et al., 2003).

The importance of training transfer is widely recognised by researchers (Baldwin & Ford, 1988; Burke & Hutchins, 2007, 2008; Holton & Baldwin, 2003; Saks & Belcourt, 2006; Compeau, Olfman, Sein, & Webster, 1995; Jasperson et al., 2005). The attention given to this problem has generated estimates of use of trained skills in the workplace. For instance, Baldwin and Ford (1988) estimated that only 10% of training investment results in transfer of skill on the job. Saks and Belcourt (2006) reported that, 62% trained users apply what they learn immediately after training. However, after the training program, six months precisely, only 44% apply the trained skills on the job.

A year after the training program, only 34% of trainees are still using what they have learned on the job. This report indicates that less than 50% of trained skill ended in organisational and individual improvements.

Transfer problems have attracted the attention of scholars, and there have been calls for more research that is specifically focused on end-users' transfer in the workplace because the goal of training is to produce motivated end-users who can transfer the learned skills and then continue to learn on the job (Compeau et al., 1995; Jasperson et al., 2005). Interestingly, the concept of training transfer has yet to receive sufficient attention in IS studies. Specifically, the challenges of transfer of ES training have not been analysed. Given the centrality and influence of skills in IS usage – a hallmark of IS/ES training – this represents a major gap in the knowledge of training transfer specific to the IS field.

This gap in knowledge resulting from the paucity of anecdotal and empirical evidence on training transfer as a measure of training effectiveness, specifically the lack of knowledge concerning end-users' motivations to apply learned skills in task scenarios in IS, prompted this research endeavour. This study aimed at closing this gap by answering the call for investigation on training transfer in IS (Compeau et al., 1995; Jasperson et al., 2005) and developing a framework of the determinants of ES training transfer. The framework analyses the influence of individual variables (attributes and attitudes), social support, and training design factors (technology characteristics) on training transfer.

1.4. Research Objectives

This study is aimed at identifying the determinants of ES training transfer. At present, there is a lack of knowledge concerning the predictors of skills transfer, and the state of research in ES training has yet to demonstrate a deep understanding of the issue (Amoako-Gyampah & Salam, 2004; Bradley & Lee, 2007; Choi et al., 2007; Esteves, 2013; Gupta & Bostrom, 2006; Rajagopalan et al., 2007) or propose a suitable framework that offers a comprehensive explanation of the determinants of skills transfer in IS. Accordingly, this study proposes a framework to bridge this gap.

To achieve this goal, this research examines social support in the workplace environment, the resources around the implemented technology that might constitute learning, and task constraints. It also looks at end-users' attitudes that ensure consistency in the achievement of transfer outcomes.

The core objective of this study therefore is:

- To build a suitable framework of end-users' transfer mechanisms in ES. The development of the framework will provide insights into the determinants of training transfer among ES end-users. Specifically, the research will enhance current understanding of the factors that facilitate skills transfer in this area, as there seems to be a dearth of comprehensive theoretical frameworks of training transfer in IS (Jasperson et al., 2005).

1.5. Overview of the Research Framework

Baldwin and Ford's (1988) model proposed individual attributes and attitudes, training design, and social factors as influences on training transfer. Transfer studies and prior models have been guided by this pioneering work, and have proposed individual, training, and social or work-environment factors as facilitators of transfer of skills in the workplace (Holton, 2005; Chiaburu & Marinova, 2005). Other research models have extended this Baldwin and Ford model by proposing other relevant predictors of transfer according to the context of the training (Colquitt et al., 2000; Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991, Holton, 2005; Machin & Fogarty, 2003; Facteua & Dobbins, 1995; Johnson et al., 2009).

Individual variables such as training motivation, locus of control, job involvement, mastery and performance goal orientations, and self-efficacy have attracted attention from scholars (Thayer & Teachout, 1995; Holton, 2005; Machin & Fogarty, 2003; Colquitt et al., 2000; Chiaburu & Marinova, 2005; Johnson et al., 2009). Researchers have also examined the influence of social support on learning and transfer in the work environment (Machin & Fogarty, 2003; Roullier & Goldstein, 1993; Holton, 2005), while the practical relevance of training and task components has been examined as a training design factor (Liebermann & Hoffmann, 2008; Noe, 1986). While these models have included several factors, there is no comprehensive list and factors can change according to the focus of the training (Machin & Fogarty, 2003).

To achieve the stated objective, this study proposes a model of the determinants of skills transfer in ES. The model analyses the influence of end-users' attitudes, social support and training design factors on skills application on the job (Baldwin & Ford, 1988; Noe, 1986; Alavi & Ladner, 2001; Johnson, Gueutal & Falbe, 2009).

In this study, end-users' attitudes, social support, and training design factors are operationalised with the following constructs relevant to IS training:

1. Computer self-efficacy (CSE): An individual's perception of his/her ability to use a computer in the accomplishment of tasks (Compeau & Higgins, 1995). CSE is the confidence to perform a range of software and hardware operations (Machin & Fogarty, 2003). It has been established in the literature that certain learners are anxious about the learning of difficult skills associated with the mastery of computers. CSE has been tested as a predictor of training mastery in the computer training context (Compeau & Higgins 1995; Machin & Fogarty, 2003).
2. Mastery orientation (MO): Mastery orientation is defined as an individual's quest for knowledge, development of new skills, and understanding of tasks and mastery of learning objectives (Dweck, 1986). MO is a frame of mind which affects the extent to which end-users are prepared to learn in task situations. The IS domain is an area that requires constant skill upgrading; it is therefore important to analyse the role of goal orientation in this area. It has been argued that MO enhances self-regulation and planning in IS learning (Gravill & Compeau, 2003, Santhanam, Sasidharan & Webster, 2008; Yi & Hwang, 2003). MO has potential implications for recruitment and training during a large IS implementation like ES.
3. Perceived ease-of-use (PEOU): The degree to which an individual believes that using a particular system will be effortless (Davis (1989). Past studies have posited a strong relationship between PEOU and system usability (Bedard et al., 2003; Bueno & Salmeron, 2008; Marler et al., 2006; Park & Wentling, 2007; Wu & Hwang, 2010).

4. Training motivation: The degree of desire, intensity and persistence of effort that trainees apply in learning-oriented improvement activities (Noe, 1986). It involves paying attention during training and deciding on how to utilise acquired skills at work (Scaduto, Lindsay, & Chiaburu, 2008). Training motivation snowballs into transfer effort in the workplace (Chiaburu & Marinova, 2005). Training motivation associates with performance, especially when learning is instrumental to job performance (Robey, Ross, & Boudreau, 2000; Scaduto et al., 2008). Motivation is important because it guides the direction of efforts, and how learned skills will be used on the job. A motivated learner is a better learner; and a better learner acquires better skills and absorbs more knowledge during the training.

As a result, a better learner is able to perform well when the skills and knowledge acquired during training are applied in the work environment.

5. Supervisory support: Supervisory support refers to the assistance, feedback and creation of opportunities for trainees' to apply learned skills in a task environment (Burke & Hutchins, 2008). It is the extent of support and reinforcement of learned skills in the task environment. Research in both IS and management studies agrees that the influence of social support from the organisation affects end-users' transfer (Dong, Nuefeld, & Higgins, 2009; Garavan, Carbery, O'Malley, & O'Donnell, 2010).
6. Peer support: This refers to colleagues' reinforcement of behaviour associated with the use of learned skills on the job (Holton, Bates, Seyler, & Carvalho, 1997; Holton, 2005). Peer support occurs when a person's interaction with his or her peers over learning outcomes influences the use of such skills on the job.
7. System interface (SI): The structural presentation of the features and the instructional support of an IS (Cho, Cheng, & Lai, 2009) which facilitates the learning and interaction with the technology. SI is a critical component of IT. Technological innovations and human interactions rely on SI; it is essential that technology features support the psychological process of learning, which will in turn result in the desired learning outcome (Alavi & Leidner, 2001). SI is operationalised as a training design factor in this study. In the training environment, complex technology can either constitute task constraints (Noe, 1986; Noe & Schmitts, 1986), environmental favourability, or resource availability (Mathieu, Martineau & Tannenbaum, 1993; Noe, 1986). Advances in the function and reliability of technology can lead to higher end-user expectations (Johnson et al., 2009) in the learning environment.

1.6. Research Question

The research questions addressed in this study have been developed from the research objectives as set out in section 1.4:

Research Question 1: How do CSE, PEOU, MO and training motivation influence ES training transfer?

Research Question 2: How do supervisory and peer support influence ES training transfer?

Research Question 3: How does SI influence ES training transfer?

1.7. Assumptions in This Study

The underlying assumptions guiding this research are presented below:

- This research is focused on the understanding of training among ES end-users. The theory of training transfer is drawn from the IS/training literature. Some of the constructs and references are also rooted in educational and social psychology studies. However, research on transfer of hard skills is rare in IS context, therefore the framework used in this study differs from those in preceding research.
- With regard to generalisation of the results, the sample used in this study was drawn from the population of ES end-users in New Zealand. Inferences are made solely from this group, and this might affect the generalisation of the outcomes at a global level, this limitation is highlighted in this study. A random sampling procedure was used for the selection of the participants. It is believed that the selected sample is representative of the ES end-user population in New Zealand.

1.8. Research Methodology

A quantitative research methodology is adopted in this study due to the confirmatory nature of the research. The collection of data was achieved by an online survey. The research participants were end-users that had earlier participated in ES training. The research questionnaire focused on the use of ES trained skills. The collected data were analysed by quantitative methods. The initial screening of the data was done through the statistical package for social science (SPSS).

The positivist paradigm is adopted in this study; positivism is suitable for research that is focused on the hypothetical testing of theories as an objective way of testing the existence of reality (Saunders, Lewis, & Thornhill, 2009). Positivism fits well with this study which is designed to test a research framework through a set of hypotheses in determining the predictors of ES training transfer. Positivism is associated with the quantitative research approach (Creswell, 2009).

Partial least squares (PLS) analysis using SmartPLS (Ringle, Wende, & Will, 2005) was used to test the hypothesised relationships in the research model. The measurement and structural models were evaluated sequentially. PLS analysis assesses internal consistency reliability, convergent reliability, and discriminant reliability.

PLS also provides analysis of the variance (R^2) explained by the model and the significance of the path coefficient. The path coefficient provides information on the relationship between exogenous and endogenous latent variables in a model. PLS is suitable for analysing complex models containing a host of exogenous and endogenous variables. It is also suitable for models with either large or small sample sizes. Its strength lies in its ability to model reflective as well as formative measurement items, in contrast to the covariance-based structural equation model. PLS analysis is a widely used method in IS studies (Chin, 1998).

1.9. Research Contributions

The research outcomes of this thesis make both practical and theoretical contributions to the literature. The thesis contributes to a more comprehensive understanding of training transfer in relation to the following:

1) The importance of end-users' attributes and attitudes towards training and training transfer.

(2) How the use of organisational support systems as transfer strategies reinforces the use of learning in the workplace.

3) How improved technology design features of the target system support positive perceptions, metacognition and training transfer.

Chapter 7 provides a more detailed discussion on the overall contributions of this research; the major contributions of this research are highlighted below:

- The study addresses the dearth of studies on training transfer in IS. This study presents pioneering empirical research on skills transfer in this area.
- The study develops a transfer framework for the study of related concepts in IS environment.
- The research model validation tests earlier calls for an investigation of skills transfer issues in IS (Jasperson et al., 2005).
- This study is one of the first studies to explicate transfer mechanisms in the IS domain.
- This study integrates training transfer into the IS domain.

1.10. Thesis Structure

This thesis is organised into seven chapters; each chapter is explained below:

Chapter 1 introduces the research background, the rationale, and the research problem that identifies a gap in knowledge. The chapter also presents the research objectives and the research questions of the study. It concludes with a brief discussion on the research design and the method for the empirical validation of the research model.

Chapter 2 discusses the theoretical foundations of the study and the concept of training transfer. The study adopts a multidisciplinary approach in the conceptualisation of training transfer, drawing from psychology, HR and IS studies. The review of existing literature provides an understanding of the state of research on transfer in IS studies and the research gap to be filled by this study.

Chapter 3 discusses existing theoretical frameworks and the conceptual model of this study. The justification for the need for a transfer framework is presented in this part of the study as well as the research hypotheses.

Chapter 4 describes the philosophy, processes and design of this study. This chapter covers important issues such as research philosophy, research approach, research strategies, and data collection method. This is followed by a description of data cleaning, factor analysis, validation steps, and PLS analytic procedures.

Chapter 5 describes the entire empirical research testing process and findings. It provides information on data cleaning methods, details of the sample, descriptive analysis, and SmartPLS 2.0M3 PLS structural equation modelling (SEM) measurement and structural estimation.

Chapter 6 discusses the findings of this research against the hypothesised paths and research questions. A summary of the results is presented and comparison with prior research studies is made.

Chapter 7 summarises the study and presents its theoretical and practical contributions. It also highlights the limitations of the study and provides guidelines for future research work in this area.

CHAPTER 2: LITERATURE REVIEW

2.1. Overview

This chapter critically reviews the existing relevant literature to provide a rich background and understanding of the motivational mechanisms of ES training transfer. The review reveals the rationale for the wide acceptance and embrace of ES by organisations. The core issues that fuel the adoption of ES are factors that relate to business, particularly the achievement of business efficiency, competitive advantage and an increase in organisational profitability.

The review identifies the critical factors in ES implementation success, among which is the provision of ES training, a pervasive method for improving end-users' performance with ES. The high rate of failure in the deployment of ES is noted, in spite of the heavy financial commitment to ES training, which is acknowledged as a crucial phase in ES implementation. The paucity of empirical evidence and sustained arguments concerning what motivates end-users to transfer knowledge gained from ES training is also demonstrated.

Section 2.2 discusses ES technology, the reasons for the widespread adoption of this innovation by organisations, and the critical factors that facilitate successful implementation of the technology. The section also highlights the pervasiveness of end-user training and its impact on the success of IS implementation. Section 2.3 describes training evaluation and the models of training transfer in providing a rich background for the context of this study and section 2.4 discusses prior theories in transfer and IS studies. Section 2.5 presents the synthesis of prior theories and models and the need for a transfer framework. Section 2.6 presents the dependent variable of the study and the rationale for the use of IS and a surrogate measure of transfer in this study. A summary of the analysis of the literature review is given in section 2.7.

2.2. Enterprise Systems (ES)

ES are customised, integrated software applications designed to support core business processes (Coulson, Olfman, Ryan, & Shayo, 2010). These integrated software packages are either purchased or leased from commercial vendors for organisational operations. ES are distinct from generic information packages because of their customised features.

ES can have a number of modules such as enterprise resources planning (ERP) core functions (e.g., IS, finance, accounting, logistics), supply chain management (SCM) and customer relationship management (CRM). In some literature, ERP and ES are used interchangeably in reference to the complete package of organisation-wide ISs; however, this study will refer solely to ES so as not to confuse it with the limited scope of ERP core functions. In fact, some ES can have multiple ERP modules installed on different subordinates, and, by definition, each ERP can be a part of the ES from a holistic viewpoint. ES packages are widely patronised by organisations.

ES platforms contain modules and suites of diverse business knowledge and business reference models from diverse industrial business settings. Various departmental and unit functions and responsibilities are integrated into a single customised package for easy access and sharing. These modules are configured to support jobs such as sales and marketing, finance and accounting, IS, materials and SCM, etc. The adoption of ES therefore helps in the integration of operational functions and the achievement of efficiency. ES has the ability to automate and integrate an organisation's business processes, share common data and practices across the ES, and produce information in real time (Shih, 2006, p. 407). The integration of these modules into a single source eliminates duplications in information platform installation and the associated costs.

Prior to the invention of ES, different information devices were installed to manage huge amounts of data at different points in time, resulting in the fragmentation of operational functions. This brought about challenges of information sharing, decision making and management among organisational units. The adoption and implementation of ES eliminates multiple deployments of ISs across units, and brings about a reduction in the time required for business decision-making processes.

The patronage of ES packages is fuelled by several factors, including the expanded global economy, fragmentation of organisational functions and business operations, and the challenges of achieving efficiency. The quest for efficiency in production and services is perhaps one of the most important reasons for the upsurge in its adoption (Shih, 2006). ES use leads to faster information transactions, cost reduction, and increased productivity, which improves business processes and performance (Mouakket, 2010; Poston & Grabski, 2001; Umble et al., 2003). Advantages that can be derived from the implementation of ES include the following:

1. Attaining a competitive advantage means that organisations must maximise profit, by reducing the cost of operations. ES can help maximise targeted profit and confer a competitive edge.
2. ES enhance organisational performance (Osei-Bryson, Dong, & Ngwenyama, 2008) through faster information transactions, cost reduction, increase in productivity, and improvement in business processes (Mouakket, 2010; Poston & Grabski, 2001; Umble et al., 2003). Faster information exchange, better-integrated supply chain links and more coordinated business processes enhance organisational performance (Mouakket, 2010; Umble et al., 2003). ES facilitate better coordination of the functional units for productivity. The linking of functional units enhances seamless information flow and accessibility among units in an organisation.
3. The impact of ES on decision support has been highlighted in the literature. ES are regarded as knowledge repositories that enhance knowledge processing (Hossapple & Sena 2005). Secondly, the elimination of bottlenecks leads to quicker decision making and coordination of departmental task functions (Holsapple & Sena, 2005). Quick decisions affect business performance, organisational competitiveness.
4. ES have been shown to benefit organisations' financial performance and overall profitability (Poston & Grabski, 2001; Hendricks, Singhal, & Stratman, 2007).
5. ES implementation improves business processes and task simplification (Law & Ngai, 2007).
6. ES implementation significantly increases the level of a firm's absorptive capacity among organisational units (Srivardhana & Pawlowski, 2007).

The above advantages suggest that ES implementation enhances efficient management of organisational resources. The integration of functional units in one database or several linked databases provides seamless cooperation and coordination which distinguishes ES from other generic IT solutions. However, in spite of the numerous benefits, ES implementation is very risky (Srivardhana & Pawlowski, 2007), costly, time-consuming and complex (Amoako-Gyampah & Salam, 2004). The critical aspect of ES implementation is the appropriation of the systems by end-users (Cabrera, Collins, & Salgado, 2006). However, this barrier can be removed with extensive training, which leads to a critical mass of knowledge required in the ES terrain (Umble et al., 2003).

2.2.1. IS Training and Outcomes

Goldstein and Ford (2002) defined training as the acquisition of skills, rules, concepts or attitudes that result in improved performance in another environment. Training is a pervasive method for enhancing individuals' performance in the workplace (Arthur et al., 2003). It is a supportive strategy for end-users to acquire skills which are needed for better performance in the task environment and it is a cornerstone in HR development systems (Nordhaug, 1989). End-user training is a critical managerial activity that affects IS implementation (Kumar, Maheshwari, & Kumar, 2003; Umble et al., 2003, Marler et al., 2006; Bueno & Salmeron, 2008). The literature asserts that the quality of the training provided affects end-users' perceptions concerning the usefulness of the technology (Bueno & Salmeron, 2008). The importance of training as a critical factor in ES is consistent with the assertions that training is a pervasive method of improving skills and changing job attitudes (Arthur et al., 2003; Bueno & Salmeron, 2008; Marler et al., 2006; Nordhaug, 1989; Yi & Davis, 2003).

In the ES context, training is used to address skill gaps prior to going live (Scott, 2005; Calvert & Seddon, 2006). Training is also used to overcome assimilation barriers (Robey et al., 2000). The need for a critical mass of knowledge in the utilisation of ES (Umble et al., 2003) makes training an effective means for skills upgrading and knowledge updating (Rowold, 2007). This importance possibly explains the huge financial investment in end-users' training by organisations (Gupta & Bostrom, 2006; Coulson et al., 2010; Marler et al., 2006; Rodecker & Hess, 2001).

ES training is usually conducted by vendors and it involves many phases, which vary from company to company. The methods involved can be formal or informal. Formal training includes classroom-based training, one-to-one instruction, online learning, formal networks of the knowledgeable user, collaborative learning, teleconferencing and video conferencing (Calvert & Seddon, 2006; Choi et al., 2007). These varied methods, in some cases, are also supplemented with on-the-job training. The use of multimedia training tools, especially web-based e-learning systems, is becoming more noticeable (Choi et al., 2007).

The process of acquiring skills and learning a new technology starts with declarative knowledge (facts about) or familiar features of the technology. The declarative knowledge phase is the initial phase of cognitive representation of the tasks (Yi & Davis, 2003), where the content of training is explained through verbal specifications of task objectives and instructions.

It also involves observing the tasks and rules which are encoded and stored as strategies for task performance (Kanfer & Ackerman, 1989). Declarative knowledge is necessary for task performance (Yi & Davis, 2003).

The second stage is the integration of procedural knowledge (tasks trialling, knowledge and content of training), followed by the enactive mastery (experience or skills) of the tasks (Bandura, 1997). This is the autonomous phase, when the individual has automated the competency required for better performance with fewer attentional resources (Kanfer & Ackerman, 1989). Potential errors or accidents in the use of technology are drastically minimised at this stage.

Kraiger, Ford and Salas (1993) argued that training outcomes are cognitive, skill-based, or affective. Cognitive outcomes include verbal knowledge, knowledge organisation and cognitive strategies. Skill-based outcomes are classified into skill compilation and automaticity. The compilation stage is focused on the task and measured by procedural skills compilation, which commonly called transfer or task performance. The affective outcomes include attitudinal and motivational variables and indicators of perceptual capability in performance episodes.

Learning can be assessed from changes in any of these three dimensions (Yi & Davis, 2001). The IS literature has assessed training based on these outcomes (Rajagapolan et al., 2007; Bradley & Lee, 2007; Amoako-Gyampah & Salam, 2004). IS studies have demonstrated that end-user training leads to the productive use of the technology (Compeau et al., 1995) by helping to overcome knowledge barriers in work processes (Mendoza, Carroll, & Stern, 2008).

The provision of training helps in developing appropriate and valuable skills for successful software application (Calvert et al., 2006; Compeau & Higgins, 1995; Marler et al., 2006). It is a way of diffusing skills and is part of the diffusion of innovation theory that has considerably influenced IT adoption (Rogers, 1995). IS training instructs end-users in the efficient use of the technology in their day-to-day activities (Chien & Hu, 2009). Similarly, training programmes reduce the potential obstacles that end-users could encounter while using the system (Amoako-Gyampah & Salam, 2004). The multiple training modules in ES lead to skills upgrade (Marler et al., 2006). In summary, training is considered effective when end-users can apply gained skills in daily task performance.

2.2.2. IS Training and IS Usage

IT success has been measured in different ways. IS studies adopt such indices as behavioural intention, users' acceptance, and system use in the IS success model (Ajzen, 1992; DeLone & McLean, 1992; Davis, 1989). For instance, Nambisan, Agarwal and Tanniru (1999) propose technology cognizance, the ability to explore, and the intention to explore as measures of user innovativeness in the use of IT. The ability to explore therefore represents users' competence in technology usage.

Systems use as a measure of IS has also been manifested in the IS success model (DeLone & McLean, 1992). This model presents six-factor taxonomy of system quality, information quality, use, user satisfaction, individual impact, and organisational impact. The model has been widely used in empirical studies of training effectiveness in IS (Rajagopalan et al., 2007). Terms such as infusion, diffusion, and assimilation of IT are used in reference to technology usage. Infusion is a reference to "the extent to which an innovation's features are used in a complete and sophisticated way" (Fichman, 2000). Diffusion is the process by which a technology spreads across a population of organisations, while assimilation refers to the process within organisations stretching from initial awareness of innovation, to potentially formal adoption and full-scale deployment (Fichman, 2000). Roger's (1995) diffusion of innovation theory is popular in IS; however, it has limited applicability in some IS adoption environments (Fichman, 1999). The discussion on IS usage is indicative of its multidimensional nature and suggests no single best way to measure its usage.

The role of training in determining IS success and use in particular has not been explicitly tested in previous IS studies (Davis, 1989; Karahanna & Straub, 1999; Venkatesh, 2003). Particularly when it comes to the ongoing use of IS since end-users do not only participate in training prior to the use of the new technology, however the focus on system use without consideration of the role of training may undervalue the role of training in the development of skills, attitudes and reactions in models of post-adoption IS use.

2.3. Evaluation of Training

Evaluation is the use of social research methods to systematically investigate the effectiveness of social intervention programmes in ways that are adapted to their political and organisational environments and are designed in the form of social action to improve social conditions (Rossi, Lipsey, & Freeman, 2004). It therefore involves procedures for assessing the conceptualisation, design, implementation, and utility of social intervention

programmes. Evaluation also involves identifying the performance entity as well as setting out criteria for assessment of the performance entity.

Key issues in evaluation include ascertaining the need for the intervention by looking at the design of the programme and its implementation, determining the impact or outcome of the intervention, and measuring the overall efficiency or the effectiveness of the programme (Rossi et al., 2004). According to Scriven (1996), there are two main categories of evaluation: formative and summative.

2.3.1. Formative and Summative Evaluation of Training

Training evaluation and training effectiveness represent two different approaches to training assessment. Although these terms are used interchangeably, training evaluation is not synonymous with training effectiveness (Alvarez, Salas, & Garofano, 2004; Kraiger et al., 1993).

The formative evaluation approach is conducted with the intention of providing information and insights on improving programme designs, quality, and efficiency in the implementation. Such evaluation identifies the shortcomings and loopholes in the programme. It proffers solutions that can improve quality in the areas of content, design, and training techniques. Formative evaluation is conducted to ascertain incremental changes (improvement) brought about by the programme (Wholey, 1996). On the other hand, summative evaluation centres on training benefits at the individual and organisational levels. It seeks to identify the influence of learning on job performance (Wang & Wilcox, 2006). Formative training evaluation suggests a short-term outcome, while summative training evaluation supports skills accountability and transfer on the job as a measure of training effectiveness (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991; Baldwin & Ford, 1988).

Table 1: Summative and formative evaluation (Rossi et al. 2004)

Summative Training Evaluation	Formative Training Evaluation
1. Assesses training goals and outcomes in relation to the set objectives. 2. Evaluation is based on the long-term outcomes 3. Focused on individual and organisational achievement in terms of effectiveness and performance. 4. Summative evaluation centres on training benefits at the individual and organisational level. 5. Measures training effectiveness in terms of on-the-job-performance.	1. Formative evaluation brings about incremental changes (improvement) in policies and programme. 2. It is focused on short-term outcomes. 3. The formative evaluation approach provides information on improving programme designs. 4. Such evaluation identifies shortcomings and loopholes. 5. It proffers solutions that improve quality in the areas of content, design and training techniques.

Source: developed by the author from the literature

2.3.2.Training Transfer

Training transfer indicates the improvement of job performance through the transfer of learned skills from the training programme to the workplace (Holton & Baldwin, 2003). The success of a training programme is dependent on the usage of skills in the work environment. In essence, when the use of the gained knowledge translates to better performance on the job, such training intervention is considered effective. Therefore, training transfer is synonymous with the effective utilisation of learning (skills and knowledge) in a task-related environment. Training transfer is evaluated in terms of the utilisation of learning behaviours (skills, knowledge and attitude). It is achieved by fulfilling the conditions of generalisation and maintenance of learned skills on the job (Baldwin & Ford, 1988; Salas & Cannon-Bowers, 2001; Chen, Thomas, & Wallace, 2005). Generalisation involves adaptability, which refers to end-users' capability to modify learned knowledge and skills in task episodes (Kozlowski., Gully., Brown., Salas., Smith., & Nason, 2001).

Baldwin and Ford's (1988) training transfer framework is the benchmark for investigations of transfer problems in organisations. The authors proposed three types of input variables: trainee attributes, training design and social support in the workplace as influences on two conditions of transfer, known as transfer maintenance and transfer generalisation. Baldwin and Ford argue that transfer of training depends on the interaction of individual attributes, social support in the work-environment, and training transfer design. Their model has since been improved upon by subsequent models (Holton, 2005). The current study proposes crucial influencing factors in the transfer process of ES training by combining elements from transfer, e-learning and IS literature, as discussed in sections 2.5–2.8

2.3.3. Dual Dimensionality of Training Transfer

The two dimensions of transfer are far transfer and near transfer (Laker, 1990). Far transfer is defined as the application of learning to situations similar to those in which the initial learning has taken place; far transfer is the application of learning to situations dissimilar to those of the original learning events (Laker, 1990). Far transfer indicates that the learned knowledge is applied in dissimilar working situations, whereas near transfer refers to working situations which are similar to the training programme. Near transfer may occur when the practical relevance of the training content is the focus of such training. Training that is targeted at near transfer concentrates on training content that replicates the actual job role. The training activities in near transfer training are practical situations that learners will encounter on the job. Teaching of relevant content similar to the actual job enhances transfer motivation and facilitates a high level of transfer on the job.

Similar dimensions of transfer are referred to as short-term near transfer and long-term far transfer (Holton & Baldwin, 2003). Short-term near transfer refers to situations where end-users apply skills immediately to work performance, according to the training content. Long-term far transfer involves continual use, generalisation and adaptation of learning into a variety of work tasks. The evaluation of transfer after end-users have had the opportunity to use their skills in a task environment has been suggested (Kirkpatrick, 2006).

2.3.4. Models of Training Transfer

While there are several models of training transfer, Baldwin and Ford's (1988) training transfer model is the dominant one. Based on the evidence from the literature, it is concluded that no one element leads to transfer; training transfer is a process which entails the interaction of internal and external variables and events prior, during and after the training (Baldwin & Ford, 1988).

Baldwin and Ford (1988) reviewed previous studies on transfer and proposed a new framework. The model describes transfer process in terms of training-input factors, training outcomes, and conditions of transfer. The model proposes that the transfer process must meet certain conditions, which are the generalisation of the materials learned in the training to the job context and the maintenance of the learned skills in the job environment. This emphasises continued training transfer and the importance of generalisation and maintenance of training. Generalisation of training refers to "a trainee's ability to apply learned capabilities (verbal knowledge, motor skills, etc.) to on-the-job work problems and situations that are similar but not completely identical to those problems and situations encountered in the learning environment" (Noe, 2002, p. 5).

Baldwin and Ford's (1988) model identifies factors that affect transfer as trainee characteristics, training designs, and work environment. The interaction of these variables leads to learned behaviours or learning outcomes which result in transfer conditions of generalisation and maintenance of skills in the task context. The model classifies ability, personality and motivational factors as individual characteristics important in achieving positive transfer. The training design factors include learning principles, sequencing, and training content.

Lastly, work-environmental factors incorporate support variables in the workplace and opportunities available for the use of learned skills in a task environment. Decreases in the use of learned skills on the job could be a result of skill decrement over time or could be a result of decreased motivation to use the skills due to constraints in the work environment Baldwin and Ford's (1988) model argues that training input is both directly and indirectly linked to training output and transfer. The transfer process is explained below:

- Training input variables (individual characteristics, training design and work environment) can directly influence both learning and the motivation to learn. The essence of training participation is skills, learning, and changes in behaviour improvement in on-the-job-performance (Wang & Wilcox, 2006).

It is expected that end-users learn the training programme, particularly the content. Thus, it is argued that the learning output is a predictor of training transfer. The content of the training enables the acquisition of necessary skills and behaviours on the job. It is therefore logical to claim that training outcomes affect skills transference in the work environment.

Baldwin and Ford's (1988) model further argues that the combination of training inputs affects transfer directly, regardless of the learning outcome. This argument finds support in the interaction of the three phases of the transfer model. The situation at work and the situation of the individual can facilitate or incapacitate skills utilisation even though learning has taken place.

As noted above, Baldwin and Ford's (1988) model has become a springboard for subsequent transfer models. A more complex conceptualisation of the transfer process was developed by Holton, Bates, & Rouna, (2000) in extending Baldwin and Ford's (1988) model. Holton et al.'s (2000) comprehensive learning system transfer inventory (LSTI) is a systemic approach of understanding transfer process. This model is an inventory of all variables purported to affect training transfer. LSTI is a multidimensional tool which comprises all training, personality, and organisation-related factors such as learning and transfer motivation, personality variables, social influence (peer and supervisor), transfer design, and a positive climatic condition for the use of skills and behavioural outcomes in the task environment.

Holton (2005) extended this initial model by the inclusion of several other constructs. The inclusion of these constructs adds to the understanding of the complex process of training transfer. His model explains the determinants of three outcomes which are important in the transfer process; that is, learning, individual performance, and organisational performance. The extended LSTI model specifies personality traits, organisational commitment, and job involvement as secondary influences on transfer. The motivational factors included in the model are: goal orientation, motivation to learn, motivation to transfer, transfer effort-performance, performance outcomes, and expected utility. The environmental factors highlighted as influences on learning, individual performance, and organisational performance includes perceptions, feedback, peer support, supervisor support, and sanctions. Lastly, this model also indicates that ability plays an important role in learning, individual performance, and organisational performance. For instance, learning ability affects learnability, and personal ability or capacity to transfer subsequently affects individual performance. It is clear from this model that motivational and environmental factors, which represent transfer in the framework, are important predictors of individual performance.

The LSTI model is an inventory of variables that can predict transfer (as represented by individual performance) in the model. LSTI is a useful systematic method of explaining training transfer, especially the variables that affect the transfer process.

The LSTI model explains individual performance as an interaction of variables associated with motivations, transfer environment, and training design. Based on this, the model incorporates personality, training, and organisational factors and argues that these factors all affect transfer.

An additional transfer framework that has tremendously influenced transfer studies is the framework propounded by Facteau, Dobbins, Russell, Ladd & Kidisch (1995). The framework examined the extent to which employees' attitudes and perceptions about training affects training motivation, and their perceptions of the extent to which they are able to transfer training back to their job (Facteua et al.1995).

This framework placed training motivation as a central factor and a precursor of training transfer. It specifies individual attitudes, training attitudes and social support as influences on perceived training transfer. The individual factors tested in this framework are, career planning, career exploration, and organisational commitment. It also examined the situational variables with task constraints, subordinate support, supervisor support, peer support, and top management support. The model concludes that individual attitudes, situational cues and task constraints affect the use of skills learned on the job.

Chiaburu and Marinova's (2005) model examines individual and organisational contextual factors that affect transfer in the workplace. Their model incorporates situational, contextual and individual predictors in their assessment of proximal (pre-training) and distal (skills transfer) training outcomes. This model argues that prior research is ambiguous concerning the influence of organisational support on transfer. The authors divide organisational support into peer and supervisory supports. The individual variables in the transfer model are self-efficacy and goal orientation.

Though goal orientation has been investigated by several researchers, most investigations are focused on either the dual typology that conceptualises goals as mastery- and performance–oriented, or the mastery, performance-approach, and performance-avoidance triad (Chiaburu & Marinova, 2005). This model operationalised a complex 2 × 2 goal orientation framework. It is argued that the 2 × 2 goal orientation framework is especially important in understanding training motivation, given the prior research result on the differential influence of goal orientation on training outcomes. Several training transfer models have examined different predictors of transfer in different training contexts (Chiaburu & Marinova, 2005; Chiaburu & Lindsay 2008, Noe, 1993; Baldwin & Ford, 1988, Liebermann & Hoffmann, 2008).

The current study is an analysis of end-users' transfer of skills in the ES. The scope of this study fits the ES training transfer context. Elements of formative training evaluation are not included in this study. The next section outlines the theoretical frameworks that have been used in transfer research and closely related theory in IS.

2.3.5.Training Transfer: The Role of Training Motivation

Training motivation signifies the degree of intensity and persistence of effort that trainees apply in a learning-oriented activity (Burke & Hutchins, 2007). Persistence covers the time before the training, during the training, and after the training (persistence in using learning during a task). Training motivation consists of users' pre-training activities, activities engaged in during the training, and the demonstration of this motivational process in tasks. The utilisation of skills learned on the system is an appropriate target outcome of post-training motivation. It has been argued that users who have high motivation in training become more attentive and absorb more training content and materials. Essentially, motivated users have a higher propensity to score high in post-training tests (Chiaburu & Tekleab, 2005). Motivation guides the way people act and react in the pursuit of goals. It can also be regarded as a process of end-users' allocation of resources in task assignments. In this context, it consists of activities such as paying attention and deciding on how to utilise acquired skills in the work environment (Scaduto et al., 2008).

Training motivation is also interpreted in terms of intentions and the decision to activate behaviour. It is a decisional process involving the allocation of mental and physical energy in the attainment of a goal. Consequently, a motivated user is more attentive, engages well, and absorbs more in episodic training environments. Training motivation increases performance through the belief that effort during training will yield growth of skills. This leads to an amplified persistence of effort. Essentially, the motivating force behind a specific choice originates mainly from the perception of the valence surrounding the choice (Vroom, 1964).

End-users who are more motivated to learn are more likely to exhibit better transfer (Brume et al. 2010). Evidence from the literature suggests that training motivation is associated with performance, especially when learning is instrumental to post-training performance (Robey et al., 2000; Scaduto et al., 2008). This indicates that the degree of end-users' motivation in the learning context affects the success of the learning activity.

Therefore, end-users' training motivation is important in both the learning-oriented environment and task-performance environment. In fact, motivated individuals have a greater propensity to learn, to achieve high scores in post-training tests, and to derive benefit for the future (Chiaburu & Tekleab, 2005).

Training motivation is seen as a key element and one of the possible mechanisms through which end-users' predictors operate on skill transfer (Chiaburu & Marinova, 2005; Noe & Schmitt, 1986). It may be difficult to learn effectively without motivation, and it may be equally difficult to transfer knowledge when effective learning has not taken place. This suggests that motivation can influence end-users to transfer what they learn in the programme onto the job (Baldwin & Ford, 1988). Subsequent empirical research has demonstrated the centrality of training motivation in the understanding of the transfer process (Colquitt et al., 2000). Training motivation is a vital constituent that connects the training situation to the transfer process and adds to the understanding of end-users' psychological and cognitive engagement in training.

The predictors of training motivation in management and leadership training settings include but are not limited to self-efficacy, mastery orientation, peer and supervisor support (Smith, Jayasuriya, Caputi, & Hammer, 2008; Chiaburu & Lindsay, 2008; Tannenbaum et al., 1991; Chiaburu & Marinova, 2005). While the literature highlights the importance of end-users' motivation and its influence on learning and task performance episodes, there has been less focus on this concept in IS training literature. In fact, most of the IS training literature seems to place less emphasis on end-users' training and transfer motivation. Hence, there is a need to highlight its central role in the training transfer process, as has been done in this study.

2.4. Expectancy Theory, Theory of Planned Behaviour (TPB) and the Decomposed Theory of Planned Behaviour (DTPB)

Transfer research has been widely conducted in management- and psychology-based studies. While end-user training is popular in IS, the focus has largely been on the formative evaluation of training and method of training and it is interesting to note that transfer research is relatively new in IS. Little is known about the suitability of transfer theories in the IS training context, though the theories have accumulated valid empirical evidence in related studies.

2.4.1. Expectancy Theory

Valence-instrumentality-expectancy (Vroom, 1964), also referred to as expectancy theory, remains a commonly used theoretical framework in research that examines training effectiveness (Smith et al., 2008). The core argument of expectancy theory in its classical form is that the force of motivation behind any behaviour is a function of valence-instrumentality and expectancy. In other words, the expectancy theory posits that human behaviour results from the interaction of the individual and the environment in the context of a specific situation, and that individual develop beliefs about the probability of various possible outcomes of their behaviours, preferring some outcomes over others (Howard, 1989).

Simply put, expectancy theory operates under three basic underlying principles: (a) anticipation of a reward activates individual behaviour' (b) perceived value of various outcomes gives direction to individual behaviour; and (c) connection develops between behaviour and outcome expectancy. It is discernible from the theory that the motivational process is a product of expectancy; that is, it is an expected outcome of behaviour. The theory suggests that motivation is shaped by the expectation that an act will be followed by a certain outcome (expectancy) and by the valence and desirability of that result (Smith et al., 2008).

In the training context, when end-users expect that effort expenditure will result in valence (valued outcome), they are motivated to learn the training material in training sessions, resulting in higher motivation to learn (Colquitt et al., 2000). The practical insight from this theory is that training leads to better performance, while performance will facilitate recognition in terms of promotion and pay. Evidence of the dominance of expectancy theory can be seen in it use in training transfer studies (Colquitt et al., 2000; Smith et al., 2008).

Research has confirmed that the expectancy basis of the theory supports motivation while the individual elements of the theory have been inconsistent in empirical findings (Howard, 1989). The reason for this is the inability to explain the complex relationship between the expectancy variables and other variables such as a rewards system or explanations often not being comprehensive enough. According to the theory, individuals will make an effort to reach a certain performance level, if there is the expectation of a reward; therefore it can be concluded that if there is no availability of valued reward, motivation is unlikely to occur. The emphasis of the theory seems to be the reward systems.

Valence is defined as affective orientations towards a particular outcome (Vroom, 1995), that is, value attached to an outcome. What constitutes valued rewards differs with different personalities; while some prefer intrinsic others will favour extrinsic rewards and there is discrepancy on what constitutes desired outcomes and actual satisfaction. This adds to the complexity of the use of reward as motivating factor. The basic components of expectancy theory (valence, instrumentality and expectancy) are not included in this research.

2.4.2. Theory of Planned Behaviour (TPB)

The theory of planned behaviour (Ajzen, 1991) is a theoretical operationalisation of attitude, subjective norms, and perceived behavioural control (PBC) in the explanation of human behavioural motivations. TPB argues that human motivation is a combination of attitude, subjective norms, and behavioural control. Thus, the activation of behaviour is a dictate of one's attitude, which reflects the favourable or unfavourable feelings towards such behaviour (Taylor and Todd, 1995).

Attitudinal disposition enhances the likelihood and strength of enacting a particular behaviour. Empirical evidence validates attitude as a predictor of behavioural performance (Hsu & Huang, 2012; Pavlou, Liang, & Xue, 2007). Though attitude is not enough to activate behaviour, it acts in concert with subjective norms and PBC.

Subjective norms are significant referents desiring the performance or non-performance of the behaviour. The dimension of subjective norms or social factors is the deepest level where the culture of conformity operates through social interactions. Existing studies aver that subjective norms predict behaviours (Chiaburu & Marinova, 2005; Hsu & Huang, 2012; Taylor & Todd, 1995).

PBC predictors consist of perceptions of internal or external constraints or resources which influence behavioural performance (Ajzen, 1991). The efficacy of TPB is evident in its wide application in the IS and training transfer literature (Al-Eisa, Furayyan, & Alhemoud, 2009; Hurtz & Williams, 2009; Hsu & Huang, 2012; Pavlou et al., 2007). Despite the wide acceptance of TPB, the relationships between the determinants of behavioural intention are not particularly well understood (Taylor & Todd, 1995). The authors further argued that the belief structures are aggregated into a unidimensional construct, and this may become difficult to operationalise empirically.

2.4.3. Decomposed Theory of Planned Behaviour (DTPB)

Decomposed theory of planned behaviour (Taylor & Todd, 1995) emerged from TPB (Ajzen, 1991). The criticisms concerning what constitutes the antecedents of attitude led to the emergence of DTPB as an approach for understanding the antecedents of attitude, subjective norms, and PBC. The efficacy of DTPB has been demonstrated in several studies (Pavlou & Fygenson, 2006; Taylor & Todd, 1995; Chau & Hu, 2001).

DTPB is considered a superior framework in the prediction of end-users' behaviours in ISs (Taylor & Todd, 1995) and is based on a multidimensional conceptualisation of belief systems. The theory draws from previous theories, such as the technology acceptance model (Davis, 1989), innovation diffusion theory (Rogers, 1995) and TPB (Ajzen, 1991). Based on the rich background provided by these theories, the three antecedents of behaviour (attitude, subjective norms, and perceived behavioural control) were decomposed to provide meaningful and powerful explanations of the determinants of behaviours.

Taylor and Todd (1995) observed that a monolithic conceptualisation of attitude is unsuitable because a belief structure may reflect a variety of underlying assumptions which obscure its relationship to attitude. The authors argue that normative belief constructs based on the divergent opinions of a group may impact on the formation of behaviours. The authors maintain that the differing and divergent influences of these groups may be unsupported and unrelated to monolithic conceptualisation. They conclude that decomposing normative beliefs according to divergent and referent groups is rational.

The influence of PBC was seen as a multidimensional construct in TPB, and accepting Ajzen's (1991) operationalisation is considered erroneous by Taylor and Todd (1995). They further argued that PBC consists of internal and external variables which can perform the role of either barriers or facilitators of behavioural performance. Also, the nature of the facilitating conditions features both resources and technological factors. It seems logical to clarify the line of division between the two. Identifying the internal human/resources constraints and external constraints in terms of technological fit and environmental barriers towards the formation of behavioural intention and performance is essential.

DTPB allows the decomposition of all the dimensions in the model. DTPB emerged from the IS context and has been used in research on IS usage and acceptance behaviour (Pavlou & Fygenson, 2006; Taylor & Todd, 1995; Chau & Hu, 2001). This may also explain why

some of the constructs are not easily adaptable in certain research context and the need to supplement them. For instance, DTPB may not be suitable for operationalising traits like goal orientation, which is an important self-regulation construct in psychological processing and the learning of tasks.

2.5. Review of Prior Theories and Models

A review of the core issues in the existing research models (Baldwin & Ford, 1988; Colquitt et al., 2000; Chiaburu & Marinova, 2005; Noe, 1986, Burke & Hutchins, 2007; Gupta & Bostrom, 2006; Bostrom et al. 1990; Alavi et al., 2001; Lim, Lee, & Nam, 2007) assists in framing this study. Baldwin and Ford's (1988) comprehensive transfer framework proposed enhancing strategies for tackling transfer problems in organisations. This framework is anchored on three distinct factors: individual characteristics, training designs, and available support in the work environment. The model posits that effective transfer depends on the presence of individual variables such as ability, personality, and motivational factors. It also classifies learning principles, sequencing, and training content as training design factors, while social support in the transfer environment includes workplace environmental factors.

Holton et al.'s (2000) LSTI approach to the transfer process expanded the variables in Baldwin and Ford's (1988) model. LSTI describes 16 factors in the person, training and organisation that affect the use of learning in job performance. All these factors are classified under four headings: individual, motivation, work environment, and ability factors. The individual factors are readiness and self-efficacy. The motivational factors include: motivation to transfer, transfer effort–performance expectation and performance-outcomes expectations.

The work environment factors include feedback/performance coaching, supervisor support and sanctions, peer support openness to change, personal outcomes-positive, and personal outcomes-negative. The ability factors are the opportunity to use learning, personal capacity for transfer, perceived content validity, and transfer design. Chiaburu and Marinova (2005) assessed the influence of both individual and organisational contextual factors on transfer. Their model operationalises peer and supervisory supports as dimensions of organisational support in the understanding of the transfer process. Self-efficacy and 2 × 2 goal orientation were framed as individual variables.

Related IS studies that contribute to the framing of this study argue that the target system, training method, and individual differences affect learning (skills, attitudes and behaviour) (Bostrom et al., 1990). Alavi and Leidner (2001) proposed a relationship among technology capabilities, instructional strategies, and psychological processes for e-learning outcomes. Likewise, Johnson et al. (2009) tested the relationship among technology (perceptions) characteristics (reliability, social presence, and media synchronicity), trainee characteristics, and end-users' metacognitive activity in an e-learning setting. Boudreau's (2003) study on learning how to use ERP technology confirmed that the quality and technology features affect learning in this terrain. The quality of the systems interface should not be burdensome. The investigation proposed voluntariness, PEOU, perceived experience, perceived system quality and perceived dependence as antecedents of ERP learning. To validate training effectiveness in an e-learning environment, Lim et al. (2007) configured the predictors of transfer as a combination of trainees' characteristics (motivation, CSE), training content, communication between traininer and trainee, ease-of-use, and environment (support received by trainees) of the organisation.

Although the reviewed models add to the understanding of training in this terrain, they do not adequately manifest the determinants of transfer in IS. None of the models explicitly address the contemporary training transfer issues in IS such as ES. Firstly, the models were not focused on learning a new technology like the ES; rather their attentions were on soft skills training transfer; that is, leadership and management skills (Chiaburu & Marinova, 2005; Gilpin-Jackson, 2007), while this study is concerned with the transfer of hard skills that involve working with equipment and software (Laker & Powell, 2011).

Secondly, the components in the previous transfer models were not explicitly suitable as a framework for the transfer of skills in IS. The research was not framed for IS settings, and also did not consider technology characteristics and variables in the IS context. Also the e-learning frameworks were focused on e-learning outcomes: even the e-learning environment differs from the ES training environment.

This study expands on existing models by developing a framework for ES training transfer. This framework suggests that end-users' characteristics, technology characteristics, and social factors all facilitate training transfer. The individual variables in this research framework are: CSE, MO, PEOU, and training motivation. The success of a training programme depends not only on the training design (Baldwin & Ford, 1988). Achieving maximum training effectiveness also depends on the available social factors such as

organisational support, which indicates a favourable transfer climate (Lim et al., 2007). The social factors deal with the impact of peer and supervisor support in influencing transfer in this study.

The centrality of technology to ES training cannot be ignored in the development of a suitable framework in this area. It is important that the system features support the ES learning environment.

Functionality and reliability in technology lead to higher expectations and positive perceptions from end-users (Johnson et al., 2009). This study includes technology characteristics as training design factors since good technology features affect cognitive processes and learning outcomes (Alavi & Leidner, 2001). End-users' favourable perceptions of the task environment influence the learning motivation and transfer in the work setting. The task component of a favourable environment (Noe, 1986) refers to the extent to which perceived available "technological necessities" determine the extent to which knowledge and skills acquired in training will be either used or constrained in the transfer setting. The presence of such enablers or resources in the training environment is important as they convey a realistic training environment (Grossman & Salas, 2011).

An investigation of the influence of technology design features on transfer is scarce (Gilpin- Jackson, 2007). Drawing from human–computer interaction and other relevant e-learning and transfer research (Johnson et al., 2009; Noe, 1986; Choi et al., 2007; Cho et al., 2009; Koh, Gunasekaran, Cooper, 2009; Boudreau, 2003; Gilpin-Jackson, 2007), SI as a technology characteristic is included as an important aspect of a target system (Bostrom et al., 1990). SI is important in ISs as a central component of a technology which facilitates human–computer interaction (Choi et al., 2007) and the acceptance or rejection of a technology (Koh et al., 2009; Mouakket, 2010).

2.6. End-users' Attitudes and Attributes

Baldwin and Ford (1988) concluded that end-users' attributes are significant precursors of transfer. End-users' characteristics include aspects such as attitudes/perceptions, motivation demographics, aptitude, and personality factors. Subsequent studies have extended Baldwin and Ford's transfer framework by analysing end-users' attributes. These transfer and IS studies have identified several end-users' attributes as influences on training effectiveness. For instance, CSE has been identified (Compeau & Higgins, 1995; Gist & Mitchell, 1992; Garavan et al., 2010; Igbaria & Iivari, 1995; Lim et al., 2007; Martocchio &

Judge, 1997; Machin & Fogarty, 2003) as well as training motivation (Robey et al., 2000; Scaduto et al., 2008; Colquitt et al. 2000), MO (Gravill & Compeau, 2003, Santhanam et al., 2008; Yi & Hwang, 3003), and PEOU (Davis, 1989; Bradley & Lee, 2007; Yi & Davis, 2001; Bedard et al., 2003; Davis & Yi, 2004; Amoako-Gyampah & Salam, 2004; Mouakket, 2010). In this study CSE, MO, PEOU, and training motivation are modelled to predict training transfer, as discussed in the following subsections.

2.6.1. Computer Self Efficacy (CSE)

Self-efficacy is the belief of an individual in one's capability to perform in task situations. Self-efficacy is defined as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances (Bandura, 1986). It describes perceived performance capabilities for a specific activity (Kraiger et al., 1993). This clarification indicates that self-efficacy is not the skills one possesses but the judgements of what one can do with the skills one possesses. Embedded in this definition is the perceptual judgment and optimism of an individual to effectively carry out a course of action. Self-efficacy represents a motivational determinant of an individual in the task domain.

Increasingly, self-efficacy has attracted attention from researchers across many disciplines (Al-Eisa et al., 2009; Chiaburu & Lindsay, 2008; Chiaburu & Marinova, 2005; Compeau & Higgins, 1995; Garavan et al., 2010; Igbaria & Iivari, 1995; Machin & Fogarty, 2003; Machin & Fogarty, 2004; Tai, 2006). In this study, CSE, or self-efficacy in the IS domain, is a relevant and important user characteristic. CSE refers to the perception of personal ability to use the computer in the accomplishment of a task (Compeau & Higgins, 1995).

This construct has been well tested in many IS studies and in different task performance domains. It has been empirically demonstrated that CSE leads to learning performance (Lim et al., 2007). Compeau and Higgins (1995) validate CSE perception as a significant predictor of computer usage. Several empirical studies have found CSE to be significantly related to system learning and usage in both the e-learning computer and software training environment (Garavan et al., 2010; Igbaria & Iivari, 1995; Martocchio & Judge, 1997; Mouakket, 2010) and overall learning performance (Lim et al., 2007). Chiaburu and Lindsay (2008) showed level of efficacy is an antecedent of motivation to learn. The inference from this stream of research is that self-efficacy affects performance across domains, including the computer environment. In addition, evidence from transfer literature suggests that self-

efficacy is positively associated with transfer intention (Al-Eisa et al., 2009; Machin & Fogarty, 2003).

Overall, empirical findings portray self-efficacy as an important prerequisite for performance. Although the literature is inundated with positive findings on self-efficacy, there are contradicting reports on perceived significant relationships (Chiaburu & Marinova, 2005; Lim et al., 2007; Vancouver & Kendall, 2006).

Some studies suggest an indirect relationship between self-efficacy and training transfer (Chiaburu & Marinova, 2005; Lim et al., 2007). It is argued that the relationship of self-efficacy and training transfer is mediated by training motivation and learning performance. Chiaburu and Marinova (2005) concluded that self-efficacy relates to training motivation and not training transfer. So when training motivation and learning performance fail to occur, self-efficacy perhaps becomes irrelevant in the task domain (Chiaburu & Marinova, 2005; Lim et al., 2007). Based on this, self-efficacy affects training transfer by interacting with training motivation and learning performance.

The mixed findings from these research investigations lead to an inconclusive position on the influence of self-efficacy in the domain of transfer. This calls for an in-depth investigation of the influence of self-efficacy on workplace behaviours. One important issue that might contribute to the mixed findings is the operationalisation of self-efficacy in different contexts. The discussion appears inconclusive, because most of the studies have taken place in a non-complex technology training environment. Therefore, validating and clarifying the role of self-efficacy in the ES work environment will add to the understanding of its role on end-users' transfer in that environment.

2.6.2. Mastery Orientation (MO)

An area of motivation in the task domain that has attracted research attention is the importance of patterns of goal orientation. The concept of goal orientation emerged out of research in educational settings. Goal orientation refers to adaptive or maladaptive cognitive patterns, developed over time, that affect developmental and performance behaviours in cognitive and other tasks (Dweck, 1986). It is a frame of mind that governs motivations and goal attainment. Goal orientation guides the pursuit of goals during events and activities. The main classifications of goal orientation as originally conceptualised are MO and performance goal orientation.

MO refers to an individual's quest for knowledge, development of new skills, understanding of tasks, and successful achievement of a reference standard for the mastery of learning objectives (Ford, Smith, Weissbein, & Gully, 1998). MO is a motivational process, based on an incremental tendency and the quest for the acquisition of skills as paths towards desired competencies. MO types are individuals who possess an exceptional desire for the acquisition of skills and the attainment of levels of competency. In learning environments, MO types are highly motivated to learn new knowledge and skills as a path towards improved performance. According to research, the MO pattern is characterised by mastery of skills and knowledge associated with goals achievement (Dweck, 1986). This describes the adaptive behaviour of MO types. This orientation involves the setting of difficult and more challenging goals for achievement. MO types are associated with increased productivity and effective performance in metacognitive activities (Ford et al., 1998).

Conversely, the performance goal orientation pattern is characterised by the belief that ability is fixed and uncontrollable (Button & Mathieu, 1996). Performance-oriented types avoid challenging situations and circumstances that demand skills accountability. This orientation type suggests that ability is not subject to alteration from its permanent state, and so ability is unmalleable even through training. In addition, performance-oriented types avoid challenging situations because of the fear of failure and subsequent sanctions. Rather, they focus on the use of previous skills and the setting of goals that present little challenge and opportunity for growth but lead to target outcomes of positive appraisal (Button & Mathieu, 1996; Salas & Cannon-Bowers, 2001). This frame of mind is diametrically opposed to the MO characteristics of malleability and adaptability. This study examines MO in view of its strong motivational influence on the development of skills in complex training situations (Gravill & Compeau, 2003; Santhanam et al., 2008).

Essentially, MO enhances self-regulated strategies, coordination and planning in the learning process and the desire to learn more (Gravill & Compeau, 2003; Yi & Hwang, 2003). MO is particularly important because of its motivational impacts on the development and use of skills in task situations. It has a central importance in this study because ES involves the learning of tasks associated with complex and challenging systems. Presumably, MO end-users adjust well in learning new and complex technologies like ES. Moreover, the literature has maintains that MO types have greater tendencies to learn.

This type of person self-regulates and desires to learn as much as they can (Gravill & Compeau, 2003; Yi & Hwang, 2003). MO individuals perceive and accept challenges as components of the learning process (Chiaburu & Marinova, 2005).

Previous research studies confirm that MO influences task performance across many domains (Maurer & Martocchio, 2008; Bell & Kozlowski, 2002; Chiaburu & Marinova, 2005; Santhanam et al., 2008; Gravill & Compeau, 2003; Yi & Hwang, 2003). MO types engage in coordinated planning activities with positive effects on task performance (Bell & Kowslowski, 2002; VandeWalle, 1997).

In related research, MO individuals have been shown to effectively transfer what has been learned from training into the work environment (Chiaburu & Marinova, 2005). Evidence from the literature on computer software training confirms that MO leads to the development of the perception of self-efficacy in the learning of difficult tasks (Gravill & Compeau, 2003). The perceptual confidence in ability constitutes a source of motivation when faced with difficult learning situations. This opinion suggests that challenging tasks become an opportunity to build competencies (Yi & Hwang, 2003).

Research has also affirmed that individualism–collectivism cultural variability moderates the influence of MO on training outcomes (Rogers & Spitzmueller, 2009). Individualism and collectivism are delineated as independent versus interdependent self-construals. Extensive evidence from research suggests that MO types experience better attitudes, higher motivation to learn, and positive transfer of learned skills in the performance of tasks (Dierdorff, Surface, & Brown, 2010; Gegenfurtner, Festner, Gallenberger, Lehtinen, & Gruber, 2009).

Despite the positive influence of MO, some studies oppose this position. For instance, some research indicates that MO relates both directly and indirectly to transfer (Bell & Kowslowski, 2002; Chiaburu & Marinova, 2005). Equally surprising is the assertion that MO affects skills transfer only when an individual's self-efficacy is high. Thus, the absence of self-efficacy leads to minimal influence of MO on training transfer (Bell & Kowslowski, 2002). The findings also suggest a complex mechanism of interaction between self-efficacy and MO (Bell & Kowslowski, 2002), contradicting opinions that self-efficacy is a component of MO (Gravill & Compeau, 2003; Santhanam et al., 2008; Yi & Hwang, 2003). The indirect relationship between MO and training transfer needs further investigation (Chiaburu & Marinova, 2005).

Regardless of these contradictory findings, empirical results show that MO response patterns consist of effort and persistence and are solution-oriented with the aim of transforming motivational force into behavioural performance (Brett & VandeWalle, 1999). Largely, the learning engagement and self-regulatory actions, strategies and planning capabilities of mastery oriented individuals in the pursuit of goals are yet to be rebutted. Goal orientation as individual difference in the learning environment is important to IS learning, because of the continual skills upgrade that is a constant occurrence in this terrain.

The dearth of knowledge on the influence of MO on training transfer in the ES might be due to the fact that transfer studies have concentrated on management training for a long time.

2.6.3. Perceived Ease-Of-Use (PEOU)

PEOU is a central construct of the technology acceptance model (Davis, 1989). It is the degree to which a person believes that using a system will be free of effort. PEOU can be linked to a user-friendly system. It also connotes a system which is devoid of complex manoeuvrings and difficult mental tasks.

PEOU, positive attitudes, and users' perception of system usability are outcomes of training (Amoako-Gyampah & Salam, 2004; Bedard et al., 2003; Yi & Davis, 2003). ES training allows end-users to interact with the system or its prototype through the testing of varieties of insinuation about the system (Amoako-Gyampah & Salam, 2004). The interaction leads to an assortment of reactions, including increased confidence, PEOU, and the perceived system usage benefits. Training reactions are also extended to the reduction of users' anxiety, ostensibly due to the development of self-efficacy.

Moreover, the opportunity to become familiarised with a system's features in the training environment in turn affects exploratory behaviours (Amoako-Gyampah & Salam, 2004; Compeau & Higgins, 1995; Igbaria & Iivari, 1995). PEOU as a training reaction outcome (Amoako-Gyampah & Salam, 2004; Marler et al., 2006) affects end-users' performance. Empirical findings indicate a positive relationship between PEOU and behavioural intentions in the ERP environment (Marler et al., 2006).

Previous studies posit strong relationships between PEOU and system usability, use intention, and behavioural performance (Bedard et al., 2003; Bueno & Salmeron, 2008; Marler et al., 2006; Park & Wentling, 2007; Wu & Hwang, 2010). For instance, there is evidence that PEOU significantly predicts e-learning system usability (Wu & Hwang, 2010).

The assessment of PEOU on system usability in an asynchronous transfer environment finds parallels in previous studies. Three dimensions of perception of usability – satisfaction, learnability and efficiency – have a statistical significance with frequency and breadth of transfer (Park & Wentling, 2007). Park and Wentling (2007) further shows that the perception of usability accounts for a significant portion of variance in overall transfer.

Evidence from several research studies is consistent on the relationship between PEOU and ES utilisation (Mouakket, 2010) and users' computer organisational commitment and outcome expectancy (Stone & Henry, 2003). In fact, research has found that the perceived usefulness of an ERP system depends on the PEOU (Bueno & Salmeron, 2008). Although there are a great number of studies on the positive influence of PEOU in the IS terrain, the role of PEOU in behavioural performance in IS remains controversial (Bedard et al., 2003). The influence of PEOU on transfer therefore needs more attention.

The accounts in the literature aver that training helps the development of PEOU. It is equally clear that PEOU predicts performance attitudes in IS. Nevertheless, the influence of PEOU as a predictor of training transfer remains an uncharted region in transfer literature. This neglect limits knowledge concerning the influence of this important factor. The controversy concerns how PEOU translates and functions as a predictor of transfer in ES. According to the training evaluation taxonomy (Kirkpatrick, 1998), reaction outcomes enhance the reproduction of training contents, attitude and behaviour in transfer situations. The evaluation aspect of this study focuses on the influence of PEOU as a determinant of performance. This theoretical lens adds to the understanding of ES implementation success from the IS perspective.

In summary, empirical evidence affirms a significant relationship between PEOU and IS usage. The literature reveals that the perception of system usability affects the breadth of transfer and system utilisation (Mouakket, 2010; Park & Wentling, 2007). PEOU also influences end-users' commitment to use a computer to realise outcome expectancy (Stone & Henry, 2003). From this premise, when there is PEOU concerning the system, the system is seen as useful (Bueno & Salmeron, 2008) and PEOU triggers positive transfer.

2.6.4. Training Motivation

End-users' training motivation is an essential personal characteristic in the learning and training process. It is a precondition for learning in the process of achieving training effectiveness (Calvert, 2006; Robey et al., 2000; Scaduto et al., 2008).

Training motivation leads to cognitive learning outcomes and the knowledge gained affects training transfer (Kraiger et al. 1993). Also, training motivation helps in the transfer of skills, since training is only effective when end-users utilise learned skills in a task environment. End-users' training motivation leads to efforts which result in applicable skills on the job; the application of the skills brings about expected performance outputs.

End-users' belief that effort during training will yield increased knowledge and skills leads to more effort in training (Vroom, 1964). The motivation behind choices enhances the achievement of better outcomes. Similarly, highly motivated users see training as a means of achieving future benefits (Chiaburu & Tekleab, 2005). Training motivation enhances eventual transfer because motivated end-users seek out opportunity to transfer the skills on the job.

The components of training motivation are (1) the motivation to learn and (2) the motivation to transfer. Both have been the focus of several studies in recent years (Chiaburu & Marinova, 2005; Klein, Noe, & Wang, 2006; Smith et al., 2008) and both have been modelled as influential precursors of training effectiveness. The motivation to learn is the degree to which an employee desires to learn and master the contents of a training programme (Noe, 1986). The motivation to learn affects users' motivation to perform in the training environment and spills over to affect end-users' transfer. On the other hand, the motivation to transfer provides a proactive component needed for actual transfer (Chiaburu & Lindsay, 2008). However, transfer motivation provides less information on motivational reactions in the training environment.

There is a connection between the training environment and the post-training usability of skills in the ES environment. Therefore, training motivation occupies a central position because ES implementation is a complex process that requires extensive training as a prerequisite for successful implementation. Available empirical findings establish both a direct and mediated relationship between training motivation and training transfer in multiple studies (Garavan et al., 2010; Klein et al., 2006). Training transfer involves the setting of goals in a learning context through motivation to learn the objectives of the training (Chiaburu & Marinova, 2005). Research has also shown self-efficacy to be an important predictor of motivation to learn (Chiaburu & Lindsay, 2008; Tannenbaum et al., 1991).

The cumulative evidence affirms a positive relationship between training motivation to learn and training transfer. End-users with a high motivation to learn have a high propensity towards skills usability on the job. The preceding discussion suggests that training motivation is a central variable in the understanding of transfer mechanisms (Garavan et al., 2010; Chiaburu & Marinova, 2005).

Theoretically, motivation signifies the need for a positive and relevant attitude in facilitating transfer on the system. In the spirit of previous studies (Klein et al., 2006; Garavan et al., 2010; Chiaburu & Tekleab, 2005; Chiaburu & Marinova, 2005), this study posits that training motivation determines end-users' skills utilisation on the system. The literature also notes mixed results on the influence of training motivation in task performance (Chiaburu & Lindsay, 2008; Chiaburu & Tekleab, 2005). This study uncovers the pattern of influence of training motivation in this context as there is no prior investigation on this issue.

On the influence of end-users' characteristics on training outcomes, a few IS studies using computer-aided training and modelling approach are also limited (Compeau & Higgins, 1995; Gist, Stevens, & Rosen, 1989). Firstly, the computer-aided instruction and behaviour modelling was conducted in classroom settings (Gist et al., 1989). Secondly, the lecture instruction techniques and behaviour modelling used two software packages that are not as sophisticated as ES packages (Compeau & Higgins, 1995). This is a further confirmation that IS training research is yet to furnish a complete understanding of training transfer as a way of understanding IS training effectiveness. The review further revealed a lack of research on the impact of end-users' training motivation on transfer in this field. This central theme in IS learning needs more attention, for motivated learners are better learners, and better learners do better jobs through skill transfer.

2.7. Social Factors

Existing taxonomies of transfer models agree that the condition of transfer of skills on the job depends on the social support in the work environment (Baldwin & Ford, 1988). The influence of the work environment on transfer is a factor that should not be ignored because the extent to which the social context (supervisors and co-workers) of the work environment provides reinforcement for transfer is very important (Noe, 1986). Environmental favourability (Noe, 1986) was consequently coined to describe a favourable work environment. Other studies have described this phenomenon differently; for instance, it is referred to as transfer climate (Roullier & Goldstein, 1993; Tracey et al.,

1995); social support (Gilpin-Jackson, 2007), and organisational support (Chiaburu & Marinova, 2005).

The social factors that are investigated in most of the transfer studies are managerial or supervisor support, peer support (Chiaburu & Marinova, 2005; Santos & Stuart, 2003), social network (Tracey & Tews, 1995), adoption environment (Gilpin-Jackson, 2007), and situational context (Noe, 2002). Organisational transfer climates are situations and consequences that either inhibit or help to facilitate the transfer of what has been learned in training into the job situation (Roullier & Goldstein, 1993). Based on existing literature, two relevant social factors are included in this research framework: supervisor and peer support, which are discussed below.

2.7.1. Supervisory Support

Organisational factors have attracted a great deal of attention and this has influenced the robustness of the literature in this area (Amoako-Gyampah & Salam, 2004; Chiaburu & Marinova, 2005; Davenport, 2000; Dong et al., 2009; Ifinedo, 2008; Lim & Johnson, 2002; Nijman, Nijhof, Wognum, & Veldkamp, 2006; Saks & Belcourt, 2006; Tracey & Tews, 2005). Organisational support comprises practices, policy procedures, and favourable cues that affect workplace performance. The impacts of organisational support measured or operationalised as managerial, supervisory, and peer support are well studied in the literature (Chau & Hu, 2002; Chiaburu & Marinova, 2005; Ifinedo, 2008).

In IS, supervisory support refers to the direction, authority and resources provided by an organisation's manager during and after IS adoption (Ifinedo, 2008). Supervisory support in the training context involves discussion and feedback on the application of skills, encouragement, rewards, coaching, and creation of opportunities for the application of skills (Lim & Johnson, 2002; Burke & Hutchins, 2008).

Supervisory support exerts multidimensional effects on learners' acquisition and use of skills on the job (Nijman et al., 2006). It also entails discussions of trainees' application of learned skills, feedback and training content, training framing, coaching, and creating opportunities for skills application (Lim & Johnson, 2002; Burke & Hutchins, 2008; Tai, 2006). The importance of supervisory pre-training activities in terms of support accounts for about 24% of the variance in training transfer (Saks & Belcourt, 2006).

Supervisory support communicates positive perceptions concerning training intervention in reaching performance outcomes (Tracey & Tews, 2005). In the research the role of supervisory support in the achievement of performance transfer is seen to be crucial.

The importance of supervisory support as a critical success factor in ES adoption and training transfer has been emphasised (Calvert, 2006; Calvert & Seddon, 2006; Dong et al., 2009; Garavan et al. 2010). In ES adoption, management support and commitment sends signals of the importance of the projects to members of the organisation. The leader-member exchange (LMX) theory (Dansereau, Graen, & Haga, 1975) argues that the degree of support and exchange of resources of value between the leader and members impacts on both individual and organisational performances. LMX suggests that the high quality of this relationship between the leader and members improves performance (Kang & Stewart, 2007). Consequently, the importance of social context, specifically the relationship between a worker and his/her direct supervisor, enhances training effectiveness (Scaduto et al., 2008). LMX literature finds parallels in ES studies that identify the importance of top management as a critical factor of ES success (Dong et al., 2009).

Studies show that supervisory support enhances transfer (Colquitt et al., 2000). It has been empirically demonstrated that users' perceptions of managerial support for skills application correlate with transfer efforts (Lim & Johnson, 2002). This empirical evidence further articulates that the work environment factors related to supervisors are among the strongest factors influencing training transfer. This is corroborated by the finding that supervisory support is also instrumental in the effectiveness of peer support in the transfer environment (Hawley & Barnard, 2005).

Hawley and Barnard (2005) aver that the support of peers becomes ineffective if there is no supervisory support. This assertion also reinforces the influence of peers in the transfer environment. A case study in the ES implementation environment illuminates the magnitude of supervisory influence as follows: "When users found that they lacked the knowledge and skills to deal with their new tasks, they tended to ignore the formal technical channels and instead turned directly to their supervisors for help" (Dong et al., 2009, p. 65).

The influence of supervisory support has also generated some inconsistent conclusions in the literature. Some studies declare that supervisors do not exert much influence on skills transfer (Nijman et al., 2006; Chiaburu & Marinova, 2005; Awoniyi et al., 2002; Velada, Caetano, Michel, Lyons, & Kavanagh, 2007).

Examination of the influence of supervisors on training transfer sometimes finds a weak correlation between supervisory support and training transfer (Chiaburu & Marinova, 2005; Velada et al., 2007). Chiaburu and Marinova (2005) contend that focal organisations are usually characterised by less dependence on supervisory support; assistance with the use of skills shifts from supervisor to peer level. The study concludes that peer support is a more potent predictor of skills transfer than supervisory support.

The relationship between supervisory support and skills transference needs more clarification. The issue of a supportive mechanism in terms of supervisory support in the training context in controversial in the literature. Therefore, validation of the influence of supervisory support is needed. Precisely how supervisory support bolsters training effectiveness in ES remains unexplored. However, LMX indicates that positive exchange between managers and members is typically productive and this study explores this relationship, given the contradictory evidence in existing studies (Nijman et al., 2006; Chiaburu & Marinova, 2005; Awoniyi et al., 2002; Velada et al., 2007).

2.7.2. Peer Support

The impact of social support (subjective norm) on social behaviour has been recognised by Ajzen (1991). Subjective norm affect conformity behaviour among members of an organisation, through socialisation. Social information processing allows individuals as adaptive organisms to adapt attitudes, behaviours and beliefs to their social context. Individual behaviours can be learned by studying the informational and social environment within which the behaviours occur and to which they adapt (Salancik & Pfeffer, 1978). Studies indicate that actions and attitudes of others serve to facilitate the extent to which an individual engages in certain behaviour. The impact of social factors in terms of environmental and social factors on training transfer has been emphasised in the literature (Rogers & Spiztmueller, 2009; Chiaburu & Marinova, 2005).

Transfer research has overwhelmingly favoured some elements originating in the organisational setting, classified as environmental factors (Chiaburu & Marinova, 2005; Velada et al., 2007). An emergent concept that accounts for a broader view of organisational support is end-users' perceptions of an organisation's caring attitude (Chiaburu et al., 2010). Transfer research has acknowledged peer influence in the workplace as one way to measure perceived support in the organisational context (Chiaburu & Marinova, 2005). Peer support refers to colleague reinforcement of transfers

on the job (Holton et al., 1997). Support emanating from peers includes encouragement, discussion of training, feedback and assessment, and associated assistance.

The interaction of individuals through mapping relationships can uncover the dynamics that exist between and within groups (Hatala & Lutta, 2007). This emphasises the role of social relationships and interactions and networking among employees in information sharing. Peer support in an organisation indicates positive interaction and social and interpersonal relationships, which signal good environmental cues and climate. Peer support refers to colleagues' reinforcements of behaviours associated with the use of learned skills on the job (Holton et al., 1997).

The influence of peer support in the workplace has attracted a great deal of attention (Chiaburu & Marinova, 2005; Clarke, 2002; Gilpin-Jackson & Bushe, 2007; Hatala & Fleming, 2007). Peer support is an influential work-environment strategy for enhancing transfer performance (Burke & Hutchins, 2007, 2008). Social and work relationships among peers help team members to achieve work goals. Research indicates that the exchange of information in the job context leads to training utilisation (Cromwell & Kolb, 2004). In particular, support among co-workers affords them greater opportunities to exchange learned skills in the execution of tasks (Cromwell & Kolb, 2004). Interpersonal relationship outcomes, such as peer support, provide an understanding for users' creation and exchange of relevant information in executing job tasks.

Peer support has been identified as an influential work-environmental variable in tracking training effectiveness (Burke & Hutchins, 2007, 2008; Lim & Johnson, 2002). Actions such as feedback, encouragement, problem-solving assistance, supplementary information, and coaching assistance supplied to end-users enhance positive transfer (Martin, 2010). It is an efficient support mechanism for referencing others in post-training task accomplishments (Clarke, 2002). Supporting this view, Martin (2010) posits that learned skills are unlikely to be utilised where there is a lack of motivation to apply them. Lack of or low motivation can therefore affect the application of skills. Workplace support is therefore crucial in the application of acquired skills (Hatala & Fleming, 2007).

Comparative analysis of supervisory and peer support in the training transfer environment demonstrates that peer support has a stronger influence on transfer than supervisor support (Gilpin-Jackson & Bushe, 2007). The literature confirms that networking and interaction among peers fosters information sharing of training content, skills and

knowledge in solving task problems (Hawley & Barnard 2005). Transfer is strengthened by peer activities which include the sharing of information.

Research also reveals that end-users with high support from peers demonstrate greater improvement on the job than those who experience low support from their peers. End-users in unfavourable climates, but with greater peer support, apply learned skills on the task more than users in favourable climates but with low peer support (Martin, 2010).

This insight indicates that peer support mitigates the effect of unfavourable work climates. Research findings also suggest very poor training transfer is characterised by unfavourable climates and low peer support. Similarly, research demonstrates that certain tasks need interpersonal cooperation among peers. Such task environments encourage the building of networks and connection to a greater extent than in those characterised by low social intensity and interaction (Chiaburu & Lindsay, 2008).

Empirical evidence from the social information processing perspective establishes a strong link between social influences and post training IS usage (Gallivan et al., 2005). Gallivan et al. (2005) argue that users learn more in a social setting that facilitates learner interaction and co-discovery. Colleagues benefit from social interaction, especially in solving learning and task problems. Peer support influences job performance to a high level in jobs characterised by high social intensity (Chiaburu & Lindsay, 2008). The literature agrees that peer support is a rich source of help in reducing role ambiguity in task environments. In this manner it enhances task performance.

The literature shows that the need for cooperation on tasks makes social interaction a primary issue in the transfer environment because social interaction increases information processing and flow. The flow of information results in the sharing of ideas, knowledge and skills required for effective performance. In the context of IS training, as information flow increases among teams, end-users acquire more useful knowledge and experiences of the tasks.

From the discussion above, it can be concluded that managers and supervisory heads influence behaviours during ES implementation in several ways, including provision of resources and leadership and showing support for training. Peer interaction and networking enhances knowledge sharing in solving work-related problems. Peer cooperation is understood to be most important among teams. It is yet unclear how this mechanism works in the ES training environment, however.

To conclude, evidence on the influence of social support is inconclusive. There is yet no agreement concerning which of the social factors functions better as a predictor of training transfer. The debate within the transfer literature concerning the impact of social factors and supervisory and peer support is ongoing. In fact, a section of the literature strongly argues that the influence of supervisory support on transfer is more potent than that of peer support (Hawley & Barnard, 2005; Lim & Johnson, 2002). It is further argued that the influence of peer support on transfer performance is dependent on the supportive environment provided by the supervisor. Contrary opinions assert that supervisory support does not affect transfer, especially in focal organisations. Lack of consensus regarding the veracity of these divergent views only confirms the paucity of knowledge on the impact of social factors on transfer.

2.8. Training Design

Research studies have stressed the importance and influence of technology design features on learning and transfer (Gilpin-Jackson, 2007; Johnson et al., 2009; Noe, 1986; Choi et al., 2007; Cho et al., 2009; Koh et al., 2009; Boudrea, 2002; Gilpin-Jackson, 2007). Training design encompasses course content, relevance, and the system design. It also includes training expectations and desires (Tannenbaum et al., 1991), identical elements, general principles, stimulus variability, and conditions of practice (Baldwin & Ford, 1988). In IS training, the main instructional system design, which is perceived to affect transfer after the introduction of new technologies, is important (Kontoghiorghes, 2001). Technology necessities can either positively affect or constrain the use of learning in a task environment (Noe, 1986).

The importance and the inclusion of system functionality in the design of IS learning has been explored (Johnson et .al, 2009; Alavi & Leidner, 2001; Noe, 1986), as well as the use of compatible systems (Gilpin-Jackson, 2007). In a synthesis of medium richness theory, Volery and Lord (2000) suggested a rich, reliable and quality SI as crucial for training design. Technically complex systems affect both end-users' cognition and effective application in the task terrain. To overcome knowledge barriers, the target systems should not be complex (Bostrom et al., 1990). The inclusion of technological and human elements is important in IS training design and consistent with the socio-technical viewpoint (Chen, 2010). SI is modelled as a training design factor in this research model.

2.8.1. System Interface (SI)

Technological innovations and human interactions rely on SI. SI is important in IS as a central component of a technology that facilitates human–computer interaction (Choi et al., 2007) and the acceptance or rejection of a technology (Koh et al., 2009; Mouakket, 2010). SI is the point of contact that facilitates users' control and interaction with an innovation, particularly in the conversion of technical capabilities into a usable product (Cho et al., 2009). It is the structural design that presents the features and instructional supports of an IS (Cho et al., 2009). SI is important in the acceptance of an innovation. This point cannot be overstressed, because interface designs impact on human interaction and performance on the systems. SI enhances users' PEOU and the usefulness of the innovation in both learning and task environments.

Systems design components include: the board, slides, menu, sound, graphic presentation, capability, functionality, and support systems. These components help in the exploration of the system features. SI is concerned with the comfort of the system, mostly in terms of utilising the variety of features in the innovation. Complex SI hinders end-users' learning and their use of the system.

The SI design components provide instant navigational guides for the extensive information seeking of the user and their exploratory behaviour towards the system. Such components also aid user perceptions of system functionality, capability and relevance (Calisir & Calisir, 2004; Cho et al., 2009; Kumar, Smith, & Bannerjee, 2004; Thong, 2002). Empirical evidence demonstrates that good screen layout, interactive navigational guides, and overall design structure stimulate learning engagement, motivation, and performance behaviour (Cho et al., 2009; Hassan & Ahmed, 2007; Scott & Walczak, 2009).

The system support components capture the perceived effectiveness of a system interface (i.e. help, customised online and technical support) in enhancing end-users' ability to access the system (Cho et al., 2009). Support items such as help and key word and index search assist users with system learning and usage. Moreover, information retrieval and interaction with other systems are largely dependent on the system support (Thong, 2002). The strongest influence on the continued use of technology after training is access to help for resolving problems (Mendoza et al., 2008) and responding to structured queries from end-users.

The third interface component discussed in this study is system functionality. Essentially this indicates the relevance and capability of a system (Pituch & Lee, 2006; Thatcher, McKnight, Baker, Arsal, & Roberts, 2011; Thong, 2002). System functionality provides information for users in the accomplishment of tasks. Logically, a system is only relevant if it accomplishes tasks efficiently and promptly. In instances where a system's functionality is inaccessible, learning capacity and the system's usability by end-users are hindered (Cho et al., 2009). On the other hand, a functional interface enhances repeated and successful experimentation on the system during ES training. User-friendly interface increases system accessibility, usability, and end-users' ability to acquire relevant knowledge (Choi et al., 2007; Lim et al., 2007; Volery & Lord, 2000).

SI provides end-users with controlled displays and information elements to assist the accomplishment of complex tasks. In a complex ES software learning environment, a user-friendly interface facilitates end-users' engagement and PEOU during system learning and task performance (Calisir & Calisir, 2004). In the learning environment, poor interface design may constitute an obstacle to users' motivation and lower learning outcomes. Generally, SI is important in terms of end-users' interaction and exploration of the system features and overall system utilisation. User-friendly interfaces can increase training motivation and the development of positive behaviour in system utilisation. Rich technology stimulates users' engagement, absorption, concentration and attention in the learning of a system. The positive perception of usefulness leads to greater exploratory use of the technology (Scott & Walczak, 2009).

A complex interface might increase users' frustration, anxiety, and hesitant behaviours in both the learning and work settings. However, this can be eliminated with a user-friendly interface (Mouakket, 2010). Complex software applications like ES require a good interface to encourage users' engagement and absorption during the training. There is compelling evidence on the role of SI as a key underlying reason for the success of ES utilisation and users' satisfaction with the system (Calisir & Calisir, 2004).

Drawing from the concepts of complexity and compatibility (Rogers, 1995), a complex interface may decrease users' satisfaction and system acceptance. In contrast, system compatibility suggests an innovation that fits the potential user's values, previous experiences, and current needs. A user-friendly interface decreases users' dissatisfaction and disorientation on the system.

Though several research studies suggest positive linearity between friendly interfaces and IS learning and usage, several others indicate otherwise. Therefore, research findings on SI are inconclusive (Boudreau, 2003; Davis & Bostrom, 1992; Gururajan & Fink, 2002). Boudreau (2003) reports an unfortunate finding concerning the extreme cumbersomeness of an ES SI; the interface annoyed end-users because it was cumbersome and unintuitive. The interface was considered the "most horrible, bizarre . . . interface ever". The study concludes that end-users were incapable of interacting with the SI 15 months following its implementation.

Davis and Bostrom (1992) assessed the impact of direct-manipulation and command-based interfaces and found no significant effect on PEOU. Gururajan and Fink (2002) also found an insignificant relationship between SI and PEOU. The assessment of the influence of three types of interface styles: direct-manipulation interface (DMI); menu-driven interface (MDI); and command-driven interface (CDI) on PEOU was significant but had no significant effect on perceived usefulness (Wiedenbeck & Davis, 1997).

The current research on the role of SI in the learning of IS, is inconclusive; as the literature on SI lacks depth in the context of IS training, hence the need for more analysis of its impact.

2.9. Dependent Variable: IS Usage as a Measure of Transfer

There is a connection between training effectiveness and training transfer; this is the reason for using the constructs as substitutes in transfer studies (Facteua et al., 1995; Noe & Schmitt, 1986; Alliger, Tannenbaum, Bennett, Traver, & Shotland, 1997). This is even evident in the definitions of training transfer and training effectiveness. Training effectiveness is the "quality of the accountability evidence, specifically with the demonstration of the training" back to the job (Blumenfeld & Holland, 1971), while training transfer is described as the application of gained knowledge and skills from training in achieving daily job outcomes (Baldwin & Ford, 1988). Inherent in the definition of transfer, is the fact that training transfer involves the use of skills (cognitive, behaviour, knowledge) in accomplishing the organisational objectives of the training. It is crucial to demonstrate the learned skills on the job. Based on this prescription, training transfer has been measured according to the goals of the training in some studies (Liebermann & Hoffmann, 2008; Sookhai, Budworth, 2010; Bennett, Lehman, & Forst, 1999; Ford et al., 1998) rather than the use of a generic transfer measure.

Similarly, some studies have focused on individual and job performance as measures of training transfer (Holton, 2005; Mathieu & Martineau, 1997; Facteua et al. 1995).

In this study, training transfer is defined as the degree to which end-users apply the knowledge, skills, behaviours and attitudes gained in training to their job (Wexley & Latham, 1991). The above description indicates that training transfer is a function of internal training factors and external factors provided by the transfer environment (Tracey, Tannebaum & Kavanagh, 1995). Transfer process is affected by the training design; for instance training designed in how to address an employee's grievance will not occur until end-users have the opportunity to address grievance issues in the workplace (Myers, 2009). Equally, end-users' training in how to use an IS package may not transfer right away, until the end-users have been able to use the IS package frequently and intensely, since mastery of the usage of IT innovation is an important goal of hard skills training (Laker & Powell, 2011) such as ES training.

In their "Commitment to Quality Training Programme" targeted at improving customer service through the use of quality principles and teamwork, Bennett et al. (1999) adapted measures from customer service quality and satisfaction studies as criteria relevant to training transfer in this regard. Comparable research on "customer-oriented service quality" training for customer service employees in banks examined the level of transfer on a 5-point Likert scale, based on four crucial defined indicators from the goals of the training: (1) sales performance; (2) schedule of appointment; (3) canvassing of customers; and (4) quality of consultancy (Liebermann & Hoffmann, 2008).

In another audit training programme, end-users were required to complete an audit project according to typical organisational practices as a measure of transfer (Sookhai & Budworth, 2010). Ford et al. (1998) analysed the influence of goal orientation and learning strategies on transfer in a complex task environment, where individuals had to combine multiple pieces of information; the study adopted a task measure for transfer. This is consistent with the argument that individual performance reflects transfer to the job (Holton, 2005; Burke & Hutchins, 2007) since individual performance is part of the transfer as a result of the application of learned skills (Kirkpatrick, 1998). Research in this area had measured training transfer in terms of post-training behaviour (Tracey et al. 1995).

In the IS environment, the use of the system increases job outcomes through the transfer of acquired learning to the job. The use of individual job outcomes as evaluation indicators of training transfer is supported in the literature (Chen, 2010).

Training in hard skills, such as IS training is targeted at proficiency, and therefore relies on more performance-based methods of instruction (Laker & Powell, 2011). ES training objectives are aimed at making end-users proficient in the use of the ES. It is apparent that training transfer, which is essentially the use of acquired knowledge, skills, and an appropriate work attitude has the potential to enhance end-users' job performance (Chen, 2010). Enhanced job performance (IS usage in this sense) is one of the goals of ES training. IS usage has been shown to be effective in determining the degree of IS training; it is therefore adopted as a surrogate measure in this study in line with previous transfer and training effectiveness studies that adopted relevant training criteria (Rajagapolan et al., 2007; Bennett et al., 1999; Ford et al., 1998; Chen, 2010; Sookhai & Budworth, 2010; Liebermann & Hoffmann, 2008).

2.10. Summary

This literature review has established that existing studies of training transfer have concentrated on management training, including communication, marketing, and leadership skills, while a relatively small number of IS studies have focused on the formative aspect of training effectiveness. Only a few IS studies have assessed computer and software learning outcomes using a behavioural modelling technique in the classroom setting, thus confirming the paucity of training transfer studies in the IS environment.

This chapter has discussed training transfer in terms of three core components: individual, social, and training design variables. The review discussed the factors affecting training transfer, transfer models, and the empirical research findings of previous studies. The discussion has revealed the gaps in the research and has set the scene for the development of the research framework and hypotheses in the next chapter.

CHAPTER 3: RESEARCH MODEL

3.1. Overview

This chapter develops a conceptual model focusing on training transfer based on the identified gap in the research on transfer in IS. The rationale for the development of this conceptual model stems from the inconsistent results across studies and the lack of a suitable and coherent model of transfer in IS. It is presumed that this theory-driven thesis will add to knowledge in this area.

3.2. Restatement of Research Questions

The purpose of this study is to establish the influential factors that motivate end-users to apply learned skills in the ES environment. To achieve these objectives, this study has developed the following three research questions:

Research Question 1: How do CSE, PEOU, MO, and training motivation influence ES training transfer?

Research Question 2: How do supervisory and peer support influence ES training transfer?

Research Question 3: How does SI influence ES training transfer?

3.3. Research Model

A model is the perception or diagramming of a complex or a system (Lazer, 1962). It is a graphic presentation of the conceptual representation of ideas and constructs. A model relates in a logical manner certain constructs or axioms that are envisaged in theory construction. It helps by suggesting fruitful lines of inquiry and explanation of relationships on existing information gaps (Lazer, 1962).

In this study, the research framework was developed after an exhaustive review of the literature of training transfer (see Chapter 2). The various concepts in this study were drawn from three main disciplines: psychology, HR/training, and IS. The constructs were selected based on their relevance and suitability for IS training, and the positions outlined in the existing literature. The research framework is depicted in Figure 1 at the end of this chapter.

3.4. End-users' Attributes and Attitudes

A number of studies have analysed end-users' attitudes and beliefs such as motivation, perceptions, commitment, self-efficacy, and locus of control (Gravill & Compeau, 2003; Machin & Fogarty, 2003; Chiaburu & Marinova, 2005; Yi & Hwang, 2003; Maurer & Martocchio, 2008; Scaduto et al., 2008). In this study CSE, PEOU, MO, and training motivation are included in the research framework and these are discussed in the subsections below.

3.4.1. CSE and Training Transfer

Self-efficacy represents an individual's judgments concerning his/her capabilities to execute a course of action. Self-efficacy is the perception of an individual's capacity to perform rather than the competencies and skills required in attaining such performance (Bandura, 1986); it is a perception of performance capability. Research has demonstrated that a person's inclination to engage in a specific action (task efforts, persistence, level of goal difficulty, and commitment) is determined by their self-efficacy (Gist & Mitchell, 1997). A form of self-efficacy known as CSE is popular in the computer and software training literature and represents an individual's perceptual abilities to accomplish tasks in the computer environment (Compeau & Higgins, 1995; Gist & Mitchell, 1992).

Empirical evidence suggests that end-users high in self-efficacy believe in their task-related capabilities and are more likely to accomplish challenging goals than end-users with lower or no self-efficacy (Bandura, 1986). Research indicates a strong link between self-efficacy and training outcomes in different contexts (Garavan et al., 2010; Igbaria & Iivari, 1995; Lim et al., 2007; Martocchio & Judge, 1997). Research has shown that self-efficacy perceptions are a precursor of computer learning and use (Compeau & Higgins, 1995; Lim et al., 2007).

End-users with high CSE are also inclined to be motivated to learn. The meta-analysis of Colquitt et al. (2000) confirms that self-efficacy predicts training motivation. Self-efficacy has also been demonstrated to mediate the relationship between conscientiousness and learning in a software training environment (Martocchio & Judge, 1997). Similarly, studies have found a parallel between self-efficacy and transfer (Al-Eisa et al., 2009; Chiaburu & Marinova, 2005; Machin & Fogarty, 2003). CSE has also been identified as an important determinant of ES utilisation (Mouakket, 2010).

The above evidence suggest that CSE enhances end-users training motivation and use of learning. It is argued that, as a result of previous accomplishment in a computer terrain, confident learners will be more psychologically engaged, self-regulated and learn better in ES training sessions. The confidence in their perceptual ability combined with self-regulation and better learning outcome will result in better application of the skills in the work environment (transfer). Hence, this study hypothesises that:

- *H1: CSE will positively influence end-users' training transfer.*
- *H2: CSE will positively influence end-users' training motivation.*

3.4.2. PEOU and Training Transfer

PEOU (Davis, 1989) is the degree of belief that using a computer-based system is free of effort. PEOU is concerned with the effort required in learning and using a system. Empirical results have confirmed that training improves attitudes, especially end-users' perception of towards a targeted system (Yi & Davis, 2001). During training, PEOU is achieved via opportunities provided for end-users to interact with the systems, through the testing of varieties of inference about the system (Amoako-Gyampah & Salam, 2004; Bedard et al., 2003; Davis & Yi, 2004). PEOU reduces end-users' anxiety and discomfort in learning and using the systems.

Research evidence shows that the perception of system usability correlates with learning and ES utilisation (Mouakket, 2010). Prior studies indicate that PEOU influences system usage (Amoako-Gyampah & Salam, 2004; Marler et al., 2006). PEOU can influence training transfer when the innovation is compatible with the users' work values, especially when the target system does not inhibit learning and use. In particular, end-users are likely to consider the use of skills when the innovation is easy to learn and use. PEOU helps especially when work procedures for an innovation do not require major changes that might demand considerable learning and unlearning, thus sending a signal of incompatibility (Chau & Hu, 2002).

PEOU is important in IS learning because end-users may be affected when a negative PEOU exists. This suggests that positive perceptions concerning the system are determined by the qualities of a system. It is therefore argued that end-users' positive perceptions concerning the features of the system will enhance positive learning behaviour and better learning attitude, which is essential for the acquisition of skills that are transferred on the job.

In light of this argument, and the evidence from prior studies, this study proposes that PEOU result in increased training motivation which leads to better learning of the features of the system and increased performance through the application of skills on the job.

Thus, this study hypothesises that:

- *H3: PEOU will positively influence end-users' training motivation.*
- *H4: PEOU will positively influence end-users' training transfer.*

3.4.3. MO and Training Transfer

Goal orientation describes a person's focus in achievement situations. Goal orientation indicates pursuits of goals or courses of action (Dweck, 1986). MO is an individual's quest for knowledge, development of new skills, understanding of tasks, and successfully achieving a reference standard of mastery of learning objectives (Ford et al., 1998). It represents a motivational process, based on an incremental tendency and quest for the acquisition of skills as a path towards desired competencies. MO types possess an exceptional desire for the acquisition of skills and the development of some level of competency.

In learning environments, mastery oriented types are highly motivated to learn new knowledge and skills as a path towards achieving better performance. MO types engage in more effortful cognitive processes during the declarative stage of learning where the acquisition of knowledge/strategy is needed but has yet to take place (Latham, Seijts, & Crim, 2008). Research has argued that there is an interaction effect between MO and cognitive ability, such that a higher mastery goal is more effective than a lower mastery goal for individuals with a lower cognitive ability in the learning environment.

Essentially, MO enhances self-regulated learning strategies, learning processes, and the desire to learn as much as possible (Gravill & Compeau, 2003; Yi & Hwang, 2003). Research has also argued that goal orientation is a motivational pattern that affects performance in diverse task environments, especially environments that connect with the development of new skills (Bell & Kowslowski, 2002; Chiaburu & Marinova, 2005; Gravill & Compeau, 2003; Maurer & Lippstreu, 2008; Santhanam et al., 2008; Yi & Hwang, 2003).

MO types are more successful in learning tasks. This notion has received support, particularly in the self-regulated environment. Research has found that MO individuals possess self-efficacy in the learning of complex tasks (Gravill & Compeau, 2003).

They see challenging and complex tasks as opportunities to learn and to build competency (Yi & Hwang, 2003). Empirical findings made it clear that end-users with MO are more motivated to learn than performance-orientated individuals, especially in the learning of complex skills that are needed for subsequent task performance in the workplace. Based on the motivational patterns inherent in MO individual, it is argued that such individuals will learn better in ES and will apply learned skills on the job.

Hence, it is hypothesised:

- *H5: MO will positively influence end-users' training motivation.*

3.4.4.Training Motivation and Training Transfer

Training motivation is employees' desire or motivation to learn from a training programme (Noe, 1986). Training motivation is a precondition for learning and training effectiveness (Calvert, 2006; Robey et al., 2000; Scaduto et al., 2008). It represents end-users' persistence in effort and acquisition of skills (Chiaburu & Tekleab, 2005).

One of the mechanisms by which predictors operate on skill transfer is through training motivation (Chiaburu & Marinova, 2005). Users' motivation to learn affects performance on the job as a result of the skills transfer. Training motivation is central to the understanding of training effectiveness because training motivation in the transfer process leads to skills acquisition due to persistent efforts and the belief that learning will increase valued future outcomes through better performance (Chiaburu & Tekleab, 2005). Klein et al. (2006) argued that the choices individuals make in learning activities impact on training outcomes. This assertion suggests that the level of motivation during learning activities affects learning success. Empirical evidence indicates that motivation to learn affects transfer outcomes (Garavan et al., 2010; Klein et al., 2006). Research indicates that people who motivate themselves to learn become better learners and acquire better skills needed in task situations (Chiaburu & Tekleab, 2005).

It is therefore argued that a motivated person is a better learner. A better learner acquires better skills and absorbs more knowledge during the training. As a result, a better learner is better able to transfer the skills and knowledge from training to the work environment.

Therefore, this study hypothesises:

- *H6: Training motivation will positively influence end-users' training transfer.*

3.5. Social Support and Training Transfer

Apart from individual factors, social support or positive transfer climate is also important in motivating end-users' skills transfer. Even if end-users are motivated to transfer, the environment where such skills will be applied must also support the transfer. Two important resources that potentially influence transfer are the management or supervisory leaders and colleagues (Calvert & Seddon, 2006; Dong et al., 2009; Garavan et al., 2010; Holton, et al., 1997; Holton, 2005). A positive environment provides the opportunity to apply learning, as well as feedback and reinforcement for transfer. In this study, supervisor and peer support are included in the research framework, and are discussed in the following subsections.

3.5.1. Supervisory Support and Training Transfer

Research on the role of social support in the training domain is extensive (Noe & Wilk, 1993) and Ifinedo (2008) has examined it in the IS context. In fact, managerial support is a critical factor in IS implementation success. Supervisory support in the training domain entails managerial discussion of training, support for skills acquisitions, feedback, coaching and reinforcement, and the creation of opportunities for skills application (Burke & Hutchins, 2008; Lim & Johnson, 2002). Supervisory support communicates positive perceptions concerning the training strategy as a way of reaching performance outcomes (Tracey & Tews, 2005). One of the ways in which organisational environments affect performance attitude is through supervisory or leadership support (Compeau & Higgins, 1995; Thomson, Compeau, & Higgins, 2006, Taylor & Todd, 1995). Research in both IS and transfer literature has documented the influence of supervisory support on end-users' attitudes towards systems (Compeau & Higgins, 1995) and the development of perceptions of use (Thomson et al., 2006) and training effectiveness (Tai, 2006; Scaduto et al., 2008).

The LMX literature, in particular, offers strong evidence of the importance of emotional support and the exchange of valued resources between the leader and members. This stream of research concurs that social exchange, in terms of support, trust, openness in communication, and help, improves work output (Kang & Stewart, 2007) and skills usability (Scaduto et al., 2008). Similarly, studies of voluntary training and development have found a positive relationship between social support from managers and actual

development activity such as the number of courses taken, the number of hours spent on development activities, and future activities (Hurtz & Williams, 2009).

Empirical evidence shows that supervisory support is an important predictor of training effectiveness (skills acquisition and application) in multidimensional ways (Nijman et al., 2006; Tai, 2006). Organisational support correlates with end-users' training motivation (Chiaburu et al., 2010). The research evidence confirms the importance of support as a way of overcoming barriers in skills acquisition.

End-users' performance of specific learning behaviours in the training environment and the extent to which end-users will be inclined to use learned skills will be dependent on the extent of support and approval provided by the supervisor (reinforcement, assistance and feedback). Based on the above, it is postulated that supervisory support as a transfer enhancing strategy will enhance end-users' skills acquisition and the extent to which they absorb learning for later use at the workplace. Therefore, this study hypothesises that:

- *H7: Supervisory support will positively influence end-users' training motivation.*

3.5.2. Peer Support and Training Transfer

Peer support is a way of measuring organisational support in the workplace (Chiaburu, Dam, & Hutchins, 2010). The transfer environment may affect the use of skills; hence the professional setting where the target technology is to be used is important. This is referred to as the implementation context in IS (Chau & Hu, 2002).

Peer support is a visible environmental favourability that suggests an organisational climate conducive to skills transference (Chiaburu et al., 2010). It also indicates a desirable environmental cue which signals a comfortable workplace climate (Chiaburu et al., 2010). Peer influence as a subjective factor (Chau & Hu, 2002) is the perception of relevant colleagues' opinions and assistance in the use of skills in the transfer context.

Cabrera et al. (2006) found that social support clearly impacts on knowledge sharing in knowledge management systems. They concluded that people who perceive their co-workers as valuing knowledge sharing feel inclined to engage in knowledge-sharing behaviours. The research outcomes accentuate the importance of peer support in behavioural performance.

Assistance from colleagues during training enhances training motivation, especially the sharing of knowledge and ideas (Cabrera et al., 2006) in solving work problems. Evidence from empirical studies suggests that social exchange among co-workers facilitates transfer and productive performance (Cromwell & Kolb, 2004; Burke & Hutchins, 2007; Burke & Hutchins, 2008; Gilpin-Jackson & Bushe, 2007; Hatala & Fleming, 2007; Martin, 2010).

In fact, research suggests that support from peers is the most effective support mechanism for training transfer (Clarke, 2002; Gilpin-Jackson & Bushe, 2007; Martin, 2010). Peer activities including social networking and the sharing of ideas in solving task-related problems are important sources of social support which signal a favourable work environment and reinforce transfers in the workplace (Chiaburu & Lindsay, 2008; Hawley & Barnard, 2005). End-users' perceptions of a supportive environmental cue affect skills application on the job.

Organisational support refers to employees' global beliefs regarding how much the organisation cares. Such care can be manifested through specific actions, including considering employees' goals and values and offering help when employees need it (Chiaburu et al., 2010). In turn, employees reciprocate through good performance and behaviours that favours organisational productivity. The social exchange theory (Blau, 1960) posits that end-users respond to good organisational support with good performance behaviours, including engaging in skills acquisition and transferring knowledge and skills to work situations (Boudreau, 2003). Research indicates that support (help, trust, openness) from peers correlates with higher levels of creativity in the work project environment (Amabile, Conti, Coon, Lazenby, & Herron, 1996).

The above indicates that social influence, such as peer support, affects the use of acquired skills. Consciously or unconsciously, end-users may align and adjust their behaviour on the use of trained skills based on encouragement and suggestions from their peers. Opinions of peers may become normative beliefs of varying intensity levels, which in turn exert considerable pressure to conform (Chau & Hu, 2002). This assertion can be interpreted thus: the greater the perception of support, the more behaviour among peers seeks to conform. It is therefore argued that the extent to which the perception of peer support is provided in a work setting correlates with end-users' degree of motivation to acquire skills, or training motivation.

Therefore, this study hypothesises that:

- *H8: Peer support will positively influence end-users' training motivation.*
- *H9: Peer support will positively influence end-users' training transfer.*

3.6. Training Design and Training Transfer

The importance of training design factors in the IS training environment has received attention from researchers (Alavi & Leidner, 2001; Noe, 1986; Noe & Schmitts, 1986; Bostrom, 1990; Kontoghiorghes, 2001). Training designs including the main instructional systems design should help end-users to learn in technology training environments (Kontoghiorghes, 2001) and enhance psychological processes and expectations which in turn result in better learning (Alavi & Leidner, 2001; Johnson, Gueutal, & Falbe, 2009). Technological features design and necessities are important in learning a target system (Bostrom, 1990; Noe, 1986).

3.6.1. System Interface and Training Transfer

SI is the point of contact between end-users and the ES. It facilitates end-users' use of technical capabilities of the system (Cho et al., 2009). In fact, the conversion of skills and capabilities to the end-product is made possible by SI constituents. Training transfer, especially in the technology environment, suggests that technology features act as resources or necessities for learning (Noe, 1986).

It has been argued that SI is a critical component of technology acceptance (Choi et al., 2007), especially during system learning and usage (Choi et al., 2007; Lim et al., 2007; Volery & Lord, 2000). SI structured queries ensure easy information retrieval. They also help in resolving problems that might be encountered in the appropriation of the systems. These embedded functions are the strongest mechanisms for the use of technology at the post-training stage (Mendoza et al., 2008; Thong, 2002).

Research suggests that a user-friendly interface improves learning outcomes in, for instance, the development of CSE and ES usage (Choi et al., 2007). SI assists knowledge and learning integration, concentration, positive attitudes, and PEOU (Scott & Walczak, 2009). It also leads to end-user satisfaction (Koh et al., 2009; Mouakket, 2010). There are also arguments that technology characteristics affect learning outcomes and transfer (Alavi & Leidner, 2001; Gilpin-Jackson, 2007; Johnson et al., 2009). Alavi and Leidner (2001)

maintain that technology characteristics affect end-users' awareness and regulation of their cognitive processes and subsequent learning outcomes. Technology components affect end-users' satisfaction because the judgement of the utility of the training (judgement of the training benefits) and end-users' transfer motivation are affected when end-users are less satisfied (Alliger et al. 1997).

Given the centrality of SI design to ES training, it is essential that SI functionalities are able to support the training environment by providing reliable features that can influence end-users' cognitive and psychological processes of learning a new innovation (Alavi & Leidner, 2001; Johnson et al., 2009).

This study therefore postulates that end-users' perception of the usability of the systems interface will encourage cognitive engagement and motivation in the ES training. The cognitive engagement during the training will lead to the development of better skills in the ES work environment.

Therefore, this study hypothesises that:

- *H10: SI will positively influence end-users' training motivation.*
- *H11: SI will positively influence with end-users' training transfer.*

3.7. Research Model and Hypotheses

The research framework has been developed based on the review of the literature in Chapter 2 and in line with the stated research objectives. Eight constructs have been identified from the psychology, HR/training, and IS disciplines and are operationalised in this study. The constructs capture components of end-users' attitude and motivational attributes, social support, and technology characteristic as predictors of training transfer. The relationship between the constructs and training transfer is depicted in Figure 1.

Figure 1: Research Model

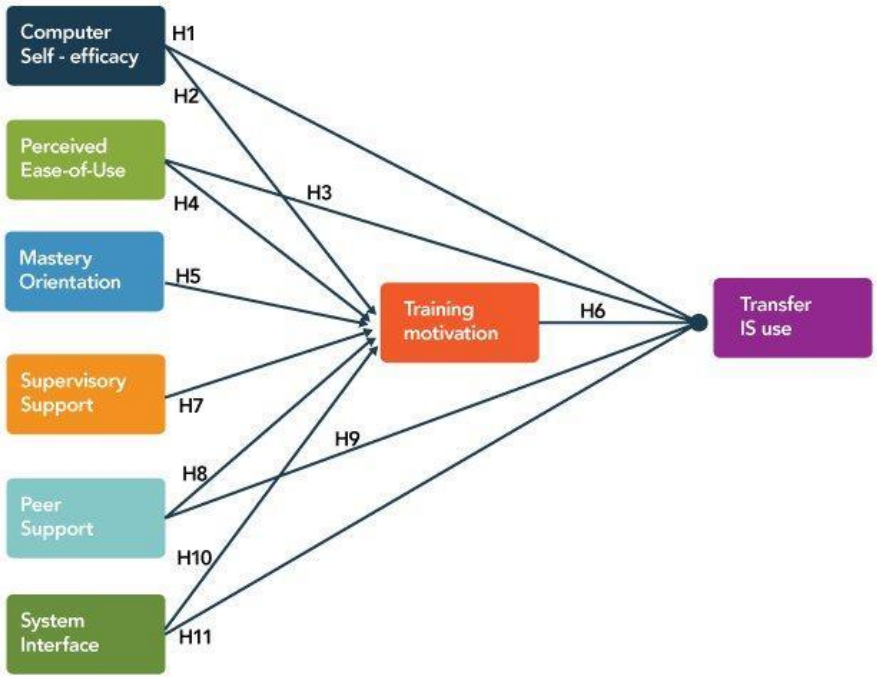


Table 2: Research Questions and Hypotheses

	Research Questions and Hypotheses
	RQ1: How do CSE, mastery orientation, PEOU and training motivation influence ES training transfer?
H1	CSE will positively influence end-users' transfer
H2	CSE will positively influence end-users' training motivation
H3	Mastery orientation influence end-users' training motivation
H4	PEOU will positively influence end-users' training motivation
H5	PEOU will positively influence end-users' training transfer
H6	Training motivation will positively influence end-users' transfer

	RQ2: How do supervisory and peer support influence end-users' transfer in ES?
H7	Supervisory support will positively influence end-users' training motivation
H8	Peer support will positively influence end-users' training motivation
H9	Peer support will positively influence end-users' transfer
	RQ3: How does system interface influence end-users' training transfer in ES?
H10	System interface will positively influence end-users' training motivation
H11	System interface will positively influence end-users' training transfer

3.8. Summary

This chapter presented the theoretical conceptualisation of the research model. It also discussed the dominant theories in transfer studies and the rationale for the development of a theoretical framework in this study. The model includes components of individual attributes, social support and training design factors. The chapter concluded with the development of 11 hypotheses to test the research questions developed for this study. The next chapter discusses the methodology, research design, and approach adopted in this research.

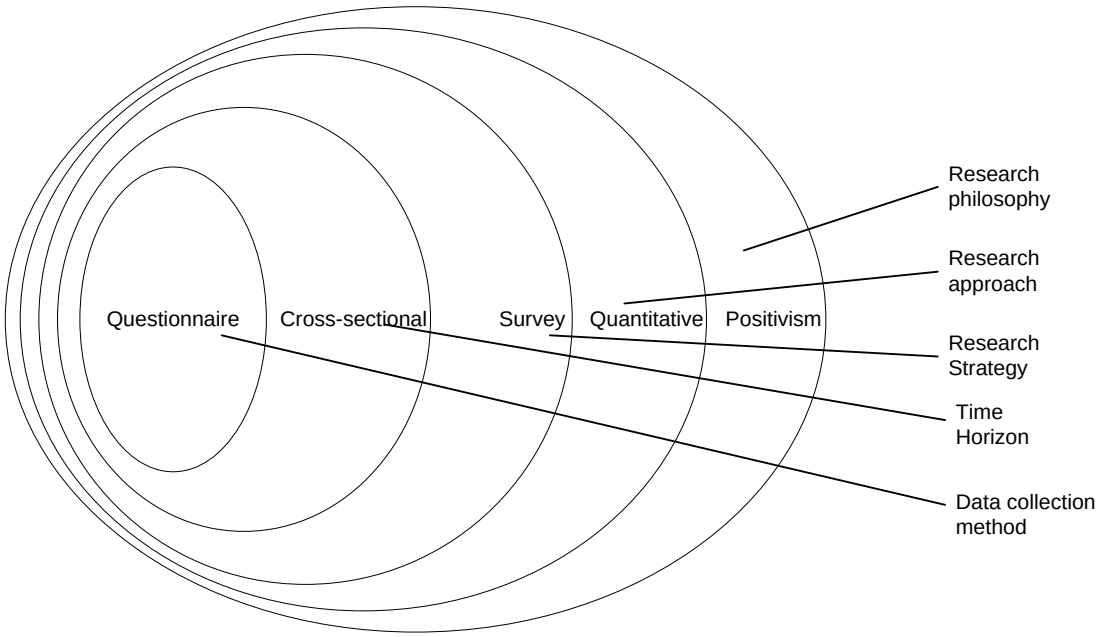
CHAPTER 4: RESEARCH METHODOLOGY

4.1. Overview

Research methodology is concerned with the worldview guiding a research process. Worldviews are usually based on paradigmatic assumptions about what constitutes appropriate research methods (Myers, 1997).

This chapter describes the assumptions, processes and design guiding the conduct of the current study, which investigates the facilitators of training transfer in ES. It discusses the research philosophy, research approach, research design, data collection, and analytic approach. Figure 2 illustrates the steps in this study (Saunders et al., 2009).

Figure 2: Research Steps



Source: Saunders, Lewis, & Thornhill (2009)

4.2. Research Paradigm

Researchers hold certain underlying principles in the course of an investigation. A research paradigm relates to the researcher's underlying assumptions and perceptions of the world, and how these guide the research framework and research strategies. It is a worldview that influences research design (Myers, 2010). These assumptions are deeply rooted in a researcher's personal experiences, culture and history (Cresswell & Plano Clark, 2007). Research investigations are generally guided by one of three major paradigms: constructivism, realism, or positivism.

The constructivist paradigm is based on the assumption that reality is socially constructed. It is concerned with the interpretation of the meaning of the phenomena under investigation. This approach looks to the social world of the participants to understand their viewpoints (Saunders et al., 2009) and relies on language, consciousness and shared meaning in social construction. The constructivist paradigm recognises the differences between people and the objects of the natural sciences (Bryman & Bell, 2007) and pays attention to the differences in individuals' make-up by employing a subjective lens.

The realist paradigm maintains that what the senses show as reality is the truth; that is, objects have an existence independent of the human mind (Saunders et al., 2009). Critical realism assumes experience is a result of sensations – images of the things in the real world, and not the things directly (Saunders et al., 2009). It is concerned with the reality of the natural order, events and discourses of the social world (Carlsson, 2004)

Lastly, the positivist paradigm is an objective explanation of knowledge and an empirical testing of hypothetical statements and knowledge based on testable experiences and quantifiable observations (Saunders et al., 2009). The positivist approach applies the natural scientific method to the study of reality (Bryman & Bell, 2011). It is focused on observable social reality and an objective process of presenting data in a value-free-manner (Saunders et al., 2009). The positivist paradigm aligns with the empirical approach of quantitative research designs, which postulate that reality is objective and attainable without human interference.

The positivist paradigm attempts to reach verifiable knowledge through data collection and testing of hypotheses. This study involves hypothetical testing of the predictors of end-users' training transfer. Based on the above, the positivist paradigm is a good fit with the objectives of this study.

4.3. Research Methodology

Research methodology is a master plan specifying the methods and procedures for collecting and analysing the information required in a research project (Zikmund, 2003). In other words, research method is a blueprint of the actions carried out in the course of an investigation. It also involves the assumptions, methodology, approaches and practices in the empirical stage of the project. The two most common research methodologies are qualitative and quantitative.

As noted above, the positivist paradigm, which involves the collection of numerical data and testing of hypotheses, is adopted in this study; therefore this study uses a cross-sectional quantitative research design and the use of survey questionnaires in the collection of the data.

Quantitative research design is based on the collection and analysis of numerical data. It is predominantly used as a synonym for any data collection technique (such as questionnaires, surveys) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data (Saunders et al., 2009). Bryman and Bell (2007) describe quantitative-based research as "entailing the collection of numerical data and as exhibiting a view of the relationship between theory and research as deductive . . . and as having an objectivist conception of social reality" (p. 154).

4.4. Research Process

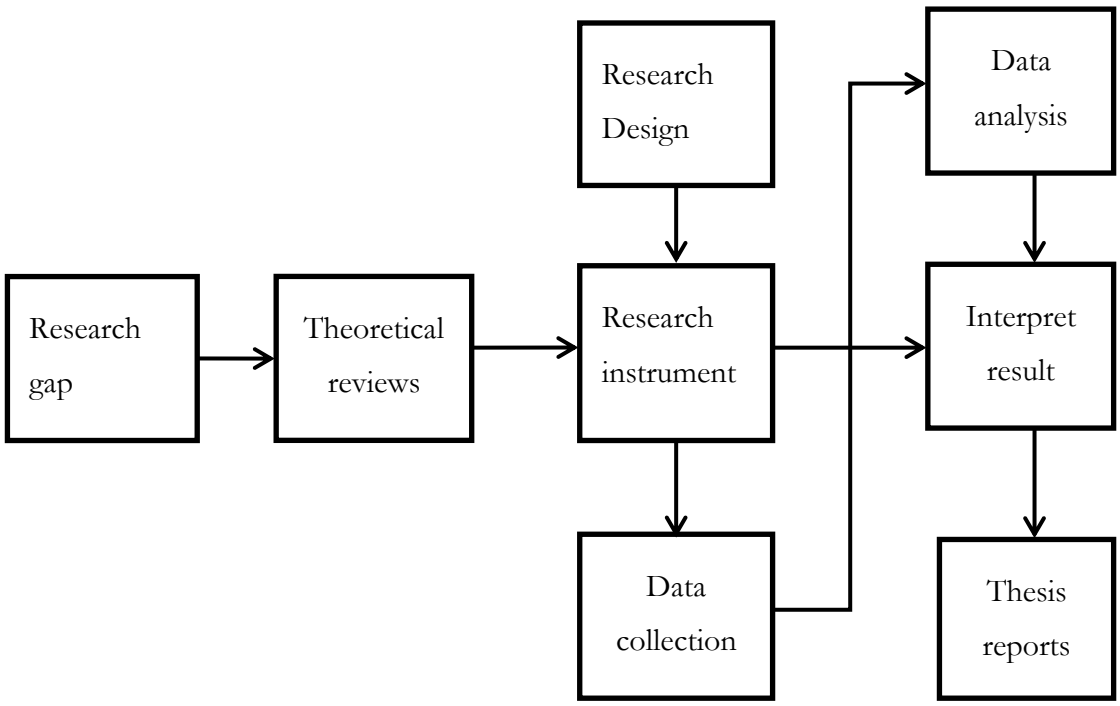
In this study the gap in the research was established by conducting a review and analysis of IS and training transfer literature (see Chapter 2). The analysis revealed a dearth of knowledge on transfer mechanisms among ES end-users. From the review and analysis it was concluded that further investigation of the motivational influences on end-users' training transfer was needed in this area.

The review and analysis of the literature focused on the theories and constructs that have shaped previous research investigations in this area. Based on the anecdotal and empirical evidence from the literature and the development of the research questions, a research model and research hypotheses were formulated.

The basic steps in research design, such as the type of research, unit of analysis, and the time horizon (Sekaran, 2003) are considered in this section. A cross-sectional study based on an online survey method was used for the data collection. The research questions and

hypotheses were validated by the partial least squares (PLS) structural equation modelling (SEM) technique. The research findings are discussed and related with the gap in the research and research questions of the study. Figure 3 shows the research design of this study.

Figure 3: Research Design



Source: developed by the author from the literature

4.5. Data Collection Technique

4.5.1. Cross-sectional Survey/Questionnaire

A survey is a strategy for deductive-based research studies. Creswell (2003) described survey design as "a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. From sample results, the researcher generalizes or makes claims about the population" (p. 153). It is used often to answer who, what, where, how much and how many questions (Saunders et al., 2009). Surveys are pre-formulated written sets of questions to which respondents record their answers, usually within rather close alternatives (Sekaran, 2003).

They are used to gather data from respondents thought to be representative of the target sample population. A cross-sectional survey obtains data from a single source at a point in time (Bryman & Bell, 2011). Consistent with the positivist stance, a cross-sectional-based quantitative method was considered to be appropriate for this study, which is focussed on the determinants of training transfer in ES.

Most importantly, this study adopts a perceptual measure of end-users' training transfer in the ES environment. The adoption of a perceptual measure stems from the difficulties associated with attempts to capture performance in the work situation. Also, some of the variables for measurement are latent in nature and can only be collected from respondents' perceptions. It has been argued that end-users are appropriate samples in transfer research (Chiaburu & Marinova, 2005; Facteau, Dobbins, Russell, Ladd, & Kudisch, 1995; Maurer & Lippstreu, 2008). Cross-sectional data are therefore reliable and satisfy acceptable levels of accuracy.

In this study, an anonymous online survey was employed rather than the traditional personal drop-off option or a combination of both methods. An online survey is a self-administered questionnaire posted on a website for respondents to complete (Zikmund, 2003). The rationales for the use of an online survey are:

- It is an efficient distribution channel.
- It is speedy and cost–effective.
- It facilitates quick data analysis, due to the removal of bottlenecks associated with paper surveys.
- It is anonymous.
- It is interactive because of the visual appeal.

Cross-sectional studies are vulnerable to the problems of common method bias (CMB). However, the influence of CMB can be checked by *ex-ante* and *post-ante* approaches (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). The statistical analysis of the threat of CMB in this study is provided in Chapter 6.

4.5.2. Unit of Analysis

The unit of analysis is the unit about which statements are being studied. The chosen unit of analysis can be anything the researcher decides as long as the unit relates to the research questions and hypotheses (Pinsonneault & Kraemer, 1993).

The unit of analysis specifies and suggests the level of data aggregation in an investigation, whether the investigation is focused on the collection of data at organisation, department, work groups, or individual level (Zikmund, 2003). At an organisational level of analysis, data are aggregated at the level of an organisation; this level of analysis emphasises organisational processes and performance at a cross-functional team and work-group level rather than at the level of individuals within the organisation (Zikmund, 2003). In contrast, an individual level of analysis emphasises the individuals who are usually employees of the organisation.

The research questions of this study clearly specify the direction of the investigation. The study examines the motivational determinants of training transfer amongst end-users in ES. This suggests an individual level of aggregation. The individual level of data aggregation is a popular approach in IS training and transfer analysis, especially in the re-invention of learning and generalisation of learned skills in the workplace. Translating training experiences to the performance of tasks makes every moment in the workplace worthwhile. Based on this, the study adopts an individual level unit of analysis for the aggregation of the collected data (Sekaran & Bougie, 2010) because the application of skills appears to be relatively easy to capture at the individual level compared to the work team or organisational level. Research has also argued that the individual constitutes a reliable source from whom information concerning motivational mechanisms can be collected (Gorgievski, Bakker, & Schaufeli, 2010; Scaduto et al., 2008).

4.5.3. Sampling Procedures

Sampling is concerned with drawing individuals or entities from a population so as to permit generalisation about the phenomena of interest from the sample to the population as a whole (Pinsonneault & Kraemer, 1993). The most critical element of the sampling procedure is the choice of the sample frame, which constitutes a representative subset of the population from which the sample is drawn. Thus, the sample frame must adequately represent the unit of analysis. The characterisation of the sample and the level of generalisation that can be drawn from the sample are the underlying notions of sampling (Sekaran, 2003).

Sampling is also concerned with representation in the selection of individual respondents from the sample frame (Pinsonneault & Kraemer, 1993). Representation in this study relates to giving each potential respondent an equal chance of being part of the sample. Sampling in this study involves a random selection of ES end-users from various business

units for the sample frame. Achieving representation in the target unit of analysis requires tact and non-purposive sampling of ES end-users who intensely utilise ES in their daily tasks (Sehgal, 2007). Sampling issues therefore involve judgment rather than simple application of technique (Pinsonneault & Kraemer, 1993). The sample in this study consisted of regular ES users with prior training experience in ES software. Therefore, the sample adequately represents the unit of analysis.

4.5.4. Ethical Issues in This Research

It is a condition that Auckland University of Technology Ethics Committee (AUTEC) approval is sought for any research to be conducted at AUT University. This is to ensure that research undertaken under this approval occurs within the parameters outlined in the human ethics application; these include the observance of the principles of informed consent, respect for privacy, truthfulness, avoidance of conflict of interest and respect for cultural values. Ethical approval was granted by AUTEC on 27 September 2011 for a period of three years (reference no 11/217).

This research was conducted in accordance with the principles of partnership, protection and participation as articulated in section 5.3.2.3 of AUTEC's approval guidelines and procedures.

Partnership: The research design conforms to culturally appropriate protocol and practice. The researcher informed participants of the personal benefits of being involved in this study, especially in the area of improving individual performance in their workplace.

Participation: The role of the participants was to share their training experiences and the utilisation of gained skills in their workplace. Participant engagement and consultation was seen as paramount to the success of the research. Great care was taken in securing the consent of the participants. Participants were aware that participation was voluntary and that their participation could be discontinued at any stage of the data collection.

Protection: All survey questions were generic and addressed the research questions specifically. Steps were taken to minimise personal and culturally sensitive questions except for demographic data. Participants were treated as anonymous and collected data were in all cases aggregated. Questions regarding specific values and cultures were not asked. The principle of privacy and confidentiality was upheld throughout the period of data collection.

The online survey method adopted allowed participants to complete the questionnaire at their convenience; this diminished potential pressure or psychological stress on the participants. To address any eventual risks, participants were (a) asked for their voluntary participation; (b) informed of their anonymity; (c) provided with the contact details of the AUTEC for any concerns; and (d) informed that they could withdraw their participation at any stage of the research. The collected electronic data were stored in an external hard drive (HDD) in a locked cabinet in the researcher's office in the Faculty of Business & Law, Auckland University of Technology. The electronic data will be stored for six years and thereafter obliterated.

4.6. Data Analysis: Structural Equation Modelling (SEM)

The technique of analysis adopted in this study is SEM, which essentially involves two key stages of analyses. The first stage involves the validation of the measurement model and the validation of the reliability of the instrument measures in a study. Basically, this determines whether the selected instrument satisfies the rule of adequacy; that is, the suitability of measures in relation to the target of measurement. This first stage also confirms the factor loadings of the items used in the measurement. When the requirements of this stage are met, the analysis proceeds to the second stage of SEM analysis.

The second stage of the analysis is the fitting of the structural model. Two basic outcomes of a structural model test are the predictive relevance as indicated by the R^2 estimate of the variance explained by a latent variable in the model. The second evaluative indicator of structural model analysis is the path coefficient estimate. Path coefficient explains the structural relationship between exogenous and endogenous variables in a model. In the same vein, it could also be a test of the relationship between some endogenous variable(s) and other endogenous variable(s).

SEM-based studies possess considerable flexibility for the interplay of theory and data. Chin and Newsted (1999) highlight the advantages of SEM as its ability to model relationships among multiple predictors and criterion variables, as well as errors in the measurement of observed variables. SEM analysis can be conducted through component-based and covariance-based techniques. The two approaches differ in their methods of estimation; however, both methods complement each other.

SEM analysis usually refers to covariance-based structural equation modelling (CB-SEM) and is based on the use of software such as AMOS, LISREL, and so on. The CB-SEM method of analysis tends towards the reproduction of a theoretical covariance matrix, without consideration for the explained variance (Hair, Ringle & Sarstedt, 2011). CB-SEM uses the maximum likelihood (ML) function in its analysis. The CB-SEM approach follows some multivariate assumptions, which include normality in data distribution. The optimum performance of the covariance structural model requires a specific sample size; this stringent condition is considered unrealistic in certain fields of enquiry (Wold, 1985).

In contrast, PLS is a component-based technique, a causal modelling method aimed at maximising the explained variance of the dependent latent constructs (Hair et al., 2011). The objective of the PLS method is prediction and theoretical development. The PLS method is closely aligned with the regression analytic method. Hair et al. (2011) argue that PLS not only primarily maximises the explained variance in the dependent constructs but also does the additional job of evaluating the data quality through the assessment of measurement model characteristics. The least square estimation is used for single and multicomponent models and for canonical correlation. The notable PLS analytical software are SmartPLS (Ringle et al., 2005) and PLS Graph (Chin, 2003). PLS analysis is discussed in detail in the next subsection.

4.6.1 Partial Least Square (PLS)

PLS is a second-generation multivariate technique with a range of features. It is a family of regression-based methods designed for the analysis of high-dimensional data in a low-structured environment (Dijkstra, 2010). As a component-based analytical method, PLS is an iterative algorithm that first separately solves out the blocks of the measurement model, and then, in a second step, estimates the path coefficients in the structural model (Vinzi, Trinchera, & Amato, 2010). PLS facilitates the testing of the psychometric properties of the scales and the estimation of the parameters of the structural model (Igbaria & Iivari, 1995). The PLS approach recognises the measurement and structural models which constitute the two components of a causal model.

The soft-approach modelling techniques of PLS do not require a strong assumption of sample distribution and size. PLS tends to be useful in exploratory research and is oriented towards "optimizing predictions" in terms of explaining variances rather than achieving statistical accuracy of estimates (Vinzi et al., 2010).

It also shifts orientation from causal model theory testing to component-based predictive modelling (Chin & Nested, 1999). PLS takes care of inadmissible solutions and factor indeterminacy in research analysis.

PLS requires several choices that if not made correctly can lead to improper interpretations and conclusions (Hair, Sarstedt, Ringle, & Mena, 2012). Hair et al. (2011) note that PLS maximises the explained variance of the endogenous latent variables by estimating partial model relationships in an iterative sequence of ordinary least squares regression and estimates latent variable scores, treating them as perfect substitutes for the manifest variables. Contrary to multiple regression or SEM estimation techniques, PLS is applied to a non-normally distributed dataset. This indicates that PLS is relaxed in terms of the rule of multivariate normality.

PLS is also suitable for both reflective and formative measures (Chin, 1998). It is not limited by the constraints of identification in the case of a more complex model. Lastly, PLS does not impose strict rules concerning sample size or distributional assumptions as demanded by CB-SEM. SEM allows modification to a specified model based on the parameter estimates. The PLS technique is widely used in research investigations and has been successfully applied in the domain of this study (Chiaburu & Marinova, 2005; Yi & Hwang, 2003).

The present investigation is a focused model study. Focused models have a small number of endogenous latent variables that are explained by a larger number of exogenous variables (Hair et al., 2012). Evidence from the literature suggests that in most cases the number of exogenous variables is at least twice as high as the number of endogenous latent variables. The PLS is suitable for focused and balanced model (Hair et al., 2012). On account of its numerous advantages, the PLS analytical technique was adopted in this study.

Generally speaking, the PLS approach is a suitable statistical technique for modelling complex multivariable relationships among observed and latent variables (Vinzi, Chin, Henseler, & Wang, 2010). The most important decisions concerning PLS relate to data characteristics, analysis of non-normal data and small sample sizes (Hair et al., 2011). PLS is also useful in situations where the research context is relatively new (Chandra, Srivastava, & Theng, 2012).

Training transfer is an emerging area of research in ES, and it therefore resonates with the component-based SEM approach. The above criteria are consistent with the primary objective of this study. Although PLS has been criticised for not being rigorous enough (Rouse & Corbitt, 2008), the advantages of PLS are considerable and summarised by Henseler, Ringle and Sinkovics (2009) as follows:

- PLS delivers a latent variable score, that is, the proxies of the constructs are measured by one or several indicators (manifest variables).
- PLS path modelling avoids small sample size problems and can therefore be applied in some situations when other methods cannot.
- PLS path modelling can estimate very complex models with many latent and manifest variables.
- PLS modelling can circumvent deviations from a multivariate distribution (non-normality of data).
- PLS can handle both reflective and formative measurement models.

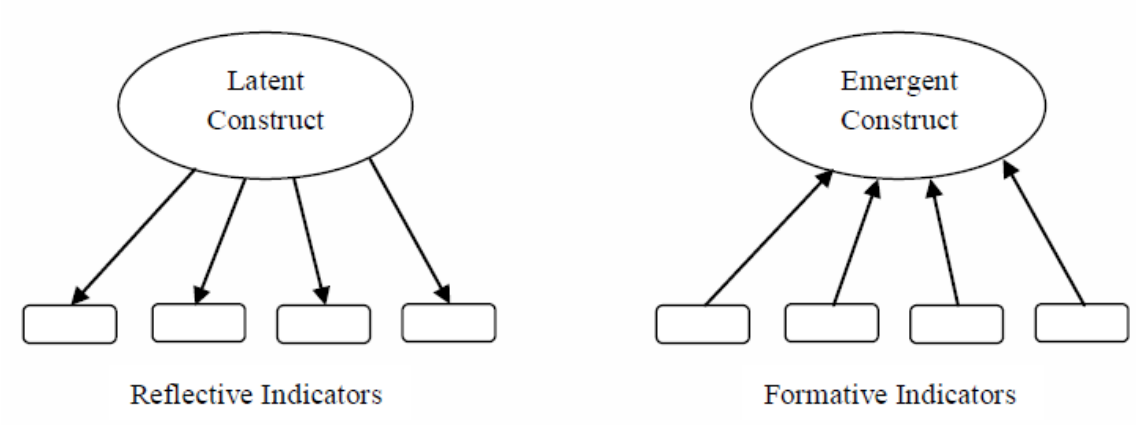
CB-SEM and PLS-SEM are two SEM approaches and that are appropriate for different research contexts, and the objective and characteristics of a study determine the choice of a SEM technique (Hair, Hult, Ringle, & Sarstedt, 2013). The PLS technique is suitable for testing a specified structural model and is appropriate for a study that is aimed at prediction and explanation of constructs, especially where theory is less developed. It is not in the character of PLS to specify an alternative model that fits the data (Sosik, Kahai, & Piovoso, 2009).

As a soft modelling technique, the objective of PLS-SEM is to identify the best prediction of relationships between variables and maximize the amount of covariance between latent variables in the model interpretation. This objective contrasts with the CB-SEM objective of theory testing and minimisation of the covariance matrix. Finally, PLS-SEM has the capacity to transform non-normal data into analysable data through a bootstrapping method.

4.6.2. Measurement Model Specification

Specifying the mode of relationship between measures and the construct is crucial in SEM. There are different modes of epistemic relationships in measurement modelling that involve reflective indicators and formative indicators, respectively (Hulland, 1999). Figure 4 illustrates the relationship between reflective and formative indicators and latent and emergent constructs.

Figure 4: Reflective and Formative Indicators (Chin, 2010)



- **Formative Measurement**

The formative measurement model exhausts the entire domain of index, meaning that the indicators collectively represent all the dimensions or independent underpinnings of the latent variables (Henseler et al., 2009). Formative manifest variables give rise to the construct or cause the construct (Hulland, 1999). A change in the indicators also leads to a change in the construct, and omission of an important index can affect the measurement. The direction of causality is from the indicators; therefore, the indicators should remain mutually exclusive (Hardin, Chang, & Fuller, 2008).

Formative items comprise an explanatory variable of indicators. Formative measurement indicators are characterised by issues concerning a meaningful assessment of reliability and validity (Hulland, 1999). The use of formative measurement in research, in contrast to reflective measurement, is minimal; about 6% of surveyed research in PLS studies is exclusively formative-based. Formative measurement seems to allow carte blanche and arbitrary links of measures to the constructs (Hulland, 1999). The challenges in the use of

formative indicators include the issue of validity and statistical validation of the formative measurement in PLS is therefore difficult.

- **Reflective Measurement**

Reflective indicators represent an error-afflicted measurement, where the direction of causality is from the construct to the indicators; thus, observed measures are assumed to reflect variation in the latent variables (Henseler et al., 2009). Reflective manifest variables are believed to reflect the unobserved, underlying construct, with the construct giving rise to the measure. A change in the construct is subsequently reflected in the composition of its indicators. The reflective measurement theory is based on the idea that latent constructs cause the measured variables (Hair et al., 2006). In reflective measurement, the direction of the arrows emanates from the latent constructs to the indicators.

Researchers are usually faced with the problem of choosing between formative and reflective indicators and providing a sustained argument and rationale for their choice. Chin (1998) and Hardin et al. (2008) provide guidelines for resolving this dilemma. Chin (1998) advocates that the choice between formative and reflective indicators in the measurement of latent constructs be based on (i) theory and (ii) empirical conditions. It is also argued that psychologically based constructs are best measured using reflective indicators, since constructs with a psychological process exist independently of any attempts to measure them (Hardin et al., 2008), though this argument has been disputed by Marakas, Johnson, Clay (2008).

Some scholars have denied the validity of formative measurement. Edwards (2011) maintains that the growing enthusiasm surrounding formative measurement is misguided, and justifications given for using formative measures are based on expressed beliefs about constructs, measures, causality and other measurement issues that are indefensible. Although the variables of this study relate to psychological constructs, the choice of reflective measurement in this study was strengthened by prior theoretical development and research investigations in the area.

Empirical evidence and meta-analysis indicate that 42% of studies in PLS path model typically consist solely of reflective measures. This affirms the acceptability and suitability of the reflective epistemic measurement model over the formative measurement model in PLS analysis (Hair et al., 2011).

4.7. Structural and Measurement Models Assessment

4.7.1. Measurement Model

The PLS model assessment is concerned with ascertaining the psychometric properties of the measurement items. The measurement model or outer model evaluation involves examining individual indicator reliabilities in terms of internal consistency and convergent and discriminant validities (Hair et al., 2011). Validity and reliability of the measures relate to epistemic links between manifest variables and latent variables. Validity is concerned with the indicators' accuracy of the measurement (Bryman & Bell, 2011).

In this study, the indicators of appropriate psychometric properties of the reflective measurement model are based on reliability indices, which are: Cronbach's alpha (α)>0.70, Fornell-Larcker criterion, also known as the average variance extracted (AVE)>0.50, composite reliability (CR)>0.60 (Hair et al. 2006). The Fornell-Larcker criterion and cross loadings (see below) are used to check for discriminant validity (Hair et al., 2011).

- **Convergent Validity**

Convergent validity assesses the degree to which blocks of items of a scale relate with the latent construct. Convergent validity also takes into consideration item reliability and construct reliability. Item reliability is assessed by cross loading. CR and AVE are suitable indices for estimating construct reliability and validity. AVE is measured by the average variance extracted, which usually equals or exceeds 0.5; higher values signify sufficient convergent validity (Hair et al., 2011). Convergent validity is also assessed by item loadings, with 0.7 AVE representing suitable internal consistency reliability.

- **Discriminant Validity**

Validity in research is based on the reflective epistemic relationship of measurement and constructs and focuses on convergent validity and discriminant validity (Hair et al., 2011). Discriminant validity is the extent to which indicators differentiate most items of constructs (Gefen,Straub., & Boudreau, 2000). It is concerned with how construct measures are unique and distinct from other related and unrelated construct measures. Discriminant validity assesses the variance a construct shares with its measures, when compared with other constructs.

Two popular ways of assessing discriminant validity are through Fornell and Larcker's (1981) AVE and cross loadings techniques. The Fornell and Larcker technique expects a latent construct to share more variance with its assigned indicators than with other latent variables in a structural model (Hair et al., 2011).

The AVE statistical value should be greater than the latent construct's correlation with all other latent constructs. Put simply, correlation among construct indicators should be higher than other construct indicators. The square root of the AVE is displayed alongside construct rows and columns. A validity test was conducted in this study, and the results are presented in the next chapter.

4.7.2. Structural Model Assessment

The structural model is also known as the inner model. The structural model examines model estimates and their quality (Hair et al., 2012). Structural model analysis provides information on the relationships between latent variables through path estimation and the explained variance of each construct through the the coefficient of determination (R^2) in a model. The path coefficient result indicates the strength of the relationships between constructs.

- **Coefficient of Determination (R^2)**

Inner model assessment is conducted through the primary criterion of the coefficient of determination (R^2). R^2 represents the percentage of a construct's variance in a PLS model (Chin, 1998b). The quality or fit of a structural model in PLS is determined by the strength of the R^2 analysis. The R^2 of the endogenous variables in the PLS model represents the percentage of the variance explained by a construct in the model. It is an aggregate of the explanatory power in an endogenous latent variable by an exogenous latent variable (Hair et al., 2011).

- **Path Coefficient**

The structural model is also assessed by looking at the relationship of the latent variables, usually by the assessment of the value of the path coefficient. The standardised path coefficients also report the path coefficient, p-values and the t-value statistics. The recommended threshold of the path coefficient is 0.20 and above (Chin, 1998a). PLS analysis relies on a combination of a series of analyses in rejecting the null hypothesis. The condition of acceptance or rejection of a hypothesis in PLS analysis is determined by the significance of the path coefficient and t-value of the hypothesised path.

The significance of the estimated values for path relationships is evaluated in PLS by bootstrapping (Henseler et al., 2009). The recommended threshold of t-statistics is 1.64 and above (Hair et al., 2011).

- **Effect Sizes *(f^2)***

It has been argued that high R^2 values in regression-based analysis are sometimes defective and deceptive due to the impact of unidentified and/or unexplained extraneous factors. This has led to calls for the ascertaining of the R^2 value through effect size (f^2) analysis (Henseler et al., 2009).

In this current study, an analysis of the results of the structural model was further evaluated through effect size (f^2) analysis. Effect size assesses the impact of exogenous variables in a model and is calculated by evaluating the impact of an exogenous variable on an endogenous latent variable. It ascertains whether a variable substantially influences the structural model outcome (Bobow-Thies & Albers, 2010; Hair et al., 2011). The statistical aim of effect size is to show whether the impact of a variable is weak, medium or large at the structural level (Henseler et al., 2009).

The effect size formula is represented below:

$$f^2 = \frac{R^2 \text{ included} - R^2 \text{ excluded}}{1 - R^2 \text{ included}}$$

The data analyses conducted in this study included all of the techniques outlined above, which are essential for effective PLS-based analysis. The data analyses are presented in Chapter 5.

4.8. Construct Operationalisation and Instrument Development

The identification of constructs and development of the items of measure were theory-driven in this study. Theory-driven approaches enhance the clarification of the meanings of the constructs used in a research study, which was performed in Chapter 1. Chapter 2 identified and introduced the dependent variable in this study, training transfer, which emerged from conceptual and empirical studies conducted by Baldwin and Ford (Baldwin & Ford, 1988). Still in the spirit of the theory-driven approach, the exogenous or independent variables of this study were drawn from previous research models in the

domain. In this study, the variables modelled as exogenous variables in the research model are: CSE, MO, training motivation, supervisory support, peer support, PEOU, and SI. The theoretical grounds of this study and research strategy draw from multiple but related disciplines. Therefore, the measurement items in this study were adapted from these disciplines. Existing measures were therefore redrafted and revised to fit the current study.

Four constructs: CSE, supervisory support, SI, and training motivation have four (4) item measurements. PEOU is measured with five (5) items, while peer support and MO have six (6) item measurements. All the items relate with their respective constructs at the reflective epistemic mode. Table 3 shows the research instrument and sources.

Table 3: Research Instrument

Constructs, Measurement Items and Sources
CSE – Mouakket (2010)
CSE - I can usually deal with most of the difficulties I encounter when I use the enterprise systems.
CSE 2 - I am very confident in my ability to use the enterprise systems.
CSE 3 - I am very confident in my ability to use the enterprise systems even if I have only online instructions for reference.
CSE 4 - I am confident in using the enterprise systems if somebody shows me how to use it first.
MO – Santhanam et al. (2008)
MO 1 - The opportunity to learn new things is important to me.
MO 2 - The opportunity to do challenging work is important to me.
MO 3 - I prefer to work on tasks that force me to learn new things.
MO 4 - If I don't succeed on a difficult task, I plan to try harder next time.
MO 5 - In learning situations, I tend to set fairly challenging goals for myself.
MO 6 - I am always challenging myself to learn new concepts.
Supervisory Support – Facteau et al. (1995)
SS 1 - My supervisor helps me with how to use the new skills on the enterprise systems.
SS 2 - My supervisor is tolerant of changes I initiate on the enterprise systems as a result of the learned skills.
SS 3 - My supervisor offers me the opportunities to use the learned skills on the enterprise systems.
SS 4 - My supervisor rewards me for using learned skills on the enterprise systems.

Peer Support – Facteau et al. (1995)
PS 1 - My co-workers care about my application of learned skills on the enterprise systems.
PS 2 - My co-workers encourage me to use learned skills on the enterprise systems.
PS 3 - My relationship with my co-workers enables me to use my learned skills on the enterprise systems.
PS 4 - My co-workers allow me to get accustomed to using my learned skills on the enterprise systems.
PS 5 - My co-workers accept my mistakes as part of trying out the learned skills on the enterprise systems.
PS 6 - My co-workers offer me constructive feedback on the use of my learned skills on the enterprise systems.
Training Motivation – Yi & Davis (2003); Al-Eisa et al. (2009)
ESTM 1 - I am very excited about enterprise systems training.
ESTM 2 - I am always interested in learning the enterprise systems training material.
ESTM 3 - I will try to learn as much as I can from the enterprise systems training.
ESTM 4 - I am motivated to learn the enterprise systems training materials that will be emphasised during the training.
PEOU – Davis (1989)
PEOU 1 - Learning to use the enterprise systems is easy for me
PEOU 2 - It is easy to do what I want to do using the enterprise systems.
PEOU 3 - Learning to use the enterprise systems is clear and understandable.
PEOU 4 - Interacting with the enterprise systems is easy.
PEOU 5- It is easy to become skilful at using the enterprise systems.
SI – Cho et al. (2009)
SI 1 - The enterprise systems interface lay-out is user-friendly.
SI 2 - The computerised instruction of the enterprise systems interface is clear.
SI 3 - The lay-out of the enterprise systems interface is well structured.
SI 4 - The overall design of the interface is satisfactory
Training transfer – Liang et al. (2010); Mouakket (2010)
UTL 1 - I have used the enterprise systems.
UTL 2 - I use the enterprise systems intensively every day.
UTL 3 - I use the enterprise systems frequently every day.
UTL 4 - I spend a lot of time using the enterprise systems.
UTL 5 - I strongly recommend the use of the enterprise systems.

4.8.1. Pre-test of Instrument

Upon completion of the constructed testing instrument, the instruments were pre-tested. Pre-testing of an instrument is an attempt to get empirical feedback from a highly controlled sample to assess the appropriateness of the original instrument (Lewis, Templeton, & Byrd, 2005). Pre-tests are trial runs with selected respondents for the purpose of detecting problems in constructed questionnaires (Zikmund, 2003).

It is expected that the pre-test sample is knowledgeable about the constructs so as to be able to make suggestions that will enhance the clarity of the questionnaire. Critiquing or refinement of an instrument under construction is important. The advantages of pre-testing a questionnaire include exposing:

- evidence of ambiguous questions
- evidence of potential misunderstanding
- evidence of repetitive questions
- evidence of a point of fatigue in respondents
- where a respondent is likely to stop doing the survey

In this study, a trial run was conducted with a group of fifty (50) post-graduate students who have significant ideas concerning ES package and constructs of the study. The questionnaires were further screened with professionals in this research area. The screening assessed the questions' wording, problems of leading questions and question sequence that might lead to respondents' bias (Zikmund, 2003).

Lastly, the questionnaire was reviewed by three (3) experienced faculty members of the department of Business Information Systems, AUT University, who constitute the supervisory team of this study. The assessment led to the fine-tuning of the initially drawn-up items.

4.8.2. Pilot Test of Instrument

Pilot testing is crucial in research based on self-completion questionnaires, since there will otherwise not be an opportunity to clear up any confusion (Bryman & Bell, 2007). A pilot survey is regarded as a "dress-rehearsal" of the instrument with a small sample that has

similar features to the actual sample to be used in the final stage of instrument administration (Lewis et al., 2005).

Pilot testing is desirable to fine-tune and refine items of an instrument before the real administration of the instrument. This exercise ensures that the constructed instrument functions well by detecting problems associated with the measures from a similar target sample (Bryman & Bell, 2007; Lewis et al., 2005). A pilot study detects inconsistencies in the items' contents or framing of the wordings by administering the questionnaires to a small sample size of the chosen respondents from the predefined unit of analysis. Hence, pilot test respondents should be similar to the population that will form the final target of the administration of the instrument. The suggestions from pilot respondents are used for further refinement of the instrument.

In this study, a similar sample frame for actual data collection was used in this pilot exercise. The pilot study made use of a pool of 50 participants. The selected participants were experienced in the use of one or two modules of ES. The selection of 50 participants as a small pilot sample is consistent with Lewis et al.'s (2005) recommendation. The participants were made up of 30 students who are registered in master's degree courses. The rest are made of post-graduate diploma students. The survey was pilot tested between March and April 2012.

The descriptive analysis showed participants were 66% male and 34% female (see Table 4). All participants were active and experienced in the use of the ES packages. Descriptive analysis showed that 86% of the respondents were in the age bracket of 20 to 40 years. Only 8% of the respondents were aged 40 or above (see Table 5).

Table 4: Pilot Sample by Gender

Gender	Frequency (n=50)	Percentage (%)
Male	33	66.0
Female	17	34.0

Table 5: Pilot Sample by Age Group

Age	Frequency (n=50)	Percentage (%)
20-25	4	8.0
26-30	16	32.0
31-35	12	24.0
36-40	11	22.0
41-45	4	8.0

The pilot test results indicated that there were no major problems in the understanding of the online survey instructions and items. The data collected from the pilot testing were analysed with SmartPLS 2.0 (Ringle et al., 2005). In contrast to the covariance-based approach of SEM, PLS is insensitive to sample size in measurement and structural model tests.

Cronbach's alpha for the constructs in the pilot test ranged from 0.71 to 0.93, with significant loadings on the factors. The PLS pilot model test revealed a reasonable and satisfactory internal consistency among the constructs.

The CR values ranged from 0.83 to 0.95, while the AVE evaluations ranged from 55% to 84%. The additional test of Fornell and Larcker's (1981) discriminant validity of the model constructs used the AVE specification that latent constructs should share more variance with their indicators than other latent constructs in the model.

Table 6 shows that all the latent constructs in the pilot test met the set prerequisites. The analysis reported satisfactory and valid measures, which permitted the actual conduct of the research.

Table 6: AVE, CR and Cronbach's alpha

	AVE	CR	Cronbach's alpha
CSE	0.6377	0.8397	0.7162
EOU	0.7135	0.9255	0.899
ESTM	0.6819	0.8652	0.7661
ESU	0.6766	0.8923	0.8365
MO	0.5537	0.8595	0.799
PS	0.718	0.9383	0.9212
SI	0.8441	0.9558	0.9384
SS	0.7429	0.8964	0.8268

4.8.3. Questionnaire Administration

The data in this study were collected from voluntary participants in New Zealand. The participants were previous ES trainees; this requirement is in line with the summative evaluation perspective of this study.

The participation recruitment was conducted through user forums like the New Zealand SAP User Group and SAP community (http://www.flickr.com/groups/nzsug). The research participants were knowledgeable workers who were intense functional users of ES in their places of work. Invitation threads were posted on selected end-users' forums. The invitation thread briefed participants on the purpose of the study and gave an invitation link to the online research survey. A reminder thread about the closing date of the survey was posted each month. The invitation thread was also sent by email to an ES trainer who provided training to the Business Information Systems Department, AUT University, for despatch to previous ES training participants.

A total of 170 completed surveys were received by the closing of the recruitment period. The research survey used items with closely related 5-point Likert scale options, ranging from "strongly disagree" (1) to "strongly agree" (5). The survey used 42 questions to capture the determinants of training transfer in the ES environment. The control function

of the online survey prevented the submission of incomplete responses from participants. The last section of the survey gathered participants' personal demographic information for descriptive purposes only.

4.9. Preliminary Analysis

4.9.1. Data Screening

Data screening of the variables was conducted in line with the multivariate analysis heuristics. Multivariate analysis checks for the presence of outliers, non-normality, CMB and factor loading in the research data. The presence of outliers and non-normal data might result in errors might threaten the validity of the research and checks were conducted accordingly.

4.9.2. Multicollinearity

Multicollinearity exists when there is a strong correlation between two or more predictors in a model (Field, 2009). Correlations between items within each construct and across constructs are expected; however, excessively high correlations create problems in multivariate analysis. Field (2009) mentioned some problems that may arise as a result of multicollinearity in a dataset. First, multicollinearity leads to a type II error. Second, it limits the size of R^2 which indicates the variance explained by the predictors. Third, multicollinearity between predictors makes it difficult to assess the individual importance of a predictor. This study assessed the dataset to detect multicollinearity disturbances among the measurement scale items of the constructs.

4.9.3. Normality

Normality of data is important in multivariate analysis. It suggests the shape of the distribution in the data. When data appears non-normal, this suggests large variation in the distribution and this is neither desirable nor acceptable in research studies. Normality of the data was demonstrated graphically and statistically in the datasets.

4.9.4.Principal Component Analysis (PCA)

Factor analysis (FA) is a statistical technique applied to a single set of variables to discover which variables in the set form coherent subsets that are relatively independent of one another (Tabachnick & Fidell, 2007). It is also useful for scale development and refinement, especially when scales are adapted from different contexts. FA is a useful tool in the early stage of the gathering and analysis of interrelationships among sets of variables

(Pallant, 2010). In this study, PCA was used to assess the reliability of the constructed scale. PCA is a proven technique for empirical summary of a dataset (Tabachnik & Fidel, 2007; Field, 2009).

According to Tabachnik and Fidel (2007),

> If you are interested in a theoretical solution uncontaminated by unique and error variability and have designed your study on the basis of underlying constructs that are expected to produce scores on your observed variables, FA is your choice. If, on the other hand, you simply want an empirical summary of the data set, PCA is the better choice. (p. 635)

The refinement of the measures was done by PCA in this study. PCA is a classical method used to assess the Kaiser-Meyer-Olkin (KMO) (Kaiser, 1974) measure of sampling adequacy of the research instrument. The item loadings, alpha coefficient and item total correlation values are key indicators for the selection of items included in the final analysis. The "Cronbach's alpha if item-deleted" was also used as an indicator for the inclusion of items. SPSS version 19 software was used to conduct this analysis.

4.9.5. Common Method Bias (CMB)

Evidence from cross-sectional research studies attests to respondents' capability and accuracy in reporting their perceptions (Chiaburu & Marinova, 2005; Velada et al., 2007). However, the problem of CMB may affect the relationships of the variables in the research (Podsakoff et al., 2003). For instance, single-sourced data may lead to artifactual covariance of variables as a result of social desirability bias.

The problem of CMB remains a notable shortcoming of cross-sectional research designs (Spector, 2006) and therefore procedural and statistical approaches were taken to diminish the potential problems of CMB in this study (Chang, Witteloostuijn, & Eden, 2010). The details of these approaches are provided in section 5.2.4 of the following chapter (Chapter 5).

4.10. Summary

This chapter discussed the analytical methods and techniques applied to the data collected in this research and outlined the construction of the research instrument including its fine-

tuning and pre-testing. It also described the steps and processes involved in the pilot test of the research instrument before the administration of the final questionnaire. The chapter concluded with a description of the post-data collection treatment of the data, covering the assessment of multicollinearity, normality, CMB, reliability, and validity issues.

CHAPTER 5: DATA ANALYSIS AND FINDINGS

5.1. Overview

This chapter presents the analysis of the data collected for this study and the research findings. First the PLS modelling of the predictors of training transfer in ES is outlined. Then, the two stages in the data analysis procedure of this research are presented. The first stage, pre-data analysis, involves cleaning procedures, such as checks for missing data, multicollinearity, CMB, data normality, and classical FA. The second stage of the data analysis covers reliability and validity issues, measurement, and structural model evaluation of the hypotheses.

5.2. Preliminary Data Analysis

Data for all latent variables included in the research model were collected from the same source. Based on this, multiple data simplification steps were taken prior to data analysis. Screening of the data before data analysis exposes the qualities of the dataset. Problems in empirical research especially relating to the quality of the collected data might include multicollinearity, skewness, CMB and non-normality, among others. The check for missing data, normality and CMB preceded the measurement and structural model analysis in this study.

5.2.1. Analysis of Missing Data

Missing data are information not available for a subject or case about which other information is available (Hair, Anderson, & Black, 2006). A respondent's inability or refusal to answer a portion of the questionnaire can result in missing data. Errors during coding can result in a large amount of missing data. In this study, an analysis of missing data was not conducted as the online survey was designed to eliminate incomplete data. Therefore, there were no cases of missing data in the dataset.

5.2.2. Multicollinearity

Field (2009) suggests that one way of identifying multicollinearity is to scan a correlation matrix of all of the predictor variables and see if any correlate very highly, that is, 0.80 or above. This study examined multicollinearity disturbances in the dataset through bivariate correlations of all the measurement scale items of the research constructs (see Appendix F). Correlations of 0.80 or above among construct items are suggestive of the presence of

multicollinearity (Field, 2009). The bivariate correlations analysis showed no evidence of multicollinearity in the datasets.

5.2.3. Normality of Data

Normality refers to the shape of the data distribution for an individual metric variable and its correspondence to the normal distribution (Hair et al. 2006). Non-normality indicates large variation in distribution, and is considered a threat to statistical validity in research. The data normality test is conducted using (1) univariate analysis of manifest variables distribution; (2) visual inspection of normal probability plot; and (3) the Shapiro-Wilk test.

The check for univariate normality of sample distribution at item level was assessed through skewness and kurtosis statistics. The skewness and kurtosis descriptor reveals values within +-2.5 for relative normality of the manifest variables. However, univariate normality does not necessarily indicate multivariate non-normality (Hair et al. 2006). Additionally, the study assessed the normal probability plot, which is a statistical procedure that shows the data observed plotted against a theoretical normal distribution (Pallant, 2010). The visual inspection of the histogram and normal probability plot showed that the variables were fairly normally distributed. The test for multivariate normality was done using the Shapiro-Wilk technique. The results from the analysis show that all variables had significant values of 0.00 (see Table 7). This is an indication of non-normal data distribution.

Given that PLS places minimal demands on distributional assumptions, the PLS algorithm is capable of transforming non-normal data via the central limit theorem and use of bootstrapping technique of resampling (Hair et al. 2011; Chin 1998a) to account for normality concerns. Violating normality distribution is not a concern in studies that use the PLS analytic method because the bootstrapping feature of the PLS is capable of handling the problems of non-normality.

Table 7: Descriptive of Items

	N	Minimum	Maximum	Mean	Std. Dev	Skewness		Kurtosis	
UTL2	170	2	5	3.74	.839	.048	.186	-.818	.370
UTL3	170	2	5	3.80	.868	-.150	.186	-.780	.370
UTL4	170	2	5	4.03	.780	-.127	.186	-1.140	.370
UTL5	170	2	5	3.72	.865	.138	.186	-.959	.370

ESTM1	170	2	5	3.75	1.003	-.291	.186	-.989	.370
ESTM2	170	1	5	3.94	.759	-.886	.186	1.979	.370
ESTM4	170	2	5	3.94	.800	-.443	.186	-.180	.370
MO1	170	3	5	4.29	.600	-.214	.186	-.579	.370
MO2	170	3	5	4.29	.600	-.214	.186	-.579	.370
MO5	170	3	5	4.18	.638	-.169	.186	-.600	.370
MO6	170	3	5	4.15	.625	-.120	.186	-.498	.370
SI1	170	2	5	3.42	.827	.088	.186	-.506	.370
SI2	170	2	5	3.37	.768	.047	.186	-.367	.370
SI3	170	2	5	3.42	.775	.182	.186	-.311	.370
EOU2	170	2	5	3.55	.769	-.061	.186	-.342	.370
EOU3	170	2	5	3.38	.770	.166	.186	-.292	.370
EOU4	170	2	5	3.36	.826	.058	.186	-.544	.370
EOU5	170	2	5	3.47	.786	.135	.186	-.379	.370
SS1	170	2	5	3.63	.791	-.108	.186	-.394	.370
SS2	170	2	5	3.54	.714	.149	.186	-.268	.370
SS3	170	2	5	3.78	.736	.019	.186	-.518	.370
PS1	170	2	5	3.61	.716	.258	.186	-.413	.370
PS2	170	2	5	3.72	.690	.109	.186	-.425	.370
PS3	170	2	5	3.82	.691	-.079	.186	-.266	.370
PS4	170	2	5	3.65	.700	.195	.186	-.419	.370
PS5	170	2	5	3.47	.924	.155	.186	-.808	.370
PS6	170	2	5	3.62	.680	.079	.186	-.268	.370
CSE2	170	2	5	3.68	.710	-.043	.186	-.248	.370
CSE3	170	2	5	3.58	.805	-.252	.186	-.375	.370
CSE4	170	2	5	3.82	.733	.015	.186	-.595	.370

5.2.4. Common Method Bias (CMB)

The cross-sectional approach adopted in this study is associated with CMB. CMB is a situation where a single factor accounts for about 50% or more of the variance in the sample data. In this study, procedural and statistical steps were taken to minimise the potential impact of the problem of CMB in the data. The steps of these procedures include:

- The use of multiple respondents for data collection (Spector, 1994).
- The data instrument is pre-arranged to mitigate problem of transient mood, retrieval cues, and demand characteristics (Chiaburu & Marinova, 2005). This forestalls cognitive correlation that may lead to response patterns.
- Criterion measures are placed in the first part of the questionnaire to reduce social desirability and consistency motif.
- An anonymous web survey is used for data collection.
- The inclusion of an unrelated construct in the research instrument.
- Complex modelling of dependent and independent constructs that inhibit individual rater's cognitive mapping (Chang et al., 2010).

The statistical approach used in this study was Harman's one-factor statistical analysis (Podsakoff et al., 2003; Podsakoff & Organ, 1986). Evidence from research attests that Harman's one-factor test is appropriate for detecting CMB method bias (Podsakoff et al., 2003). Harman's one-factor test in this study did not find a single factor accounting for more than 50% of variance extracted; one factor however accounted for about 37% of the variance. This suggests that the data was not pervasively affected or threatened by CMB (see Appendix D for more detail).

5.3. Descriptive Statistics

The participants of this study were ES end-users. As noted in Chapter 4, 170 survey responses were obtained for analysis.

Tables 8–12 present the descriptive statistics for the sample.

Table 8: Gender of Participants

Gender	Frequency	Percentage (%)
Male	104	61.2
Female	66	38.8
Total	170	100.0

Table 9: Age Groupings of Participants

Age	Frequency	Percentage (%)
20-25years	19	11.2
26-30	53	31.2
31-35	45	26.5
36-40	21	12.4
41-45	18	10.6
46-50	14	8.2
Total	170	100.0

Table 10: Business Units of Participants

Business Units	Frequency	Percentage (%)
IT	23	13.5
Engineering	22	12.9
Services	20	11.8
Marketing	24	14.1
Production	19	11.2
Finance	31	18.2
Logistics	31	18.2

Table 11: Participants' Experience

Experience	Frequency	Percentage (%)
Less than 6 months	25	14.7
Over 6 months	58	34.1
1 year	42	24.7
1 year plus (11–16 months)	19	11.2
1 and half years and above	26	15.3
Total	170	100.0

Table 12: Levels of Education

Level	**Frequency**	**Percentage (%)**
Post-graduate	45	26.5
Bachelor	81	47.6
Diploma	29	17.1
Certificate	15	8.8
Total	170	100.0

The descriptive information was captured in the last section of the questionnaire. The majority of the research participants were in the 20-30 age brackets (42.4%). This implies that the use of ES packages is popular with this age group. Perhaps this figure also reflected the organisational hierarchy, as most end-users were at the operational level.

The popularity of ES cuts across business units. The descriptive analysis reveals the experience of the users in ES: 14% of the respondents completed their training 6 months

prior, and 34% completed ES training over 7 months prior, which meant they had over 7 months' experience. Overall 72% completed ES training one year or less before the collection of this data.

The analysis suggests that the sample is representative of the wider population. ES training takes between 6 months and 1 year to complete in most cases. The educational qualifications of the respondents, includes 81 holders of bachelor's degrees and 45 holders of post graduate degrees respectively. This implies that the sample were knowledgeable workers/end-users. Table 13 shows the descriptive of items indicators.

Table 13: Descriptive of Items Indicators

Constructs	Codes	N	Min	Max	Mean	Std. Deviation
Training transfer	UTL2	170	2	5	3.74	.839
	UTL3	170	2	5	3.80	.868
	UTL4	170	2	5	4.03	.780
	UTL5	170	2	5	3.72	.865
Training Motivation						
	ESTM1	170	2	5	3.75	1.003
	ESTM2	170	1	5	3.94	.759
	ESTM4	170	2	5	3.94	.800
Mastery orientation						
	MO1	170	3	5	4.29	.600
	MO2	170	3	5	4.29	.600
	MO5	170	3	5	4.18	.638
	MO6	170	3	5	4.15	.625
System Interface						
	SI1	170	2	5	3.42	.827
	SI2	170	2	5	3.37	.768
	SI3	170	2	5	3.42	.775
Ease-of-Use						
	EOU2	170	2	5	3.55	.769
	EOU3	170	2	5	3.38	.770
	EOU4	170	2	5	3.36	.826
	EOU5	170	2	5	3.47	.786
Supervisory Support	SS1	170	2	5	3.63	.791
	SS2	170	2	5	3.54	.714
	SS3	170	2	5	3.78	.736

Peer Support						
	PS2	170	2	5	3.72	.690
	PS3	170	2	5	3.82	.691
	PS4	170	2	5	3.65	.700
	PS5	170	2	5	3.47	.924
	PS6	170	2	5	3.62	.680
CSE						
	CSE2	170	2	5	3.68	.710
	CSE3	170	2	5	3.58	.805
	CSE4	170	2	5	3.82	.733

5.4. Measurement Issues

The dearth of studies on training transfer in ES meant that in most cases existing measurement items were re-worded to measure the variables in this study. Against this background, the study conducted some reliability and validity checks on the survey instrument, which are discussed below.

5.4.1. Factor Analysis

PCA reported a satisfactory measure of sampling adequacy. The analysis showed that transfer measure, end-users' training motivation, CSE, PEOU, SI, MO, and peer and supervisory support measurement items reported Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy above 0.883, which exceeded the specified benchmark of 0.6. The assessment of the factor loading values of 0.70 was also confirmed by the measurement model. The KMO measures of sampling adequacy values are reported in Table 14 below.

5.4.2. Reliability

The internal consistency of the scale items with their core concepts was analysed. Reliability was measured by coefficient alpha. Coefficient alpha signifies the extent of relations of specified items with the constructs measured. SPSS version 19 was used to test the reliability of the items used in the study. The study based the deletion of items on the statistics of an "item-to-total correlation" value of 0.3 and the "Cronbach's alpha if items deleted" benchmark. "Cronbach's alpha if items deleted" indicates the overall value of Cronbach's alpha if a particular item is deleted (Field, 2009). The deletion of items improves the contribution of other items in the overall Cronbach's alpha. Items that did

not contribute significantly to the overall Cronbach's alpha or whose contribution was negligible were dropped (see Appendix E).

5.5. Structural Equation Modelling (SEM)

SEM encompasses a family of models that are capable of estimating multiple and interdependent relationships, and this has popularised its widespread use in management, social science, marketing and IS studies.

5.5.1. Assessment of Measurement Model

The measurement model was evaluated by assessing the validity and reliability of the items in it. This study assessed the internal consistency reliability with Cronbach's alpha and CR, which are appropriate for reflective measures (Hair et al., 2011).

i. Internal consistency reliability

The check for the epistemic relationship of the constructs and measures is a crucial stage in PLS analysis, especially in the use of reflective measurement. Reliability checks expose measurement errors in a piece of research and typically begin with a Cronbach's alpha reliability check to determine the reliability and convergent of items.

To determine the appropriateness of a research instrument, it is necessary to assess the reliability and validity of the instrument prior to its use. Although scale reliability does not confer validity, it does confer consistency and stability of measures. Indicator reliability is the internal consistency reliability which signifies the degree to which the items making up the scale are all measuring the same underlying attributes of a construct (Pallant, 2010) and shows it has convergent validity (Hair et al., 2006).

The two commonly used statistical scale reliability methods are CR (Werts, Linn, & Joreskog, 1974) and Cronbach's alpha estimates (Cronbach, 1971). Cronbach's alpha ascertains the degree of interrelationship between the theory and its measure. It provides an indication of the correlation among all of the items that make up the scale (Pallant, 2010). Composite reliability is preferred over Cronbach's alpha because it provides a better estimate of variance shared by the respective indicators since it uses the item loadings obtained within the nomological network (Hair et al. 2006).

In this study, both CR and Cronbach's alpha were used to assess the reliability of the scales. The results show an appropriate internally consistent measurement value of 0.7 or above (Nunnaly, 1978). Table 14 shows that the CR of each construct for this study ranges from 0.8668 to 0.9395, which exceeds the recommended threshold of 0.7. The results of the internal consistency reliability assessment therefore permitted the conducting of the structural model analysis.

Table 14: Internal Consistency Reliability

Variables	CR	Cronbach's alpha
CSE	0.8838	0.8037
EOU	0.9424	0.9182
ESTM	0.8668	0.7692
UTL	0.9195	0.8823
MO	0.8739	0.8077
PS	0.9257	0.8992
SI	0.9395	0.9035
SS	0.8639	0.7675

ii. Indicator reliability

The check for item reliability was conducted through the assessment of the factor loadings. The indicator reliability of measurement model suggests an indicator's variance is explained by its underlying latent variable. This can be observed through an assessment of the factor loadings. The criterion used for determining the relevance of measurement items in a latent construct is that 50% of the variance of the latent construct should be explained by the factor loadings. A satisfactory item factor loading is at least 0.7 and the minimum significance level is 0.05.

In this study, all the measurement items exceeded the benchmark of 0.7. The measurement model has loadings surpassing 0.700; the loadings ranged from 0.7549 to 0.9365. All measurement items are significant at the level of 0.001.

Table 15 shows the measurement model assessment, and the fitness of all measures included in this model. Table 15 also confirms the internal consistency reliability of the measures.

Table 15: Items Loadings, CR & KMO

Constructs	Items	Factor Loadings	Composite Reliability	Kaiser Meyer-Olkin (KMO)
Mastery orientation	MO1	0.7876	0.8739	0.72
	MO2	0.7876		
	MO5	0.776		
	MO6	0.833		
Computer self-efficacy	CSE2	0.8901	0.8838	0.70
	CSE3	0.8639		
	CSE4	0.7841		
ES Training Motivation	ESTM1	0.7639	0.8668	0.68
	ESTM2	0.865		
	ESTM4	0.8505		
System Interface	SI1	0.9009	0.9395	0.748
	SI2	0.916		
	SI3	0.9295		
Supervisor support	SS1	0.7549	0.8639	0.691
	SS2	0.8362		
	SS3	0.8778		
Perceived ease-of-use	EOU2	0.8842	0.9424	0.811
	EOU3	0.9365		
	EOU4	0.9212		
	EOU5	0.8412		
Peer support	PS2	0.9006	0.9257	0.845
	PS3	0.7979		
	PS4	0.8955		
	PS5	0.7898		
	PS6	0.8357		
IS use	UTL2	0.8775	0.9195	0.822
	UTL3	0.8707		
	UTL4	0.7793		
	UTL5	0.9107		

iii. Validity

In this research, validity refers to the degree to which a scale purportedly measures the object of what it intends to measure. In line with the PLS reflective research framework, we tested for convergent and discriminant validity in this study.

- **Convergent validity**

Convergent validity measures the degree to which blocks of items of a scale relate with the latent construct. Convergent validity also takes into consideration item reliability and constructs reliability. Fornell and Larcker's (1981) AVE is used for estimating construct validity. An AVE value of at least 0.5 indicates sufficient convergent validity (Hair et al., 2011). Table 16 shows that the AVE of the research constructs range from 0.6343 to 0.8382. All AVE values surpassed the recommended threshold of 0.5.

Table 16: Results of AVE Analysis

Variables	**AVE**
CSE	0.7178
PEOU	0.8083
Training Motivation	0.6850
MO	0.6343
Peer Support	0.7144
System Interface	0.8382
Supervisory Support	0.6799
Training transfer	0.7412

- **Discriminant validity**

Discriminant validity represents the extent to which indicators differentiate among other numerous constructs (Gefen, Straub, & Boudreau, 2000). It is concerned with construct measures' uniqueness and distinctiveness from other related and unrelated measures of other constructs. It assesses the variance that a construct shares with its measures when compared with other constructs.

Research investigations assess discriminant validity by cross loadings and AVE. The rule of thumb is that the square root of the AVE must exceed the correlations between the measure and all other measures (Hair et al., 2011). Discriminant validity assessment at the indicator level using cross loadings is based on the principle that the respective latent construct should be higher than the loadings with other (latent constructs') cross loadings.

This study assessed discriminant validity with both AVE and cross loading techniques. Tables 17 and 18 show the results of the discriminant validity assessment based on AVE cross loadings. Table 17 shows the square roots of the AVEs (in bold) and the inter-correlation value between constructs. The results show that the diagonal values which represent the square roots of AVE are higher than the off-diagonals and therefore meet the Fornell and Larker's (1981) criterion of discriminant validity.

Table 17: Latent Variable Correlations

	CSE	**EOU**	**ESTM**	**UTL**	**MO**	**PS**	**SI**	**SS**
CSE	**0.847**							
EOU	0.5304	**0.890**						
ESTM	0.4716	0.4868	**0.827**					
UTL	0.6419	0.54	0.4882	**0.860**				
MO	0.3811	0.257	0.4715	0.3268	**0.796**			
PS	0.5467	0.4791	0.4413	0.5202	0.3225	**0.845**		
SI	0.5315	0.7454	0.4486	0.4616	0.3275	0.4603	**0.914**	
SS	0.3538	0.4294	0.4635	0.3816	0.2069	0.383	0.4755	**0.824**

Note 1: Diagonal elements in bold are the square roots of average variance extracted (AVE). The off-diagonal elements are the correlations among constructs. For discriminant validity, diagonal elements should be larger than the off-diagonal elements.

Note 2: CSE = Computer self-efficacy; EOU = ease of use; ESTM = ES training motivation; UTL = Training transfer; MO= Mastery orientation; PS = peer support; SI = system interface; SS = supervisory support

Table 18: Factor and Cross Loadings

	CSE	EOU	MO	ESTM	PS	SI	SS	UTL
CSE2	**0.8901**	0.5814	0.3423	0.497	0.5446	0.5545	0.3442	0.6069
CSE3	**0.8639**	0.472	0.2677	0.3401	0.5141	0.5257	0.294	0.537
CSE4	**0.7841**	0.2542	0.3617	0.3393	0.3052	0.2351	0.2506	0.4746
EOU2	0.589	**0.8842**	0.233	0.4236	0.496	0.6846	0.308	0.5193
EOU3	0.4648	**0.9365**	0.2293	0.4363	0.4286	0.7159	0.3908	0.539
EOU4	0.4532	**0.9212**	0.2092	0.4496	0.4426	0.6656	0.4261	0.4934
EOU5	0.3854	**0.8412**	0.2554	0.4399	0.3406	0.5999	0.4236	0.369
MO1	0.3628	0.1319	**0.7876**	0.3673	0.1506	0.2421	0.1546	0.286
MO2	0.3232	0.2339	**0.7876**	0.3863	0.2575	0.2727	0.1792	0.3061
MO5	0.1765	0.2703	**0.776**	0.3431	0.3215	0.26	0.1651	0.1885
MO6	0.3401	0.1877	**0.8333**	0.4017	0.2989	0.2682	0.1604	0.255
ESTM1	0.3293	0.3432	0.3674	**0.7639**	0.36	0.3566	0.3489	0.3475
ESTM2	0.4512	0.4526	0.415	**0.865**	0.4168	0.4488	0.3993	0.4172
ESTM4	0.3831	0.406	0.3873	**0.8505**	0.3196	0.3071	0.4003	0.4423
PS2	0.4815	0.4394	0.2922	0.3936	**0.9006**	0.401	0.336	0.4387
PS3	0.414	0.3953	0.3174	0.4264	**0.7979**	0.3754	0.4201	0.371
PS4	0.4924	0.4387	0.29	0.3916	**0.8955**	0.4129	0.3421	0.5261
PS5	0.4791	0.331	0.2464	0.3063	**0.7898**	0.3526	0.1659	0.4208
PS6	0.4429	0.4117	0.2127	0.3415	**0.8357**	0.4005	0.3432	0.4301
SI1	0.4187	0.6922	0.3042	0.4349	0.3396	**0.9009**	0.3491	0.3991
SI2	0.5069	0.6362	0.2937	0.3778	0.4148	**0.916**	0.4929	0.4039
SI3	0.5332	0.7146	0.3013	0.4174	0.505	**0.9295**	0.4662	0.4618
SS1	0.317	0.3288	0.1382	0.294	0.1949	0.3964	**0.7549**	0.2994
SS2	0.2024	0.3101	0.1202	0.3684	0.3244	0.3027	**0.8362**	0.2817
SS3	0.3536	0.4134	0.2356	0.4581	0.3934	0.4697	**0.8778**	0.3578
UTL2	0.5392	0.4742	0.234	0.3759	0.4003	0.4011	0.3619	**0.8775**
UTL3	0.4772	0.4306	0.1787	0.3401	0.5015	0.3068	0.3013	**0.8707**
UTL4	0.5576	0.4448	0.4124	0.4752	0.4511	0.4235	0.281	**0.7793**
UTL5	0.6212	0.5024	0.2869	0.4745	0.4399	0.4448	0.3649	**0.9107**

5.5.2. Assessment of Structural Model

PLS structural equation modelling (PLS-SEM) is strong in prediction, especially where knowledge in a field is not well established. This study seeks among other things to contribute to the development of theory in this domain by exploring the predictors of training transfer in ES.

The measurement model assessment carried out above confirmed the consistency and suitability of the measurement items as the first stage of PLS analysis. The second stage of the analysis is the structural model, and the testing of the hypothesised relationships between the exogenous and endogenous variables.

The structural model analysis involves three stages of analysis. The first stage identifies the values of the path coefficients, the coefficient of determination (R^2), and lastly the effect sizes of the exogenous variables in the model.

i. Coefficient of determination (R^2)

PLS inner model assessment is a variance and non-parametric-based analysis of the relationships between exogenous and endogenous constructs. The criterion for inner model structural relations is the coefficient of determination (R^2), otherwise called squared multiple correlation. It is the percentage of the variance in the endogenous variables that is accounted for by the predictors in the model, and is perhaps the most valuable descriptor of the relationship between components (Falk & Miller, 1992). R^2 values indicate the explanatory power of the structural model. A substantial explanatory power of R^2 values is approximately 0.67, while 0.33 suggests an average, and 0.19 a relatively weak, explanatory power (Chin, 1998a).

ii. Path coefficient

Path coefficient is the strength of relationships between constructs. Standardised path coefficients also report the path coefficient, p-values and the t-value statistics. The recommended threshold of the path coefficient is 0.20 and above (Chin, 1998b).

PLS statistical significance of the path coefficients is determined by bootstrapping analysis. The bootstrapping technique is a re-sampling exercise performed by SmartPLS to determine the t-statistical value of hypothesised relationships among latent variables. This study conducted a bootstrap analysis (n=200) whereby 200 re-samples were applied to produce the t-statistics from the 170 cases in line with PLS rubrics (Chin, 1998b).

iii. Effect size (f^2)

Effect size (f^2) involves determining the R^2 of the dependent variable when the independent variable is included or excluded as a predictor of the dependent variable (Bobow-Thies & Albers, 2010). Effect sizes of 0.02, 0.15 and 0.35 indicate that the effect is small, medium and large respectively (Chin, 1998). In this study the effect size was calculated independently of the SmartPLS software, because SmartPLS is incapable of conducting f^2. The effect size analysis was done through an excel sheet. The results of the effect size analysis on training transfer and training motivation appear in Table 19, which presents the results of the structural model assessment.

Table 19: Results of the Structural Model

Hypothesised Paths	Path Coefficients	T. Statistics Value	Effect Size (f^2)
CSE -> ESTM	0.121	1.6553*	0.01
CSE -> UTL	0.398	6.1444***	0.18
EOU -> ESTM	0.227	2.6159**	0.05
EOU -> UTL	0.222	2.4185**	0.40
MO -> ESTM	0.300	3.6803***	0.13
ESTM -> UTL	0.148	2.1008**	0.03
SS -> ESTM	0.245	3.4522***	0.08
PS -> ESTM	0.096	1.1915	0.01
PS -> UTL	0.156	2.3074**	0.03
SI -> ESTM	-0.044	0.4929	0.00
SI -> UTL	-0.053	0.7177	0.00

*** $p < 0.01$ (> 2.65)

** $p < 0.05$ (> 1.96)

* $p < 0.10$ (>1.65)

NS = not significant

5.5.3. Testing the Hypotheses

The assessment of a structural model must follow the validation specifics of PLS analysis. The structural model can be assessed by validating the paths of the relationships among the latent variables. Path coefficient values should be around 0.10 (Hair et al., 2011) to predict a reasonable relationship. However, path coefficient values do not predict the strength of the relationships. The PLS statistical estimate of the path coefficient significance value is determined by the t-value. This is done through the bootstrapping re-sampling feature of analytical software.

This study used bootstrapping techniques to assess the path coefficient significance. The critical t-values at 1.65 and 1.96 are suitable values for the assessment of the significance of the path coefficient in PLS (Hair et al., 2011). A conclusion regarding the acceptance or rejection of a hypothesis is based on the t-value at the conventional significance level of 0.05 and 0.01. The results of the path coefficient estimates, t-values of significance, and tested hypotheses are shown in Table 20.

In this study, the path coefficients confirmed most of the hypothesised relationships. Hypotheses 1, 2, 3, 4, 5, 6, 7, 9 are statistically significant. Hypotheses 8, 10 and 11 did not reach a significant level in the structural model.

The effect size analyses confirmed the above findings. f^2 ranged from small to large effects of 0.01 to 0.4. It is not an uncommon occurrence for effect to range from small to medium; however, this does not mean that the observed result is insignificant.

Table 20: Results of the Hypotheses

	Hypotheses	**Result**	**t-value**	**Significance Level**
H1	CSE will positively influence end-users' training transfer.	Supported	**6.1444**	0.01
H2	CSE will positively influence end-users' training motivation.	Supported	**1.6553**	0.10
H3	PEOU will positively influence training motivation.	Supported	**2.6159**	0.05

H4	PEOU will positively influence training transfer.	Supported	**2.4185**	0.05
H5	MO will positively influence end-users' training motivation.	Supported	**3.6803**	0.01
H6	End-users' training motivation will positively influence training transfer.	Supported	**2.1008**	0.05
H7	Supervisory support will positively influence training motivation.	Supported	**3.4522**	0.01
H8	Peer support has a positive influence on training motivation.	Not significant	**1.1915**	NS
H9	Peer support will positively influence training transfer.	Supported	**2.3074**	0.05
H10	SI will positively influence training motivation.	Not significant	**0.4929**	NS
H11	SI will positively influence training transfer.	Not significant	**0.7177**	NS

5.6. Summary

This chapter discussed the quantitative analytics of the research and their application to the data collected. The research model was tested through the variance-based approach of PLS-SEM based on valid data obtained from a sample size of 170. This thesis investigates end-users' motivational determinants of training transfer in ES. Specifically, the research objective is to identify the predictors of end-users' application (transference) of skills in ES. This is manifested in the improved use of the systems as a result of the acquired skills. Based on the above, the research aims to identify the motivational elements of transfer in terms of individual, organisational and technological characteristics.

The model developed for this research satisfies the validity and reliability measures as demonstrated by the internal consistency and CR criteria. In the first place, all items met the minimal and expected criteria of acceptable item loading of 0.7 or greater. Secondly, the items demonstrated internal CR of 0.7.

The model also displays construct, convergent and discriminant validity. The AVE values of the construct were 0.5 or higher. All the indicator items loaded on their respective latent variables and the square roots of the construct's AVE were higher than the off-diagonal (inter-correlation) items.

In addition, the obtained R^2 values were high enough to be satisfactory. For example, the model explained about 50% variance of end-users' training transfer. The model also reported 44% of variance in end-users' training motivation as a precursor of training transfer. The substantial R^2 values demonstrate powerful explanatory influences on the latent variables in the model. Finally, the results confirmed 8 out of the 11 hypothetical directional paths specified in the model, based on the t-values. The next chapter presents a discussion of and reflection on the tested hypotheses.

CHAPTER 6: DISCUSSION OF RESEARCH FINDINGS

6.1. Overview

This chapter presents a summary of the research findings in relation to the research questions. This discussion is based on the three research questions developed in Chapter 2 and the 11 hypotheses developed in Chapter 3. This chapter also compares the findings with those of previous research studies.

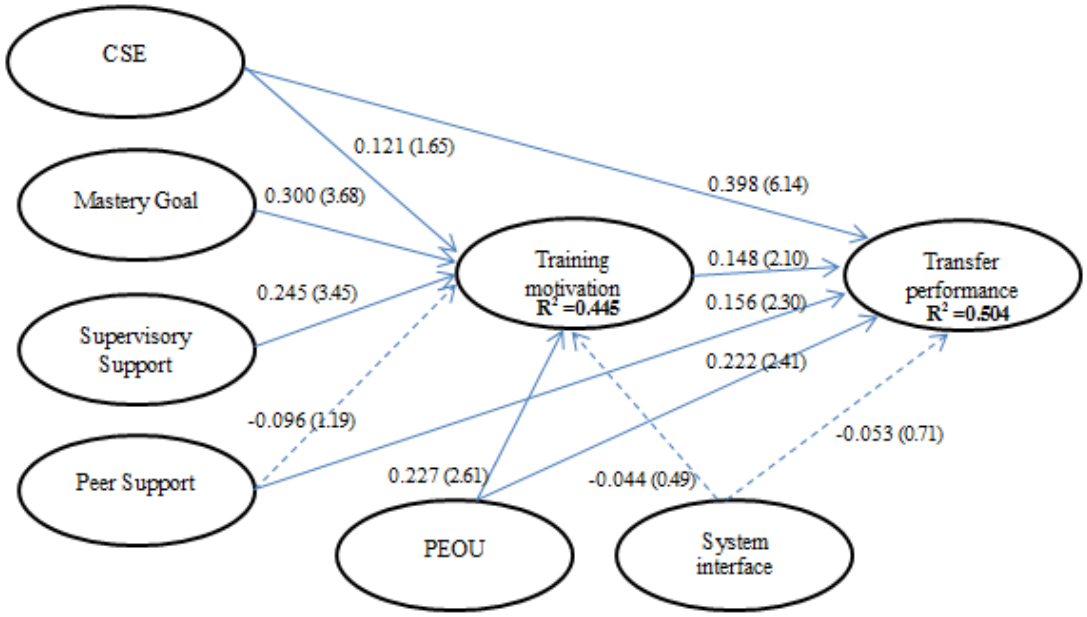
6.2. Summary of Findings

The results of this empirical investigation indicate that end-users' training transfer in ES is significantly and directly influenced by CSE, peer support and PEOU. The indirect influence of end-users' training motivation, supervisory support, and MO on training transfer is also confirmed by the structural model. In addition, end-users' training motivation emerges as an important precursor of training transfer.

The PLS analysis of MO, supervisory support, and PEOU yielded a positive and significant association with training motivation. In contrast, the analysis identified a negative association between peer support and training motivation in this study. The SI was insignificant in the model, however, and the hypothesised positive relationships between end-users' perceptions of SI and systems usage were not statistically supported in this setting.

Figure 5 graphically illustrates the summary of the PLS results. The explanatory power of the model is good, ranging from R^2=0.445 (training motivation) to R^2=0.504 (training transfer).

Figure 5: Structural Model (Path coefficient, and the t-values in brackets and the R^2).



Note: The dotted lines (from peer support to training motivation and from SI to training motivation and training transfer) are not significant.

Table 21 shows the research questions and the results of the hypothesis testing. The statistical evidence supported eight hypothesised paths (H1, H2, H3, H4, H5, H6, H7, and H9) in this study. Three of the hypothesised paths (H8, H10 and H11) had no statistical support from the PLS analysis.

Table 21: Summary of the Research Questions and Hypotheses

	Research Questions and Hypotheses	**Outcome**
RQ1: How do CSE, PEOU, *MO and training motivation influence training transfer in ES?*		
H1	CSE will positively influence end-users' training transfer.	**Supported**
H2	CSE will positively influence end-users' training motivation.	**Supported**
H3	PEOU will positively influence end-users' training motivation.	**Supported**

H4	PEOU will positively influence end-users' training transfer	**Supported**
H5	MO will positively influence end-users' training motivation.	**Supported**
H6	End-users' training motivation will positively influence training transfer.	**Supported**
RQ2: How do supervisory and peer support influence training motivation and training transfer in ES?		
H7	Supervisory support will positively influence end-users' training motivation.	**Supported**
H8	Peer support will positively influence end-users' training motivation.	**Rejected**
H9	Peer support will positively influence end-users' training transfer	**Supported**
RQ3: How does SI influence training motivation and training transfer in ES?		
H10	SI will positively influence end-users' training motivation.	**Rejected**
H11	SI will positively influence end-users' training transfer	**Rejected**

6.3. Discussion of the Research Findings

This section discusses the research findings in relation to the research questions. The results are discussed and compared with the related literature.

6.3.1. Research Question 1: How do CSE, MO, PEOU, and training motivation influence transfer in ES?

This study investigates the motivational determinants of training transfer in ES. Thus, the study examines the factors that enhance skills application in the ES environment. Training transfer is the extent to which end-users apply learned skills from training to the workplace. Research suggests that the motivation to transfer learned skills in the workplace is a function of individual, training design, and transfer environment variables (Baldwin & Ford, 1988). The transfer model suggests that individual attitude and attributes, such as training motivation, PEOU and MO are important transfer facilitators.

Self-efficacy is an individual perceptual capability to effectively execute courses of actions in task domains (Bandura, 1986). This study hypothesised that CSE (Compeau & Higgins, 1995) positively influences training transfer in ES. The findings of this study show that CSE influence training motivation and transfer. The path coefficient from CSE to training transfer (H1) is statistically significant, with medium effect size (β=0.39, t=6.144, p<0.01, f^2=0.18). H2, which assesses the influence of CSE on training motivation, also receives statistical support (β=0.12, t=1.65, p<0.10, f^2 0.01) from the structural model.

The results show that CSE is a strong predictor of training transfer in ES. The influence of CSE is medium in the analysis (f^2 =0.18). However, the analysis also shows that CSE influence is stronger for training transfer than training motivation. The effect size of the influence of CSE on training transfer is medium while the effect size of CSE on training motivation is weak (f^2=0.18; f^2 0.01 respectively). The result confirms that end-users' confidence concerning their capabilities affects the use of trained skills in the ES environment. In the training setting, the acquisition of skills results in better self-efficacy which enhances performance behaviour.

In this study, CSE is positively associated with training transfer and end-users' training motivation. Previous generic IS experience helps the development of a positive attitude in the ES training environment. The results show that end-users are more likely to be motivated to learn and apply learned skills in an environment similar to their previous technology training environment, even though training environments differ to some extent. Overall, these results are in parallel with previous studies, which conclude that self-efficacy predicts training transfer across task domains (Lim et al., 2007; Al-Eisa et al., 2009; Chiaburu & Marinova, 2005; Compeau & Higgins, 1995; Garavan et al., 2010).

Considering PEOU as a trigger of positive transfer, H3 and H4 analysed the influence of PEOU in end-users' training motivation and training transfer. The results for H3 show that PEOU has a positive influence on end-users' training motivation. The path between PEOU and training motivation is significant, with a small effect size (β=0.22, t =2.6159, p<0.05, f^2 0.05). The statistical tests confirm that PEOU is a significant determinant of end-users' training motivation.

This outcome indicates that end-users positive perception influence learning motivation and subsequent use of learned behaviour in the task environment. The development of positive perceptions and belief systems enhances end-users' post-adoption behaviours in IS (Amoako-Gyampah & Salam, 2004; Bedard et al., 2003).

H4 proposed a positive relationship between PEOU and training transfer. The evidence from the PLS assessment strongly supports this hypothesis. The study finds a positive relationship between PEOU and training transfer (β=0.22, t =2.4185, p<0.05, f^2 0.40). PEOU contribution to the model is significant, this is also evident in the larger effect size (f^2 0.40).

These results suggest that PEOU of a system's functions enhances learning. On the other hand, negative perceptions concerning the system may result in learning demotivation; that is, a decrease in the motivation to learn and reluctance and hesitation to apply skills on the system. The importance of the role of PEOU in the IS environment is reinforced by these findings.

Further evidence from this study suggests the MO motivational process prompts individuals to achieve better outcomes in the learning environment. H5 was concerned with the influence of MO on end-users' training motivation. MO refers to an individual's quest for the acquisition of knowledge and development of skills (Dweck, 1986; VandeWalle & Cummings, 1998). MO is especially important when learning leads to the acquisition of competencies and subsequent improved task performance.

The results from this study suggest that MO predicts end-users' training motivation. The significance of MO in the model is supported by a medium effect size (f^2 0.13). The path coefficient between MO and end-users' training motivation is significant, with medium effect size (β=0.30, t =3.68, p<0.01, f^2 0.13). This result is consistent with previous assertions and empirical findings (Gravill & Compeau, 2003; Santhanam et al., 2008).

This finding substantiates previous research evidence which indicates that MO type end-users achieve mastery of learning objectives (Ford et al., 1998). This is because MO types focus on the mastery of learning and are motivated to achieve in learning situations. In this study, MO as a motivational process enhances the achievement of learning objectives (Gravill & Compeau, 2003; Yi & Hwang, 2003). The PLS analysis shows that MO significantly predicts training motivation.

H6 posited that end-users' training motivation significantly influences training transfer. The path coefficient between end-users' training motivation and training transfer was statistically significant. This evidence suggests that when end-users are motivated to learn ES, they are more inclined to use the learning in task situations (Scaduto et al., 2008).

The path coefficient from training motivation to training transfer was significant, with a small effect size (β=0.245, t =3.4522, p<0.01, f^2 0.08).

The literature suggests that training motivation is a precursor for training transfer (Calvert, 2006; Robey et al., 2000; Scaduto et al., 2008). The positive relationship between training motivation and training transfer affirms the centrality of training motivation in the transfer process. In the training environment, two beliefs are associated with end-users' motivation: making efforts in training sessions results in learning and learning the training material is useful for the achievement of valued outcomes on the job (Brown & Ford, 2002). This research finding is consistent with earlier investigations into the influence of training motivation on performance behaviour (Garavan et al., 2010; Chiaburu & Marinova, 2005).

Overall, in relation to Research Question 1, the study finds that CSE, MO, PEOU and training motivation positively influence training transfer in ES. The results of this study support the conclusion that end-users' characteristics significantly predict transfer on the job (Colquitt et al., 2000; Garavan et al., 2010).

6.3.2. Research Question 2: How do peer and supervisory support influence training motivation and transfer in ES?

Conformity behaviour among members of an organisation is affected by the level of social support available. Evidence suggests that supervisory and peer support are crucial sources of social influence in the transfer environment (Cromwell & Kolb, 2004; Clarke, 2002; Gilpin-Jackson & Bushe, 2007; Martin, 2010; Velada et al., 2007). Peer and supervisory support also operate as organisational support mechanism (Chiaburu et al., 2010).

A positive climate provides adequate resources and opportunities for learning and application of learning. Supervisory and peer support are favourable environmental factors in the workplace (Chiaburu & Marinova, 2005; Hawley & Barnard, 2005; Liebermann & Hoffman, 2008; Kang & Stewart, 2007). LMX states that leaders who form high-quality social exchanges with their subordinates create an environment where subordinates have higher levels of trust, empowerment and performance (Kang & Stewart, 2007). This suggests that LMX exerts some influence on training effectiveness.

In training settings, support manifests in terms of training framing, feedback, coaching, encouragement, rewarding behaviours, and creation of opportunities for the application of skills (Tao, 2006; Lim & Johnson, 2002; Burke & Hutchins, 2008).

End-users who enjoy some level of support from their superiors are more likely to have positive attitudes towards organisation-funded training interventions like ES training. In line with these findings, this study examines the influence of supervisory support on training motivation (H7).

The PLS analysis found a positive relationship between supervisory support and training motivation (β=0.24, t =3.4522, p<0.01, f^2 0.08). Therefore, the hypothesised path between supervisory support and end-users' training motivation is supported, with a small effect size (f^2). This finding corroborates previous findings on the relationship between supervisory support and training motivation (Hawley & Barnard, 2005; Liebermann & Hoffman, 2008; Scaduto et al., 2008). The finding reinforces the tenets of exchange theories, such as social exchange theory, norms of reciprocity and LMX (Blau, 1964; Dansereau et al., 1975; Gouldner, 1960) which give strong support to healthy exchanges between a leader and members. Such theories hold that such exchange leads to reciprocated behaviours which affect training effectiveness (Velada et al., 2007).

Therefore, a good working relationship between the leader and the follower would include good communication about what behaviour is tied to good and bad performance. Again, if the leader and the follower agree on what is important from a performance standpoint, and if they see the training as contributing to this desired performance, the employee outcome expectancy would increase because training is a path to the performance desired by the leader (Scaduto et al., 2008). The literature also highlights the payoff between a leader and the follower for goal attainment, suggesting that the payoff could be in the increase of opportunities for the attainment of the outcome expectancy of the follower (Scaduto et al., 2008).

Social exchanges between a leader and follower come with commitment on the part of the subordinate to reciprocate high-quality relationships by engaging in discretionary behaviours, and paying attention to skill acquisition and application (Scaduto et al., 2008). Supervisory support shows a significant relationship with the motivation to transfer (Chiaburu et al., 2010). Organisational managers are also sources of motivation for the actualisation of organisational goals. A supervisor constitutes a crucial source of support and powerful motivating force during training and during ES implementation (Dong et al., 2009; Scaduto et al., 2008).

Positive peer support has been found to contribute to a good organisational climate for transference of skills (Chiaburu et al., 2010). The dynamics of workplace exchanges among colleagues facilitate productive training transfer (Cromwell & Kolb, 2004; Martin, 2010; Gilpin-Jackson & Bushe, 2007). Previous studies have argued that peer activities such as problem-solving assistance and provision of supplementary information enhance training effectiveness (Facteau, et al., 1995; Gallivan et al., 2005; Martin, 2010; Hawley & Barnard 2005; Chiaburu & Lindsay, 2008).

This study examines the influence of peer support on training effectiveness - training motivation – H8 and at the distal level of training transfer – H9. The relationship between peer support and end-users' training motivation (H8) was not statistically significant (β=0.09, t =1.1915, p<0.10, f^2 0.01); neither were the path coefficient and effect size. This finding is consistent with a previous study (Facteau et al., 1995) that examined the influence of peer support on training motivation and unexpectedly found a negative relationship between peer support and training motivation.

This finding may be attributed to certain factors. ES training allows end-users to focus mainly on the mastery of the ES modules and because of this end-users might adopt an individualistic learning approach to achieve their learning goals. An individual learning approach may decrease interactions among peers during the technology training. This gives rise to the question of whether the learning approach in the technology training affects peer influence in training episodes.

Another possible explanation for this result may be end-users' unfamiliarity and inadequate awareness of the training content. ES training content consists of job tasks and processes in the workplaces which are embedded in the ES modules; this might impact on peer interactions during the training.

Cultural variability can impact on training acquisition and transfer (Rogers & Spitzmueller, 2009). Evidence shows that individualism, unlike collectivism, does not correlate with motivation to learn. Therefore, in the event where most of end-users are individualistic in their learning approach, peer support for training motivation will be low or perhaps non-existent. The individualistic approach comes with less social intensity and peer interaction as opposed to collectivism which is more beneficial because it facilitates better interaction (Gallivan et al., 2005).

In addition to the assessment of the impact of peers on training motivation, H9 analysed the influence of peer support on training transfer. In agreement with the argument that social support affects the need to conform and embrace certain types of behaviour, the hypothesised path between peer support and end-users' transfer received significant support from the PLS analysis.

The coefficient path from peer support to training transfer showed a positive relationship and a small effect size (β=0.15, t =2.3074, p<0.05, f^2 0.03). This finding is consistent with past findings on the influence of social support in the workplace (Burke & Hutchins, 2007, 2008; Hatala & Fleming, 2007; Gilpin-Jackson & Bushe, 2007; Martin, 2010). The research confirms that peer networking and social interaction in the workplace affect end-users' training transfer in ES.

This result is not surprising, because end-users' familiarity with the system's features and functions may produce increased interaction and communication among peers, which might culminate in collaboration in solving and resolving difficult task issues. Again, the stage of skill procedurilisation of the training; that is, the building of smaller and discrete behaviours into a domain-specific production (Kraiger et al., 1993), may impact on skills transfer. Research suggests that training transfer can be automated if there is the opportunity to practise the new behaviour (Goldstein & Ford, 2002).

In answering the second research question of this study, the PLS-SEM model confirms that training transfer is influenced by peer and supervisory support. Supervisory support affects training transfer through end-users' training motivation, while peer support affects training transfer directly.

6.3.3. Research Question 3: How does SI influence training motivation and transfer in ES?

Research on the impact of SI in the transfer of technology training effectiveness is lacking, a situation this research aimed to improve. This area is important because SI is crucial in human–technology interaction. Success in both learning and task performance may depend on SI flexibility and compatibility with the values and needs of end-users.

This study explores the role of SI in the technology training transfer environment. Contrary to expectations, the assessment of the impact of SI on training motivation (H10) did not find support from the structural model.

The coefficient of the path from SI to end-users' training motivation was not significant (β=-0.044, t =0.4929, p<0.10, f^2 0.00), indicating SI does not relate significantly with training motivation. This finding is inconsistent with other studies on the influence of SI on system usage (Cho et al., 2009; Choi et al., 2007; Koh et al., 2009; Mouakket, 2010).

The study further examined the impact of SI on training transfer (H11). The PLS analysis found that SI does not enhance the application of skills in ES. The path coefficient between SI and training transfer negatively correlates (β=-0.053, t =0.7177, p<0.1, f^2 0.00). This finding is consistent with previous assessments of the role of SI in the learning of ERP technology (Boudreau, 2003; Davis, 1993; Davis & Bostrom, 1992; Gururajan & Fink, 2002; Hasan & Ahmed, 2007; Wiedenbeck & Davis, 1997).

While the results of this study show that SI has an insignificant impact on training motivation and transfer, this does not amount to a total rejection of the importance of SI in practice, especially during the learning and the application of learned skills in the ES environment. This outcome may also express fundamental differences between ES technology and other types of technology or web interfaces (Cho et al., 2009; Choi et al., 2007). The answer to the third research question is that SI is not associated with training transfer in ES.

The model developed in this study appears robust in measuring training transfer. The individual, social, and training design exogenous variables were suitable predictors of the endogenous variables of this study. The model fit based on R^2 and the standardised path coefficients (Chin, 1998a) reported R^2 values of 0.445 and 0.504 and respectively. These results are comparable with previous studies that show R^2 values of 035, 0.41, 0.45 and 0.61 for training transfer respectively (Choi et al., 2007; Chiaburu et al., 2010; Scaduto et al., 2008; Liebermann & Hoffman, 2008). Meanwhile, the R^2 values of training motivation from research studies range from 0.16 to 0.68 (Chiaburu et al., 2010; Smith et al., 2008; Garavan et al., 2010).

6.4. Summary

This chapter discussed the research findings of this study, answered the three research questions, and discussed the 11 hypotheses in the light of the research findings. The research evidence confirms the influence of CSE, PEOU, MO and supervisory support on training motivation in ES.

The analysis suggests that CSE, PEOU, peer support and end-users' training motivation are significant predictors of training transfer in ES. From the results of the statistical analyses, H1, H2, H3, H4, H5, H6, H7 and H9 received statistical support in the structural model. Meanwhile, H8, H10 and H11 failed to reach a significant level in the model. The draws conclusions from this discussion and summarises the research reported in this thesis.

CHAPTER 7: CONCLUSION

7.1. Overview

The chapter presents the conclusions of this study. It summarises the findings and how the research questions have been answered. The study's contribution to academic and practice is also covered, along with the limitations of the study and suggestions for future research in this area. Finally, the concluding remarks of the thesis close this research investigation.

7.2. Linking Research Findings to Research Questions

Research Question 1: How do CSE, MO, PEOU and training motivation influence training transfer in ES?

The research findings show that CSE, PEOU and training motivation influence end-users' training transfer in ES. The PLS analysis also shows that MO significantly predicts training transfer through training motivation. These results validate hypotheses H1, H2, H3, H4, H5 and H6.

Research Question 2: How do peer and supervisory support influence training motivation and transfer in ES?

The research findings show that both peer and supervisory support is an important normative predictor of training transfer in ES. From the analysis, supervisory support correlates with end-users' training motivation, while peer support correlates with training transfer directly. These results validate hypotheses H7 and H9.

Research Question 3: How does SI influence training motivation and training transfer in ES?

The research findings did not support the influence of SI on training transfer. The path coefficients between SI and training motivation and training transfer were not significant; hence H10 and H11 were rejected.

To sum up, the PLS results validate hypotheses H1, H2, H3, H4, H5, H6, H7, and H9. Hypotheses H8, H10 and H11 receive no statistical support from the PLS analysis.

7.3. Contributions/Implications of Study

There is a dearth of research concerning ES training transfer, particularly the motivation for skills transfer in this environment. The strength of this thesis is evident in its theoretical and practical contributions to the IS and training literatures, which are discussed below.

7.3.1. Theoretical Contributions

The first contribution of this study is that it addresses the lack of studies of training transfer in IS. The study assessed transfer of skills in a relatively new and complex IS environment. To the best of the researcher's knowledge, this research is a pioneering empirical contribution to the study of skills transfer in this area. Previous studies of transfer have been conducted on soft skills; that is, managerial and leadership training transfer (Tai, 2006; Chiaburu & Marinova, 2005; 2010) or computer training in the classroom (Compeau & Higgins, 1995; Gist et al., 1988, 1989). This study expands on the IS training literature which demonstrates little knowledge of the summative evaluation of end-users' training (Choi et al., 2007; Coulson et al., 2010; Marler et al., 2006; Rajagopalan et al., 2007).

Secondly, this study develops a theoretical framework for the study of training transfer in the IS environment. Transfer is a complex process, and this is widely recognised by organisations. Interestingly, training transfer has been neglected in IS research, hence the absence of a suitable and coherent theoretical framework in this area. This study fills the gap in this regard.

Thirdly, the research model validation answers the call for an investigation of skills transfer issues in IS (Jasperson et al., 2005). This study is one of the first to conceptualise the determinants of training transfer in the IS domain.

Finally, the current study integrates training transfer into the IS domain. It integrates attitudinal, motivational, social support, and environmental favourability of the system design factors from psychology, HR/training and IS theories into a research framework which specifies the influence of end-users' attitude, availability of social support, and technology features on training transfer in IS terrain. The integration of these theories brings to the fore the importance of the subject matter across disciplines, especially the importance of attitude, social cues, and technology design features in training transfer.

7.3.2. Practical/Managerial Implications

The research findings have important implications for the transfer process in organisations. This study provides a better understanding of transfer strategies, particularly how to enhance effective training transfer in the workplace. The research reported in this thesis will assist organisations to understand:

1) The importance of end-users' attributes and attitudes on training and training transfer.

2) How the use of organisational support systems as transfer strategies reinforces the use of learning in the workplace.

3) How improved technology design features of the target system support positive perceptions, metacognition, and transfer on the system.

The practical implications of this research are discussed below:

- **CSE and training transfer**

The research findings confirm that CSE is an important determinant of skills transfer in ES. End-users' confidence in their ability to function in a computer environment helps the application of new behaviour in real job situations. This implies that priority should be given to end-users with higher levels of self-efficacy as models who can affect the training motivation and self-efficacy of their peers. The intervention may also include the design of ES training in the best way that facilitates the development of CSE. In addition, managers should be patient and provide support at the early stage of ES usage, as self-efficacy may also be influenced by the design of the job and job environment (Cabrera et al., 2006). Since managers are aware of opposing forces in the workplace they should create situational cues that may encourage personal confidence.

- **PEOU and training transfer**

PEOU favourably associates with end-users' training motivation and training transfer. The goals of ES training can be achieved if end-users develop a positive perception of the technology. PEOU during ES training influences the degree of positive attitude concerning training motivation and use of skills on the system. The implication of this is that ES system features should be easy to interact with, especially during ES learning. The technical functions of the system should be easy and user-friendly to support learning and system accessibility.

- **MO and end-users' training motivation**

The findings of this research confirm that MO is a predictor of training effectiveness through training motivation in ES. This implies that managers should be aware of the likely individual differences in their staff's goal orientation patterns. The relationship between MO and training transfer may be relevant for selection purposes. It is advisable to select MO types and attempt to modify the orientation of end-users who lack MO, since ES training is a complex and difficult terrain which might be unsuitable for performance goal orientation types who are usually characterised by maladaptive cognitive and behavioural patterns in difficult task environments.

Managers may apply psychometric tests to pre-screen end-users in recruitment prior to the ES implementation to ascertain goal orientation types. Also, pre-training psychometric tests could be applied to identify end-users' goal orientation and their readiness for the training; in this way, appropriate intervention could be put in place to modify the orientation, since goal orientation is modifiable and inducible. Knowing an end-user's orientation type prior to ES training may reveal which goal orientation types are suitable and effective in ES training.

- **Training motivation and training transfer**

Evidence from this investigation asserts the centrality of end-users' training motivation in the ES transfer environment. The results indicate that training motivation is a predictor of training transfer. Training provision increases an organisation's chances of making returns on investment through end-users' efficient performance. It is therefore important for managers to ensure that issues relating to an effective training outcome are well taken care of in the design of the training. According to this study, end-users' training motivation to learn has some selection implications for both IS and IT managers. Managers should consider personalities that are predictive of motivated individuals during hiring decisions for critical positions that might warrant learning and frequent updating of skills.

Empirical evidence suggests that end-users' motivation to learn can be increased (Colquitt et al., 2000). Therefore, the more end-users' ability to learn is increased, the more they are willing to gain knowledge and master the training content (Tai, 2006). Likewise, it is important for organisations to note that perceived barriers and enablers affect performance across the domain by indirectly impacting on motivation itself (Klein et al., 2006).

This means that barriers in the learning environment affect both training motivation and outcomes which adversely impact on the overall performance. Lower training motivation leads to a reduction in learning and transfer efforts in the workplace. Therefore, it is essential for organisations to show strong commitment and provide incentives and resources during the implementation of training. Lastly, the effect on training transfer of the motivation to learn is manifested in the extent of end-users' engagement with the ES training activities.

- **Supervisory support and end-users' training motivation**

This research finds support for the influence of supervisory support on end-users' training effectiveness through training motivation. This finding highlights the role of supervisory managers in end-users' transference of skills in ES. Particularly, organisations should note that supervisors constitute agents of skills transfer and a central source of support (Chiaburu et al., 2008; Dong et al., 2010). This finding suggests that supervisory support is an important factor which influences skills application. This evidence finds parallels in a previous study that found social support contributes to a favourable environment (Noe, 1986). Supervisors might alleviate transfer problems in ES through a range of actions and strategies during and after ES training; for instance, granting more autonomy, task delegation, rewards, assistance, and assigning opportunities for skills transfer will increase performance in ES. In sum, supervisors should actively support their staff to enhance end-users' training motivation.

- **Peer support and training transfer**

The finding asserts the centrality of social influence in the ES transfer environment. This implies that organisations should develop strategies that encourage knowledge sharing and supportive activities from peers during ES implementation training. The provision of incentives and rewards in the workplace might be reciprocated in the form of positive transfer among end-users. Such interventions aimed at increasing end-users' perceptions can be achieved through high performance systems policies, such as performance appraisal.

- **System Interface and training transfer**

This study empirically validates the determinants of training effectiveness in ES setting. The research assessed the influence of SI on end-users' training motivation and skill application at the proximal level. It is interesting to find that SI does not influence end-users' training motivation and skill usage in this study; that is, transfer of skills in ES.

This research finding is inconsistent with previous literature on the role of SI on system usage in generic IT (Choi et al., 2007; Cho et al., 2009; and Calisir, & Calisir, 2004). The inconsistency might be explained by the main purpose of ES. The emphasis of ES is on *integration* rather than *interface*. The concern of companies is whether ES can provide real-time and accurate integration among processes occurring in the functional departments and inter-organisational activities. SAP has improved much in the area of interface design. However, this has not increased its adoption compared with the traditional SAP enterprise control component, which is built in a more complicated but integrated way.

Intuitively, one might expect SI to positively influence learning and transfer of skills; however, in this study, it is possible for end-users to be less motivated by the tasks which they perform during skill learning and transfer. SI might be ineffective in the learning and using of a complex packages like the ES, unlike other SI such as the library, web and generic IT interfaces. It is also possible that SI impact training motivation or transfer through PEOU. This might be worth looking at in the future.

A previous study that reported the positive influence of SI was not a post-training analysis, and the participants in the study had almost four years' experience of the technology (Calisir & Calisir, 2004). Enactive mastery, which represents competence (experience) on tasks, regulates perceptual judgement (Bandura, 1997). It follows that there should be a correlation between experienced participants' perception (as demonstrated by Calisir & Calisir, 2004) of the SI and performance of the system.

Research suggests that users are not able to build their confidence with a complex technology. Complex tasks heightens end-users' anxiety. In highly challenging task environment, users may experience an overload of complexity in the use of emerging and complex technologies (Burkhard & Roldan, 2009). This implies that attention should be directed at SI design that taps into ease of access, navigation aids, and logical flow of information searches, particularly when training how to use complex technologies like ES.

7.4. Limitations

This area of research has a strong tradition of relying on end-users' self-reports as the soundest source of data to test hypotheses because it rely on end-users' perceptions (Maurer & Lippstreu, 2008) that are directly relevant to their training transfer. The limitations of this study, though not uncommon to cross-sectional studies, require certain steps be taken to minimise the potential impact of CMB in self-reports.

First, the data for the predictors and criterion measures were collected from the same source at the same time. Data collected from a single source can potentially lead to CMB. However, this effect was controlled through Harman's one-factor supplemental statistical test (Podsakoff et al., 2003). Harman's one-factor analysis showed that only one factor accounted for the majority of the variance (37%), which suggests that CMB was not a pervasive concern in this study.

Also, the study applied numerous procedural steps to minimise the effect of CMB and to increase its accuracy. The procedural steps in the research design are believed to improve the accuracy of the self-reported data. The research questionnaire was arranged so that the predictor variable was placed in the first section of the questionnaire to discourage a consistency motif. An unrelated construct was also included in the research survey to minimise consistency motif and social desirability in participants' responses. The use of the anonymous survey method also improved the accuracy of the dataset.

Second, the data of the study was collected through self-reporting. Self-reporting is argued to be a reliable way of measuring training transfer and there is no evidence from the literature that suggests otherwise or indicates that end-users cannot accurately self-report training transfer (Facteua et al., 1995). However, the use of objective organisational data may advance knowledge in this area.

Third, data collection is restricted to end-users in New Zealand. Therefore, the findings may be limited to New Zealand and may not necessarily reflect training transfer in other countries. Therefore, further research that replicates this study in other countries would help to generalise the findings.

Finally, caution should be taken in drawing causal inferences from this study, due to its non-experimental design.

7.5. Further Research

Further research is recommended for the purpose of replicating and extending the current research findings. The following recommendations are proposed for future research investigations based on the limitations of this study identified above.

First, a longitudinal investigation of motivational determinants of training transfer in ES would be a useful direction for future research in this area.

An assessment of the change and consistency in this relationship over time will add to the understanding of transfer mechanisms.

Second, future investigation is required at different levels of analysis. A multilevel analysis of the determinants of transfer among end-users in ES will contribute to knowledge in this area. An understanding of transfer mechanism at the team level is essential.

Third, this current study reports mixed outcomes for the influence of social support (peer and supervisory support) on training motivation and training transfer. The influence of peers on end-users' training motivation is insignificant, while the supervisory support correlates positively with training motivation. Nonetheless, these factors were retained in the research model as the reported relationships were found reasonable and logical. However, the reported outcomes are recommended for further investigation in future research.

Fourth, future research should endeavour to understand the interaction between PEOU and SI and training effectiveness in the ES context. Perhaps PEOU, SI and training transfer may be differently related than suggested in the research model. For instance, rather than SI being directly linked to transfer, this relationship could be assessed indirectly by testing SI as an antecedent of PEOU.

Fifth, future studies should examine and compare the compatibility of the SI of various ES and their influence on training effectiveness in ES. Comparing the interfaces of popular ES solutions will add to the understanding of the influence of SI, which may also guide better future interface design.

Sixth, future research should collect objective data; even though perceptual measures are acceptable in research, efforts should be geared towards the use of multi-sourced data including objective data and observation of end-users' engagement in the use of the skills.

Future research is also required to expose the causal influences of MO on training transfer as the current research did not test for this influence, based on the theoretical argument that MO is predictor of training motivation (Chiaburu & Marinova, 2005).

Lastly, this study is focused on a particular technology and its users. Therefore research should be conducted using other technologies or user groups for comparison with this study.

7.6. Concluding Remarks

This is one of the first empirical studies to examine training transfer in ES. Training transfer is an area of concern in training studies in IS. Research in IS uncovers resistant and hesitant behaviours in the use of ES among end-users. This leads to a high failure rate in ES projects, despite the huge training and technology investment. Yet there is a paucity of knowledge regarding ES training transfer. This shows that ES researchers and practitioners have ignored the need for empirical investigations of the influence of individual attitude and attributes, social support and technology design on ES training transfer. This research identifies the motivational determinants of training transfer, that is, the facilitators of end-users' skills utilisation in ES. This research agenda was executed through an online survey method of data collection.

The study began with a methodical review of the literature and theories from management, psychology, and IS to develop a conceptual framework of ES training transfer. The review of the literature generated three research questions, which were answered through the testing of 11 research hypotheses.

The research model explains significant levels of variance in the two endogenous variables. The model explains 40% and 50% of variance in end-users' training motivation and training transfer, respectively in ES. Furthermore, 8 of the 11 hypothesised paths in the research model received support from the PLS model testing, while three of the hypotheses were rejected. Overall, the research outcome shows that ES training transfer is predicted by CSE, PEOU, training motivation and peer support. It is evident from this finding that MO, supervisory support, and PEOU strongly predict end-users' training motivation.

The explanatory power of the model has important implications for both theory and practice. The findings from this study can help organisations in understanding how attitude, social support, and training design issues, especially technology design, can affect ES training transfer. Having a clear understanding of how these determinants influence end-users' transfer can help organisations to address transfer problems.

Lastly, this theoretical conceptualisation and empirical demonstration of ES training transfer increases knowledge on the summative evaluation of skills in IS. Given the above, this research has perhaps laid a foundation for future studies in this area.

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APPENDIX A: Ethics application approval

MEMORANDUM

Auckland University of Technology Ethics Committee (AUTEC)

To: William Wang

From: Dr Rosemary Godbold Executive Secretary, AUTEC

Date: 27 September 2011

Subject: Ethics Application Number 11/217 An examination of the determinants of training effectiveness in ES.

Dear William

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 22 August 2011 and I have approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 10 October 2011.

Your ethics application is approved for a period of three years until 27 September 2014.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through http://www.aut.ac.nz/research/research-ethics/ethics. When necessary this form

may also be used to request an extension of the approval at least one month prior to its expiry on 27 September 2014;

- A brief report on the status of the project using form EA3, which is available online through http://www.aut.ac.nz/research/research-ethics/ethics. This report is to be submitted either when the approval expires on 27 September 2014 or on completion of the project, whichever comes sooner;

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

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this. Also, if your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply within that jurisdiction.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact Charles Grinter, Ethics Coordinator, by email at ethics@aut.ac.nz or by telephone on 921 9999 at extension 8860.

On behalf of AUTEC and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Dr Rosemary Godbold

Executive Secretary

Auckland University of Technology Ethics Committee

Cc: Chris Arasanmi chris.arasanmi@aut.ac.nz

APPENDIX B: Research instrument

ENTERPRISE SYSTEMS (ES) TRAINING TRANSFER SURVEY

Purpose: This research is embarked upon to understand ES training transfer among end-users. ES encompasses Enterprise Resource Planning Systems (ERPs) like SAP, Oracle and Microsoft Dynamics information software and others.

This study seeks to learn from your experiences and perceptions on the utilisation of ES in your organisations after the training. The survey takes approximately 20-30 minutes to complete. The completion of the questionnaire affirms your consent and willingness to participate in this survey. This is an anonymous survey and all information will be kept confidential. Information gathered will be used only for academic purposes.

Please be as honest as you can in your responses. For any clarification, please contact the researcher on this email address: carasanm@aut.ac.nz or call +64-2190-3729.

1. *Please indicate the ES system in use in your organisation:

SAP ☐ Oracle ☐ Others ☐

SECTION - A

	Please indicate the extent of your agreement or disagreement with the following statements based on the scores from 1-5 (where 1 indicates "Strongly Disagree" and 5 indicates "Strongly Agree").	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
2	I have use the enterprise system					
3	I use the enterprise system intensively everyday					

4	I use the enterprise system frequently everyday					
5	I spend a lot of time using the enterprise system					
6	I strongly recommend the use of the enterprise system					
7	I am very excited about the enterprise system training					
8	I am always interested in learning the enterprise system training material					
9	I will try to learn as much as I during the enterprise system training					
10	I am motivated to learn the enterprise system training materials					
11	The opportunity to learn new thing is important to me					
12	The opportunity to do challenging work is important to me					
13	I prefer to work on tasks that force me to learn new things					
14	If I don't succeed on a difficult task, I try harder next time					
15	I tend to set fairly challenging goals for myself in learning situations					
16	I always challenge myself to learn new concepts					
17	The enterprise system interface layout is user friendly					
18	The computerized instructions of the enterprise system interface is clear					
19	The lay-out of the enterprise system interface is well structured					
20	The overall design of the enterprise system interface is satisfactory					

SECTION - B

	Please indicate the extent of your agreement or disagreement with the following statements based on the scores from 1-5 (where 1 indicates "Strongly Disagree" and 5 indicates "Strongly Agree").	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
21	Learning to use the enterprise system is easy for me					
22	It is easy to do what I want to do using the enterprise system					
23	Learning to use the enterprise system is clear and understandable					
24	Interacting with the enterprise system is easy					
25	It is easy to become skilful at using the enterprise system					
26	My supervisor helps me when I ask for advice on how to use the learned skills on the enterprise system					
27	My supervisor is tolerant of changes that I initiate on the enterprise system as a result of the learned skills					
28	My supervisor offers me the opportunities to use the learned skills on the enterprise system					
29	My supervisor rewards me for using the learned skills on the enterprise system					
30	My co-workers cares about my application of the learned skills on the enterprise system					

31	My co-workers encourage me to use the learned skills on the enterprise system					
32	My relationships with my co-workers enables me to use my learned skills on the enterprise system					
33	My co-workers allow me to get accustomed to using my learned skills on the enterprise system					
34	My co-workers accept my mistakes as part of trying out the learned skills on the enterprise system					
35	My co-workers offers me constructive feedback on the use of my learned skills on the enterprise system					
36	I can usually deal with most difficulties I encounter when I use the enterprise system					
37	I am very confident in my abilities to use the enterprise system					
38	I am very confident in using the enterprise system even if I have only online instructions for reference					
39	I am confident in using the enterprise system if somebody show me how to use it first					
40	Our customers keep promises they make to our firm					
41	Our customers are trustworthy					
42	Our customers are genuinely concerned that our business succeeds					

DEMOGRAPHY

1. Gender: Male ☐ Female ☐

2. Age: 20-25 ☐ 26-30 ☐ 31-35 ☐ 36-40 ☐ 41-45 ☐ 45-50 ☐

3. Education:

Diploma\Certificate ☐ Bachelor ☐ Postgraduate ☐

4. Experience on the use of ES since completion of Training:

Less than 6 months ☐ Over 6 months ☐ 1 year ☐

1years plus (11-16months) ☐ 1/half years & above ☐

5. Please indicate your industry:

Sales & Marketing ☐ Banking & Finance ☐ IT\Telecoms ☐

Oil & Gas ☐ Manufacturing ☐ Supply Chains\Logistics ☐

Consulting\Services ☐ Engineering\Construction ☐

……..THANK YOU…….

APPENDIX C: Participant Information Sheet

Project Title: AN EXAMINATION OF THE DETERMINANTS OF ENTERPRISE SYSTEMS TRAINING EFFECTIVENESS.

An Invitation

My name is Chris Arasanmi. I am a doctoral student at Auckland University of Technology (AUT) and this research is part of my doctoral degree requirement. I invite you to participate in this research titled: The determinants of in enterprise systems training transfer. Your participation in this research is at your discretion. You may withdraw from further participation in this research at any time.

What is the purpose of this research?

The purpose of this research is to understand how end-users put into practice skills gained from enterprise systems training, such as the SAP and Oracle training programme. This research is required as part of the fulfilment for the award of a PhD degree in Business Information Systems. The research findings will be published as a doctoral thesis.

What will happen in this research?

You will receive an invitation email to participate in a web survey. Together with this email you will receive an Information Sheet (what you are reading right now) and a set of criterion questions. This data is collected to ensure your eligibility to participate in this web survey. You will be invited to complete the anonymous web survey which will take approximately 15 minutes. All of your responses will be uploaded into the server. You have at least 3 months to fill in the web survey (starting from the date you receive the second email).

What are the discomforts and risks?

A minimal amount of discomfort is anticipated during the completion of the survey. The question(s) might be viewed as sensitive by certain participants.

How will these discomforts and risks be alleviated?

The participants will remain anonymous.

What are the benefits?

This research will provide valuable information on why users utilise skills and knowledge when using the system in the workplace.

How will my privacy be protected?

The privacy of the respondents will not be affected in any way as names, ages, or any other details that may identify them are not required in this survey. In the final report, data will be presented in aggregate.

What are the costs of participating in this research?

The only cost of participating in this web survey is your time.

What opportunity do I have to consider this invitation?

You are under no obligation to complete the web survey.

How do I agree to participate in this research?

By completing this web survey, you are indicating your consent to participate in the research.

Will I receive feedback on the results of this research?

You are welcome to email Chris Niyi Arasanmi (chris.arasanmi@aut.ac.nz) if you wish to receive a summary of the research findings.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr. William Wang (william.wang@aut.ac.nz)

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Dr Rosemary Godbold, *rosemary.godbold@aut.ac.nz*, 921 9999 ext 6902.

Whom do I contact for further information about this research?

Researcher Contact Details: Chris Arasanmi, *chris.arasanmi@aut.ac.nz*

Project Supervisor Contact Details: Dr. William Wang, *william.wang@aut.ac.nz*

APPENDIX D: Harman One Factor Test

Total Variance Explained					
	Initial Eigenvalues			Extraction Sums of Squared Loadings	
Component	Total	% of Variance	Total	% of Variance	Cumulative %
1	11.198	37.325	11.198	37.325	37.325
2	2.615	8.718			
3	2.147	7.156			
4	1.834	6.113			
5	1.720	5.733			
6	1.222	4.075			
7	.966	3.220			
8	.822	2.742			

APPENDIX E: Reliability Assessment

ESUTL-5 **Cronbach's a =.881**				**EOU-5** **Cronbach's a =.926**		
Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted		Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted
UTL1	0.6	0.884		EOU1	0.757	0.926
UTL2	0.784	0.839		EOU2	0.811	0.908
UTL3	0.769	0.843		EOU3	0.872	0.896
UTL4	0.619	0.878		EOU4	0.847	0.9
UTL5	0.84	0.824		EOU5	0.744	0.921
MOT-4 **Cronbach's a =.799**				**SS-4** **Cronbach's a =.749**		
Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted		Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted
MOT1	0.488	0.775		SS1	0.501	0.716
MOT2	0.774	0.679		SS2	0.67	0.625
MOT3	0.556	0.827		SS3	0.617	0.651
MOT4	0.688	0.715		SS4	0.414	0.765
MO-5 **Cronbach's a =.801**				PS-6 **Cronbach's a =.896**		
Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted		Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted
MO1	0.662	0.749		PS1	0.627	0.895
MO2	0.532	0.777		PS2	0.848	0.86
MO3	0.435	0.81		PS3	0.694	0.882
MO4	0.445	0.808		PS4	0.81	0.865
MO5	0.635	0.754		PS5	0.661	0.892
MO6	0.669	0.747		PS6	0.745	0.875
SI-4s **Cronbach's a =.930**				CSE-4 **Cronbach's a =.**783		
Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted		Items	Item-Total Correlation	Cronbach's Alpha if Item Deleted
SI1	0.782	0.902		CSE1	0.439	0.803
SI2	0.836	0.91		CSE2	0.74	0.654
SI3	0.877	0.896		CSE3	0.664	0.689
SI4	0.857	0.929		CSE4	0.534	0.757

APPENDIX F: Multicollinearity

Bivariate Correlations of measurement items

	UTL1	UTL2	UTL3	UTL4	UTL5	MOT1	MOT2	MOT3	MOT4	MO1	MO2	MO3	MO4	MO5	MO6	MO7	SI1	SI2	SI3	SI4	EOU1	EOU2	EOU3	EOU4	EOU5	SS1	SS2	SS3	SS4	PS1	PS2	PS3	PS4	PS5	PS6	CSE1	CSE2	CSE3	CSE4
UTL1	1	.523	.488	.445	.603	.307	.249	.269	.383	.284	.233	.093	.214	.089	.195	.177	.152	.135	.230	.212	.366	.258	.342	.280	.232	.132	.259	.283	.092	.381	.199	.173	.312	.186	.208	.337	.402	.282	.376
UTL2	.523	1	.723	.527	.777	.264	.310	.277	.397	.199	.188	.056	.178	.154	.202	.112	.333	.346	.419	.429	.434	.430	.478	.447	.333	.315	.260	.325	.189	.446	.350	.286	.394	.291	.361	.306	.481	.455	.434
UTL3	.488	.723	1	.551	.744	.254	.332	.310	.297	.123	.225	.043	.077	.107	.111	.016	.251	.298	.294	.349	.406	.442	.425	.400	.260	.193	.281	.263	.157	.425	.399	.365	.516	.406	.421	.358	.461	.403	.335
UTL4	.445	.527	.551	1	.591	.357	.393	.390	.373	.399	.361	.133	.099	.216	.331	.314	.403	.347	.410	.450	.422	.426	.454	.396	.305	.238	.173	.280	.120	.371	.400	.284	.463	.416	.334	.331	.530	.501	.371
UTL5	.603	.777	.744	.591	1	.313	.389	.316	.443	.249	.272	.091	.230	.166	.223	.119	.375	.390	.453	.488	.466	.485	.492	.451	.362	.279	.258	.356	.131	.488	.361	.342	.440	.337	.369	.328	.602	.482	.481
MOT1	.307	.264	.254	.357	.313	1	.555	.255	.466	.289	.269	.146	.275	.329	.289	.212	.323	.268	.382	.360	.394	.305	.310	.347	.264	.224	.291	.332	.243	.256	.332	.353	.293	.270	.274	.288	.291	.292	.253
MOT2	.249	.310	.332	.393	.389	.555	1	.632	.646	.219	.336	.125	.267	.229	.281	.165	.398	.393	.385	.417	.456	.350	.342	.402	.404	.220	.321	.389	.329	.349	.386	.409	.417	.301	.380	.363	.447	.240	.205
MOT3	.269	.277	.310	.390	.316	.255	.632	1	.572	.261	.333	.149	.178	.180	.328	.270	.392	.348	.344	.383	.372	.358	.368	.366	.356	.142	.203	.275	.248	.243	.303	.311	.358	.178	.226	.298	.388	.310	.215
MOT4	.383	.397	.297	.373	.443	.466	.646	.572	1	.310	.322	.183	.289	.243	.351	.244	.310	.270	.264	.306	.417	.337	.376	.385	.359	.233	.320	.407	.204	.337	.310	.354	.265	.145	.270	.309	.411	.205	.344
MO1	.284	.199	.123	.399	.249	.289	.219	.261	.310	1	.606	.407	.467	.407	.497	.544	.253	.191	.219	.203	.160	.153	.093	.073	.162	.114	.034	.214	-.068	.114	.155	.152	.173	.106	.040	.167	.276	.254	.412
MO2	.233	.188	.225	.361	.272	.269	.336	.333	.322	.606	1	.215	.306	.423	.465	.480	.301	.229	.219	.253	.223	.204	.208	.216	.213	.127	.103	.200	.055	.142	.183	.209	.244	.255	.199	.233	.290	.230	.305
MO3	.093	.056	.043	.133	.091	.146	.125	.149	.183	.407	.215	1	.258	.398	.366	.404	.158	.133	.131	.147	.103	.097	.009	.029	.047	-.184	-.084	.095	.191	.133	.176	.153	.230	.211	.117	.096	.170	.106	.095
MO4	.214	.178	.077	.099	.230	.275	.267	.178	.289	.467	.306	.258	1	.388	.408	.360	.147	.170	.146	.209	.159	.057	.096	.118	.213	.200	.164	.291	.180	.158	.111	.211	.117	-.093	-.057	.221	.139	.055	.307
MO5	.089	.154	.107	.216	.166	.329	.229	.180	.243	.407	.423	.398	.388	1	.674	.540	.194	.252	.267	.250	.243	.222	.247	.225	.282	.095	.127	.173	.240	.140	.302	.313	.246	.220	.279	.183	.205	.112	.118
MO6	.195	.202	.111	.331	.223	.289	.281	.328	.351	.497	.465	.366	.408	.674	1	.662	.217	.263	.256	.263	.208	.168	.185	.155	.166	.103	.118	.165	.152	.228	.293	.337	.259	.202	.166	.236	.312	.247	.305
MO7	.177	.112	.016	.314	.119	.212	.165	.270	.244	.544	.480	.404	.360	.540	.662	1	.232	.172	.210	.219	.190	.103	.151	.082	.043	.064	.038	.165	.020	.087	.135	.183	.156	.151	.069	.157	.241	.203	.238
SI1	.152	.333	.251	.403	.375	.323	.398	.392	.310	.253	.301	.158	.147	.194	.217	.232	1	.730	.743	.720	.548	.616	.674	.621	.566	.278	.201	.371	.189	.254	.284	.277	.321	.249	.300	.284	.446	.413	.173
SI2	.135	.346	.298	.347	.390	.268	.393	.348	.270	.191	.229	.133	.170	.252	.263	.172	.730	1	.799	.783	.489	.583	.610	.578	.504	.442	.333	.451	.285	.246	.355	.358	.344	.336	.364	.319	.536	.514	.201
SI3	.230	.419	.294	.410	.453	.382	.385	.344	.264	.219	.219	.131	.146	.267	.256	.210	.743	.799	1	.855	.555	.677	.679	.626	.574	.374	.300	.468	.240	.356	.457	.394	.463	.381	.433	.283	.541	.517	.268
SI4	.212	.429	.349	.450	.488	.360	.417	.383	.306	.203	.253	.147	.209	.250	.263	.219	.720	.783	.855	1	.592	.664	.695	.686	.573	.328	.294	.428	.254	.391	.449	.452	.464	.398	.391	.398	.552	.544	.263
EOU1	.366	.434	.406	.422	.466	.394	.456	.372	.417	.160	.223	.103	.159	.243	.208	.190	.548	.489	.555	.592	1	.715	.704	.685	.611	.161	.222	.333	.297	.362	.334	.286	.350	.349	.339	.468	.524	.407	.311
EOU2	.258	.430	.442	.426	.485	.305	.350	.358	.337	.153	.204	.097	.057	.222	.168	.103	.616	.583	.677	.664	.715	1	.780	.714	.663	.300	.163	.303	.212	.366	.463	.363	.408	.414	.452	.393	.633	.543	.279
EOU3	.342	.478	.425	.454	.492	.310	.342	.368	.376	.093	.208	.009	.096	.247	.185	.151	.674	.610	.679	.695	.704	.780	1	.868	.689	.283	.289	.382	.279	.447	.394	.350	.395	.270	.394	.422	.498	.435	.215
EOU4	.280	.447	.400	.396	.451	.347	.402	.366	.385	.073	.216	.029	.118	.225	.155	.082	.621	.578	.626	.686	.685	.714	.868	1	.709	.299	.345	.398	.366	.425	.379	.404	.428	.293	.355	.464	.485	.385	.254
EOU5	.232	.333	.260	.305	.362	.264	.404	.356	.359	.162	.213	.047	.213	.282	.166	.043	.566	.504	.574	.573	.611	.663	.689	.709	1	.301	.324	.408	.329	.332	.334	.295	.336	.198	.261	.412	.465	.317	.155
SS1	.132	.315	.193	.238	.279	.224	.220	.142	.233	.114	.127	-.184	.200	.095	.103	.064	.278	.442	.374	.328	.161	.300	.283	.299	.301	1	.493	.498	.229	.159	.230	.204	.115	.078	.197	.150	.249	.310	.254
SS2	.259	.260	.281	.173	.258	.291	.321	.203	.320	.034	.103	-.084	.164	.127	.118	.038	.201	.333	.300	.294	.222	.163	.289	.345	.324	.493	1	.581	.451	.292	.228	.374	.337	.186	.234	.323	.254	.113	.127
SS3	.283	.325	.263	.280	.356	.332	.389	.275	.407	.214	.200	.095	.291	.173	.165	.165	.371	.451	.468	.428	.333	.303	.382	.398	.408	.498	.581	1	.357	.393	.353	.422	.351	.138	.384	.367	.336	.309	.245
SS4	.092	.189	.157	.120	.131	.243	.329	.248	.204	-.068	.055	.191	.180	.240	.152	.020	.189	.285	.240	.254	.297	.212	.279	.366	.329	.229	.451	.357	1	.243	.271	.260	.334	.271	.348	.323	.211	.146	.003
PS1	.381	.446	.425	.371	.488	.256	.349	.243	.337	.114	.142	.133	.158	.140	.228	.087	.254	.246	.356	.391	.362	.366	.447	.425	.332	.159	.292	.393	.243	1	.648	.576	.547	.407	.503	.386	.435	.386	.318
PS2	.199	.350	.399	.400	.361	.332	.386	.303	.310	.155	.183	.176	.111	.302	.293	.135	.284	.355	.457	.449	.334	.463	.394	.379	.334	.230	.228	.353	.271	.648	1	.714	.760	.627	.689	.435	.465	.455	.287
PS3	.173	.286	.365	.284	.342	.353	.409	.311	.354	.152	.209	.153	.211	.313	.337	.183	.277	.358	.394	.452	.286	.363	.350	.404	.295	.204	.374	.422	.260	.576	.714	1	.666	.418	.561	.427	.389	.375	.277
PS4	.312	.394	.516	.463	.440	.293	.417	.358	.265	.173	.244	.230	.117	.246	.259	.156	.321	.344	.463	.464	.350	.408	.395	.428	.336	.115	.337	.351	.334	.547	.760	.666	1	.670	.647	.538	.507	.447	.270
PS5	.186	.291	.406	.416	.337	.270	.301	.178	.145	.106	.255	.211	-.093	.220	.202	.151	.249	.336	.381	.398	.349	.414	.270	.293	.198	.078	.186	.138	.271	.407	.627	.418	.670	1	.655	.393	.486	.484	.220
PS6	.208	.361	.421	.334	.369	.274	.380	.226	.270	.040	.199	.117	-.057	.279	.166	.069	.300	.364	.433	.391	.339	.452	.394	.355	.261	.197	.234	.384	.348	.503	.689	.561	.647	.655	1	.396	.453	.416	.232
CSE1	.337	.306	.358	.331	.328	.288	.363	.298	.309	.167	.233	.096	.221	.183	.236	.157	.284	.319	.283	.398	.468	.393	.422	.464	.412	.150	.323	.367	.323	.386	.435	.427	.538	.393	.396	1	.504	.367	.252
CSE2	.402	.481	.461	.530	.602	.291	.447	.388	.411	.276	.290	.170	.139	.205	.312	.241	.446	.536	.541	.552	.524	.633	.498	.485	.465	.249	.254	.336	.211	.435	.465	.389	.507	.486	.453	.504	1	.670	.527
CSE3	.282	.455	.403	.501	.482	.292	.240	.310	.205	.254	.230	.106	.055	.112	.247	.203	.413	.514	.517	.544	.407	.543	.435	.385	.317	.310	.113	.309	.146	.386	.455	.375	.447	.484	.416	.367	.670	1	.535
CSE4	.376	.434	.335	.371	.481	.253	.205	.215	.344	.412	.305	.095	.307	.118	.305	.238	.173	.201	.268	.263	.311	.279	.215	.254	.155	.254	.127	.245	.003	.318	.287	.277	.270	.220	.232	.252	.527	.535	1