

**INFORMATION SYSTEMS INTEGRATION, INFORMATION
TECHNOLOGY CAPABILITY, ORGANIZATIONAL
AMBIDEXTERITY AND THE PERFORMANCE
OF BANKS IN KENYA**

**BY
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DECLARATION

This research thesis is my original work and has not previously, in part or entirety been submitted at any other University or institution towards the award of any degree.

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DEDICATION

This Thesis is dedicated to my family members, Margaret Wangari Mwangi my wife, my two sons, Allan Kamau Mwangi and Ryan Waweru Mwangi and my two daughters, Sandra Wanjiru Mwangi and Natasha Nyawira Mwangi for their patience and support. You gave me a reason to hold on during very difficult times. Your support and trust made this daunting task possible. To my mother for the noble work she did of making me who I'm today. To all of you, I will be forever grateful.

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LIST OF ABBREVIATION AND ACRONYMS

AST	Adaptive Structuration Theory
AVE:	Average Variance Extracted
BI:	Business Intelligence
BSC:	Balanced Scorecard
CAK:	Communication Authority of Kenya
CBK:	Central Bank of Kenya
CBSEM:	Covariance Based Structural Equation Modeling
CDT:	Creative Destruction Theory
CFA:	Confirmatory Factor Analysis
CR:	Composite Reliability
CRM:	Customer Relation Management
DCT:	Dynamic Capabilities Theory
DTM:	Deposit Taking Microfinance
DV:	Dependent Variable
DV:	Dependent Variable
EFA:	Exploratory Factor Analysis
FA:	Factor Analysis
GSM:	Global System for Mobile communication
HBR:	Harvard Business Review
HTMT:	Heterotrait-Monotrait
ICT:	Information and Communication Technology
IOS:	Inter-Organization Systems
IT:	Information Technology
ITC:	Information Technology Capability
ITU:	International Telecommunication Union
IS:	Information Systems

ISI:	Information Systems Integration
IV:	Independent Variable
KLR:	Kenya Law Report
KNBS:	Kenya National Bureau of Statistics
KMO:	Kaiser-Meyer-Olkin
LV:	Latent Variable
MFBS:	Microfinance Banks
MFC:	Mortgage Finance Company
ML:	Maximum Likelihood
MV:	Mediating Variable
PCA:	Principal Component Analysis
PLS:	Partial Least Square
PLS-SEM:	Partial Least Square SEM
RBT:	Resource-Based Theory
RBV:	Resource Based View
ROI:	Return on Investment
SaaS:	Software-As-A-Service
SEM:	Structural Equation Modeling
SCM:	Supply Chain Management
ST:	Structuration Theory
STS:	Sociotechnical Systems
VAF:	Variance Accounted For
VCM:	Value Chain Model
VIF:	Variance Inflation Factor

ABSTRACT

Great effort has been made by researchers attempting to examine and explain how IS deployment in organizations relate to firm performance. The findings have been inconsistent, with some studies recording significant positive relationships, others null and still others reporting negative effects. Scholars face difficulties in articulating universally accepted understanding of information systems in organizations. Contributing to the search for clarity on the link between IS integration and organizational performance, this study conceptualized a relationship between IS integration, organizational ambidexterity, IT capability and the overall outcome of the organization. The overriding objective aimed at verifying whether there exists a significant direct relationship between IS integration and organizational ambidexterity and performance. The interactive effect of IT capability on these two associations was of interest too. The mediating influence of ambidexterity on the relationship between IS integration and performance was also considered. Finally, the overall effect of IS integration, IT capability and organizational ambidexterity on firm performance was tested. The inconsistencies of the findings of the relationship between IS and firm performance have partly been blamed on an imbalanced and non-integrated approach of several studies when investigating IS and organizations. There is need to balance the social and technical components of the organization and IS as well. However, relying on theories that focus on a fewer sociotechnical system (STS) constructs, most IS studies have yielded empirical results that explains the technical or social components separately in a narrow context. This could be the source of the incoherency. There may be need to employ meta-theories to guarantee an integrated and balanced approach. Additionally, the theories should provide a linkage between the IS and organization domains. The current study employed a mixed method design of descriptive, exploratory and cross section to investigate the relationships of the constructs in the study. Guided by the adaptive structuration theory (AST) to link the two domains, the current research employed structural equation modeling, specifically PLS-SEM to analyze the relationships between the conceptualized constructs. From the analysis and in conformity with earlier studies, the direct linkage between IS integration and firm performance was found to be insignificant, as was the moderating effect of IT capability on this relationship. The analysis revealed that over 80% of IS integration effect on firm performance is explained through organizational ambidexterity, indicating that ambidexterity fully mediates this relationship. However, the moderating influence of IT capability was found to constraint the relationship of IS integration and ambidexterity. The insignificant linkage between IS and performance and the full mediation of ambidexterity between IS and performance would imply that IS impacts firm performance indirectly. From the findings, the ROI of automation should focus on IS enabled performance proxies not on IS. The study also points to mitigation of the imbalance between social and technical aspects of IS and organization by use of sociotechnical systems theories. With STS meta-theories providing a linkage between IS and organization domains, employing STS theories in IS and organization studies would likely address the inconsistencies witnessed in several studies' findings.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

The last two decades has witnessed the information and communication technology (ICT) revolution that has driven global development in an extraordinary way. Technological progress, infrastructure deployment, and falling prices of ICT artifacts as predicted in Morse law in 1960s have brought unanticipated growth in ICT access and connectivity to billions of people around the world. For instance, between 2000 and 2015, the number of mobile cellular subscriptions worldwide increased seven-fold from less than 1 billion to more than 7 billion (The International Telecommunication Union, [ITU], 2015). Globally 3.2 billion people are using the Internet with the developing countries contributing 2 billion to this number (ITU, 2015). This unprecedented growth of ICTs has affected the general populace lifestyles. For business organizations, it is a race of constantly trying to keep pace by adopting these technologies to increase effectiveness and efficiencies of operations. Business organizations are employing ICTs to streamline operations as well as exploring new frontiers of accessing new markets, inventing innovative ways of operations and rapidly availing new offerings to the market.

Information systems have become inseparably intertwined with business activities and operations. Organizations are essentially reliant on their information and communication technologies (ICTs) to run most of the processes and operations. The subject of the value of IS-driven business success has a long history within the information systems literature and as Schwarz, Kalika, Keffi, and Schwarz (2010) posit. Throughout the history of the IS discipline, various researchers have struggled to understand how IS contributes to the strategic and operational success of organizations using assorted lenses and competing theoretical models (Bostrom, Gupta & Thomas, 2009). Earlier empirical studies such as Bharadwaj (2000); Dehning and Stratopoulos (2003); Radhika and Hartono (2003) have shown that investment in information systems does translate into improved firm performance. However, other studies such as Chae, Koh, and Prybutok (2014; Sandberg, Mathiassen, and Napier (2014) confirm that the mechanics of how IS contributes to firm performance is still a source of debate. Corporations allocate and commit huge

resources to acquire information systems related products with expectation of economic returns of improved organization performance. Research studies to prove this premise have however generated mixed results, leading to a perceived productivity paradox of IS in organizations (Santhanam & Hartono, 2003).

The last two decades preceding the year 2000, as Bhatt (2000) posits, IS integration and the resultant impact on organizational operational improvement had been the topic of significant interest. Today information systems integration is perceived not only in increasing productivity and efficiency, but as a driver of innovations for creating new business models superimposed on established models as well as creating new service delivery channels and customer experiences. These transformations have been achieved through the eradication of duplications, inefficiencies, mitigating human induced errors, compressing the time to develop products and services, and improving clients' prospects in products and services. In about ten years, IS has become a competitive necessity and a strategic partner in the survival of all organizations across all sectors. (Harvard Business Review Analytic Services [HBR], 2014).

The present dynamic business environment necessitates that firms develop and implement effective and seamless inter-firm business associations as businesses continue depend on each other to satisfy modern consumer needs (Schreyögg & Sydow, 2010). The inter-organization systems (IOS) providing the linking glue amongst firms is now a competitive requirement for seamless interorganizational interactions. The goal is to facilitate improved customer experience, cost reduction as well as improving service provisioning especially where firm interdependencies exists in meeting customer needs. Internally, there is unprecedented adoption of information systems to automate most of the critical processes and operations. This has increased the amount of information organizations are generating (the big data) and the ability to access and analyze this information from within and externally. Using business analytics and business intelligent (BI) tools, the information gathered is expected to improve decisions making and subsequently influence organizational processes and operations. The public cloud deployment option and the various IS service cloud delivery options including Software-As-A-Service (SaaS) is taunted to increase

organizational agility and effectiveness and enable accelerated leverage on new IS innovations (HBR, 2014).

The classical Porter's competitive forces allude that industry profitability is determined by its structure embodied in the five forces (Peppard & Ward, 2004). Information systems affect the industry forces and subsequently the industry structure as Coelho (1999) stated in the study of IS value in cost reduction in the value chain. Integrating IS can enable achievement of cost leadership, product differentiation, facilitate focus on a select market segment and development of customer and supplier intimacy and increase switching costs. These four are the fundamental tenets of Porter's generic strategies. Bhatt (2000) argues that from the mid-1980s, the question of information systems integration and the role IS plays in organizational processes' enhancement has been of substantial attention by managers and scholars. Through data analytics and business intelligence scrutiny of the big data, information systems have become a key tool for environmental scanning. IS facilitates the identification of external changes that require appropriate organizational response.

Business organizations are continually faced with a demand for new products, services and innovating new delivery channels to keep pace with the competition. These demands coupled with the petition by the information age global customer have forced organizations to utilize the pervasiveness of information systems to remain relevant in the market. Wade and Hulland (2004) on their analysis of the applicability of the resource-based theory (RBT) in IS research, qualified IS as one of the key resources that business organizations can employ to address both internal and external demands to guarantee successful survival. This has greatly impacted the effectiveness and efficiency of organizations. With appropriate information from both internal and external sources, managers are contending with the desire to increase operational efficiencies by effective application of existing resources and capabilities, while and simultaneously pursuing external opportunities for growth. These two-prong approaches of the pursuit of exploiting internal resources and simultaneously exploring new opportunities externally form the basis of ambidexterity concept within organizations (Gibson & Birkinshaw, 2004).

The current unrest in the dynamic business environment, as stated by Schreyögg and Sydow (2010), is challenging the premise upon which the resource-based theory (RBT) is pegged on. The information age with its unprecedented innovations and the increased competition is challenging the notion of business organizations attaining sustainable competitive advantage by possession of unique resource endowment only. It is the application of different configurations of the unique resources in response to the shifting operating environmental forces that may guarantee long-term competitiveness as advocated by the dynamic capability theory (DCT), not the mere possession of a static stock of unique resources (Wheeler, 2002). Dynamic reconfiguration of resources will facilitate organization's effective utilization of resources internally while reorganizing itself to address the external forces. This capability to reconfigure the resources dynamically to both exploit internally and explore new opportunities externally is the tenet of ambidextrous organization (Birkinshaw & Gibson, 2004).

Schumpeter's creative destruction theory (CDT) explains the happenings in organizations today in relation to the pace of ICT innovations in business operations. The observation of Spencer and Kirchhoff (2006) on the failing of dominant firms occasioned by the introduction of disruptive technologies is a reality across all industry sectors. Organizations are adopting new innovations as the ICT industry relentlessly release new technologies. Early adopters abandon old technologies and embrace new ICT innovations as competitive parity sets in resulting from the entire industry adoption of the existing technologies. The pace of ICT innovations and the adoption of these technologies in business operations have accelerated the obsolescence of ICT technologies. Market leaders in various sectors leverage on new ICT technologies to pursue new ways of doing business in response to the imitations from industry laggards that erode any competitive advantage associated with the prevailing technologies (Parker, 2012).

Information systems researchers attempting to scrutinize and explicate how IS adoptions leads to organizational outcome have often found it difficult to yield clear and universally understandable findings about information systems in organizations. This partly has been due to researchers concentrating too much on either the technology part while sidelining the social element of IS or failure to sufficiently cater

for the technical role of the technology as an artifact. Many IS studies substantiates this longstanding research deficiency for integrated consideration to both social and technical components of the organization as work system (Bostrom et al., 2009).

Information systems researchers have turned to social-technical systems (STS) theories such as structuration theory as a mitigation measure for the imbalance of the social and technical subsystems of the organizations when examining IS effect in organizations. STS theories view an organization as a work system composed of two subsystems; the technical and the social subsystems. These two subsystems are perpetually interacting and influencing each other throughout the life of the organization. From STS theories, meta-theories can be developed that can simultaneously address both the social and technical domains of the organization as a work system (Bostrom et al., 2009).

The combination of social and technical subsystems in relation to the resultant organizational performance implies complementarity. Based on Choi, Poon and Davis (2008) citing Edgeworth (1881) conceptualization of complementarity, posit that organizational activities are complementary in nature if adopted and done in combination result in enhancing the overall contribution of each other. The complementary nature of the social and technical subsystems coupled with the application of meta-theories will result in more balanced and coherent IS research outcome of the effect of IS adoption on organizational performance (Bostrom et al., 2009).

There has been a great advance in technology and aggressive infusion of information technology in all aspects of life. Globally as stated by the International Telecommunication Union (2015), developing countries have contributed a great proportion of increased access and usage of ICT between 2000 and 2015. In Kenya, the national access and use rate is over 80%. ICTs have been acknowledged as an enabler of the vision 2030, the Kenya's economic blueprint (Communication Authority of Kenya, [CAK], 2016; CAK, & Kenya National Bureau Statistics [KNBS] 2011). This progress is a result of ICT infrastructural developments with multiple undersea fiber cables linking Kenya with the rest of the world as well as the increased fiber interconnections of different parts of the country. The decreasing cost

of connectivity and ICT artifacts and a vibrant ICT savvy populace has accelerated the diffusion of ICT in Kenya especially mobile-based ICTs.

The increased use of technology by the consumers has caused business organizations to aggressively leverage on this penetration to reach new markets that traditionally would be costly to reach. The banking sector is among the leaders in leveraging on the robust ICT opportunities in Kenya (Central Bank of Kenya [CBK], 2014). This has brought a paradigm shift in banking operations in Kenya as confirmed by Aduda and Kingoo (2012). Sharma (2011) asserts that, for banks, technology has emerged as a strategic resource for achieving higher efficiency, greater control of operations, enhanced productivity and profitability. For customers, it is the realization of their anywhere, anytime, anyway banking dream. Leveraging on robust IT platforms has enabled quality banking services that are efficient and on a wider scope in Kenya as revealed by the CBK supervisory reports (CBK, 2015; 2014). Banking institutions in Kenya continue to embrace technology to enhance efficiency internally and provide convenience to customers (CBK, 2014; Kamau, 2009; Nyangosi & Arora, 2009).

Increasing rivalry by businesses for limited clients and other factors of production has made the overall organizational performance crucial to the successful existence of the modern business entities. Consequently, firm performance as a variable of interest has taken a vital role as the absolute objective of the modern business. Subsequently other organizational processes and activities like IS, marketing, human capital activities among others are all eventually evaluated on their influence on the overall organizational outcome. This implies that firm performance is the definitive dependent variable appealing to researchers interested in any aspects of business management (Richard, Devinney, Yip, & Johnson, 2009).

There is uncertainty and debate about how IS contributes to organizational performance (Arvidsson, Holmström, & Lyytinen, 2014; Sandberg et al., 2014). An assessment of extant literature shows that studies investigating the relationship between information systems and organizational performance differ on the theorization of major concepts and their connections (Melville & Kraemer, 2004; Sandberg et al., 2014). There are considerable opportunities that exist for using IS in organizations to facilitate long-term firm performance as Piccoli and Ives (2005)

assert. Creating organizational ability to exploit and explore simultaneously and subsequently influencing long-term performance could be such opportunity. Relying on the STS theories and specifically the adaptive structuration theory (AST) meta-theory and the robust SEM analysis, the current study examined how information systems integration influences organizational ambidexterity and subsequently organizational performance.

1.1.1 Information Systems Integration

The extent to which organizational information and application systems are shared, accessed and utilized by all organizational actors to facilitate effective and efficient facilitation of achievement of the organizational goals and objectives defines the firm's IS integration (Bhatt, 2000). Conceptually information systems integration can be regarded as an information architecture, the telecommunication interconnections, and support organization that facilitate the generation, flow and use of organizational information internally and externally in the process of fulfilling organizational mission. The main purpose of information systems integration in business operations is the provision of timely and reliable information support organizational-wide to facilitate response to the ever-changing operating environment.

There are three elementary organizational activities associated with IS, data entry, data conversion to information, and the outputting of the processed information needed by the organization to function in the attainment of its mission. Organization's stakeholders including customers, suppliers, distributors, shareholders, and regulatory authorities are in constant interaction with the business organization and its information systems continuously throughout the life of the organization. Figure 1.1 below is a schematic representation of how information systems enable horizontal integration of business processes to facilitate seamless intra and inter organizational interactions.

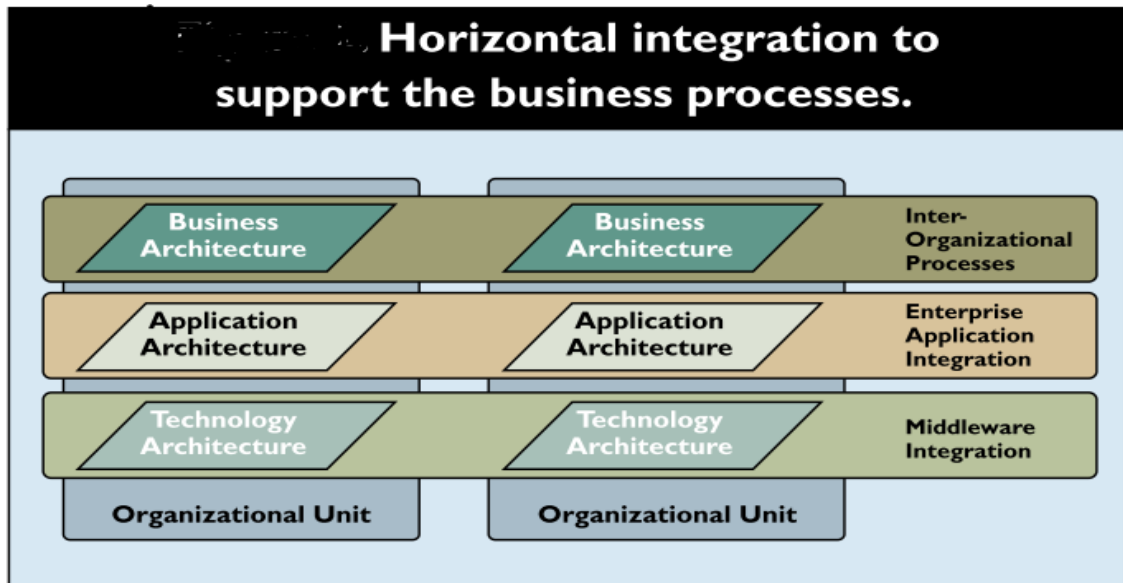


Figure 1.1 IS Organizational Processes Integration (Hasselbring, 2000)

According to Hasselbring (2000) each organizational unit can be structured vertically in three distinct architectural layers, the business architecture layer defining the organogram and the organizational business workflows as articulated on the established rules and processes; the articulation of business concepts in form of enterprise applications is defined in the application architecture and finally, the definition of the information and communication infrastructure is at the technology architecture layer.

The vertical inter-linkages of the layers within the unit and the horizontal linkages and interrelatedness of the various organizational units are enabled by information systems as the glue. This IS enabled seamless interconnections and flow of information constitute IS integration within an organization. The coordination enabled by information systems integration in business operations facilitates more views to be shared across the organization, enabling the employees' awareness about the organizational operations to be broadened (Bhatt, 2000). Information systems such as groupware and collaboration systems like email systems are some of the application employed to accomplish this task.

1.1.2 Information Technology Capability

Information technology capability (ITC) is the firm's ability to appropriately combine and apply information technology and other firm resources to develop unique organizational competitive advantage (Wang, 2007). This is in line with the dynamic reconfiguration as advocated by the dynamic capabilities theory. IT capability as Sandberg et al.(2014) posit represents the appropriation of the combined physical and tacit information systems resources within the organizations. These physical and intangible resources include, the technological artifacts, relational linkages within and without the firm, the established organizational practices, managerial skills, employees' business processes knowledge among other organizational specifics competences. All these are geared towards the furtherance of the organizational goals.

Chae et al. (2014) posit that IT capability of a firm encompasses the firm's information technology infrastructure, human resources aspects of IT comprised of the technical and the management skills of running the IT organization and the IS-enabled intangibles consisting of knowledge assets, client alignment, and the associated complementary synergies. Extending prior research on this area, Lu and Ramamurthy (2011) conceptualized information technology capability as an underlying concept revealed in three perspectives: information technology infrastructure ability, information technology business spanning ability and the information technology proactive stance competence. Consequently, information technology capability is the overriding general construct subsuming the three perspectives or dimensions.

Information technology capability therefore reveals the degree to which an organization excels in managing its information technology based resource endowment to effectively and efficiently facilitate business processes and strategies. ITC is a collation and articulation of the commonality contribution of the three IT capability perspectives. An organization exhibiting greater information technology capability should equally portray a substantial degree of each of the three information technology capability perspectives (Lu & Ramamurthy, 2011). IT capability is heterogeneous among firms and creates unique competitive advantages and intangible

resources in organizations (Bharadwaj, 2000). Erformance and Mithas (2011) applies a progressive gauge of information management capability to address the demand for development of an incessant evaluation of information technology capability and mitigate the difficulties experienced as a result of having overt nature of the dominant information technology capability measurement that results in a dichotomy of either existence or absence IT capabilities within organization.

1.1.3 Organizational Ambidexterity

An ambidextrous organization is one that has the aptitude to effectively and simultaneously explore and exploit in managing today's business demands (Raisch, Birkinshaw, Probst, & Tushman, 2009). According to Patel, Messersmith and Lepak (2013), ambidexterity is the capability of a firm of proficiently utilizing the prevailing opportunities and simultaneously innovating sufficiently to address the future opportunities and challenges. Ambidexterity implies agility, the capability to perceive prospects for innovation and grab the opportunities by reconfiguration necessary available resources astutely as advocated by the dynamic capability theory (Sambamurthy, Bharadwaj, & Grover, 2003).

Long-term success and survival of any organization is dependant on the effective exploitation of the available resources and capabilities to take advantage of prevailing opportunities, while concurrently actively scouting for new ones and espousing essentially new proficiencies that will facilitate reaching out new markets or exploitation of new opportunities (Sambamurthy, Wei, Lim, & Lee, 2007). Organizational ambidexterity focuses on the ability of the organization to balance efficient utilization of its existing competencies through exploitation and at the same time foster the innovativeness through exploration to bring forth the products and services that will enhance future firm competitiveness (Patel et al., 2013).

Predominantly in several organizational literature, there is consensus about organizational success in a dynamic operating environment and organizational ambidexterity. To be successful organizations in this turbulent environments should be efficient in exploiting the available resources and competence and effectively adaptive to the mutating environment (Gibson & Birkinshaw, 2004). The perverseness

of information systems in organizational operations and processes is expected to have some influence on firm's attainment of ambidexterity capability. Cloud computing as a new way of availing IS to organizations is accelerating IS adoption with greater flexibility and minimal initial capital outlay. A recent survey of large and midsize organizations around the world conducted by the Harvard Business Review Analytic (HBR, 2014) revealed that companies that are moving most aggressively to adopt cloud computing are being rewarded with competitive advantage through increased business agility.

1.1.4 Organizational Performance

Consistent with Richard et al., (2009) assertion, the overall organizational performance incorporates three explicit aspects of the overall organizational outcomes; financial performance, product market performance and shareholders' returns. This therefore implies that a firm performance can be measured in various ways such as sales growth, market share, productivity and profitability among other qualitative measures like organizational reputation. How a firm measure on a number of these indicators in comparison with other players in the industry over a specified period of time is an indicator of its overall performance for that period. The consistence of organizational overall performance determines its survival over time. As asserted by Hoque and James (2000), in recent years concerns has been raised with traditional performance measures that focused solely on financial metrics. Hoque and James pointed to Kaplan and Norton 1992 balanced scorecard (BSC) together with intellectual property concepts as emerging ways of integrating financial and non-financial performance measures. These measures are more inclusive and broad in nature to capture a number of critical non-financial firm performance dimension.

According to Porter and Millar (1985), organizational competitiveness is enshrined on an organization either being a cost leader or and product differentiator. Based on Porter and Miller classical view, the two are the main approaches to the attainment of firm's competitiveness and therefore improved performance. However, rooted in extant strategic management literature, is the resource-based view (RBV). RBV posits that business organizations competition is based on unique, valuable and rare resource endowment. Resources that are hard to emulate, and nonsubstitutable (Barney, 2001).

Dynamic capabilities theory extends resource-based view by advancing the notion that competitiveness of the firm is not solely based on the stock of these resources, but on their strategic and dynamic application to match the operating environment. Information technologies with its pervasiveness as one of these organizational resources is ubiquitously present in every aspect of the organization. Various studies like Mithas, Tafti, Indranil, and Goh (2012); Piccoli and Ives (2005) among others have shown that IS if properly deployed and utilized can lead to long-term firm performance. Recent report by Harvard Business Review survey report (HBR, 2014), corroborates this findings.

1.1.5 Commercial and Microfinance Banks in Kenya

The banking sector in Kenya is governed by the Banking Act cap 488, the Central Bank Act cap 491, the Microfinance Act 2006 and the Microfinance regulations of 2008. The deposit taking microfinance (DTM) are referred as the Microfinance Banks (CBK, 2014). Kenya Post Office Savings Bank (Postbank) is in its own category and is owned by the Government and operates under Act Cap 493B of Kenyan laws (KLR, 2015). By end of December 2014, the banking sector in Kenya comprised of the Central Bank of Kenya as the regulatory authority, 44 banking institutions inclusive of 1 mortgage finance company (MFC), 8 representative offices of foreign banks and 12 Microfinance Banks (MFB) (CBK, 2014).

The sector recorded improved performance in 2015 and 2014 compared to the previous years of 2013 and 2012 based on the secondary data from CBK reports and individual banks' financial reports. Total net assets within this period rose by 18.5%, customer deposits rose by 18.65%. The rise in deposits resulted largely from increased deposit mobilization by banks as they expanded their outreach and service networks to tap unserved segments of the market (CBK, 2014).

Kenyan commercial banks are classified into three peer groups using a weighted composite index that comprises of net assets, customer deposits, capital and reserves, the number of deposit accounts and the number of loan accounts (CBK, 2014). A bank with a weighted composite index of 5% and above is classified as a large bank. A medium bank has a weighted composite index of between 1% and 5% while a small

bank has a weighted composite index of less than 1%. For the period ended 31st December 2014, there were 6 large banks with a market share of 49.9%, 16 medium banks with a market share of 41.7% and 21 small banks with a market share of 8.4% (CBK, 2014). Competition in the sector caused shifts in market share positions for the banks in the three peer groups in the 2013-2014 period. (CBK, 2014).

The banking sector in Kenya is projected to maintain an upward trend in performance as a result of the continued expansion of banks within and outside the country. As witnessed globally the banking industry has been in a process of significant transformation and the force behind this transformation is innovation in information technologies (Aduda & Kingoo, 2012). The continued automation is expected to further transform the industry, advance inclusivity and boost economies of scale. The commercial banks business strategies are mainly driven by the capabilities of their core banking systems and other integrated systems like the CRM, mobile apps among others. The capability of these systems enables banks to roll out different innovative products and services faster to the customers (CBK, 2014). The increase in the use of technology by banks has been driven mainly by increased competition leading them to adopt cost-effective channels in offering financial services to ensure efficiency and maintain market share. Local banks in Kenyan situation has been exacerbated by the recent introduction of interest capping and tight regulatory and supervisory framework by the Central bank of Kenya.

1.2 Research Problem

Today, organization and technology innovation are inseparably linked and the demand for technology-enabled business transformation services is rapidly growing. Business organizations are striving to leverage on new IS innovations to improve operational effectiveness and efficiencies. Understanding the economic impact of information systems in organizations is a critical issue to information systems researchers and practitioners. The correlation in IS investment and the overall organizational outcome has been a subject of debate among IS researchers. Despite the huge investments in IS in recent years, demonstrating information systems ROI in terms of resultant organizational performance has proven extremely difficult (Adam, Mann, & Zwass, 2000). There is sufficient literature about the benefit of information

systems to the organization as demonstrated by Chae et al. (2014; Melville and Kraemer (2004) and Wade and Hulland (2004) among other studies. However, these myriad studies and theoretical reviews have not successfully clarified succinctly the relationship between IS and the overall organizational outcomes.

Despite some skepticism about the direct influence of IS on organizational performance by several studies such as Adam, Mann, and Zwass (2000); Chae et al. (2014) , there are IS researchers who believe superior information systems capability can be a source of significant competitive advantage. However, some researchers based on their own findings, have objected the conclusions of studies that indicate positive relationships between investment in information systems and organizational performance and productivity (Adam et al., 2000). Melville and Kraemer (2004) confirm revelation from the literature review that studies investigating information systems and firm performance linkage lack commonality in the conceptualization of the main constructs and their interrelationships.

The question of performance resulting from IS lacks a comprehensible common understanding with different studies revealing inconsistent results. The presumed role of IS intervention for improved firm performance has witnessed large investments of organizational resources as Bostrom et al. (2009) concluded. This has also generated great interest to IS researchers and practitioners. However, information systems studies have difficulties in yielding coherent and generalizable results of IS and organization. According to Bostrom et al. (2009), the cause is partly may be due to the unbalanced approach of the studies on IS and organization. As a work system, the organization consists of the social and technical subsystems. Any research about IS and organization should equally address itself to the two subsystems.

Lack of clarity between the link of IS and firm performance is exacerbated by the unparalleled ICT innovations and the continued adoption of these innovations in organizations' operations. Organizations are consistently employing new ICT innovations to beat the competition (Chae et al., 2014; Piccoli & Ives, 2005; Spencer & Kirchhoff, 2006). The gains of IS investments are not immediately realized but reaped in the longer time. Therefore, any study relying on an examination of cross-

sectional data especially on the same period of investment will yield results that may not reflect the reality.

Adam et al. (2000) contend that, the other strong reason for disagreement among researchers involves the argument that the relationship reflecting the connection between IS deployment and organizational performance do not necessarily imply causation. This is especially the case if the correlations are based on the data from the same year of IS implementation. There is also a strong indication that causality between IS and organizational performance cannot be established by using the conventional statistical techniques. There is a call to researchers to apply multivariate and non-parametric methods as opposed to the commonly used methods such as correlation and regression analyses to enable the inference of causality between IS and organizational performance (Adam et al., 2000).

There is a general feeling among IS scholars of the need to have the correct conceptualization of the appropriate constructs and employment of the suitable methodologies to produce universally generalizable and coherent results. Therefore, there is need to enhance research in this area by encouraging the development and use of new methodologies. Additionally, these studies need to be guided by meta-theories that are a result of crossbreeding of the pedigree theories from the social and technical domains of the organization as a working system. This hybridization of the theories will facilitate a balanced focus between the technical and the social subsystems of the organization when investigating and explaining the effect of IS on the organization (Bostrom et al., 2009).

The quest for digital transformation as a driver of enhanced performance notwithstanding, long-term successful survival of organizations as Andriopoulos and Lewis (2009) affirm, requires effective and efficient utilization of current resources and capabilities, for incremental innovations and simultaneous exploration for opportunities to foster radical innovations. The desire to achieve effectiveness and efficiencies is accelerating the adoption of new technologies by organizations at present compared to the last decade. Organizations are investing increasingly to automate a significant number of their processes both vertically and horizontally across sections through workflows. This is driven by the desire to eliminate human

inefficiencies and errors and saving costs on human capital establishment simultaneously (HBR, 2014).

There have been unprecedented developments in ICTs in the recent past. Like in others sectors world over, the banking sector practitioners and researchers are keen to establish the applicability of the IS innovations for better performance (Magutu, Muganda, & Ondimu, 2011; Sharma, 2011). The interest has been induced by banking institutions investing heavily in automation projects in pursuit of operational efficiency and sustained performance as a result of increasing competition. According to CBK, supervisory report of 2014, Kenyan banks' increasingly use of technology has been driven mainly by stiff competition leading them to adopt cost-effective channels in offering financial services. The goal has been to ensure efficiency, profitability and possibly increasing the market share.

According to Aduda and Kingoo (2012), the banking industry in Kenya has been in a process of significant transformation. Driving this transformation is the adoption of innovations availed by information technologies. As alluded by Nyangosi and Arora (2009) in their study, ICT inclusion is required to achieve excellence business goals in Kenyan banks. The integration of IS in banking sector forms the basis of competitiveness and consequently overall performance. Kenya's banking sector continued to grow in terms of inclusiveness, efficiency, and stability. This growth to a great extent has been as a result of the progressive application of IS in key processes within the banks' operations. The sector continued to leverage on robust IS platforms in the provision of quality banking services with their strategies driven by capabilities of the core banking systems and other integrated systems (CBK, 2014).

Information systems offers enormous potential and emancipate various opportunities to the banking sector. It provides cost-effective, rapid and systematic provision of services. IS also enables sophisticated product development and releases to market, provides reliable techniques for risk management through data analytics and BI tools, brings transparency to the entire banking ecosystem system and helps the sector reach geographically distant and diversified markets at insignificant or no costs (CBK, 2015; Sharma, 2011).

Coupled with cut-throat inter-industry competition within the sector, the banking sector in Kenya is currently experiencing unprecedented forces that are threatening many banks' survival especially the lower tier category. The introduction of interest capping regulation by parliament, the renewed stringent regulatory and supervisory role by the CBK and the ever-increasing mobile financial services by other non-banking industry players has exacerbated the profitable existence of Kenyan banks. In addition to rationalizing their operations and downsizing of the staff establishment, increasingly the banking industry in Kenya is expected to heavily turn to information systems to streamline their operation both internally and externally. This is already being witnessed through the adoption of mobile and Internet banking and transaction settlement through unconventional methods through mobile phones by a majority of customers. This is made possible by the integration of the core banking systems, mobile apps and the GSM telecommunication networks.

A great deal of research has been carried out in the area of IS and firm performance. For example Chae et al.,(2014); Gallagher and Worrell (2008); Lu and Ramamurthy (2011); Sandberg et al. (2014); Tallon and Pinsonneault (2011) among others. The goal of these studies has been to establish the relationship between the various aspects of information systems, organizational performance and agility and also on organizational ambidexterity and performance (Gibson & Birkinshaw, 2004; Prieto et al., 2007).

In the recent years, a budding concept emphasizing the imperative of organizational fluidity is gaining traction in management literature. The genesis of fluidity in organizations as a necessary competence is the recognition of growing complexity and unrest in business environment which organizations must contend with to survive. To successfully maneuver the continuously mutating operating environment, the proposed solution is having extremely agile and malleable organizational arrangements anchored on persistently varying templates, rapid improvisations and impromptu responses to the shifting environmental forces. The proposed organizational form is in direct conflict with the conventional organizational establishment that stresses on identity, path dependence, specialism within organizational setup and reproducible routines that produce stability (Schreyögg & Sydow, 2010).

The recurring theme in several organizational literatures is associating long-term success in organizations to organizational ambidexterity. Ambidextrous organizations are aligned and efficient in managing today's business demands and at the same time exhibiting adaptiveness to persistently changing business environment (Gibson & Birkinshaw, 2004). Contrasting Ghemawat and Costa (1993) that exploitation and exploration are competing activities, Auh and Menguc (2005); He and Wong (2004) and Tushman and O'Reilly III (2006) contend that exploitation and exploration are complementary activities and therefore firms should strike the correct balance between the two. This balanced view of exploitative and explorative efforts is enshrined in the ambidexterity concept (He & Wong, 2004). Ambidextrous firms are aligned and efficient and adaptive to environmental changes (Gibson & Birkinshaw, 2004; Prieto et al., 2007). Several studies corroborate that successful firms are able to reconcile both exploitation and exploration by being ambidextrous (Gibson & Birkinshaw, 2004; He & Wong, 2004). Organizational ambidexterity is believed to augment long-term organizational performance and survival (Lin, Yang, & Demirkan, 2007).

Though there is a consensus that ambidexterity is a critical capability for successful long-term existence of any organization, sources of ambidexterity in organizations is yet to be established conclusively. Research is now focused on how firms can achieve ambidexterity (Prieto et al., 2007). Despite the inherent contradictions in organizational structures and systems that lead to either efficiency or innovation, organizational scholars have called for the necessity of cultivating both competencies within a firm (He & Wong, 2004; Katila & Ahuja, 2002). Researchers have suggested that firms may achieve both exploration and exploitation through structural or contextual methods of differentiation within themselves (Gibson & Birkinshaw, 2004; Tushman & O'Reilly III, 2006).

In pursuit for establishing how ambidexterity can be achieved, Gibson and Birkinshaw (2004) suggested that firms can attain context based ambidexterity through balancing alignment and adaptability at the departmental level. Birkinshaw and Gibson (2004) projected that contextual ambidexterity can be achieved by carefully identifying particular collection of organizational systems and processes which establishes a context that concurrently promote exploitative and explorative

capabilities, this was also suggested by Patel et al. (2013). Originally Tushman and O'Reilly III (1996) analyzed structural ambidexterity by recognizing the part for processes and systems within organizations to achieve the desired balance between exploitation and exploration. With the increased turbulence in the operating environment, the ability to reconcile the trade-offs between exploratory-exploitative is crucial to enhance firm performance and guarantee long-term successful survival (Rothaermel & Alexandre, 2009). The integration of exploitation and exploration is central to organizational dynamic capabilities as asserted by (Zollo & Winter, 2002).

The challenge of attaining organizational ambidexterity persists and therefore the need for further theoretical attempts and empirical inquiries on how organizations achieve ambidexterity (Prieto et al., 2007). Kauppila (2010) states that, recently researchers have begun to realize that management systems and other firm-level characteristics may be insufficient to fully explain ambidexterity in all organizations. Whereas each distinct antecedent provides intriguing explanations, a comprehensive picture of how a firm can create ambidexterity is still missing. Could IS pervasiveness across all aspects of organizational operations and processes be a possible source of capability of exploiting and exploring? The direct linkage of IS and firm performance remains unestablished to a great extent as Adam, Mann, & Zwass (2000) and other studies reveal, it is possible that IS effects organizational performance indirectly by facilitating other organizational performance enablers like ambidexterity.

Prieto et al. (2007) found out that at product development level, IS facilitates ambidexterity and that ambidexterity mediates the relationship between information technology and product development performance. Extending the scope to the entire organization and using the robust structural equation modeling that has the ability to rigorously scrutinize direct and indirect relationships amongst one or more exogenous and endogenous latent variables Hashim (2012), the current study extended the scope to the entire organization. The study investigated the relationship between information systems integration, organizational ambidexterity and performance and the moderation effect of IT capability on the two associations for the entire organization. The inclusion of IT capability and ambidexterity constructs in the current study was to provide mitigation of the imbalance between the technical and social subsystems of the organization when examine and explain how IS influences organizational

performance. According to Bostrom et al. (2009) a large number of IS research point to this long standing inadequacy of addressing the technical & social components in an integrative and balance approach when examining IS and organization as a work system. Sandberg et al. (2014) description of IT capability reveals that the IT capability construct encompasses both the technical and social elements of information systems in the organization as advanced by the socialtechnical systems theorists (Bostrom et al., 2009).

This study thus seeks to answer the following research questions; 1) How does information systems integration affect the performance of banks in Kenya? 2) How does information systems integration affect organizational ambidexterity of banks in Kenya? 3) What is the effect of IT capability on these relationships? And finally, 4) What is the influence of ambidexterity on the relationship between IS integration and banks' overall performance?

1.3 Research Objectives

Investigating the influence of IS integration and IT capability on organizational ambidexterity and subsequent organizational performance was the overall objective of this study. To achieve the overall objective, the following five specific objectives were formulated.

- i. To examine the relationship of IS integration and banks' performance.
- ii. To establish the influence of information technology capability on the relationship between IS integration and banks' performance.
- iii. To establish the influence of information technology capability on the relationship between IS integration and organizational ambidexterity of the bank
- iv. To establish the influence of organizational ambidexterity on the relationship between IS integration and banks' performance.
- v. To establish the overall effect of IS integration, IT capability, and ambidexterity on the banks' overall performance.

1.4 Value of the Study

Information systems researchers attempting to investigate how information systems in organizations leads to firm performance have often faced difficulties in providing articulate and universally extrapolatable results. According to Bostrom et al. (2009), several empirical studies point to this shortfall. This long-time deficiency has partly resulted from a lack of an integrated balanced approach to both the social and technical subsystems of the organization when conducting these studies. Researchers have expressed the need for developing STS based linking theories ‘hybridized theories’ that will integrate all the diverse theories used in IS research that are either biased to social or technical subsystems of the organization. These linking theories are known as meta-theories (Bostrom et al., 2009). The meta-theories will aid in ensuring a balanced approach to both organizational subsystems as the IS researchers interrogate how technology leads to organizational outcomes through the deployment of information systems.

The current study contributes to these efforts by applying one of the proposed STS based meta-theory to help mitigate the unbalance findings of IS effect in the organization. The study was guided by the AST theory to examine the effect of information systems in the organizational context as postulated by (Bostrom et al., 2009; Gopal, Bostrom, & Chin, 1993). The meta-theory contribution was achieved through the inclusion of IT capability and ambidexterity constructs. These constructs traverse both the social and technical subsystems of the organization (Sandberg et al., 2014). Additionally, the current study employed structural equation modeling in respond to a call to IS researchers to employ other robust methodologies when investigation the causality between IS and organization (Adam et al., 2000). SEM provided the rigor of testing out various combination of exogenous-endogenous relationship that the conventional statistical techniques cannot easily afford.

The creative destruction theory of Schumpeter explains a lot of happenings in the organization today as they unprecedentedly adopt new technologies to address the increased and complex operating environmental forces. The pace of innovation in ICT industry and the adoption of these innovations to address the competing forces as new opportunities to leverage on new technology are identified have accelerated the

obsolesce of technologies. This study, therefore, intended to validate the Schumpeter's creative destruction theory within the banking industry in Kenya (Parker, 2012).

Furthermore, the study contributes to the existing knowledge to the search of organizational ambidexterity by investigating whether IS integration and IT capability are part of the sought antecedents of ambidexterity Prieto et al. (2007). Additionally, could organizational ambidexterity capability be part of the sought subtle linkage of IS and firm performance (Adam et al., 2000)? The study was meant also to enhance the previous empirical research of unit or departmental level ambidexterity and performance by extending the scope of the analysis to enterprise level (Prieto et al., 2007).

Practically the findings would highlight the ways to effectively deployment IS to support ambidexterity and subsequent firm performance. By addressing the three dimensions of building IT capability while investing in ICT, management would increase the business value of IS deployment. With over 93% of Kenyans having access to mobile phone and 73% utilizing mobile financial services, opportunities for mobile-integrated bank services abound. There is potential to widen the scope for mobile financial services using technology as exemplified by the Equitel of Equity bank a revolutionary platform that provides customers with tools to perform all financial transactions as well as make calls, send SMS and access the internet using thin SIM technology (Equity Bank 2016). The World's first Mobile-based Government bond, the M-AKIBA that was launched recently by the National Treasury of Kenya that now allows citizens to participate in Government issued bond market using their mobile phones is another prove of mobile financial services capability (National Treasury 2017). The study will encourage the practitioners to continue leveraging on innovations as the ICT industry relentlessly continues to bring new innovations in the market.

The study provides an insight to policy makers and regulators on how IS can be used to further enhance operational efficiencies, inclusivity and boost economies of scale in the rollout of innovative products and services by financial sector players in Kenya. The study also provides some insight in assessing and adjusting existing frameworks

to accommodate various IS based innovations (CBK, 2015). This will ensure that risks associated with these innovations are considered by banks through enforcement of various measures by the regulators and supervisory authorities. With increased usage of information systems and other IS innovations on financial services, there is need to relook at the security framework against the threats posed by the increasing cyber crime. The conventional banking regulatory and supervisory framework is insufficient to address the new challenges that arise from the adoption of a new paradigm in the provision of financial services in the digital age. For example, the mobile financial services being offered by GSM companies need to be defined whose domain it is for regulatory and supervisory purposes, is it under telecommunication and therefore under Communication Authority or is it under the financial services and therefore under the CBK?

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Information systems researchers have made substantial effort in linking information systems and IS-enabled capabilities to organizational performance, critical gaps still remain. Literature has also highlighted organizational ambidexterity as an important capability that firms need to guarantee long-term success. With IS ubiquitous across organizational operations, it is expected that it influences organizational ability to be ambidextrous and thereby influence firm performance. This chapter reviews the theoretical and empirical literature on IS, ambidexterity, and firm performance. The chapter concludes with a proposition of an approach that introduces ambidexterity as a mediator in the relationship between IS integration and firm performance. The interactive influence of IT capability on IS relationship with ambidexterity and firm's performance is also examined as well. The following is the chapter outline, section 2.2 is the key highlights of IS in the banking industry, 2.3 is the study's theoretical background followed by a review of the extant literature on information systems, ambidexterity and firm performance in section 2.4. The proposed conceptual model with the associated hypotheses of the study concludes this chapter on sections 2.5 and 2.6 respectively.

2.2 Information Technology and the Banking Industry

Information and communication technology revolution is affecting competition in three vital ways as Porter and Millar (1985) posit; first, ICT is changing industry structure thus altering the basis of competition; secondly, ICT creates competitive advantage by according business organizations innovative ways of outperforming competition, and finally, ICT broods new businesses opportunities and markets. This often sprung from within a company's existing operations like the mobile financial services (MPESA) and data services through internet service provision portfolio of Safaricom which was initially a GSM company for mobile telephony only and the Equitel services that combines mobile financial services and GSM provisioning through virtual mobile network operator services by the Equity bank of Kenya (Equitel, 2016; Safaricom, 2015).

ICT is affecting the competition land scape of many sectors and reshaping the way products and services address consumer requirements. These effects among others are the reasons why information systems have attained strategic significance and are different from the many other technologies used by business organizations in the past (Porter & Millar, 1985).

As Aduda and Kingoo (2012) and Sharma (2011) appropriately assert the banking industry has been in a process of significant transformation, the potency behind this transformation globally is innovation in information technologies. The developments and evolution of technologies are leading to increasing competition in different financial institutions around the world (Sharma, 2011). In an environment of escalating competitiveness, ICT innovations such as mobile and online banking and relationship marketing are becoming increasingly important (Lang & Colgate, 2003). In the prior years, banks faced significant uncertainty regarding investments in advanced technologies, but currently, they are investing heavily in technology to maintain a competitive edge as Sharma (2011) indicates in an evaluation study of IS application in the banking sector in India. The study found out that ICT offers enormous potential and emancipated various opportunities to the banking industry. This is confirmed locally by the various annual CBK banking industry supervisory and monitoring reports (CBK, 2015; 2013, 2014).

Information and communication technologies are enabling the building of new markets as well as expanding the existing market scope and reach. Information systems also facilitate access to information and also a reduction in operational costs, CBK supervisory reports reveal consistent improvement in bank employee productivity over the years as a result of automation (CBK, 2014). IS integration has been credited to the increase in transparency in the banking operations (CBK, 2015). The benefits of ICT integration in business organizations are felt in the long run. Large investment and associated skills development often results in a short-term reduction in profitability. Appropriate application of IS in the banking sector can standardize customer experiences globally especially in online banking as the Jordan and UK comparative study by Yazan (2008) revealed.

Integration of IS in the banking sector has brought a number of benefits to both banks and customers. However, the application of information systems has exacerbated the traditional banking risks and raised many new threats that the regulating and supervisory authorities need to address (Sharma,2011). Despite these risks associated with IS application in the banking sector, appropriate IS deployment coupled with requisite IT capability will ensure the overall benefits far outweigh the associated challenges.

2.3 Theoretical Background

Information systems researchers are known of utilizing theories from other established fields and using them in their own research as Wade and Hulland (2004) affirm. As result of this, IS discipline boasts of a rich aggregate of theoretical and conceptual models from other disciplines. The following is a discussion of relevant theories and models in relation to IS and organizational performance. Particularly, the theories applied in the current study are; the resource-based theory (RBT) and its enhanced variant, the dynamic capability theory. Schumpeter's creative destruction theory as exemplified by the unprecedented adoption of new IS innovations and obsolescence of technologies. Complementarity theory addresses the augmenting effect of both the social and technical subsystems of the organization. Additionally, the complementary theory was subtly used to gauge on the overall effect of the study's exogenous variables on the endogenous variable. Included in theoretical framework are the socio-technical systems (STS) theories specifically the structuration theory and the subsequent adaptive structuration theory (AST).

The AST is one of the meta-theories that IS researchers are advocating for examining IS effect within organizational context (Bostrom et al., 2009). The meta-theories are a result of the combination of a number of theories within IS and organizational domains. These meta-theories are meant to facilitate an integrative and a balanced approach to both the social and technical subsystems of IS and the organization that has been lacking when studying IS in the organization as a work system. The study was anchored on the sociotechnical systems theoretical base. Specifically, the AST as a meta-theory that enables the linking between IS and organizational domains.

Adaptive structuration theory also enabled the study to address and mitigate the uneven of social and technical subsystems of the organization which was identified as the main weakness of a number studies on IS and organization.

2.3.1 The Resource-Based and the Dynamic Capabilities Theories

Dynamic capabilities theory (DCT) arises from the resource-based theory (RBT). Resources-based view (RBV) postulates that organizations compete on the basis of inimitable corporate resources and capabilities that are valuable, rare, hard to emulate, and nonsubstitutable by other resources (Barney, 2001). RBT assertion is that an organization's competitive advantage comes from strategies that exploit existing firm-based resources and capabilities. However, over time scholars recognized that a stockpile of static assets is not sufficient to maintain long-time leadership in mutating business environments experienced by business organizations presently across all sectors (Schreyögg & Sydow, 2010). Therefore, there was need to reexamine the postulates of the resource based theory. This led to the formulation of the dynamic capabilities theory that addressed critical assumptions of the RBT (Wheeler, 2002).

Dynamic capability refers to the ability of an organization to attain innovative forms of competitiveness by regenerating competencies and firm resources and applying them to attain congruence with the mutating business environment (Eisenhardt & Martin, 2000; Teece, Pisano, Shuen, & others, 1997; Wheeler, 2002; Zollo & Winter, 2002). This ability is dynamic in the sense that the organization must constantly build, adapt, and reconfigure intrinsic and external competencies to achieve alignment with the changing environment (Schreyögg & Sydow, 2010; Wheeler, 2002). The development of dynamic competences reflects organizational leadership's ability; first to demonstrate aptness receptiveness and rapid innovation for example in adopting and applying IS innovations to take advantage of existing opportunities and secondly, to effectually coordinate and redistribute internal and external resources and competencies based on circumstances facing the organization and guided by the managerial and organizational processes, market positions, and path dependencies (Teece et al., 1997). Dynamic capabilities create resource configurations and improvisations that generate value-creating strategies (Schreyögg & Sydow, 2010).

Their strength lies in applying them preferably, more astutely in comparison to the competition (Eisenhardt & Martin, 2000).

The resource-based theory premise of business organizations pegging their competitive advantage on resource endowment is not sustainable in the information age. The rate of innovations especially in IS and the adoption by the businesses is unprecedented. Any IS anchored advantage is being eroded faster as laggards increase the speed to keep up with the innovations and leaders pursue new IS innovations to leverage on and keep their market positions (Parker, 2012).

In organizational perspective, dynamic competences are at the core of the ability of the firm's ambidexterity, which enables the firm to compete simultaneously in both established and developing markets and to explore and exploit. The speed of reconfiguration and deployment of existing resources and capabilities and the recognition of the changes in the environment requiring a quick organizational response are as result of exploitative and explorative aspects of ambidexterity respectively (O'Reilly & Tushman, 2007). Information systems is key among the resources that dynamic capabilities theory advocates for reconfiguration and redeployment in pursuit of long-term competitiveness (Porter & Millar, 1985). Additionally, as Patel et al.(2013) assert, IS effect on firm performance is through its enablement of certain organizational capabilities and organizational agility and dynamism. Confronted by the increasingly turbulent and multifaceted environments, any permanence, identity formation and building of static problem-solving mechanisms will always be perilous to the firm. Erecting boundaries and routinized practices are essential benefits for having an organization in every aspect, however, they have the flip side when they become cemented and path-dependent. They can become inherently risky endeavor to the extent that they may blind the actors to new problems and untried solutions which may provide the answers to the successful survive of the organization (Schreyögg & Sydow, 2010).

The ideal of full organizational agility and fluidity as advanced by DCT inescapably renders itself to both theoretical and practical contradictions. In highly turbulence environments, DCT advocates for relentless changing organizational forms that is in a continuous transition state. This is a too easy and neat solution as Schreyögg and

Sydow (2010) argue, fluidity and flexibility ideal instigates the right vision at the wrong position and extends it too far. Applicability of dynamic capability theory in a highly turbulent environment may pose some challenges.

It may require that the firm is perpetually in changing mode in pursuit of strategic fit necessary to achieve competitive advantage. The indeterminate state resulting from the continuous state of change is incompatible with beacons and fixated practices, which are indispensable tenets for establishing and using organizational setups (Schreyögg & Sydow, 2010). Realizing fit, alignment, or complementarity is a challenging task with organizations of any type or size. The espoused operational environmental turbulence requires the desired fluidity and flexibility as advocated by the dynamic capabilities theory, but at the same time providing some semblance of organizational stability.

2.3.2 The Theory of Complementarity

According to Choi, Poon, and Davis, (2008), the concept of complementarity was first introduced by Edgeworth in (1881). Based on Edgeworth conceptualization, activities are complements if carrying out more of any one of them increases the yields to doing more of the others. Some organizational activities and practices are mutually complementary in nature and adopted and done in combination, enhances the overall contribution of each other. This, therefore, means the impact of the system of complementarity will be greater than the sum of its parts as a result of the synergistic effect of bundling the business activities or practices together.

The organization as a working system is made of social and technical systems as postulated by the social-technical systems theorists (Bostrom et al., 2009). In the investigation and explication of IS in organizations, it is highly desirable to focus on the two subsystems in an integrative and a balanced approach. The combination of social and technical subsystems in relation to the resultant organizational performance implies complementarity as espoused in the complementarity theory. The complementary nature of sociotechnical subsystems of the organization aided by the application of meta-theories will result in a more balanced and coherent IS research outcome when studying the outcome of IS usage on organizational performance. The biased and non-integrative approach of IS and organization of information systems

studies has been identified by many researchers in IS as one of the reasons for the inconsistency of various studies (Bostrom et al., 2009).

The collective effect of IS integration, IT capability and organizational ambidexterity on organizational performance might differ in extent compared to the individual and even sum of the sub-effects as result of the synergies created when applied together, due complementarity effect. The current study used SEM analysis which provides flexibility of combining both exogenous and endogenous variables in different formations and analyzing their relationships in the proposed model. It is common for researchers to investigate the complementary relationship among various business practices (Choi et al., 2008).

2.3.3 The Creative Destruction Theory

Schumpeter's creative destruction concept posits that business cycles are the recurrent fluctuations in the rate at which innovations are introduced into the economy (Parker, 2012). The introduction of new revolutionary innovations attacks the foundation of existing equilibrium at rare and irregular intervals. During these episodes, economies grow strongly and experience boom as the innovators reap the benefits of the new innovations. However, the diffusion of these innovations eventually attracts imitators as the profits of the innovations capture the attention of the late adopters and laggards. The imitators swarm into the market and compete away the pioneering entrepreneurs' competitive advantage. These imitators facilitate in establishing the new order as new equilibrium for the economy. The economy slows down and stagnates as the state of competitive parity sets in with no differentiator within industry players.

The competitive parity predominates the industry until another set of pioneering entrepreneurs disrupt the stable equilibrium again with a new set of revolutionary innovations that renders the previous obsolete. This precipitates the next boom and the cycle repeats itself (Chiles, Bluedorn, & Gupta, 2007; Parker, 2012). Schumpeter suggested that this process of entrepreneurial innovations is responsible for the regular and commonly observed fluctuations in the economic activity which he termed the normal business cycle.

The replacement of the old technologies certainly benefits the entrepreneurs introducing the new ones at the expense of the incumbents whose operations is tied to the older technologies. The old technologies or innovations now becomes obsolete with its associated competitiveness. Schumpeter termed this process creative destruction (Parker, 2012). Scholars studying the technological change phenomenon have described how radical innovations are often accompanied by shakeups in the industry structure as a result of discontinuity of the industry equilibrium herald destruction of old competitive advantage (Spencer & Kirchhoff, 2006).

Sustainability of competitive advantage resulting from information systems erodes much faster in any given industry. This is exacerbated if the technological basis of the competitiveness is not prohibitive in terms of capital outlay or skills required to adopt it. Currently, there has been unprecedented innovations witnessed in the ICT industry and accelerated adoption of these new innovations in the information age than decades before. Schumpeter's creative destruction theory explains the current events in adoption of new technologies across all sectors of the economy. Organizations are abandoning old technologies and adopting new ones to address various competitive forces and leverage on the new IS innovations to take advantage of availed opportunities. Information and communication technology industry is releasing innovations at a much faster rate than witnessed before. The pace of ICT innovations and the adoption of these innovations in organizational processes and operations have augmented the obsolesce of these technologies. Respective industry leaders constantly pursue new ways to gain competitiveness using IS innovations. This is in response to imitators who are actively eroding and rendering any associated benefits of the existing innovations and resetting the market equilibrium recursively (Parker, 2012).

Despite Schumpeter's work contribution to the entrepreneurial studies, researchers in this field have identified a number of limitations and flaws to his conceptualization. A number relates to the Australian economy setup where Schumpeter was basing his conceptualization. According to Chiles et al. (2007), despite the use of the phrase 'creative destruction', Schumpeter rejected or deliberately ignored the subjectivism of the human mind and consequently failed to address entrepreneurial creativity that produces something entirely new. Schumpeter only explained the dissemination of novelty and not its emergent. While acknowledging inventions which herald

innovation, Schumpeter assumed inventions are trivial, abundantly available and known to everybody. The second criticism is in theorizing that equilibrium is the economy's natural state and that entrepreneurs disrupt one equilibrium only to get to attain another, by this, Schumpeter completely ignored or avoided a central question, why should entrepreneur suddenly intrude into equilibrium, a system in which all options have been considered and the best choices already made.

2.3.4 Structuration and the Sociotechnical Systems Theories

Giddens (1984) is known in the information systems discipline largely for the conceptualization of the structuration theory (ST). However, it should be emphasized that Giddens makes no mention of IS in his work. Further, despite its profound usage by IS and management researchers, it should be noted that ST is a generic theory of social setup and not a specific theory for information systems (Jones & Karsten, 2008). The structuration theory specifies three kinds of structures; the signification, domination, and legitimation. According to structuration theory structures exist only in the mind of human agents or traces of human activities. Structuration is explicated as the conditions controlling the continuity or transformation of structures and therefore the imitation of social systems (Bostrom et al., 2009). The attention is on the inter-subjectivity of the agents endorsing the structures, that is how the actors comprehend and eventually use these structures. At the core of Giddens' structuration theory, is the connection between entities and society. Giddens is in sharp contrast with the traditional dualistic view that explains the social phenomena as being determined either by impartial social structures, which are characteristics of the whole society or by autonomous human actors. Giddens proposition is that the structure and actors are a jointly constitutive duality. Therefore, according to this proposition, a social phenomenon is a resultant of both the agents and the structures and not a product of either. Neither the social structure nor the agent is independent of each other. Somewhat the human agents relies on social structures in their activities, and concurrently, these actions serve to yield and regenerate the prevailing social structure (Bostrom et al., 2009).

Structurationist analyses in IS have helped in increasing the understanding of importance of IS based contemporary phenomena in a number of areas. Early reviewers of ST use in information systems studies include Walsham and Han 1991 as cited by Bostrom, et al.(2009) who emphasize on the potential usefulness of ST as a linking theory in IS research efforts. This corroborate with comment by Jones and Karsten (2008) on the expediency of the theory when studying the relationship between IS and organization. Jones and Karsten (2008) supporting Bostrom, et al.(2009) emphasize the need of the future research to give equal focus on the interaction between the social agents and subsequent structures that constitute the organization.

The use of structuration theory to study organizations as sociotechnical systems has two limitations. The first weakness of the theory is that structuration fuses together structure and agency, it diminishes the understanding of structure to an enacted condition. Structuration theory is biased with the use of artifacts in human-machine systems. The artifacts have characteristics of physical substances (machines or technology) and control human behavior. Coalescing the two fades the aptitude to comprehend technology's role in sociotechnical transformation (Bostrom et al., 2009). Secondly, the other constraint of structuration theory postulate comprises the purposeful change, ST was envisioned to describe social systems within society, but organizational working systems are premeditated with explicit goals and objectives. Though structuration accords a mechanism for explanation of the replication of social structures within the systems, it fails to provide any clarifications the reasons why some structures succeed and becoming established and others fail (Bostrom et al., 2009; Gopal et al., 1993).

Giddens' structuration theory is part of a big grouping of sociotechnical systems (STS) theories. STS theories view an organization as a work system made of social and technical subsystems that are in perpetual interactions and influencing each other throughout the life of the organization. A work system is a system in which human agents and technology cooperatively execute processes to give outputs in form of either products or services for internal consumption or external consumption (Bostrom et al., 2009; Burnes, 2004). The element of the technical subsystem consists of the organizational processes, procedures and the technologies (information,

machines, methodologies, etc.) employed to execute the business activities. The technical subsystem converts the work system's inputs to outputs in a manner that augments the general work system outcome.

The social subsystem constitutes the attributes innate in human agents. This subsystem is composed of the knowledge, skills, attitudes, values and needs that human participants contribute to the environment in addition to the reward system and positional hierarchical structures that are present in an organization. The social subsystem assimilates into the technical subsystem to support the performance in the conversion of the inputs to outputs (Bostrom et al., 2009; Gopal et al., 1993). The proponents of STS theories argue that for the desired results of the organizational study as a work system to be achieved, the interdependence of these two subsystems has to be explicitly recognized and addressed. Structuration and adaptive structuration theories are some of the examples of STS theories that are gaining traction in IS research (Bostrom et al., 2009).

2.3.5 The Adaptive Structuration Theory

Corroborating with Furumo and Melcher (2006) assertion, in order to comprehend the dynamic process involved in the technology paradigm shift, it is important to employ a theory that is able to account for the dynamic nature of the technology. Adaptive structuration theory (AST) draws a number of assumptions of Giddens's structuration theory. Adaptive structuration theory allows advanced technology adoption to be viewed as a dynamic process. In addition to the assumptions of structuration theory, AST augments the IT artifacts in the information systems structures as elements of the social context (Bostrom et al., 2009).

As a meta-theory, AST provides an ontological framework of concepts, conventions, and arguments. Desanctis, Poole, and Zmud (1994) while proposing adaptive structuration theory as a feasible approach for examining and investigating the role of innovative technologies in organizational change indicated that AST scrutinizes the change process from two perspectives; i) from structural types that are provided by the innovative technologies and ii) from the emergent structures in human actors as people interact with these technologies. Desanctis et al. (1994) identified seven conditions for applying AST effectively that would elicit the required understanding for each of the sociotechnical system components as shown in figure 2.1 below.

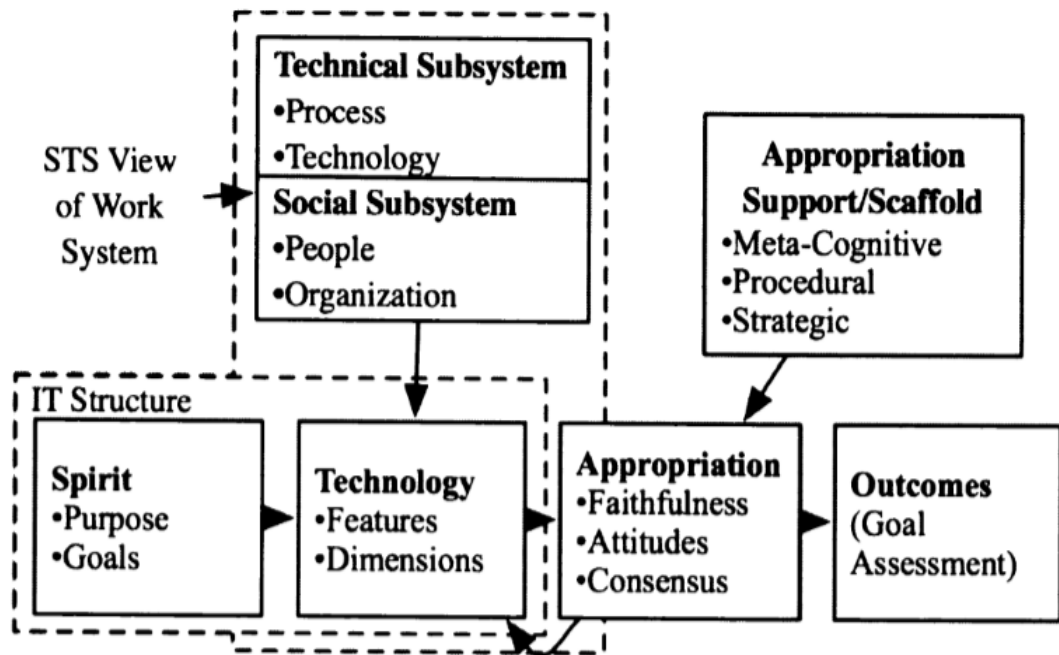


Figure 2.1: A Map of IS and STS in AST Theory (Bostrom et al., 2009)

Adaptive structuration constitutes of seven requirements; i) structures identification, ii) the linkages or connections among the structures, iii) system descriptions, iv) structures appropriation, v) the structural contextual impact and or the influence, vi) the influence of agents and vii) the power dynamics. These seven requirements map onto the sociotechnical aspects of the organization as abounded work system.

Adaptive structuration theory is organized around a set of concepts that are intended to be applied broadly in the research of information systems deployment and use and equally in other contexts (Poole, 2009). Desanctis et al. (1994) advancing AST theory as a more prime theory for studying information systems and organizations posit that adaptive structuration theory offers a model that explains the interplay between three key facets of understanding IS and organization. These facets are; the advanced technologies, the social structures, and the human interactions. One has to be a versed with these three and critically address them when examining and explaining the effect of IS in the organization.

Corresponding to structuration theory, AST emphasizes on the social structures (rules and resources) availed by the technologies and institutions as the foundation for human action. The social structures serve as the patterns for planning and executing tasks. Within an institution, structures precede the development and deployment of advanced technology. Some structures include the reporting arrangements, organizational knowledge, processes and other organizational operating procedures. Several of these structures are incorporated into the advanced technologies by the designers. The structures may be reproduced to emulate their nontechnology complements, or they may be adapted, improved or combined with manual procedures thereby redeveloping new structures within the technology.

When the technology is completed, it presents a collection of social structures for possible utilization in the interpersonal relations including rules and resources. As these structures then are brought into interaction, they are subsumed into social life. Therefore, on one hand, there are technology affiliated structures and structures in actions on the other hand. The two structures set are perpetually entangled. Additionally, there is an iterative association between technology and actions with each interactively influencing the other. To understand precisely how technology structures can generate organizational change, as Desanctis et al. (1994) confirm, one has to uncover the complexity of technology-action relationships. This requires an analytical distinction between social structures within the technology and social structures within the action. The interplay between the two types of structures must be considered.

Adaptive structuration theory like all STS approaches have a fundamental problem, that of complexity introduced by the intentional inclusion of voluntarist influence as well as the social and technical components. The outcome of these inclusions is a system with dual impact of both social and technical elements over time. Equally of concern is that, AST also provide an indirect nonlinear model of causation, rather as a meta-theory, it provides a context into which other specific theories can be plugged to make contextually proper predictions about system performance (Bostrom et al., 2009).

Criticism of AST by researchers is on two accounts. The first criticism is the assertion that structures exist within a technology. This is a complete deviation from structuration theory. Accordingly, some IS scholars have indicated that it is pointless to study structures that preexist in a technology for the reason that, technology associated structures are in constant evolution during the application development and even after the deployment of the application. However, a recent study has diluted this criticism by evidentially proving that technology associated structures not only impact on future development, but entrenched structures in implemented technology do influence other consequences such as firm's resilience (Ignatiadis & Nandhakumar, 2007). The second criticism is the conceptualization of quality of application or appropriation of entrenched structures. Proponents of structuration contend that appropriation relates to the choice of human actors to endorse a structure. These researchers, therefore, advocate for an exclusive attention on emergent structures rather than the quality of utilization of entrenched structures (Orlikowski, 2000). Nevertheless, recent studies assert that existing structures do matter and that the degree to which humans actors appropriate the structures have a substantial impact on the outcomes (Chu & Robey, 2008).

Adaptive structuration theory as a meta-theory provides a more robust option compared to the prevailing theories employed in IS research (Bostrom et al., 2009). In addition to mitigating the imbalance between sociotechnical subsystems of an organization, AST facilitates the linkage between the information systems and organizational domains. Further, AST additionally can be used as a framework for other theories to plug in and be used to investigate various IS and organizational phenomena. The AST theory was used to guide the current study.

2.4 Review of Empirical Studies of Information Systems and Firm Performance

Various studies have been carried out in IS domain and in strategic management covering various aspects of IS deployment and organizational performance; IS, ambidexterity and firm performance. The following is a critical review of the various studies and theoretical concepts as it relates to the current study's variable relationships.

2.4.1 Information Systems Integration and Firm Performance

Information systems scholars have made substantial progress in relating information systems and IT-enabled capabilities to organizational outcome based on an evaluation by Kohli and Grover (2008) and a recent one by Sandberg et al. (2014). However, as Chae et al. (2014) and Mithas, Tafti, Bardhan and Goh (2012) indicate some critical gaps still remain. According to Mithas et al. (2012) prior empirical studies reveal either a positive, negative or zero effect of general IS investments on profitability. The negative and null findings, however, contradict submission from other studies that show organizations actually benefit from information systems and IS-enabled capabilities. These contradictory findings of different studies of the same phenomenon prompted Dedrick, Gurbaxani, and Kraemer (2003) to term the association between IS and firm performance the profitability paradox of IT.

As Schwarz et al. (2010) claim, the issue of deriving value from IS investment has been the focus of an abundant body of research including articles, editorials, conferences, seminars, and books. With the swelling automation budgets in organizations, the interest on this issue is on the increase (Bostrom et al., 2009). This continued interest coupled with the incoherent results have led to an important debate on the purported IT productivity paradox. Among this body of research is a host of research perspectives that have been employed utilizing a variety of diverse theoretical basis, methodologies, varying scope of analysis (economy level, industry level, firm level), different variable conceptualizations, spanning different durations, and examining varying contexts (Bostrom et al., 2009; Melville & Kraemer, 2004). While many of the prior studies have contributed to confirming the IT paradox specifically at the macroeconomic level and the industry level, a majority of recent studies have fixated on the organizational level (Mahmood & Mann, 2000).

Empirical evidence by Mithas et al. (2012) resulting from using archival data from 1998 to 2003 for more than 400 global organizations revealed that IS has an enabling impact on organizational profitability. However, Chae et al. (2014) reexamining the association between information systems capability and firm performance with data from the 2000s surprisingly showed no significant relationship between IS capability and firm performance. Ghobakhloo, Tang and Sabouri (2014) in an empirical study of

IS-enabled supply chain process integration revealed that integration processes provide an important linkage between IS and business performance. Schwarz et al. (2010) based on their study contend that investment is enacted within the information systems resources and associated with the targeted business processes and reflected in the IS-business alignment. Schwarz et al. (2010) concluded that the resolution of the IT productivity contradiction lies not in high-level understanding of the relationship between IS investment and outcome but on how the IS investment is enacted and reflected in organizations.

Peppard and Ward (2004) theoretical analysis based on RBT concluded that it entails understanding how IS influences the business, identifying new strategic prospects, evaluating technological novelties, developing new technology-enabled business models, ranking investment opportunities based on envisioned business impact, managing information systems enabled change, deploying the appropriate technology, proper management of IS projects and stakeholders, effective and efficient technology investments, guaranteeing proper IS resource usage, organizational personnel embracing the appropriate behaviors and values in using the information, and the value from the IS adoption being captured and documented by the firm and finally, ensuring IS investment does not become a source of competitive hindrance. Unfortunately, a number of IS researchers do not take this broad spectrum that addresses both the social and the technical subsystems of the organization as a working system (Bostrom et al., 2009).

This approach advocated for by sociotechnical systems theorist point to the disjointedness and ungeneralizable understanding of IS-organizational relationship (Bostrom et al., 2009). In a similar theoretical investigation of information systems and competitive advantage, empirically reinforced by Dehning and Stratopoulos (2003), Mata et al. (1995) determined that only IS management skills are probable to be the basis of competitive advantage. Dehning and Stratopoulos (2003) described these skills as the aptitude of IS managers to comprehend and acknowledge business requirements; the ability of the IS managers to work with functional and business process owners; skill to coordinate IS activities in ways that facilitates other functional heads; and the ability to proactively prospect future organizational requirements. The Dehning and Stratopoulos suggested that in the pursuit for IS-

sourced competitive advantage, firms must concentrate less on technology artifacts and more on the ways of establishing and managing IS and technology in the firm. This proposition is also supported by Sandberg et al. (2014). Therefore, what differentiates organizations with effective performing information systems is not technical supremacy or wizardry, rather, it is the way IS activities are managed in relation to other organizational processes, resources and capabilities. However this approach will result in an imbalanced focus since the technology artifacts and the associated structures do influence the outcome of IS organizational relationship based on adaptive structuration theory (Bostrom et al., 2009).

The recent developments in information technology industry have been hailed with great interest by scholars and practitioners in the banking community globally (Aduda & Kingoo, 2012; Sharma, 2011). This is as a result of the discovery of the internal and the external benefits that ICTs accords banks' innovativeness as highlighted by Magutu et al. (2011) in the study on economic benefits and innovativeness in commercial banks in Kenya. In this study, they found out that IS offers enormous potential and limitless opportunities to the banking sector. Lang and Colgate (2003) also concur to this assertion when viewing the new ways of customer relationship enabled by IS compared to the traditional face-to-face interactions. Information systems provide cost-effective, rapid and systematic provisioning of services to the customers, extends market outreach and creates new markets with minimal costs. It has been established that IS also infuse transparency in banks' operations (CBK, 2015; Sharma, 2011).

The above discussion of the various empirical studies and theoretical analyses indicates the need to explore more on the association between IS and organizational performance. This is in pursuit for clarity of the relationship between IS and organizational performance as identified by Mithas et al. (2012). Based on Bostrom, Gupta, Thomas, et al. (2009) conclusion, information systems scholars have failed to produce comprehensible generalizable results of IS and organizational outcome. To determine the nature of the outcome of IS effect on the organization, it is important to establish if there is any linkage between IS and organizational outcome. To contribute to the extant knowledge, the current study anticipated that; There was a direct relationship between IS integration and organizational performance of banking institutions in Kenya.

2.4.2 Information Technology Capabilities and Organizational Performance

Organization's information technology capability (ITC) is the aptitude to marshal and deploy IT-based resources fused with other organizational resources and capabilities to create a unique competitive advantage (Bharadwaj, 2000; Sandberg et al., 2014; Wang, 2007). It is the utilization of the physical or intangible IS resources such as technology artifacts, knowledge, routines, associations, management skills, business process comprehension and human resources to augment the organizational goals. IT capability is critical for the realization of IS business value and performance advantage that results from IS deployment. Studies have linked competitive advantage of the firm to firm-wide IT capability (Bharadwaj, 2000; Chae et al., 2014; Mata et al., 1995; Mithas et al., 2011; Sandberg et al., 2014). These studies' findings concur that effective use of IT-related resources can help organizations build unique IT capability and thus competitive advantages.

Information technology capability can create an inimitable and sustainable performance as part of intangible assets of a company as Wang (2007) concluded. However, Bostrom, et al.(2009) argue that despite the large IS investments, the role of intervention of IS bringing about change in the organizations especially as vehicles of improved operational and management efficiency has remain inconclusive, despite being a hot research topic. Studies struggle to produce consistent and universally generalizable understanding.

Lu and Ramamurthy (2011) conceptualize IT capability as a concealed construct manifested in three dimensions: i) information technology infrastructure aptitude; ii) IT business spanning competence, and ii) IT proactive deportment. IT infrastructure capability (the technological foundation) is the organizational ability to implement compatible platforms, an ability that captures the extent to which the organization is good at managing and utilizing data management services and designs, telecommunication network services, and systems portfolio and services (Bharadwaj, 2000; Ross, Beath, & Goodhue, 1996; Weill, Subramani, & Broadbent, 2002). Information technology business spanning competence (business-IS strategic partnership; IS operating & influencing strategic decisions) is the ability of the organizational management to visualize and effectively utilize IT resources to

promote and boost business objectives- alignment to ensure IT supports organizational goals and objectives. It is a capability that manifest the degree to which the organization creates precise IS strategic vision, seamlessly combine business and IT strategic development, and empowers management's capacity to comprehend the value of IT spending within the organization (Bharadwaj, 2000; Mata et al., 1995; Ross et al., 1996; Wade & Hulland, 2004). IT proactive department (Opportunity orientation) is the organizational ability to proactively pursue new ways to embrace IS innovations and apply them astutely or effectively utilize existing IS resources to generate business opportunities. It is a stance that assesses the extent to which an organization attempts to be always current with IS innovations, its appetite to try out new business aligned IS development as necessary, constantly looking for new ways to improve its effectiveness of IS application in its operations, and nurtures an organizational environment that promotes experimentation of new ways of IS application in the business (Agarwal & Sambamurthy, 2002; Fichman, 2004; Weill et al., 2002). At the abstraction level, IT capability is the higher-level generally unobserved construct that is manifested by the three dimensions. IT capability therefore mirrors the extent to which the organization is good at managing its information systems resources to facilitate and augment business strategies, processes and operations. IT capability is the collective representation of the commonality shared by all three dimensions.

Organization with superior IT capability ought to display to a great degree each of the three IT capability dimensions. The IT capability construct as identified above captures both the technical and social elements of IS and organization. Bostrom, et al. (2009) alluded to the imbalanced emphasis as one of the major sources of incoherency of studies' findings that attempt to scrutinize and explicate how IS impact organizational performance. Too much attention on either the technology or on the social elements of the information system and or the organization at the expense of the other results to unintegrated approach on both the social and technical subsystems in the organization. Most studies address themselves to one of the IT capability dimensions and relate it to organizational performance. This will always produce different results.

Mithas et al. (2011) in their study on how information management capability influences performance of a conglomerate business group found out that information management capability has a vital role in facilitating the development of other organizational capabilities that in turn affect firm performance and that IT infrastructure plays a critical foundational role. This result collaborates with the assertion that firms can build IT capability by effectively integrating and deploying IT resources with other resources in an organization. Using a matched comparison study methodology on ITC and organizational performance, Bharadwaj (2000) revealed that organizations demonstrating high degree of IT capability outperformed a controlled group in a variety of profit and cost-based performance measures. However, Chae et al., (2014) in the study to reexamine the link between IT capabilities and performance based on data from the 2000s found the linkage insignificant. IT capability is not about a specific set of sophisticated technological functionalities, but rather an enterprise-wide competence to leverage technology application distinguished from the other competitors. It is entrenched within the firm's fabric as an intangible aspect of IS integration. It can be implicit and difficult to recognize but its presence and effectiveness is attested in business operations effectiveness and efficiencies as results of IS leverage (Peppard & Ward, 2004). It thus follows that the actual performance benefits of IS integration within an organization can only be realized if it is matched with the IT capability.

Information technology capability is crucial when analyzing the relationship between information systems and organization. However, the above expositions point to an indirect influence, significant or otherwise. The conceptualization of the IT capability construct of some of the studies above is not explicit as pointed by Melville and Kraemer (2004) and Sandberg et al. (2014). Bostrom, et al.(2009) state that several scholars point to a long time trendancy of IS research absence of integrated attention to both social and technical subsystems when carrying studies on the relationship between IS and organization.

To address the disproportionate between social and technical elements, conceptualization of constructs that relates to IT capability need to correspondingly accommodate both the social and technical elements of IS. Lu and Ramamurthy (2011) conceptualized IT capability as a concealed construct manifested in

information technology infrastructure, information technology business spanning ability and information technology proactive capabilities, this conceptualization aids in mitigating the unequal focus of both social and technical. This has been one of the major causes of deficiency of integrated approach of social and technical components when studying IS and organization as work system. As alluded earlier in this section from Bharadwaj (2000); Chae et al.(2014); and Peppard and Ward (2004) observations, IT capability seem to impact organization performance indirectly either as an intangible of IS integration or other business performance enablers. This study, therefore, proposes that IT capability has a significant moderation effect on the relationship between IS integration and organizational performance.

2.4.3 Information Systems Integration, IT Capability and Organizational Ambidexterity

Strategic management and organizational scholars have increasingly shown a great interest in organizational ambidexterity (Kauppila, 2010). By definition, an ambidextrous organization has the capability to efficiently exploit its competence endowment to respond successfully to the prevailing environmental forces, while flexibly exploring future competencies that will be necessary to address new challenges as the operating environment mutates (Good & Michel, 2013; Raisch et al., 2009). Information systems facilitate seamless integration and exchange of information between various functions within the organization that augment this capability.

Information systems is expected to influence the organization capabilities of alignment and flexibility developed by the creation of a particular type of organizational context (Schreyögg & Sydow, 2010). Gibson and Birkinshaw (2004) generally defined organization context as the organizational systems, processes, and beliefs that shape individual-level behaviors within the organization. Information systems as one of the ingredients of organization context are often pointed out as the anchor to achieve both exploitation and exploration and develop firm ambidexterity. Though Prieto et al. (2007) study findings revealed significant evidence confirming that IT encourages explorative and exploitative activities at product development level, the results may be different at the organizational scope. In a study on IS

alignment, agility and firm performance on 241 firms Tallon and Pinsonneault (2011) uncovered a significant and positive relationship between IS and agility and subsequently on firm performance. However, agility addresses the responsiveness aspects of ambidexterity through the exploitation of current capabilities. In a study of commercial banks, Magutu et al. (2011) and Lang and Colgate (2003) found out that, through information systems, banks : i) are able to monitor and optimize the sale-cash circuit; ii) that IS facilitated timely response to customer evolving requirements; and iii) IS facilitated the mitigation of exchange rate risks among other IS enabled exploitative and explorative activities in back office operations.

Information systems are inseparably intertwined with almost all business operations across the value chain and the industry value system, it should be expected therefore, that information systems influence the organizational exploitation and exploration activities. Nonetheless, there is little prove on the role of IS integration and enterprise-wide ambidexterity. This is the case notwithstanding Prieto et al. (2007) findings that IT encourages exploitation and exploration activities and the subsequent performance at a business unit level. IS integration can influence firm adaptiveness and innovation (Bhatt, 2000; He & Wong, 2004; Lavie & Rosenkopf, 2006; Zahra & George, 2002). But how this can be achieved, need to be empirically proved. Gibson and Birkinshaw (2004) recommended that organizational performance may well be enhanced through developing designated group of systems and processes which, when combined complementarily creates a context that permits meta-capabilities of exploitation and explorations to thrive within an organization and thereby sustaining firm performance. However, Patel et al. (2013) contend that these are general characteristics and that little empirical work has been done to identify the organizational systems that facilitate contextual ambidexterity as conceptualized by Gibson and Birkinshaw (2004).

To address this paucity of research in this area, Patel et al. (2013) investigated how human resource management systems contributes to contextual ambidexterity in the organization. This study was restricted to human resources systems, however, there is usually a number of systems that equally have an influence on organizational ambidexterity. The current study endeavor to extend the scope and investigate enterprise-wide information systems integration and its influence on organizational contextual ambidexterity.

There is a great debate as mentioned earlier on the direct link between IS and organizational performance by information systems researchers and practitioners alike (Bostrom, et al. (2009)). Some studies indicate strong positive relationship while others reporting insignificant linkage (Melville & Kraemer, 2004; Mithas, Tafti, Indranil, et al., 2012). In pursuit of the rationale of this inconsistency, some information systems researchers posit that correlation affecting the linkage between IS and organizational performance does not necessarily imply causation (Adam et al., 2000). There is a growing thought that information systems could be impacting organizational outcome through other performance enablers like organizational ambidexterity. Further, Adam et al. (2000) emphasize that the causality between IS and organizational performance cannot be established by using the conventional statistical techniques.

From the foregoing, the current study endeavors to examine the relationship between IS integration in organizations and the ability to be ambidextrous and the effect of IT capability on this relationship. Additionally, as suggested by Adam et al. (2000), the current study will employ structural equation modeling, a more robust analytical technique instead of the conventional statistical method. Combined with IT capability as discussed above, IS integration was expected to greatly influence organizational wide ambidexterity capability as an enabler of firm performance. Therefore, the current study proposition was that; IT capability has a significant moderating effect on the relationship between IS integration and organizational ambidexterity.

2.4.4 IS Integration, Organizational Ambidexterity and Firm Performance

There is a growing stream of thought emphasizing on the need for organizational fluidity and agility. This is in response to the growing complexity and increasing business operating environmental turbulence that business organizations have to grapple with (Schreyögg & Sydow, 2010). As Nosella, Cantarello and Filippini (2012) stated, the recent development of the concept of ambidexterity theme is the recognition that business organizations today are increasingly dealing with highly contrasting and conflicting goals. Some of these goals ostensibly pull in opposite directions. For example, the requirement for incremental versus radical innovations, exploitation versus exploration, alignment versus adaptability among other challenges that require frugality and exactness of response. Grasping and managing the tension

among these crucial organizational goals as well as succeeding in instantaneously achieving high levels of both opposing poles is essential to the organizational overall performance and successful existence (Raisch et al., 2009).

Organizations able to achieve the seemingly opposing goals by competently managing the tension of the conflicting forces are said to possess the ambidextrous capability. They have the competence to accomplish the incompatible activities by realizing high degree of the pair simultaneously (Nosella et al., 2012). Ambidextrous organizations succeed both in incremental, punctuated and radical innovations (Durisin & Todorova, 2012). Management scholars provide accounts of how firms balance tension among goals when facing the dynamics of innovation. There is a unanimous agreement in the organizational literature that successful firms in dynamic operating environments are ambidextrous and efficient in their addressing of today's business demands while simultaneously being responsive to the environmental fluctuations (Gibson & Birkinshaw, 2004). Research on ambidexterity indicates that the use of high-performance work systems is an important antecedent to facilitate ambidexterity. Ambidexterity leads to better firm performance as Patel and Kearney (2013) concluded in their study of 215 hi-tech SMEs exploring the associations between an organization's human resources systems and the ability to exhibit ambidexterity.

Patel and Kearney (2013) study's finding affirms Gibson and Birkinshaw (2004) multistage study to complement structural ambidexterity with the contextual antecedent of ambidexterity in an organization. The results revealed a positively high correlation between ambidexterity and performance across 41 business units. Business organizations are progressively confronted with inconsistent challenges of dynamically utilizing the existing competencies and searching new ones (Bhatt, 2000; Good & Michel, 2013; Vera & Crossan, 2004). Firms need to generate new information associated with new products and services for developing markets to sustain their performance. On the other hand, firms are leveraging on existing competencies and exploiting current products and services for mature markets (Danneels, 2008). To address these tensions, there is need to explicitly identify the actual form of ambidexterity to apply, either contextual or structural to successfully confront the contrasting goals.

Attaining long-term success necessitates a dynamic capability that enable the organizations to meet the present market demands while concurrently being proactive and forward looking for opportunities to leverage on (Bhatt, 2000; Gibson & Birkinshaw, 2004). Consequently, prior literature has contended that successful firms are ambidextrous. These firms are able to create sustainable competitive advantages through evolutionary and revolutionary organizational change Tushman and O'Reilly (2006) through exploitative and exploratory innovation (Benner & Tushman, 2003; Jansen, Van Den Bosch, & Volberda, 2005). Studies indicate that most successful firms have the ability to reconcile both exploitation and exploration activities as advanced by (Auh & Menguc, 2005; He & Wong, 2004; Katila & Ahuja, 2002). These studies view exploitation-exploration as complementary. However, in contrasting perspective, some studies view the two as competing activities that might require tradeoff (Good & Michel, 2013). Some studies describe a series of trade-offs, Wei, Yi, and Guo (2014) findings revealed that relative exploratory dimension and interactive dimension have different effects on new product development. Ambidextrous organizations are good in balancing exploiting current competencies for incremental innovations and searching for new opportunities to stimulate radical innovations and in that way ensuring continuity of firm performance over the long-run (Andriopoulos & Lewis, 2009).

One of the main reasons of the growing interest in ambidexterity capability in organizations is the empirical demonstration of a positive and significant association between ambidexterity and organizational outcome (Suzuki, 2015). Consequently, many empirical studies have been carried out and corresponding papers written on this relationship. In a number of these literature, the financial and firm performance are the dominant dependent variables as Nosella et al., (2012) found out with ambidexterity as the predictor variable. There are different approaches to ambidexterity, either based on organizational units arrangement termed structural ambidexterity as originally postulated by Tushman and O'Reilly III (1996) or one based on certain organizational characteristics which Gibson and Birkinshaw (2004) termed as contextual ambidexterity.

A number of the studies are not explicit on their foundational aspect of the ambidexterity construct as either contextual or structural as employed in their contexts. When investigating the connection between ambidexterity and organizational performance, the importance of understanding the basis of ambidexterity construct as either structural or contextual is vital to the outcome. This applies to any study investigating ambidexterity as one of the constructs of interest as Jansen, Simsek, and Cao (2012) found out. Within the same unit of analysis, the outcome of the structural or contextual ambidexterity might yield completely different outcomes. There are several types of tensions that organizations have to contend with to survive. These are some of the tensions that a number of academic and managerial papers that are contributing to the ambidexterity concepts have addressed. The permutations of the various tensions have produced fragmented ambidexterity literature.

The concept of ambidexterity is used in different fields with each assuming a different theoretical literature stream as highlighted by Raisch and Birkinshaw (2008). This largely contributes to the incongruities in understanding the ambidexterity concept. The topologies of tensions among many that the organization faces need to be precisely identified in the given investigation that requires the organizational ambidexterity capability. Most studies do not explicitly identify which set of tensions they address themselves to but unilaterally employ ambidexterity construct.

Precise identification of the basis of ambidexterity, structural or contextual and explicit selection of the tension to address with ambidexterity capability is important for two main reasons; one, it will aid in placing the findings into perspective either structural or contextual aspect of ambidexterity and secondly, the identification of the organizational tension under investigation. Different tension topologies will yield different outcomes under different conceptualization of organizational ambidexterity; contextual or structural (Jansen et al., 2012). Basing on contextual ambidexterity, the current study proposed the following; Contextual organizational ambidexterity has a significant intervening effect on the relationship between IS integration and organizational performance.

2.4.5 IS Integration, IT Capability, Ambidexterity and Firm Performance

Information systems have transformed the way organizations operate and the way business is carried out globally. An important model that illuminates the role of information systems in the creation of value within organizations is the value chain model (Porter & Millar, 1985). Value chain analysis extricates a company's value creation activities into primary and support activities. The value chain model facilitates in identification of explicit critical leverage areas where an organization can apply IS most effectively to enhance its competitive position (Peppard & Rylander, 2006). According to Porter and Millar (1985), every value creating activity has two components, the physical component and information-processing component. The physical component incorporates all the physical tasks required to perform the activity while the information-processing component constitute all the stages needed to capture, manipulate and communicate the data necessary to complete the activity.

Today different types of information systems are spread throughout the value chain. These systems are enabling firms in performing optimization and control functions as well as the judgmental executive function especially on the information component of the value chain model activities. The primary purpose of the value chain model was to investigate the internal operations of an organization to identify potential points to enhance firm's overall efficiency and effectiveness. However, the value chain model has been employed as a basis for explaining the facilitation IS can offer to value chain' primary and secondary activities (Coelho, 1999). Figure 2.2 below shows examples of systems that can be used for both primary and support value creation activities of a firm's value chain.

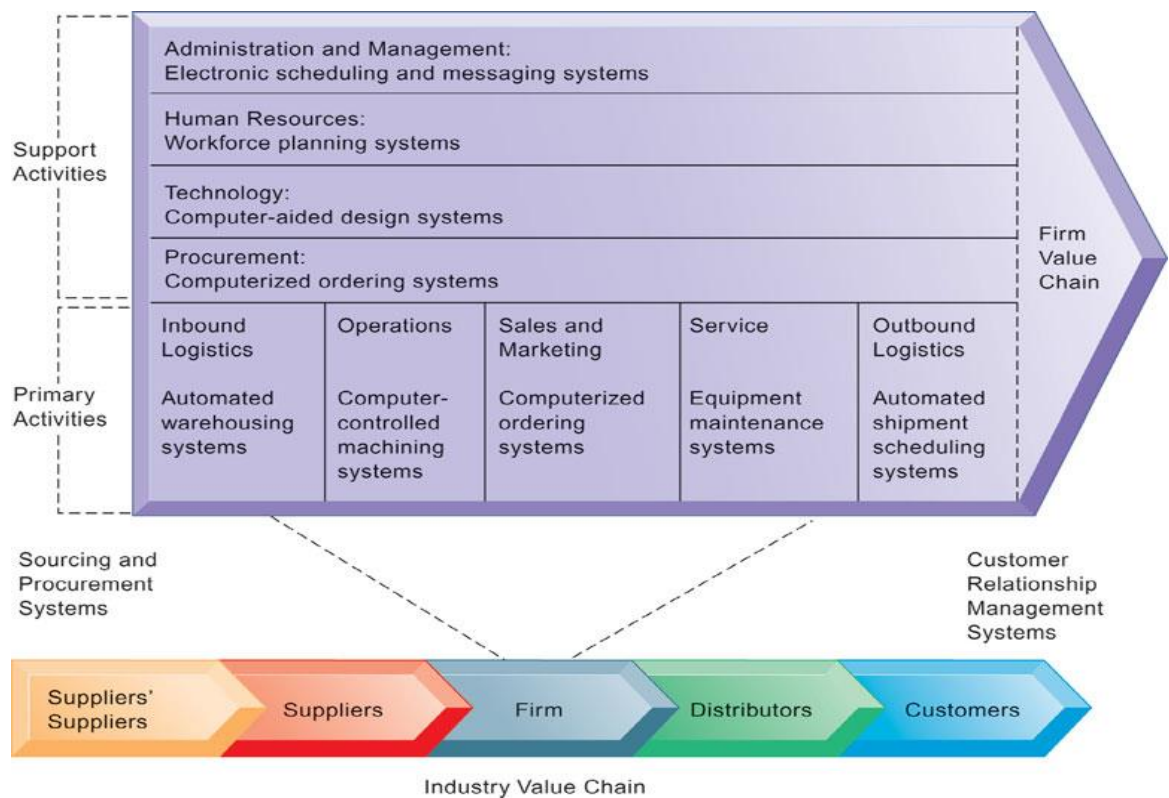


Figure 2.2 The Value Chain Model Laudon & Laudon (2012).

Organizations that effectively manage core processes across functional boundaries will be winners in the marketplace, information systems are often the key to this process improvement and cross-functional coordination, (Bhatt, 2000; Pearlson & Saunders, 2004). However, linking IS integration in organizational processes and the subsequent performance has remained a struggle for IS scholars prompting the quest for investigation on how the efficiencies and effectiveness gained from profound integration of IS in organizations impacts firm performance (Bostrom et al., 2009; Mahmood & Mann, 2005).

Information technology capability is critical for the realization of IS business value and performance advantage. This performance results from the integration of information systems in the value creation processes of the organization. It is the competence of being able to marshal and apply IS based resources and incorporating the other organizational resources and capabilities that create an inimitable competitive advantage in the organization (Sandberg et al., 2014; Wang, 2007). Basing on Lu and Ramamurthy (2011) conceptualization, IT capability ranges from the organizational ability to deploying shareable foundational IS infrastructure,

business-IS strategic partnership and the quest of the firm exploring new ways to adopt IS innovations in addition to exploiting prevailing IS resources to generate business opportunities. For example Safaricom, originally a GSM firm using IS innovations has modeled a new business opportunity through the mobile financial services to emerge the most profitable firm in the East Africa region for a number of years (Safaricom 2015).

Mithas et al. (2011); Mithas, Tafti, Indranil, et al. (2012) and Sandberg et al. (2014) are among the studies that have linked firm-wide IT capability with a competitive advantage. These studies allude that effective use of IS resources can enable organizations to build unique IT capability and subsequently sustainable competitive advantage as part of the intangible assets of an organization (Wang, 2007). Though Chae et al. (2014) in the study to reexamine the link between IT capabilities and firm performance showed statistically insignificant relationship, Bharadwaj (2000) using a matched comparison study on the linkage between IT capability and organizational performance revealed that organizations demonstrating high IT capability tend to perform better than those that do not on a number of performance parameters. The study by Mithas et al. (2011) conclusion was that appropriate information management capability plays a crucial role in developing other organizational capabilities that subsequently directly influence firm performance.

IT infrastructure, part of the dimensions of IT capability plays a critical foundational role in information management. IT capability is entrenched within the fabrics of a business organization as an intangible aspect of IS integration. It is an organizational-wide competence to leverage technology to distinguish from competitors. It is implicit and hard to recognize, but its existence and efficacy is reflected in business operations (Peppard & Ward, 2004). IT capability is engrained in the fabrics of the organization as part of intangible assets. The establishment of an insignificant connection between IT capability and firm performance by Chae et al. (2014), is a pointer that the influence of IT capability on firm performance is indirectly through enablement of other firm meta-capabilities that have a direct influence on performance.

Suzuki (2015) and other scholars have empirically established, a positive linkage of ambidexterity and the overall organizational outcome. This discovery has elicited a growing interest by both researchers and practitioners in this nascent concept that traverses various fields (Nosella et al., 2012). The recent development of ambidexterity theme is the recognition that organizations are increasingly bombarded with contrasting and conflicting goals. Maneuvering through these tensions and ability to succeed in simultaneously achieving high levels of the opposing requirements is essential to a firm competitiveness and long-term survival. Consistent with the generic ambidexterity hypothesis as espoused by various studies like He and Wong (2004); Raisch and Birkinshaw (2008), it is was Gibson and Birkinshaw (2004) that first provided empirical evidence of ambidexterity increasing performance though at organizational unit level.

According to Jansen et al. (2012), prior studies on organizational unit ambidexterity fall short of considering inter-unit variations in performance within the same firm. Investigation of ambidexterity and performance in the multiunit setup is scarce. This is the case despite the general principles of organizational design that optimal conditions for business unit's performance are contingent on the attributes of the organizational context in which the unit operates (Jansen et al., 2012). Additionally, the synergistic effect of various organizational units' ambidexterity can have a profound effect on the enterprise-wide ambidexterity capability. This effect can either weaken or strengthen the overall ambidexterity due to trade-offs of the complementarity effect. The overall performance effects can be expected to be conditioned by organizational-level characteristics as well.

Combining organizational IS integration and the intangible organizational IT capability as the antecedent of contextual ambidexterity, the current study examined the relationships between IS integration, organizational ambidexterity and organizational performance and IT capability influence on these associations. In addition, the link between contextual ambidexterity and firm performance was also examined. In this study, the contribution of IS integration and IT capability as an antecedent of contextual ambidexterity as advanced by Gibson and Birkinshaw, (2004) was also investigated. Exploration and exploitation tension were the organizational contrasting goals or tensions under review in this study.

Therefore, the overriding proposition under examination is that there is a correlation between information systems integration, IT capability, organizational ambidexterity and organizational performance of banks in Kenya.

2.4.6 Summary of Literature Review and Knowledge Gaps

Following a review of the literature on various constructs in this study, Table 2.1 is a summary of some important empirical studies relating to the current study variable conceptualizations and relationships.

Study	Purpose	Methodology	Findings	Gap	Contribution of Current Study
(Chae et al., 2014) USA	To reexamine the link between IT capability and firm performance	Matched approach	No significant link between IT capability and firm performance.	Focused on IT capability which is a subset of IS integration	Relation between IS integration and performance & the ITC influence on this relationship
(Aduda & Kingoo, 2012) Kenya	investigated the relationship between e-banking and performance of Kenya banking system	Cross-sectional survey	there exists a positive relationship between e-banking and bank performance	E-banking is just one aspect of IS integration in banks, there are many aspects of application of ICT in banks	Holistic assessment of ICT application in banking industry and overall performance
(Magutu et al., 2011) Kenya	a survey on the business value of information communication technologies in the financial departments of commercial banks in Kenya	Cross-sectional survey	ICT has: 1) ensured proper management of account balances at value dates; 2) helped in the monitoring and optimization of the sales cash circuit; 3) led to system responsiveness to changing user needs; and 4) helped in the coverage of exchange-rate risk.	Focused ICT innovation & benefits to commercial banks departmental level.	Enterprise-wide effects of ICT on performance banking sector in Kenya and influence of ITC on this relationship
(Nyangosi & Arora, 2009) Kenya	To examine the adoption of information technology in Kenyan banks.	Cross-sectional survey	Achievement of business excellence goals needs inclusion of IT in banking business	Effects of IS integrations on banks performance to validate the findings	To establish whether IS integration and ITC and ambidexterity are areas of IT contribution to performance
(Kamau, 2009) Kenya	To investigate efficiency in the banking sector in the post-liberalization period in Kenya.	Cross-sectional survey	Banks were not fully efficient in all respects; Banks still have room to improve performance by improving their technology, skills and enlarging their scale of operations so as to be fully efficient.	Technology associated efficiency alluded to but not established	Establish IS and ITC effects on bank's ambidexterity & performance
Revilla & Rodriguez (2007) Spain	To establish IT as a driver of ambidexterity and ambidexterity as a mediator of the relationship between IT and product development performance.	Cross-sectional survey	ambidexterity in product development through IS achievable IS is a supportive technology to create the capacity for ambidexterity for the realization of performance gains	Firm-level IT effect on ambidexterity and subsequent firm performance is of importance	Firm-wide IS and ambidexterity and firm performance. In addition to IT capability influence on this relationship is of interest
Gibson & Birkinshaw (2004) USA, Japan, India, S Korea, Canada & France	To establish antecedents, consequences, and mediating role of organizational ambidexterity on business unit performance	Cross-sectional survey	Contextual ambidexterity mediates the relationship between features of organizational context that encourage these behaviors and subsequent business unit performance. There seem to be trade-offs between alignment and adaptability, successful business units were able to simultaneously develop these capacities	While ambidexterity mediates unit level performance, organizational wide view might show different outcomes	The current study will address firm-wide ambidexterity and its influence on the relationship between IS and firm performance
Bharadwaj (2000) USA	Employ the resource-based view to develop the theoretical links and empirically examine the association between ITC and business performance	Matched approach	Firms with high IT capability tend to outperform a control sample of firms on a variety of profit and cost-based performance measures.	Combined effect of ITC and IS integration on firm performance.	Influence of ITC and ambidexterity on IS and firm's performance

Table 2.1 Summary of Empirical Studies and the Knowledge Gap

2.5 The Proposed Conceptual Model

From the reviewed empirical literature and the established knowledge gap highlighted in Table 2.1 above, Figure 2.3 below shows the proposed conceptual model of the variables relationships for the current study. Based on the reviewed literature, IS integration, IT capability and organizational ambidexterity constructs subsumes the sociotechnical constructs of IS and organization as suggested by Bostrom et al. (2009) and Gopal et al.(1993).

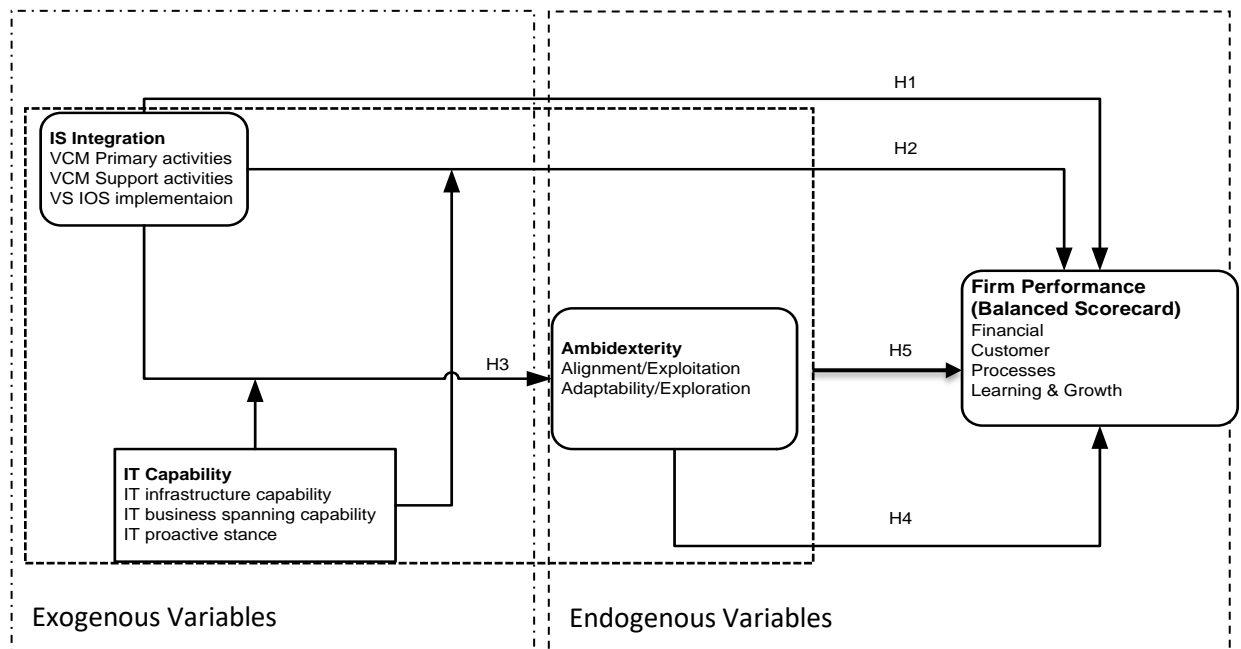


Figure 2.3. The Proposed Conceptual Model

2.6 The Research Hypotheses

Subsequent from a thorough review of information systems, organizational ambidexterity, and performance conceptualizations, the current study proposed that IT capabilities influence the association between information systems integration, organizational performance, and organizational ambidexterity. Further, it was proposed that organizational ambidexterity influences the link between IS integration and firm performance. From these general propositions, the study had the following five hypotheses.

H₁: There is a relationship between IS integration and organizational performance.

H₂: IT capability moderates the relationship between IS integration and organizational performance.

H₃: IT capability moderate the relationship between IS integration and organizational ambidexterity.

H₄: Organizational ambidexterity mediates the relationship between IS integration and organizational performance.

H₅: The overall effect of IS integration, IT capability, and organizational ambidexterity on organizational performance is statistically significant at $p < 0.05$ level

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Chapter three provides a detailed account of the methods and approaches that were adopted in conducting this study. These include the philosophical foundation explained in section 3.2; the research designs and tools that were employed are highlighted in section 3.3. The study population and sources and methods of data collection are described in section 3.4 and 3.5 respectively. Section 3.6 discusses the operationalization of the research's variables, followed by the exploratory factor analysis (EFA) in section 3.7. EFA was required to check on the quality of the study's measures. Section 3.8 highlights the reliability and validity tests that were carried out on the measurement model and finally, the analysis of the study's data employing the structural equation modeling (SEM) is explained in section 3.9.

3.2 Philosophical Orientation

There are several philosophical approaches in social science research. In IS research, interpretivism, critical realism, pragmatism, and positivism are the dominant approaches (Goldkuhl, 2012; Mingers, 2002; Orlikowski & Baroudi, 1991). According to the tenets of the interpretive philosophy, reality is subjective and is socially constructed and therefore the researchers' role is to understand the inter-subjective meanings embedded in social life (Orlikowski & Baroudi, 1991). One of the main criticism is that interpretivism paradigm ignores the possible structures of conflict within a society - structures that would generate change (Goldkuhl, 2012). Critical realism perspective's goal is to provide an evaluative dimension by attempting to critically appraise and change the social reality under examination (Mingers, 2002). Embedded in the positivist approach is the presence of a physical and social world autonomous of human beings and the researchers' duty is to explain this world through universal laws and principles (Orlikowski & Baroudi, 1991). Positivism paradigm is predicated on observations and experiments based on the existing theory that can be expressed numerically (Mingers, 2002).

Positivism paradigm epistemologically is driven by the practical testability of theories that are based on the presence of a priori fixed associations. The phenomenon of interest in positivism is single, tangible, fragmentable and there exists a sharp demarcation between observation reports and theory statements. There exist a real, uni-directional cause-effect relationships that are capable of being identified and tested through hypothetico-deductive logic analysis (Baskerville & Wood-Harper, 1996; Mingers, 2002; Orlikowski & Baroudi, 1991).

This study was guided by the positivist paradigm. A priori nomological network of conceptualized variables comprising of IS integration, IT capability, organizational ambidexterity and organizational performance was specified as shown in conceptual and SEM model in figure 3.1 in section 3.9.2.

3.3 Research Design

The study used mixed designs of descriptive, exploratory and cross-sectional. The Study envisioned to establish the effect of IS integration, organizational ambidexterity and IT capability on firm performance. These three research designs enabled the achievement of the general and the specific objectives of the study. Cooper and Schindler (2008) contended that a cross-survey design collects data from a select sample of a population to explain a prevailing phenomenon by enquiring from individuals about their views, behaviors attitudes, or ideals. The study also intended to explore and examine IS integration and IT capability as possible antecedents of contextual ambidexterity in organizations. This, therefore, made descriptive, explorative and cross-sectional survey designs suitable for the current study because the proposition was to collect data and views to determine the performance effects of IS integration, IT capability and ambidexterity of banking institutions in Kenya.

Magutu, Muganda, and Ondimu (2011) employed this design when they carried out a study on economic benefits of ICT innovations in commercial banks in Kenya. The cross-sectional survey design abetted the collection of uniform and comparable primary data that captured the study units' similarities and differences across all banking institutions which enriched the study findings.

3.4 Study Population

The population comprised all banking institutions in Kenya as defined by the banking Act CAP 488 and CAP 493B. According to CBK (2014) the banking sector in Kenya consisted of the Central Bank of Kenya, 44 banks, one mortgage finance institution, 12 microfinance banks (MFBs) and 8 representative offices of foreign banks. Kenya Post Office Savings Bank (Postbank) is on its own category and is define by CAP 493B (KLR, 2015). The overseas owned banks included 10 locally registered foreign banks and 4 branches of foreign registered banks.

The target population was the 56 banking institutions authorized to operate in Kenya. These comprised the Central Bank of Kenya, 42 commercial banks (3 public, 27 private, 1 private mortgage finance company and 13 foreign-owned banks), 12 microfinance banks and Postbank. The 12 microfinance banks are privately owned, and the Postbank is owned by the Government. The 8 representative offices of foreign banks in Kenya are not permitted to operate in Kenya and therefore were omitted from the study population. This project employed a census approach. According to the sampling tables by Bartlett, Kotrlik and Higgins (2001) calculated based on Krejcie & Morgan's 1970 table and Cochran's 1977 sample size formula, the minimum suitable population for sampling is 100 elements and therefore study used the census. The list of the population is provided in Appendix D.

3.5 Data Collection

Both primary and secondary sources were used to get data for the study. Primary data was the responses on all the study variables based on the questionnaire. Structured questions questionnaire which was developed after separate expert opinion from three senior bank managers was the principal tool for collecting primary data. A 5-point Likert scale extending from 5-representing to 'a greater extent' and 1-denoting to 'not at all' was used.

As Mahmood and Mann (2005) correctly claim, the benefits accruing from any automation initiative in organizations usually takes time to realize and therefore a four-year period secondary data on financial performance taken from 2012 to 2015 was considered. The secondary data was sourced from banks' annual reports and CBK's annual supervisory reports. The secondary data on banks' performance was based on CBK performance measures and other non-financial measures based on the balanced scorecard (BSC) as utilized in evaluating performance in Libyan banks (El-shukri, 2007).

The respondents were the heads of information technology units in the banking institutions. Being in senior management positions, they were presumed to be knowledgeable enough to respond to the questionnaire competently. However, in some instances where the head of IT was not available the questionnaire was filled by senior staff in IT or in business management. A trial test of the questionnaire was performed to guarantee clarity, precision, objectivity and unambiguity of the primary data collection instrument. Since the main respondents were IT savvy, an online version of the questionnaire was distributed using SurveyMonkey online tool. However, only 11 responses were collected through the online method after one month of numerous reminders and this necessitated a revert to a manual face to face or drop and pick later approach for the remainder of the study units to enhance the response rate.

3.6 Operationalization of Research Variables

The four latent variables in this study were operationalized in accordance with previous studies or theoretical expositions and expert opinion to ensure construct validity as shown in Table 3.1 below. Each of the four variables in this study used multi items indicators to factor in the multidimensionality of the latent variables.

Latent Variable	Indicator	Supporting literature	Questionnaire items
Information Systems Integration	Extend of IS in VCM primary & supporting activities	(Laudon & Laudon, 2012; Lu & Ramamurthy, 2011; Pearlson & Saunders, 2004; Porter & Millar, 1985)	2.1 i to 2.3ii
	Use of IS in VS (IOS) for inter-organization operations in value system		
Organizational Ambidexterity	Alignment/Exploitation characteristics	(Gibson & Birkinshaw, 2004; Lu & Ramamurthy, 2011; Magutu et al., 2011; O'Reilly & Tushman, 2007; Tallon & Pinsonneault, 2011)	All items in part 4
	Adaptability/Exploration characteristics		
IT Capability	IT infrastructure capability IT business spanning capability IT proactive stance	(Lu & Ramamurthy, 2011 (Bharadwaj, 2000; Mata et al., 1995; Ross et al., 1996; Sandberg et al., 2014; Wade & Hulland, 2004; Zhang, Sarker, & Sarker, 2013)	All items in part 3
Firm Performance	Financial and non-financial measures based on BSC	(Aduda & Kingoo, 2012; Central Bank of Kenya, 2014; El-shukri, 2007; Hoque & James, 2000; Richard et al., 2009)	5.1i to 5.1ii Secondary data from CBK & Banks sites (Annual financial reports)

Table 3.1 Summary of Variables Operationalization

3.7 Evaluation of the Measurement Model's Scale Items

Exploratory factor analysis (EFA) is a typical statistical technique for evaluating measurement models. It was originally developed by psychologists to test theories of intelligence but has found applicability in other disciplines. Exploratory factor analysis refers to a class of procedures that include centroid, principal components and principal (common) factor analysis methods that differ in their statistical criteria used to derive factors (Kline, 2011).

Exploratory factor analysis was used to evaluate scale items used in the initial measurement model. The objective of factor analysis (FA) as part of the EFA was to refine the scale, therefore, the communality and pattern matrix information were of interest. The two outcomes of FA were used to check on the scale items with low communality and the lowest loading on any of the extracted FA components and eliminate such items. Item groups' scale reliability for each corresponding construct was carried out before using the scale item on the initial measurement model. Once the measurement model was developed it was subsequently estimated using CFA analysis. This a mandatory precondition of SEM analysis before estimation of the inner structural model using the measurement scales of the outer model.

3.8 Validity and Reliability Tests of the Measurement Scale

Based on table 3.1 above, the measurement scales used in the questionnaire were derived from existing theoretical and empirical literature and from the expert opinion of senior managers in the banking industry who were consulted during the questionnaire development and trial run. Confirmatory factor analysis was employed to evaluate the outer model. The study's CFA model was unidimensional which offers precise tests for convergent and discriminant validity (Urbach & Ahlemann, 2010).

Following the refinement item scales through EFA as implemented in the questionnaire, the validity, and reliability of the outer model was examined. PLS-SEM tests both validity and reliability as part of measurement model development and evaluation. The following assessments of the outer model were applied; internal consistency evaluated through composite reliability as recommended by Chin (2013), indicator reliability based on item loadings, average variance extracted (AVE) which is a measured of convergent validity. Fornell-Larcker criterion and heterotrait-monotrait (HTMT) were used to evaluate discriminant validity. Indicator cross loading on constructs which is a good measure of indicator grouping was also carried out. The SmartPLS version 3.2.1 software tool which was employed in this study evaluates and displays a number of quality tests results including Cronbach's Alpha, collinearity statistics among others. Only those tests that are appropriate for the current study were selected for consideration as shown in results sections of chapter four.

3.9 Data Analysis

Descriptive statistics such as the central measure of the responses on measurement items as captured on the questionnaire, the respondents' profile and other related characteristics of the unit of analysis was accomplished using SPSS version 20. Subsequent analysis including estimation of measurement and structural models, mediation, hypotheses testing, and the overall model test and model predictive relevance was carried out using structural equation modeling (SEM). Partial least squares SEM (PLS-SEM) as implemented in SmartPLS version 3.2.1 software tool was employed to analyze the primary data. Since SEM technique simultaneously tests and estimates causal relationships among multiple latent variables, it was deemed appropriate for the current study (Gefen, Straub, & Boudreau, 2000; Hair, Ringle, & Sarstedt, 2013; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014).

The ability to test observed (measurement) variables and unobserved hypothetical construct (latent) variables distinguishes SEM from other standard statistical techniques like ANOVA and multiple regression that analyses observed variable only. The explicit representation of measurement error is a special characteristic of SEM. However, this does not imply that SEM can compensate for gross psychometric flaws, no technique can, but this property lends a more realistic quality to analysis. Some more standard statistical techniques make unrealistic assumptions in this area (Urbach & Ahlemann, 2010). For instance, it is assumed in multiple regression that all predictor variables are measured without error (Kline, 2011). It is also possible to specify either measurement or latent variables (or a combination of both measurement and latent variables) as predictors in SEM models. This capability permits great flexibility in the type of hypotheses that can be tested in SEM (Kline, 2011). The following sections provide the details of structural equation modeling analysis as employed in the current study. In congruence with the current study's philosophical paradigm, research that applies SEM usually follows a positivist epistemological belief (Urbach & Ahlemann, 2010).

3.9.1 Structural Equation Modeling

Structural equation modeling is a category of multivariate statistical techniques utilized to scrutinize direct and indirect associations of one or more exogenous variables (Construct) and one or more endogenous variable (constructs) (Hashim, 2012; Kline, 2011). SEM permits the assessment of the overall model fit in addition to testing the measurement and structural models. While evaluating the theorized structural relationships among latent variables, SEM also evaluates the associations present between the construct and its corresponding measures (Urbach & Ahlemann, 2010). SEM can be viewed as an agile tool for carrying out statistical multivariate analysis ranging from path analysis, canonical correlations and growth curve models among others (Urbach & Ahlemann, 2010). Chin, (1998) posits that, with SEM researchers can; i) model associations among several independent variables; ii) conceptualize unobserved variables; iii) provide for errors in the captured measures of the observed variables; and iv) statistically assess predetermined hypothetical and measurement assumptions compared to experimental data.

There are two main methods in structural equation modeling, partial least squares structural equation modeling (PLS-SEM) and covariance based structural equation modeling (CB-SEM). The two approaches are differentiated by the fundamental statistical assumptions and the type of assessment statistics they generate (Gefen et al., 2000). The CB-SEM employs the maximum likelihood (ML) function to lessen the variances between the sample covariance and those projected by the conceptualized model. The projected parameters attempt to replicate the observed covariance matrix. Maximum likelihood requires normal distribution and independence of the observed variables and therefore works well with large sample sizes (Chin, 1998). Conversely, PLS-SEM main objective is to maximize the covariance amongst the exogenous variable(s) and the endogenous variable (Hair et al., 2014). Contrasting the covariance-based, PL-SEM employs least squares approximation for solitary and multi-component representations and for canonical correlations. PLS-SEM approach circumvents several obstructive conventions with ML and safeguards against inappropriate solutions and construct indeterminacy as Fornell and Bookstein (1982) confirmed. Despite criticism in

some literature about PLS-SEM deficiency of rigor and its unsuitability of examining the relationship between latent variables, currently, researchers are qualifying PLS-SEM as vigorous approach of SEM model estimation as evidenced by its increasing application in marketing and business research (Hashim, 2012). PLS-SEM should be considered as an alternate technique of SEM when the CB-SEM restrictive assumptions are not practically achievable. The distributional and informational demands of CB-SEM can be impractical for a number of areas of investigation particularly in social sciences. Therefore, the two SEM approaches should be regarded as complementary and not competing statistical approaches (Hashim, 2012; Hair, Ringle, & Sarstedt, 2011). Hair et al. (2011) provide a proposition as an appropriate guidance for choosing either CB-SEM or PLS-SEM for any study planning to employ SEM for analysis. Table 3.2 below list the five guiding considerations.

Principles to Appraise		CB-SEM	PLS-SEM
1	Research objective <ul style="list-style-type: none"> i. Predicting key target constructs ii. Theory testing, theory confirmation or comparison of alternative theories iii. Exploratory of an extension of an existing structural theory 	ii	i iii
2	Measurement model specification <ul style="list-style-type: none"> i. If formative constructs are part of the structural model ii. If error terms require additional specification such as co-variation 	ii	i
3	Structural model <ul style="list-style-type: none"> i. If a structural model is complex ii. If a structural model is non-recursive 	ii	i
4	Data characteristics and algorithm <ul style="list-style-type: none"> i. Data meet distributional assumptions ii. Data did not meet distributional assumptions iii. Small sample size consideration iv. Large sample size consideration v. Non-normal distribution vi. Normal distribution 	i iv vi	ii iii iv v vi
5	Model evaluation <ul style="list-style-type: none"> i. Use latent variable scores in subsequent analyses ii. Requires global goodness of fit criterion iii. Need to test for measurement model invariance 	 (ii) (iii)	(i)

Table 3.2 CB-SEM and PLS-SEM Selection Rules. Hashim (2012).

CB-SEM is the appropriate approach if the research goal is theory confirmation. Theory validation requires the demonstration of the theoretical model fitting or replicating what is observed on the collected data (Hashim, 2012). Accordingly, Garson (2016) and Hair et al.(2014) classify CB-SEM as suitable technique for hard modeling whose main intention is the minimization of the covariance matrix. Minimization of covariance matrix is the core asset of CB-SEM. Conversely, PLS-SEM suits research objectives that are for prediction and theory development oriented in nature. Therefore, PLS-SEM is viewed as soft modeling (Hashim, 2012). In soft modeling, the emphasis is on detecting the best

forecast of the associations amongst variables and therefore emphasizes on maximizing the amount of covariance amongst latent variables to improve the model predictive relevance (Garson, 2016). Contrary to CB-SEM that normally utilizes reflective measures for its CFA model, in PLS-SEM, a researcher can choose reflective, formative constructs or a mixture of reflective and formative constructs in a single SEM model (Urbach & Ahlemann, 2010). From the preceding descriptions of CB-SEM and PLS-SEM and in reference to Table 3.2 guidelines of selecting between the two SEM approaches, PLS-SEM was the suitable methods for the current study since the prediction of covariance of the model variables rather than theory testing or validation was the goal. The sample size constraint of the study rendered PLS-SEM as the most appropriate SEM method for the current study.

3.9.2 Reflective and Formative Latent Variables

In SEM literature, latent variables (unobserved variables) also referred as constructs can be either formative or reflective depending on whether they are modeled with reflective or formative indicators. For reflective constructs, the indicators (observed variables) also referred as measurement variables are viewed as a demonstration or proof of the underlying construct. The existence of the construct is manifested by the indicators (Hashim, 2012; Kline, 2011). These indicators are parallel measures that co-vary and are meant to measure the same hidden fundamental construct. Causation in reflective constructs is from the latent variable (LV) to the indicators. The arrow direction points from the LV to the indicator implying that the underlying construct causes the indicator. Any variations in the fundamental construct are expected to cause variations on the indicators as well (Hair et al., 2014). This causal direction of indicators for reflective constructs implies that the indicators for reflective constructs should be internally consistent because all of the observed measures are presumed to be correspondingly binding indicators of the fundamental latent variable (Petter, Straub, & Rai, 2009).

Formative latent variables on the other hand, refer to constructs that have formatively modeled indicators. Converse of reflective constructs where the underlying construct is manifested by the corresponding indicators, in formative constructs, indicators are

collectively grouped to constitute the meaning of the construct. The indicators combine to form the underlying construct (Hair et al., 2014; Petter et al., 2009). In divergence to a reflective construct, a formative construct infer that the indicators have an influence on the fundamental construct (Jarvis, Mackenzie, & Podsakoff, 2003). The set of indicators cooperatively determines the theoretical and the observed meaning of the underlying construct. The direction of causation is from measures (indicators) to the latent variable inferring that indicators cause the construct (Hashim, 2012; Kline, 2011; Urbach & Ahlemann, 2010). Figure 3.1 below illustrates the reflective and formative constructs with their associated indicators respectively.

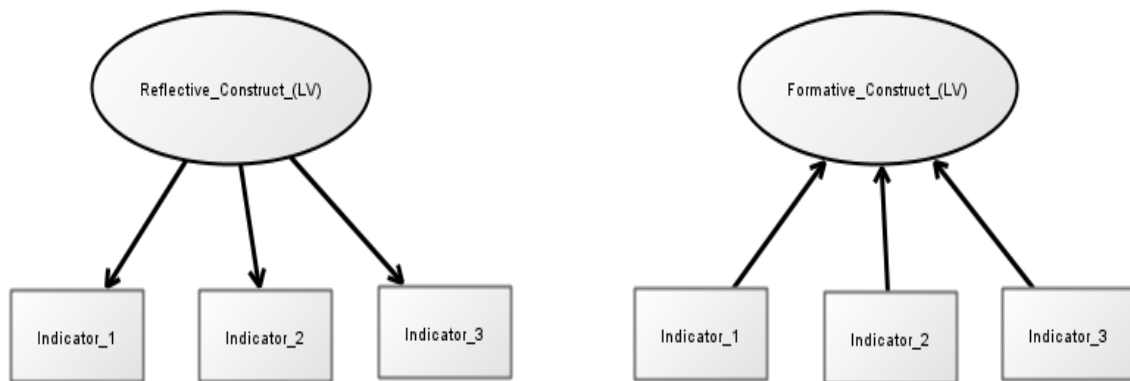


Figure .3.1 Reflective and Formative Constructs

For reflective latent variables, internal consistency among the indicators is a critical measure. Therefore, the examination of the respective internal reliability of the set of indicators associated with each construct is essential. These measures are vital to certify that the observed measures or the indicators are consistent. Reflective constructs are unidimensional, consequently changing or removing some measures from the grouping would not affect the content validity. For formative indicators however, correlation nor high internal consistency of any grouping associated with underlying construct is not necessary. Therefore, any variations in the formative indicator consequently causes variations in the underlying construct (Jarvis et al., 2003). A formative indicator can define latent construct representing different perspectives of it and any alteration will have a corresponding effect on the construct (Gefen et al., 2000). In addition to internal

consistency, it is important to examine the loading of the reflective indicators as a validation of the correlation amongst the indicators for the corresponding constructs (Hashim, 2012; Kline, 2011). For formatively modeled constructs, the explanation of formative indicator should be grounded on weight. The weight reveals information concerning the contribution of each indicator in the formation of the underlying Construct (Chin, 1998). Figure 3.2 below is a sample of SEM model with formatively and reflectively modeled constructs.

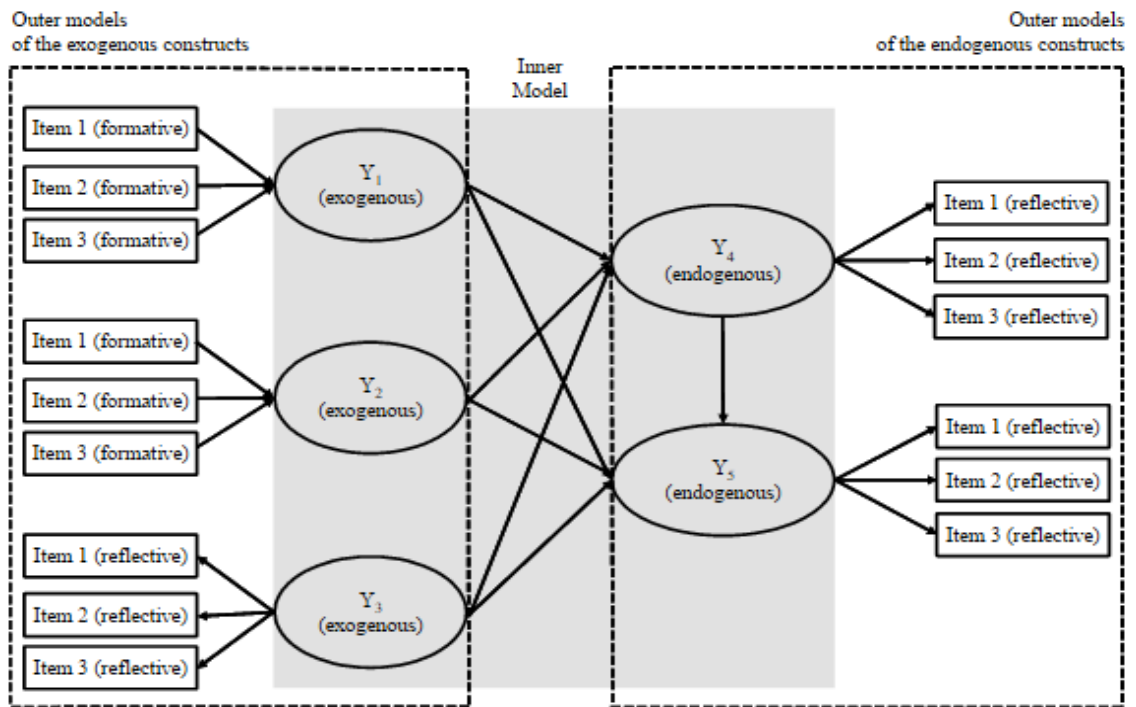


Figure 3.2 Formative and Reflective Constructs SEM Model. Hair et al. (2014).

The four latent variables in this study are modeled as reflective constructs with reflective indicators. In this study, latent variables under investigation can only be revealed through demonstration of the existence of observable characteristics that relates to the conceptualization of the construct of interest. It is only the presence of the underlying (unobservable) construct that the (observable/indicators) manifest or measurement variables can be detected. The section below describes the current study's measurement and the structural model's appraisal and the associated relevant tests. Figure 3.3 below shows the study's final full structural regression model which comprises the study's outer and the inner models.

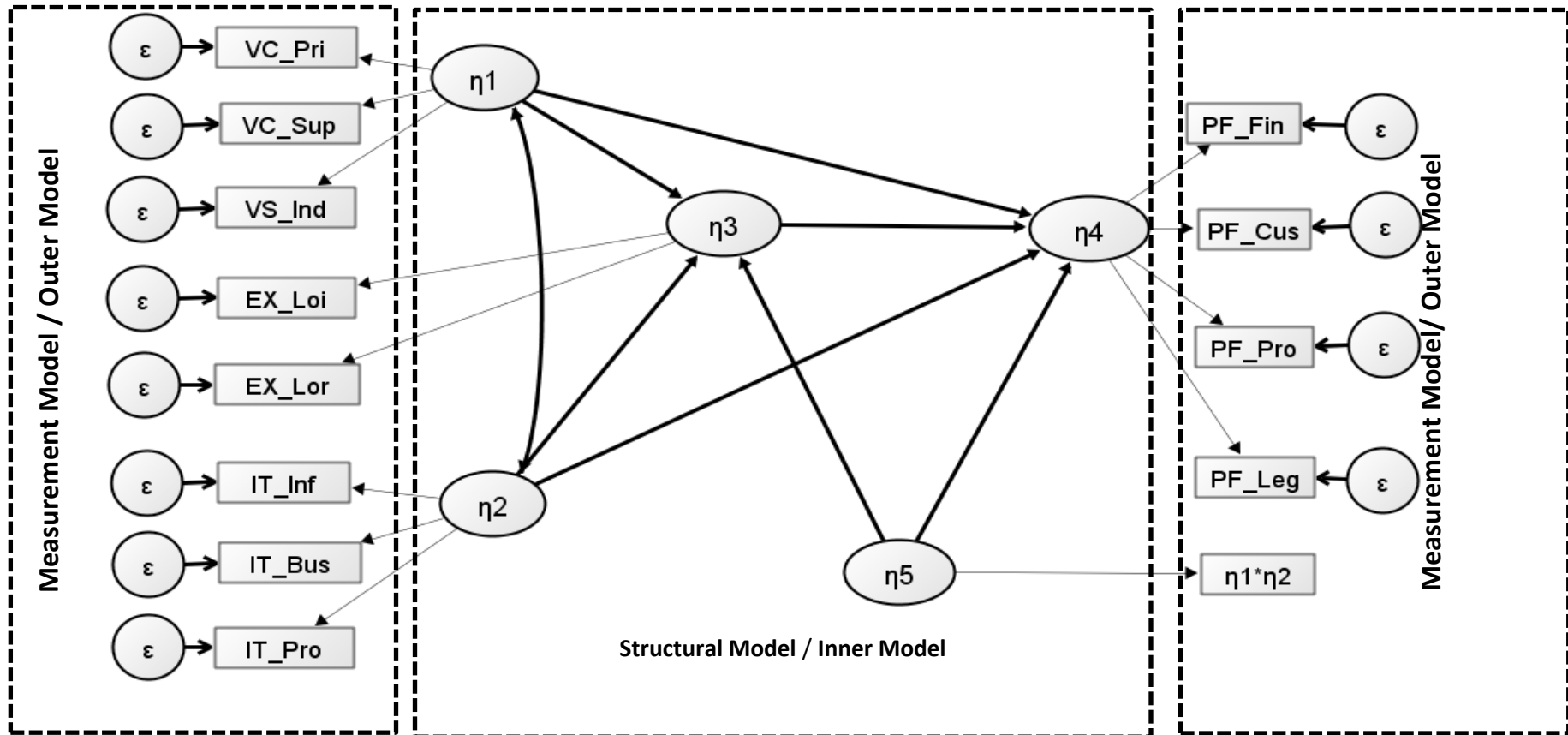


Fig 3.3 The Study's Full Structural Model

VC_Pri; VC_Sup; VS_Ind are Indicators for η_1 -Information systems integration; **IT_Inf, IT_Bus, IT_Pro** are indicators for η_2 -Information technology capability; **EX_Loi, EX_Lor** are indicators for η_3 - ambidexterity and; **PF_Fin, PF_Cus, PF_Pro, PF_Leg** are the indicators for η_4 - organizational performance. $\eta_1 * \eta_2$ represented by η_5 : is the IT capability moderation between information systems integration, and ambidexterity and the organizational performance respectively;

3.9.3 Measurement and Structural Models Evaluation

Structural equation modeling analysis is a two-phase process. The outer (measurement) model is analyzed first followed by the inner (structural) model (Hair et al., 2014). Generally, the objective of model validation is to establish that the measurement and structural model satisfy the quality conditions for the observed phenomenon (Urbach & Ahlemann, 2010). The following subsections are an exposition of the procedures to evaluate the study's hypothesized measurement and the structural models.

3.9.3.1 The Measurement, Outer Model

As stated earlier on reflective indicators, the qualification of a reflectively modeled constructs is the demonstration through analytical testing of the indicators' internal consistency, indicators' reliability, convergent and discriminant validity of the respective indicators and the indicators' cross-loadings. (Hair et al., 2011; Hair et al., 2014; Jarvis et al., 2003). The conventional gauge for measures of internal consistency is the Cronbach's alpha. However, as (Hair et al., 2014) contend, this traditional gauge has an important drawback. With Cronbach's alpha, the reliability value can be increased by merely adding the number of measurement items in the grouping for a given scale irrespective of the additional items having the same degree of inter-correlation or not (Hair et al., 2011). Moreover, Cronbach's alpha is grounded on the limiting postulation that all indicators are of equal importance (Garson, 2016). A more reliable measure should afford the researcher with superior assurance that the respective indicators are collectively consistent in their respective measurements (Garson, 2016). In this study, therefore, the composite reliability of measurement model was evaluated through construct reliability (CR) and average variance extracted (AVE) measure.

Indicator reliability assesses the degree to which a variable or a grouping of variables are sturdy with what they propose to compute (Urbach & Ahlemann, 2010). A given construct reliability is autonomous of and is evaluated distinctly from the SEM model's constructs. Chin (1998) posits that the indicator loadings ought to be substantial at least at the p-value of 0.05 and that the loading ought to be larger than 0.7. This is for the reason

that, with the loading value at 0.70, a given latent variable is thought to be able to provide for at least 50% of its indicators' change. The implication of the indicator loadings can be established employing a resampling process like bootstrapping or jackknifing. According to Garson (2016) caution should be exercised when deciding to drop. Accordingly, an indicator should be dropped only if its reliability is low and the elimination of that indicator substantially raises the construct's reliability.

Convergent validity assess the degree to which grouped items revealing the underlying construct congregate contrasting items groupings measuring unrelated constructs (Urbach & Ahlemann, 2010). In PLS-SEM, convergent validity is assessed by means of the value of average variance extracted (AVE). As stated by Fornell and Larcker (1981), satisfactory convergent validity is attained when the AVE value of a latent variable is at minimum 0.50. For segregation of different measures for different constructs from one another, discriminant validity test is carried out on the respective constructs. Converse to convergent validity, discriminant validity is a test to establish that the items measure what they are purposed to measure and inadvertently not something else in this case the appropriate and intended construct and not a different one within the same SEM model (Urbach & Ahlemann, 2010). Conventionally PLS-SEM approach applies two discriminant validity measures. The commonly employed tests of discriminant validity in PLS-SEM are; i) the cross loading (Chin, 1998) and ii) the Fornell-Larcker's criterion (Fornell & Larcker, 1981). Recently, however, the heterotrait-momotrait ratio of correlations (HTMT) measure has gained traction as a more reliable measure of discriminant validity. The current study used all the three measures, to test discriminant validity while convergent validity was evaluated using average variance extracted.

The initially proposed measurement model was found to be extremely weak after the preliminary evaluation. This necessitated a re-specification of the model and subsequent evaluation to guarantee its efficacy for the estimation of the structural model. Typically model re-specification involves either aggregating, dropping or addition of indicators. In this case aggregations of a number of scale items were done in order to strengthen the measurement model using item parceling technique. Item parceling is the technique of

aggregating items scales to single indicators. Item parceling is known to strengthen the result of SEM analysis and is useful in small sample sizes with comparatively fewer model parameters and does provide a better measurement model fit (Edwards et al., 2000). Item parceling was carried out on the item scale measures of the initial measurement model which greatly improved the final measurement model fit.

3.9.3.2 The Structural, Inner Model

Assessment of the (inner) structural model enables the investigator to analytically prove or reject the hypothetical theorization of the priori structural model (the equivalent of conceptual model) based the collected sample data (Kline, 2011; Urbach & Ahlemann, 2010). The assessment of the structural model follows the successful assessment and validation of the measurement model. Unlike in CBSEM, the overall goodness of fit of the model cannot be established in PLS-SEM, however, there are several measures that are used to evaluate the structural model appropriateness.

The current study assessed multicollinearity through the use of variance inflation factor (VIF), latent variables relationships were tested using path coefficients. The R^2 , the coefficient of determination for the two endogenous variables was used to evaluate the association of an endogenous variables' accounted for variance in relation to the total variance. The model predictive relevance was evaluated using the Stone-Gleisser Q^2 value. Individual latent variable's contribution to both the total explained variance R^2 and the overall predictive accuracy of the model Q^2 was evaluated using the change effect size values of f^2 and q^2 respectively. The mediating influence of ambidexterity between the association of IS integration and organizational outcome was accomplished by using the bootstrapping approach test of mediation which is more robust compared to Baron & Kenny's (1998) and Sobel's (1982) approaches as Hadi, Abdullah, and Ilham (2016) correctly assert.

3.9.3.2.1 The Mediation and Moderation Test Analysis

Associated with Objective 4 of the study, is the hypothesis H_4 which presumed that organizational ambidexterity significantly mediates the association between information systems integration and firm performance. As stated by Hadi et al. (2016), in PLS-SEM, mediation analysis uses one of the following approaches; i) Baron and Kenny (1986) analysis; ii) Sobel (1982) and ii) The bootstrap method by Preacher and Hayes (2004). In Baron and Kenny's approach, mediation analysis is based on the establishment of significant direct effect relationships between the predictor variable (IV) with the explained variable (DV) and mediator variable (MV) and explained variable. The absence of this indicates no mediation. However, it has been established that the mediation may work even with non-significant relationships in the direct paths.

The Sobel's assessment considers the substantiality of the mediator by finding the product of coefficients ($IV \rightarrow MV * MV \rightarrow DV$), $c+d$ in the figure. 3.4 below.

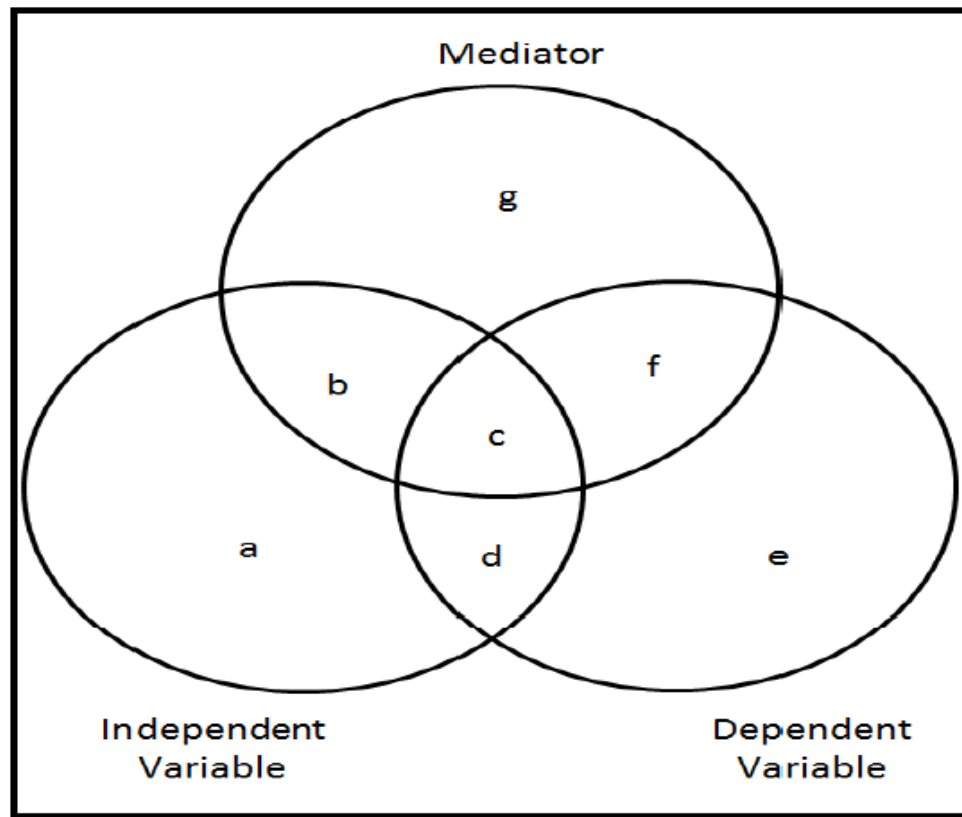


Figure 3.4 The Sobel's Approach of Mediation. Hadi et al., (2016)

This area represents the effect of IV on DV. The area where the circle overlaps represent the relationship between IV and DV or the effect of IV on DV. This correlation can be broken down into c and d, c represents the variance that IV and DV have in common. This area also represents the product of coefficients ($IV \rightarrow MV * MV \rightarrow DV$). Sobel's test examines the area c. if the area of c is larger than the area of d, it represents the significance of Sobel's test which is a sign of moderation. Sobel's test depends on distributional assumptions and according to Hair et al. (2014), the distribution of indirect effect ($IV \rightarrow MV \rightarrow DV$) tends to be asymmetric unless the sample is large enough. This asymmetry proscribes the applicability of Sobel's test when working with small sample sizes like is the case of the current study.

The bootstrap method developed by Preacher and Hayes (2004) is non-parametric resampling test. The bootstrap method is not reliant on the assumption of normal distribution and therefore fit for smaller sample sizes (Hair et al., 2013; Pardo & Román, 2013). This test has an advantage over Sobel's test and helps determine the mediation effect with certainty (Hadi et al., 2016).

Based on the aforementioned reasons, the current study employed the bootstrap approach mediation test. In this approach, bootstrapping is used twice; first without the presence of the mediation, and secondly with the presence of the mediation. It should be noted that if the direct effect is not significant, there is no mediating effect (Hair et al., 2014). The normal PLS algorithm in PLS-SEM as implemented in SmartPLS version 3.2.1 does not provide significance test results unless bootstrapping is enabled before running the PLS algorithm. The following section explains the bootstrapping process that was necessary to perform in this study since the significance levels were part of the core test of the research hypotheses.

There are two approaches for modeling moderation in PLS-SEM, the product indicator method used with reflective models and the second is the latent variable score approach based on the product of latent variable scores. This is used with formatively modeled constructs (Garson, 2016). The current study model constructs are reflectively modeled

and therefore, the product indicator method was used to analyze the two instance of moderation influence. In product indicator method, a new virtual latent variable (construct) that is a product of the predictor and moderator, the two exogenous variables in this case (IS_Int*IT_Cap) is added the SEM model with path pointing to the dependent variable (endogenous variable). The indicators of the new construct are the products of every possible pair of the indicators of the predictor variable and the moderating variable. If there is an interaction effect beyond the separate linear effects of the predictor and moderating variables, then the coefficient of the path from the created virtual construct to the independent (endogenous variable) will be significant, else, the moderation does not exist.

3.9.3.2.2 Estimation with PLS Bootstrapping

Distributional patterns such as normal, chi-square, or other known distribution forms are not presumed in path coefficients of PL-algorithm. The common asymptotic statistical significations cannot be determined applying the normal PL-algorithm (Garson, 2016). Therefore, bootstrapped coefficients signification needed to be invoked in order to compute the significance values. The SmartPLS software tool that was used for analysis in this study necessitated the assessment of the model after requesting bootstrapping rather than the normal PLS Algorithm when executing analytical calculations. Bootstrapping utilizes the resampling technique to calculate the statistical substantiality of the PLS coefficients. Bootstrapped significance is not similar to the asymptotic assessments of significance conversant to adherents of regression and other casually normal data applications (Garson, 2016).

Bootstrapped significance is commonly applied when data normality cannot be ascertained. (Garson, 2016). Bootstrapping technique was appropriate because the distributional properties of PLS estimates are unknown for the target population. As classically computed, bootstrapping normally uses many “leave one out” samples from the available study data. This permits calculation of a specified coefficient of interest for a large number of the resampling, permitting standard deviation to be calculated. Enumerating standard deviations from the established coefficient to 0 produces a

statistical significance level. While bootstrapping can handle any distributional pattern, generalization to the population is not permitted unless random sampling was done from the population. However, the data at hand can be generalized. The implication of the foregoing is that, bootstrapped estimates are intended to fix the non-normal distribution of data limitation and not non-random sampling problem. Figure 3.5 and Table 3.3 below jointly describes the data analysis procedure that was applied in the analysis of the study variable relationships as shown on the structural regression model.

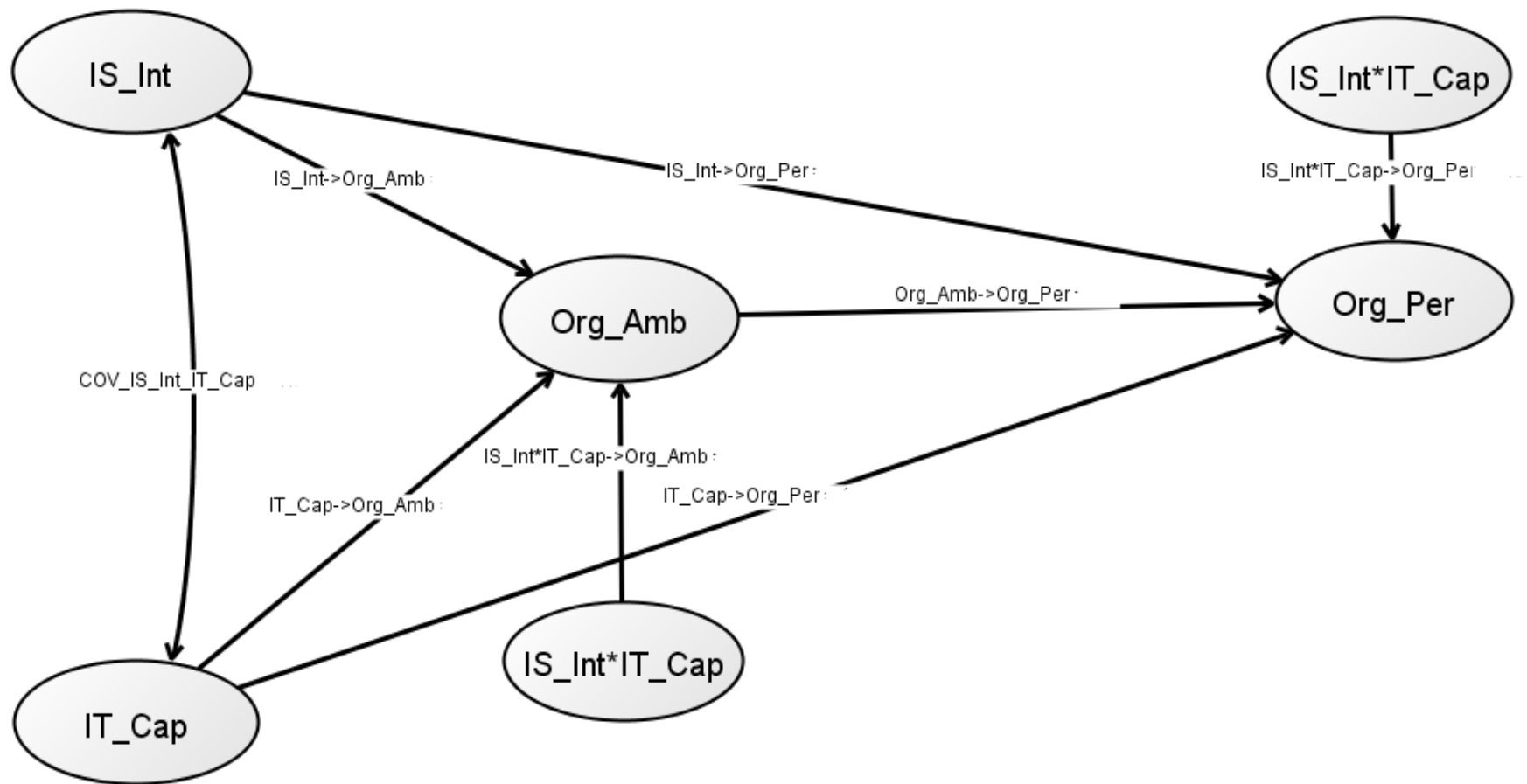


Figure 3.5: SEM Structural Regression Model

IS_Int*IT_Cap: Indicates moderation effect of IT_Cap on relationship between IS_Int and Org_Per and Org_Amb

Objective		Hypothesis	Analysis	Interpretation at $p < 0.05$
i.	To examine the relationship between IS integration (η_1) and Banks' performance (η_4)	H_1	Structural Regression (SR) Analysis	Path coefficient IS_Int \rightarrow Org_Per has to be statistically significant not to reject H_1
ii.	To establish the moderating influence of IT capability η_2 on the relationship between IS integration (η_1) and banks' performance (η_4)	H_2		The path coefficient IS_Int*IT_Cap \rightarrow Org_Per has to be statistically significant not to reject H_2
iii.	To establish the moderating influence of IT capability η_2 on the relationship between IS integration (η_1) and ambidexterity (η_3)	H_3		The path coefficient IS_Int*IT_Cap \rightarrow Org_Amb has to be statistically significant not to reject H_3
iv.	To establish the intervening influence of ambidexterity (η_3) on the relationship between IS integration (η_1) and banks' performance (η_4)	H_4	Bootstrapping Approach	Use bootstrapping procedure to analyze the significance of the direct path coefficient IS_Int \rightarrow Org_Per if not statistically significant no mediation. If direct is significant include the mediator and run the bootstrapping again, if the indirect path Org_Amb \rightarrow Org_Per is not statistically significant there is no mediation, if the indirect path IS_Int \rightarrow Org_Amb \rightarrow Org_Per is statistically significant, then calculate the variance accounted for (VAF) to assess the strength of the mediation (VAF values $> 80\%$ full mediation; between 20% and 80% partial mediation and $< 20\%$ no mediation)
v.	To determine the overall effect of IS integration (η_1), IT capability (η_2) and ambidexterity (η_3) on banks' performance (η_4)	H_5	$f^2 \rightarrow$ change effect size of R^2 and $q^2 \rightarrow$ change effect of Q^2	The coefficient of determination R^2 value and the Stone Gleisser value Q^2 of banks' performance must be statistically significant not to reject H_5

Table 3.3 Summary of Data Analysis Procedures

Once the above tests and analyses were procedurally and judiciously executed, the general objective and the subsequent subsumed specific objectives of the current study were achieved.

3.10 Chapter Summary

This chapter presented the methodological approach of the study. The chapter started with the research philosophical orientation that guided the study and concluded with summary of data analysis procedures employed to analyze the collected data. The research design and its justification, the study population and data collection were addressed in this chapter in addition to the study's variables operationalization. The Study employed the structural equation modeling, specifically PLS-SEM for data analysis. Consequently, the chapter addressed the PLS-SEM analysis using the SmartPLS software tool detailing and justifying various analysis to be carried out based on SEM guidelines and the objective of the study. These analyses included evaluation of measurement model and its associated indicators. The tests for measurement model's indicators included validity and reliability. The structural model evaluation guidelines for mediation and moderation of the proposed relationship of the constructs was discussed. The justification for the SEM model fitness based on the PLS-SEM and SmartPLS tool was outlined. The chapter concluded with a tabulation of the data analysis procedures that will enable the achievement of the study's objective.

CHAPTER FOUR: RESEARCH FINDINGS

4.1 Introduction

Chapter four is a description of the findings of the survey performed guided by the research design of the previous chapter. This study applied SmartPLS 3.2.1 software tool to conduct SEM analysis on the collected survey data using PLS-SEM technique. The discussion of the findings is as follows: Section 4.2 highlights the study's response rate and related examinations of the responses. The profile of the respondents and some descriptive statistics on some characteristics of the study units is highlighted in section 4.3. Section 4.4 is the preliminary analysis including data cleaning and screening, while section 4.5 provides the evaluation of the psychometric characteristics of scale items to ensure the quality of the measures. In section 4.6 the initial and the re-specified final measurement models are evaluated respectively which precede the evaluation of the structural model in section 4.6 and finally the testing of hypotheses in section 4.8.

4.2 Response Rate and Examination of Returned Questionnaires

The population of the study encompassed all the banking institutions in Kenya as defined by the banking Act CAP 488 and CAP 493B. According to the Central Bank of Kenya supervisory report of 2014, the banking industry in Kenya included the Central Bank of Kenya, 44 commercial banks, 1 housing finance company (MFC), 12 deposit taking microfinance banks (MFBs) and 8 representative office of foreign banks which are not allowed to operate in Kenya like other banking institutions CBK (2014). Kenya Post Office Savings Bank (Postbank) is defined by CAP 493B and is owned by the government. From the 44 commercial banks, 3 were excluded from the study because they were under receivership and subsequently one was in the process of liquidation due to noncompliance.

Therefore, the total questionnaires were distributed to the Central Bank, 41 commercial banks, 1 MFC 12 MFBs and Postbank. This was a total of 56 questionnaires.

Respondents returned 52 representing a response rate of over ninety-two percent (92.86%). This response rate was considered adequate for analysis. If the unit of study is the organization questionnaire return rate of about 35 percent and above is considered appropriate for such cross-sectional survey studies based on Baruch and Holtom (2008) conclusion.

4.2.1 Questionnaire Response Refinement

The filled questionnaires were sequentially coded upon receipt. Collected data was inspected for comprehensiveness, constancy and accurateness. Thereafter, the filled questionnaires were checked for completeness, and suitability of the respondents.

From the 52 returned questionnaires, 2 were considered unusable and therefore eliminated. Out of the 2, one questionnaire was missing responses to over 25 percent of the questions and the other questionnaire was a copy from the same bank, implying more than one respondent from the same institution responded. Therefore, a total of 50 questionnaires provided the data for subsequent analysis.

4.2.2 Questionnaire Data Coding

This research included four constructs and a number of scale items (indicators) associated with each construct. Part two to five of the questionnaire were organized and pre-coded based on these four constructs. Table 4.1 in appendix B summarizes the coded scale items. After verifications of the returned questionnaires, the data was entered into SPSS version 20 for preliminary analysis. Variable names and labels in SPSS were aligned with the questionnaire outline to mitigate data entry errors. SmartPLS version 3.2.1 does not provide for direct data entry. Therefore, SPSS was used and later imported SPSS data file into SmartPLS in csv file format.

4.3 Profile of Respondents

The following are the descriptive statistics of the survey respondents and the constructs variables. Data from the final 50 questionnaires was entered into SPSS version 20.0 and thereafter data analysis began. Frequency distribution of the various aspects of the study units was generated.

The descriptive statistics comprised information about the type and peer group of the banks based on CBK classification. The respondents were also classified as either being in business or IT management. Years worked in the banking industry and specifically in the present institution were classified as either less or more than one year. More than one year was considered sufficient to authentically provide credible information required by the study. Table 4.2 through 4.6 summarizes this basic information about the banks as study units and the corresponding respondents. Table 4.2 summarizes respondents based on bank type, either microfinance or commercial bank. From the Table 4.2 below, the commercial banks contributed a greater percentage of the responses compared to microfinance banks.

Type		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Microfinance	9	18.0	18.4	18.4
	Commercial	40	80.0	81.6	100
	Total	49	98.0	100	
	Missing	1	2.0		
	Total	50	100		

Table 4.2: Participants by Bank Type

Table 4.3 below indicates the number of respondents by bank peer group as categorized by CBK by 2014 for both commercial and microfinance banks. Based on CBK criterion discussed earlier, only a few banks make it to the large tier peer group. Majority falls under lower tier and subsequently provided more responses to this study.

Peer Group		Frequency	Percentage	Valid %	Cumulative %
Valid	Small	25	50.0	53.2	53.2
	Medium	14	28.0	29.8	83.0
	Large	8	16.0	17.0	100.0
	Total	47	94.0	100.0	
	Missing	3	6.0		
	Total	50	100		

Table 4.3: Participants by Bank Peer Group

The targeted respondents were those in IT management in the banking institutions. However, in some banks when the IT management proved difficult to get, competent senior business management staff were requested to fill the questionnaire. Table 4.4 below shows the respondents classification either as IT management or business management. The target group contributed a greater percentage which was crucial to the quality of collected data.

Dept. (Business / IT)		Frequency	Percentage	Valid %	Cumulative %
Valid	Business Management	14	28.0	28.6	28.6
	IT Management	35	70.1	71.4	100
	Total	49	98.0	100.0	
	Missing	1	2.0		
	Total	50	100		

Table 4.4: Participants by classification

4.4 The Preliminary Analysis and Data Cleaning and Screening

The initial analysis was conducted to guarantee the data was rendered into a form appropriate for further scrutiny and interpretable into intelligible outcome. The main problems with initial analysis are usually the correctness of data entry, omitted observations, outliers, and distributional related issues (Hair et al., 2014). The most pertinent issues are considered.

The cleansing and screening of the collected primary data comprised of inspection of the data entry accurateness, identifying inconsistent responses and missing data. Descriptive statistics and frequency distributions methods were used to clean and screen the data. Insignificant data entry errors identified were compared with the entries on the physical questionnaire and corrected appropriately. Owing to the small data set, it was possible to manually counter check all the entries in SPSS data file against the original data source, the questionnaires. This check found no entry errors.

Missing data can be traced from mistakes independent from the respondent particularly during data input errors or from respondent associated faults for example question omissions or incorrect response. In the present analysis, initial data screening identified missing data due to data entry errors. The main attention in the data cleansing and screening was to identify incorrectly answered or skipped questions. From the 50 questionnaires, only 2 had missing data. Due to the small sample size, the few missing values instances were substituted with the mean as proposed by (Hair et al., 2013). The small sample size lends itself to mean replacement as the best option than case removal.

4.5 Descriptive Analysis

The scale items measuring the latent constructs were rated on a five-scale Likert measure. The ranges were as follows, a 5-point indicated to a great extent and a point of 1 indicating not at all. The mean score for all items associated with the four latent constructs are as follow; information systems integration was between 3.45 and 4.34, information technology capability between 2.68 and 3.90, organizational ambidexterity was between 3.52 and 4.00 and organizational performance between 3.48 and 4.41. The figures from all indicators of the constructs generally show a mean of greater than the moderate point (3) which points out the respondents mostly agree with the items. A summary of average and standard deviation of the complete set of scale items is provided in Table 4.5 in appendix C.

The graph in figure 4.1 below reveals automation through IS integration does not necessarily imply possession of IT capability. The trend indicates that this is the case across all banks involved in the current study. From the graph, all banks report high level of automation, but there is a gap between IS integration through automation and IT capability, pointing to lag of IT capability despite high degree of automation.

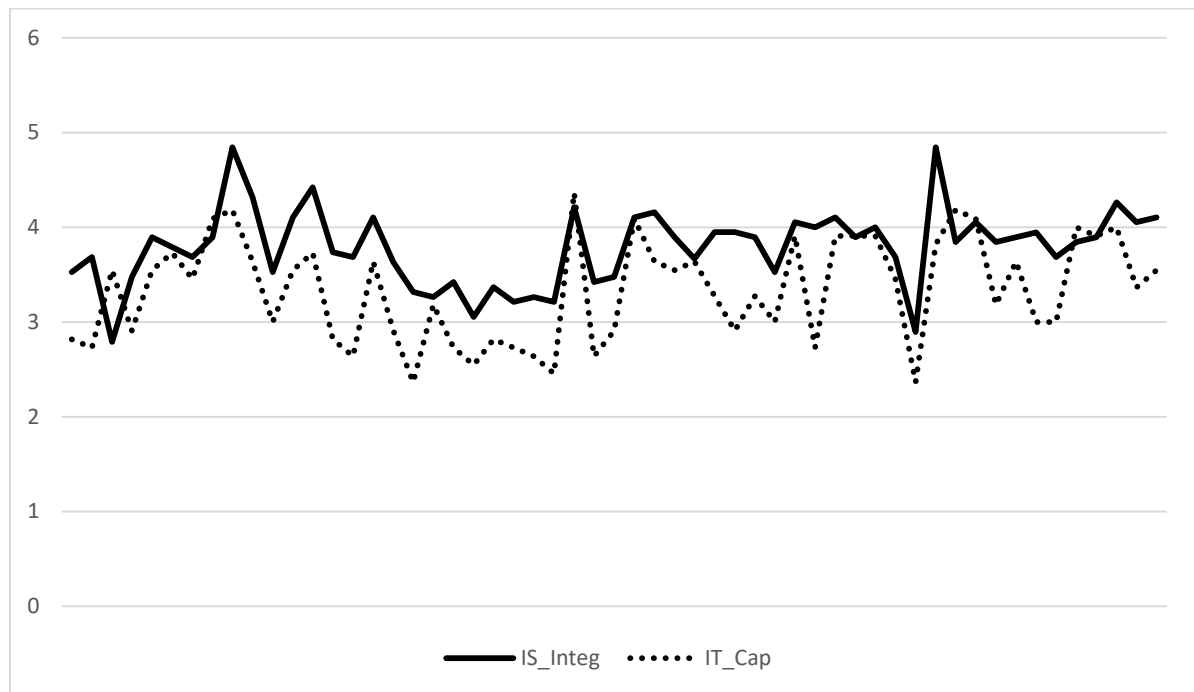


Figure 4.1 Comparison of IS Integration and IT Capability Across Banks

Generally, all banks reports above average on IS integration, IT capability and organizational ambidexterity as the graph in Figure 4.2 shows. IT capability graph seems to be in line with ambidexterity but out synch with IS integration as revealed in Figure 4.1 above.

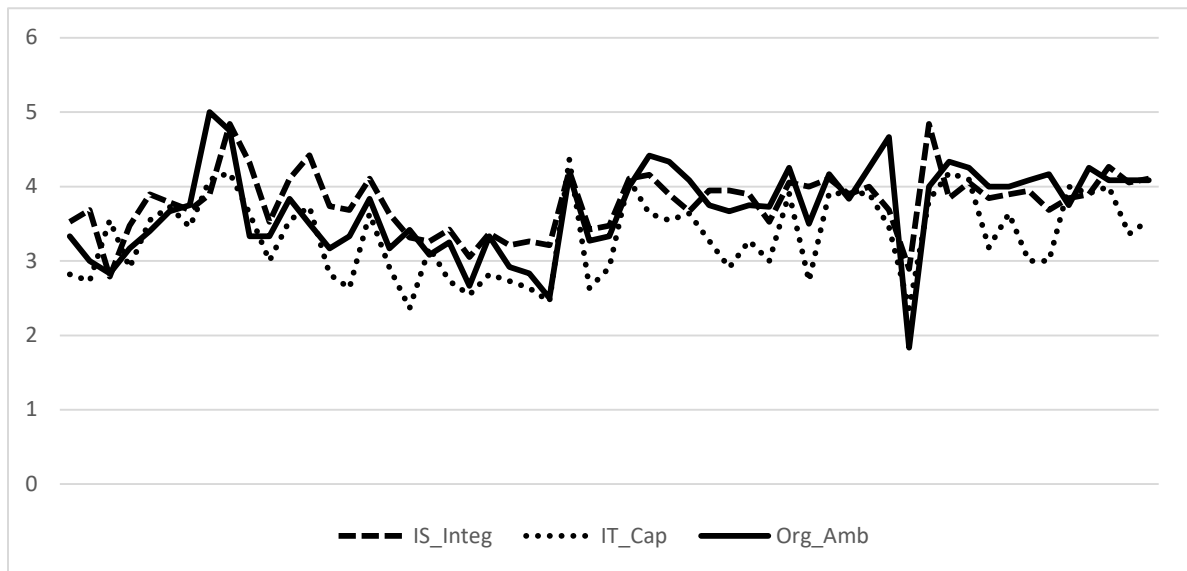


Figure 4.2 IS Integration, IT Capability and Ambidexterity Across Banks

All banks to a great extent show a general trend of organizational ambidexterity moving in with organizational performance, Figure 4.3 below. This seems to validate the reviewed literature about the correlation between ambidexterity and organizational performance.

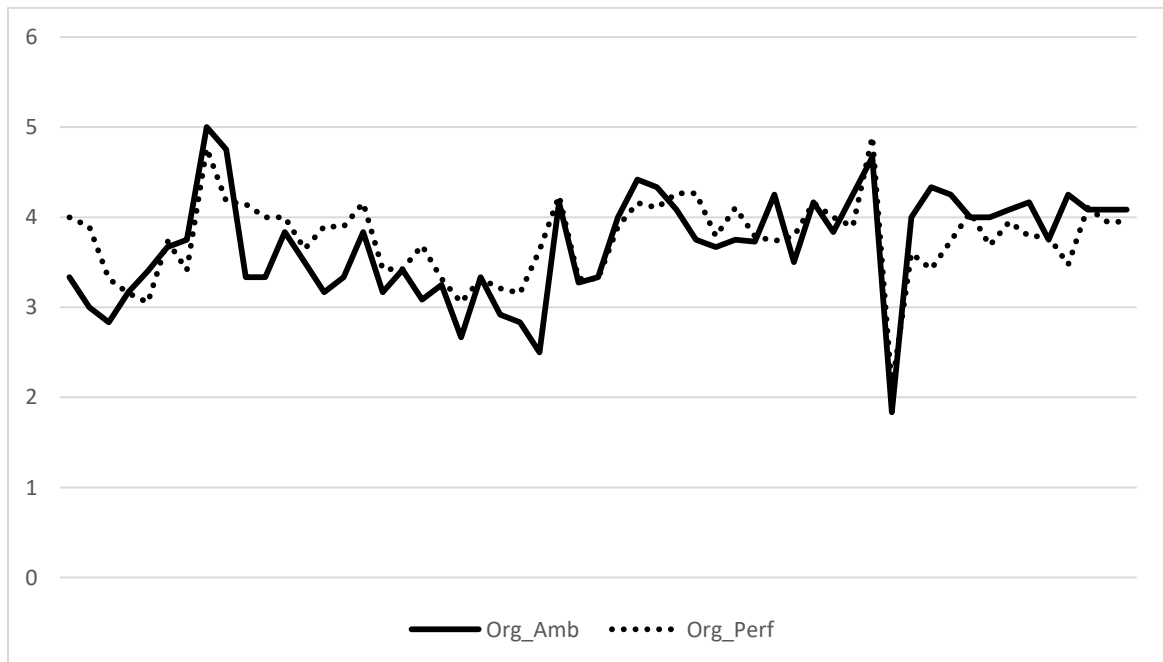


Figure 4.3 Ambidexterity and Organizational Performance Across Banks

4.6 Psychometric Evaluation of the Measurement Model

According to Kline (2011), exploratory factor analysis (EFA) is a standard statistical technique for evaluating measurement models. Originally EFA was developed by psychologists to test theories of intelligence. The term EFA refers to a class of procedures that include centroid, principal components and principal factor analysis methods that differ in their statistical criteria used to derive factors (Kline, 2011). Subsection 4.5.1 below consider the statistical descriptive analysis and provides the overall information of the sample data's scores. The subsequent subsection addresses the factor structure of the study's latent variables (constructs) to attain a clear picture of associations amongst variables (constructs).

4.6.1 Factor Analysis and Scale Items Evaluation

Factor analysis is employed to shrink several variables into a reduced group of variables. Factor analysis is also applied to disentangle the direct associations amongst variables into their discrete basic simplified patterns, that are then presented in a correlation matrix (Henson & Roberts, 2006). Factor analysis is a suitable method for data scrutiny through the utilization of principal component analysis (PCA) a variable lessening procedure (Suhr, 2005). Further, PCA technique is applied in theory testing especially so because PCA guarantees elimination of the exceptional error variability (Tabachnick, Fidell, & Osterlind, 2001).

The PCA employs varimax rotation to decide and select the representative components factors for the grouping. Varimax rotation is a suitable procedure for the reason that it offers a basic structure in the outcome of the analysis to segregate the components in the first phase, this simplifies the interpretation of results (Henson & Roberts, 2006). Additionally factor analysis also detect factor loading that reveals the correlation of each variable with selected representative factor or variable (Hair et al., 2013). Factor loading is appropriate for different sample sizes which should be of sufficient size enough to permit the correlations to be consistently estimated. The Kaiser-Meyer-Olkin (KMO) tests the appropriateness of a given sample to qualify for factor analysis.

To carry out factor analysis, a matrix of correlation amongst the variables is evaluated by way of KMO and Bartlett's inspection. KMO assesses the sampling appropriateness; it checks for small partial correlations between items (Brace, Kemp, Snelgar, & Lee, 2006; Pallant, 2001). According to Brace, Kemp, Snelgar, and Lee (2006), KMO value of 0.5 and below are weak, while a KMO values 0.6 is satisfactory. Consequently KMO value in excess of 0.5 or nearer a value of 1 implies that factor analysis is a fitting procedure for evaluating the correlation matrix (Hair et al., 2013). Bartlett's inspection of sphericity checks to confirm that the correlation matrix is not an identity matrix, which would confirm the inappropriateness of the factor model (Pallant, 2001). To prove the appropriateness for PCA application, the Bartlett value has to be significant at the p-value of 0.05 level and is considered appropriate to apply PCA, otherwise the sample data is possibly not suitable for factorization through PCA.

Factors that are present in a dataset are decided and selected on the basis of the eigenvalues and percentage of change (Brace et al., 2006; Pallant, 2001). Eigenvalues are used to determine the number of factors to select as representative of the other variables. Many researchers propose that factors with the eigenvalues exceeding 1 should be considered as being sufficiently significant and therefore qualify to be considered unique enough to stand as individual factors; else should be eliminated from subsequent analysis. In unique cases where only a single component yields eigenvalue of 1 or more, by implication all the group items are presumed to measure the same causal factor and therefore these items are redundant and should be sufficiently be represented by a single item (Brace et al., 2006; Pallant, 2001).

Amongst the items, there are usually variations, the information on the amount of explained variance in each item is provided by factor analysis communalities outcome. This is another important outcome of FA. Low values of communality (e.g less than 0.3) might imply that a particular item does rhyme well with the rest of the items in the set. If the objective of FA is to improve or refine a scale, the communality and pattern matrix information can be used to remove an item that has low communality and also lowest loading on any of the extracted component in the pattern matrix (Pallant, 2001; Suhr,

2005). This information was used to check on the psychometric of the measures in this study.

In this study, 50 cases and 4 latent variables; Information Systems integration, IT Capability, Organizational Ambidexterity and Organizational Performance were analyzed through PCA applying the varimax rotation. The outcome of the PCA analyzing through varimax rotation for each of the item scales associated with each of the 4 construct variables is presented in the following subsections.

4.6.1.1 Information Systems Integration

Information systems integration construct had a KMO value of 0.752 and Bartlett's assessment significant with a value of: 539.229, at $p < .001$ level as shown in Table 4.6 below. Consequently, for IS integration items, it was suitable to employ PCA.

Component	Initial Eigenvalues & Extraction			KMO & Bartlett's Tests		
	Sums of Squared Loadings			KMO	Bartlett's Tests	
	Total	% Variance	Cumulative %		χ^2	Sig.
1	7.028	36.991	36.991	0.752	539.229	< .001
2	2.516	13.241	50.232			
3	1.784	9.389	59.621			
4	1.379	7.258	66.879			
5	1.227	6.460	73.339			
6	.852	4.482	77.821			
7	.711	3.742	81.564			
8	.599	3.153	84.716			
9	.581	3.056	87.772			
10	.502	2.642	90.414			
11	.349	1.836	92.250			
12	.304	1.600	93.850			
13	.266	1.399	95.249			
14	.215	1.132	96.381			
15	.189	.994	97.375			
16	.169	.889	98.264			
17	.141	.742	99.005			
18	.113	.594	99.599			
19	.076	.401	100.000			

Table 4.6 Factor Analysis of IS Integration

Table 4.6 above indicates that only 5 components to be extracted from the all the 19 items representing IS integration. From the PCA analysis outcome, only 5 components had an eigenvalue greater than 1 (7.028, 2.516, 1.784, 1.379 and 1.227). The 5 components explained 73.00% (36.99%, 13.24%, 9.39%, 7.26% and 6.46%) of the total variance.

Table 4.7 below is the communalities outcome which is an indication of the degree of variance existing in each variable for the components. The PCA outcome shows that all 19 items communalities were higher than .5 with item VCM2 (Loan Management) with a value of .868 being the highest and .591 being the lowest. Based on Brace et al. (2006) recommendation any item with a communality lower than .3 implies that the item does not fit well with the other item and therefore, it should not be considered for further analysis. All the 19 item scales measuring IS integration were above threshold of 0.5. Therefore, all items fit well with each other and were retained for subsequent analysis.

Composite variables & item labels	Communalities	Component				
		1	2	3	4	5
Interconnections of internal processes	.741	.811	-.231			.141
Interconnections of interorganizational processes	.754	.810	.141		.148	.222
Risk Management	.757	.739	.170	-.208	-.322	-.188
Operations with other stakeholders	.669	.705	-.211	-.341	-.105	
Research & Development	.730	.686	.500			
Account Management	.775	.666	-.326	.422	-.168	.138
Compliance Management	.667	.634	.126	-.387	-.309	
Interconnections of customer oriented processes	.744	.632		.211	.503	.209
Interlinkages with money remittance providers/GSM to offer services to customers	.777	.620	-.470	-.402		
Inter-bank operations	.636	.586	-.387			.371
Credit/Risk Management-Credit info sharing	.788	.583		-.274	.575	-.207
Loan Management	.868	.581	-.264	.427	-.338	-.405
Transactions with corporate & retail clients	.591	.574	-.339	-.210	.257	-.191
Human Resource Management	.737	.467	.710	.100		
Customer Relationship Management	.685	.364	.668	.188	.260	
Procurement Management	.696	.523	.572	-.210	-.189	.128
Treasury Management	.791	.537	-.350	.542	.275	.108
Cash Management	.854	.457	.116	.504		-.612
Asset Management	.657	.316	.158	.373	-.392	.507

Table 4.7 PCA Communalities for IS Integration's Items

4.6.1.2 Information Technology Capability

The IT capability was measured using 11 scale items which had KMO value of .820 and Bartlett's testing was significant 316.040 at $p < .001$ signifying that PCA analysis was suitable for IT capability data.

Component	Initial Eigenvalues & Extraction			KMO & Bartlett's Tests		
	Sums of Squared Loadings			KMO	Bartlett's Tests	
	Total	% Variance	Cumulative %		χ^2	Sig.
1	5.434	49.401	49.401	0.820	316.040	< .001
2	1.575	14.318	63.719			
3	1.008	9.163	72.882			
4	.804	7.311	80.193			
5	.506	4.604	84.797			
6	.455	4.135	88.932			
7	.373	3.387	92.319			
8	.320	2.912	95.231			
9	.271	2.459	97.690			
10	.140	1.276	98.966			
11	.114	1.034	100.000			

Table 4.8 Factor Analysis of IT Capability

From Table 4.8, 3 components exceeded the eigenvalue cutoff 1 (5.434, 1.575 and 1.008), indicating that the PCA extracted three components. These components explained 72.88% of the overall variance.

The communalities result of the 11 items reveals values higher than 0.5 and therefore retained as a measure of IT capability. The highest communality was .983 and the lowest 0.556 above the cutoff of 0.3 as shown on Table 4.9 below.

Composite variables & item labels	Communalities	Component		
		1	2	3
IT Business spanning capability-There is strong partnering relationship between IT and business management	.802	.890		
IT Business spanning capability-Head of IT is part of senior management	.718	.845		
IT Business spanning capability-Annual business units' and IT plans are done in a collaborative manner	.714	.835	-.121	
IT Proactive stance-Deliberate effort to discover & utilize existing IT solutions in business operations	.768	.826	-.292	
IT Business spanning capability-IT & Business both have critical role in development & implementation of strategy	.695	.797	-.243	
IT Proactive Stance-Deliberate search for IT innovations to enhance operations	.687	.797	-.225	
IT Proactive stance-Among leaders in trying new IT innovations	.556	.731		.138
IT Infrastructure Capability-Applications h/w platform	.564	.685	.278	.135
IT Infrastructure capability- Always h/w change due to application changes	.747	.325	.801	
IT Infrastructure Capability-Operational/process changes always lead to applications changes	.783	.379	.799	
IT Infrastructure Capability-Always changes in bank processes/operations leads to changes in applications & h/w	.983	-.154		.979

Table 4.9 PCA Communalities for IT Capability's Items

4.6.1.3 Organizational Ambidexterity

Organizational ambidexterity had KMO value of 0.908 and Bartlett's inspection significant with a value of: 448.274) at $p < .001$ level. Therefore, suitability to apply PCA analysis to organizational ambidexterity scale items.

Component	Initial Eigenvalues & Extraction Sums of Squared Loadings			KMO & Bartlett's Tests		
	Total	% Variance	Cumulative %	KMO	Bartlett's Tests	
					χ^2	Sig.
1	7.703	64.193	64.193	0.908	448.274	< .001
2	.964	8.033	72.225			
3	.848	7.069	79.295			
4	.488	4.065	83.360			
5	.459	3.829	87.189			
6	.364	3.031	90.219			
7	.321	2.673	92.893			
8	.259	2.155	95.047			
9	.203	1.691	96.738			
10	.150	1.248	97.986			
11	.134	1.120	99.106			
12	.107	.894	100.000			

Table 4.10 Factor Analysis of Organizational Ambidexterity

Only one component had eigenvalues greater than 1 (7.703) and therefore PCA extracted one component as shown in Table 4.10 above. This component explained 64.19% of the total variance.

The communalities of all the 12 items surpassed 0.3 cutoff as shown on Table 4.11 below. The highest had .819 and the lowest communality was .495. Consequently, all the items qualified as a good measure of organizational ambidexterity subsequently for further analysis.

Composite variables & item labels	Communalities	Component	
		1	
Building & reinforcing existing knowledge, skills, processes & structures	.819	.905	
Pursuit of drastic innovations designed to meet the needs of emerging customers or markets	.738	.859	
Deliberate pursuit of new knowledge & skills to develop new product/service offerings	.715	.845	
There deliberate efforts to create new markets	.712	.844	
Concentrates on increasing efficiency of existing products	.685	.828	
Constant effort to improve established products	.612	.782	
Concentrates on broadening existing knowledge & skills	.609	.780	
Concentrates on expanding existing products	.609	.780	
Incremental innovations to meet existing market needs	.605	.778	
Build existing knowledge & extending products & services	.581	.762	
Constantly developing new channels of products & services delivery	.523	.723	
There are efforts to always develop new knowledge and progressively departure from existing knowledge	.495	.703	

Table 4.11 PCA Communalities for Organizational Ambidexterity's Items

All 12 items loaded on organizational ambidexterity as shown on Table 4.11 above. The ranges for the item loading was between .703 for item ER3 (There are efforts to always develop new knowledge and progressively departure from existing knowledge) as the lowest and the highest being .905 for item EI7 (Building & reinforcing existing knowledge, skills, processes & structures).

4.6.1.4 Organizational Performance

Organizational performance construct had KMO value of 0.847, and Bartlett's measure was significant: 395.967 at level $p < .001$ as shown on Table 4.12 below. Therefore, PCA appropriateness for organizational performance items was validated.

Component	Initial Eigenvalues & Extraction			KMO & Bartlett's Tests		
	Sums of Squared Loadings			KMO	Bartlett's Tests	
	Total	% Variance	Cumulative %		χ^2	Sig.
1	7.150	51.070	51.070	.847	395.967	< .001
2	2.182	15.588	66.657			
3	.935	6.681	73.338			
4	.683	4.880	78.218			
5	.619	4.419	82.637			
6	.510	3.646	86.283			
7	.432	3.086	89.369			
8	.365	2.608	91.977			
9	.274	1.955	93.932			
10	.252	1.800	95.733			
11	.203	1.453	97.186			
12	.166	1.184	98.370			
13	.139	.995	99.364			
14	.089	.636	100.000			

Table 4.12 Factor Analysis of Organizational Performance

Two components for organizational performance had an eigenvalue larger than 1 (7.150 and 2.182), implying that PCA mined 2 components. The 2 components catered for 51.07% and 15.59% of the variance respectively and 66.66% of the cumulative variance.

All the 14 items of organizational performance had communalities higher than the threshold of .3 as shown on Table 4.13. Therefore, all the items were validated as a measure of organizational performance. The uppermost communality was .816, no item had a communality lower than 0.4.

Composite variables & item labels	Communalities	Component	
		1	2
Registered improvement in Deposits Amount	.743	.820	-.266
Registered improvement in Deposit Accounts	.816	.794	-.430
Registered improvement in Credit/Risk management	.743	.771	.386
Bank's Net Assets registered improvement	.698	.768	-.329
Registered improvement in Customer satisfaction	.651	.746	-.308
Registered improvement in Market Share	.641	.743	-.299
Overall employee productivity	.595	.713	.296
Registered improvement in Quality service delivery	.647	.698	.400
Registered improvement in Stakeholders engagement	.719	.695	.486
Registered improvement in capital & reserves	.597	.689	-.350
Registered improvement in Loan Accounts	.471	.659	-.193
Registered improvement on Intra & inter functional coordination	.786	.640	.613
Registered improvement in Return on Assets	.529	.624	-.375
Registered improvement in Compliance Requirements	.696	.608	.571

Table 4.13 PCA Communalities for Organizational Performance's Items

From Table 4.13, all 14 items loaded on the organizational performance construct. The uppermost loading was .820 for CR5 (Registered improvement in Deposits Amount) with low loading being of item PR2 (Registered improvement in Compliance Requirements) with a value of 0.608.

4.6.2 Constructs Factor Structure

The next step after FA evaluation of the construct measures' before measurement and structural evaluation, was the assessment of the reliability of the latent variables' indicators as a measure of the underlying constructs. The preceding section dealt with factor analysis for each of the 4 latent variables and their associated scale items (indicators). This section assesses the reliability of the measures for the latent variables. Three important aspects are involved in considering whether a measurement is reliable, these are, stability, internal reliability and inter-observer consistency. Stability considers whether or not a measure is stable over time. Internal reliability evaluates the consistency of the indicators that make up the scale. As explained in chapter three, the study has reflectively modeled latent variables. Due to the multiple item measures used in this

study, internal reliability was employed. Each individual answer to each question was combined to form an overall score and therefore the risk of lack of coherence was real. The common method of testing internal reliability is Cronbach's alpha. As a rule of thumb, a figure of ≥ 0.90 is excellent reliability, 0.70-0.90 is high reliability, 0.50-.70 is moderate reliability, and ≤ 0.50 is low reliability (Pallant, 2001).

To assess the reliability, item-total association or interitem association is evaluated for every item. Common and basic recommendation propose that the item-total correlations ought to be in excess of .5, while interitem correlations should score values higher than .3 (Hair et al., 2011; Suhr, 2005). The common and widely employed measure of the internal consistency of scales is the Cronbach's alpha coefficient (Hair et al., 2011). Based on Cronbach's alpha measure recommendation, a value of .7 is admissible as prove of internal consistency of a set of items (Pallant, 2001). The study's summary of the item-total correlations and the Cronbach's alpha and the associated constructs are shown on Table 4.13 through to Table 4.15. Though a few scale items did not surpass the .5 guideline of the item-total correlation, the Cronbach's alpha for all the latent variables was between .862 and .939. Consequently, all the study's constructs (latent variables) were beyond the recommended .7 cutoff.

The item-total correlations of the group of the 19 items measuring IS integration within the organizations was between 0.255 and 0.777 with Cronbach's alpha value of 0.901. The IT capability with a set of 8 items had item-total correlations values of 0.587 as the lowest and the highest being 0.847. Cronbach's alpha of the IT capability was at 0.923, this was after 3 items (IC2; IT Infrastructure capability- Always h/w change due to application changes, IC3; IT Infrastructure capability-Operational/process changes always leads to applications changes, and IC4; IT Infrastructure capability-Always changes in bank processes/operations leads to changes in applications & h/w) were dropped due to their very low item-total correlations. The 12 items set measuring organizational ambidexterity had item-total correlations between 0.650 to 0.872 with Cronbach's alpha value of 0.951.

The 14 items representing organizational performance recorded item-total correlations range from .557 to 0.840 with Cronbach's alpha value of 0.939.

Questions Codes	Scale Items-Description	Item-Total Correlation	Cronbach's Value
VCM1	Account Management	0.602	0.901
VCM2	Loan Management	0.516	
VCM3	Cash Management	0.406	
VCM4	Customer Relationship Management	0.333	
VCM5	Treasury Management	0.457	
VCM6	Human Resource Management	0.438	
VCM7	Compliance Management	0.592	
VCM8	Risk Management	0.706	
VCM9	Research & Development	0.659	
VCM10	Asset Management	0.255	
VCM11	Procurement Management	0.484	
VS1	Inter-bank operations	0.498	
VS2	Operations with other stakeholders	0.634	
VS3	Transactions with corporate & retail clients	0.513	
VS4	Interlinkages with money remittance providers/GSM to offer services to customers	0.525	
VS5	Credit/Risk management-Credit info sharing	0.525	
VCM15	Interconnections of internal processes	0.745	
VCM16	Interconnections of customer oriented processes	0.579	
VS9	Interconnections of inter-organizational processes	0.777	

Table 4.14 Reliability Statistics for IS Integration's Measurement Item

All the 19 scale items were retained with a Cronbach's alpha of .901 even though a few item-total Correlations' were slightly below the guideline.

The reliability assessment for the 12 IT capability latent variable measures is shown on Table 4.15 below.

Questions Codes	Scale Items-Description	Item-Total Correlation	Cronbach's Value
IC1	IT Infrastructure Capability-Applications h/w platform	.511	0.862/0.923
IC2	IT Infrastructure capability- Always h/w change due to application changes	.218	
IC3	IT Infrastructure Capability- Operational/process changes always leads to applications changes	.258	
IC4	IT Infrastructure Capability-Always changes in bank processes/operations leads to changes in applications & h/w	-.128	
BS1	IT Business spanning capability-IT & Business both have critical role in development & implementation of strategy	.508	
BS2	IT Business spanning capability-Annual business units' and IT plans are done in a collaborative manner	.534	
BS3	IT Business spanning capability-Head of IT is part of senior management	.576	
BS4	IT Business spanning capability-There is strong partnering relationship between IT and business management	.519	
PS1	IT Proactive stance-Deliberate effort to discover & utilize existing IT solutions in business operations	.532	
PS2	IT Proactive stance-Deliberate search for IT innovations to enhance operations	.526	
PS3	IT Proactive stance-Among leaders in trying new IT innovations	.521	

Table 4.15 Reliability Statistics for IT Capability's Measurement Items

The results on Table 4.15 above reveal that 3 of the 12 items scale (IC2, IC3, and IC4) as highlighted had very weak item total correlation resulting to a relatively lower Cronbach's alpha of .862 relative to the other latent variables. With the removal of the

three scale items, the Cronbach's alpha improved to record a value of 0.923 while item-total correlations improved to record values of between 0.587 and 0.847 compared to initial range of between -0.128 and 0.576. This greatly improved the reliability of the IT capability measures. The three scale items (IC2, IC3, and IC4) were marked for eliminated from subsequent analysis but would still be included for the construction of the initial measurement model to verify their respective indicator loadings and compare with corresponding item-total correlation as shown in Table 4.15 above to justify their elimination from subsequent analysis.

Questions Codes	Scale Items-Description	Item-Total Correlation	Cronbach's Value
ER1	Deliberate pursuit of new knowledge & skills to develop new product/service offerings	.810	0.951
ER2	Pursuit of drastic innovations designed to meet the needs of emerging customers or markets	.827	
ER3	There are efforts to always develop new knowledge and progressively departure from existing knowledge	.650	
ER4	There deliberate efforts to create new markets	.833	
ER5	Constantly developing new channels of products & services delivery	.685	
EI1	Build existing knowledge & extending products & services	.742	
EI2	Concentrates on broadening existing knowledge & skills	.735	
EI3	Incremental innovations to meet existing market needs	.745	
EI4	Constant effort to improve established products	.752	
EI5	Concentrates on expanding existing products	.743	
EI6	Concentrates on increasing efficiency of existing products	.784	
EI7	Building & reinforcing existing knowledge, skills, processes & structures	.872	

Table 4.16 Reliability Statistics for Organizational Ambidexterity's Measurement Items

As shown on Table 4.16 above, organizational ambidexterity's Cronbach's alpha of .951 and Item-Total Correlation range of .650 and .872, the 12 scale items indicated a very stable measure and therefore all the 12 were retained for consequent analysis.

Questions Codes	Scale Items-Description	Item-Total Correlation	Cronbach's Value
FN1	Bank's Net Assets registered improvement	.785	0.939
FN2	Registered improvement in Return on Assets	.697	
FN3	Registered improvement in capital & reserves	.780	
CR1	Registered improvement in Market Share	.750	
CR2	Registered improvement in Loan Accounts	.571	
CR3	Registered improvement in Customer satisfaction	.840	
CR4	Registered improvement in Deposit Accounts	.787	
CR5	Registered improvement in Deposits Amount	.782	
PR2	Registered improvement in Compliance Requirements	.557	
PR3	Registered improvement on Intra & inter functional coordination	.578	
PR4	Registered improvement in Stakeholders engagement	.666	
LG1	Registered improvement in Quality service delivery	.645	
LG4	Registered improvement in Credit/Risk management	.737	
LG5	Overall employee productivity	.649	

Table 4.17 Reliability Statistics for Organizational Performance Measurement Items

Organizational performance measures had a Cronbach's alpha of .939 and item-total correlation of between .557 and .840 surpassing the criteria for reliable measures and therefore all the items were all retained.

In summary, after the removal of the 3 scale items of IT capability all the remaining items representing the 4 constructs recorded fitting item-total correlations and Cronbach' values. Cronbach's alpha greater than 0.90 indicates excellent reliability for all constructs measures. This therefore revealed that the data set was within the tolerable range of internal consistency and therefore fit to be used for model estimation.

4.7 Estimation of the Initial Measurement Model

Partial least squares as implemented in Smart PLS 3.2.1 software tool was employed to evaluate the outer (measurement) and the inner (structural) models. This statistical software package appraises the psychometric characteristics of the outer model and estimates the parameters of the inner model. The multiple-indicator approach to the

measurement of CFA model represents literally half the basic rationale of analyzing covariance structures in SEM. The analysis of the structural model is the other half. Confirmatory factor analysis (CFA) of the measurement model is a crucial technique whose understanding facilitates the understanding of structural regression models which have features of both path models and CFA models (Kline, 2011).

Measurement models are employed to achieve two main objectives in SEM technique. First is to instruct how the underlying constructs' measures are to be captured through the manifest variables which are physically observable and secondly, the measurement model define the quality of the manifest variables reliability and validity as measures of the underlying constructs (Hair et al., 2011). Confirmatory factor analysis is a way of appraising measurement models in which the manifest variables explain the underlying constructs (Hair et al., 2014). Three phases are necessary to achieve this goal. The first one is the comparison of the various measurement models with the intention to demonstrate the associations of the selected constructs. The second phase involves placing the selected model to the CFA. The final phase is the appraisal of the measurement model's reliability if the constructs are defined reflectively and validity for both reflectively and formatively modeled constructs. Reliability and validity appraisal guarantees that the indicators for each construct in the measurement model congregate to quantify the intended particular construct (Latent variable) (Hair et al., 2014). Reliability is a measure of the internal consistency for latent variables' indicators. It reveals the extent to which the indicators or the manifest variables represents the singular underlying construct (Hair et al., 2013). Reliability provides a proof and confidence of the consistency of the measurement of the indicators.

Following the assessment of the questionnaire scale items as discussed in the preceding sections. The questionnaire scale items were used to develop the initial measurement (CFA), model. The initial measurement model was subjected to validity and reliability assessment. The following tests were employed to accomplish the reliability and validity appraisals; the internal consistency reliability, indicator reliability, convergent validity and discriminant validity.

This study adopted a two-phase model analysis procedure suggested by Garson (2016). This segment focuses on the measurement (outer) model analysis while subsequent segment will address the analysis of structural (inner) model. The measurement model evaluates the association amongst the indicators and the hypothetical concepts they epitomize. The second phase is the analysis of the constructs' or latent variables' relationships as hypothesized on the SEM model. The conceptualized associations are evaluated using the collected data. This constitutes the inspection of the projected associations and the testing of the hypothesized relationships among the constructs.

The initial measurement model had a set of 56 indicators representing the four constructs. The 56 indicators were appraised by way of CFA as the first phase of PLS-SEM analysis for the measurement model. The 4 constructs and their associations with the respective set of scale items (questionnaire items) representing the observed variables were defined in the measurement model. This specifies in what way a particular set of indicators (in this case the questionnaire/scale items) connects to their corresponding constructs. Each of the 4 constructs in the current study was measured using multiple scale items as captured the questionnaire.

Table 4.18 below shows the composite reliability (CR) as well as the average variance extracted (AVE) values for the 4 constructs for the initial measurement model. The suggested limit point is 0.7 for CR and 0.5 for AVE according to Fornell and Larcker (1981) and Hair et al. (2013). As Table 4.18 shows, the 4 constructs in this study recorded high values of CR with lowest being .896, the upper being .955. However, some constructs had low AVE ranging from 0.364 to 0.642. Similarly, some had very low indicator reliability based on the loadings. For analyzing CFA models when the sample size is not large (not between 100-150 cases) among other requirements is to ensure that one uses indicators with good psychometric characteristics with a relatively high standardized factor loading (e.g. >0.70). Models with relatively low standardized factor loading are more susceptible to Heywood cases (inadmissible results) (Hair et al., 2011). Therefore, the statistics on Table 4.18 indicated that the initial measurement model was not reliable and needed to be re-specified through item parceling. Fig 4.1 shows the initial measurement model.

Latent Variables	Composite Reliability	AVE	Lowest indicator Loading
Information systems integration	0.913	0.364	0.470
Information technology capability	0.896	0.492	-0.136
Organizational ambidexterity	0.955	0.642	0.720
Organizational performance	0.935	0.510	0.619

Table 4.18 Construct Reliability, AVE and Factor Loading

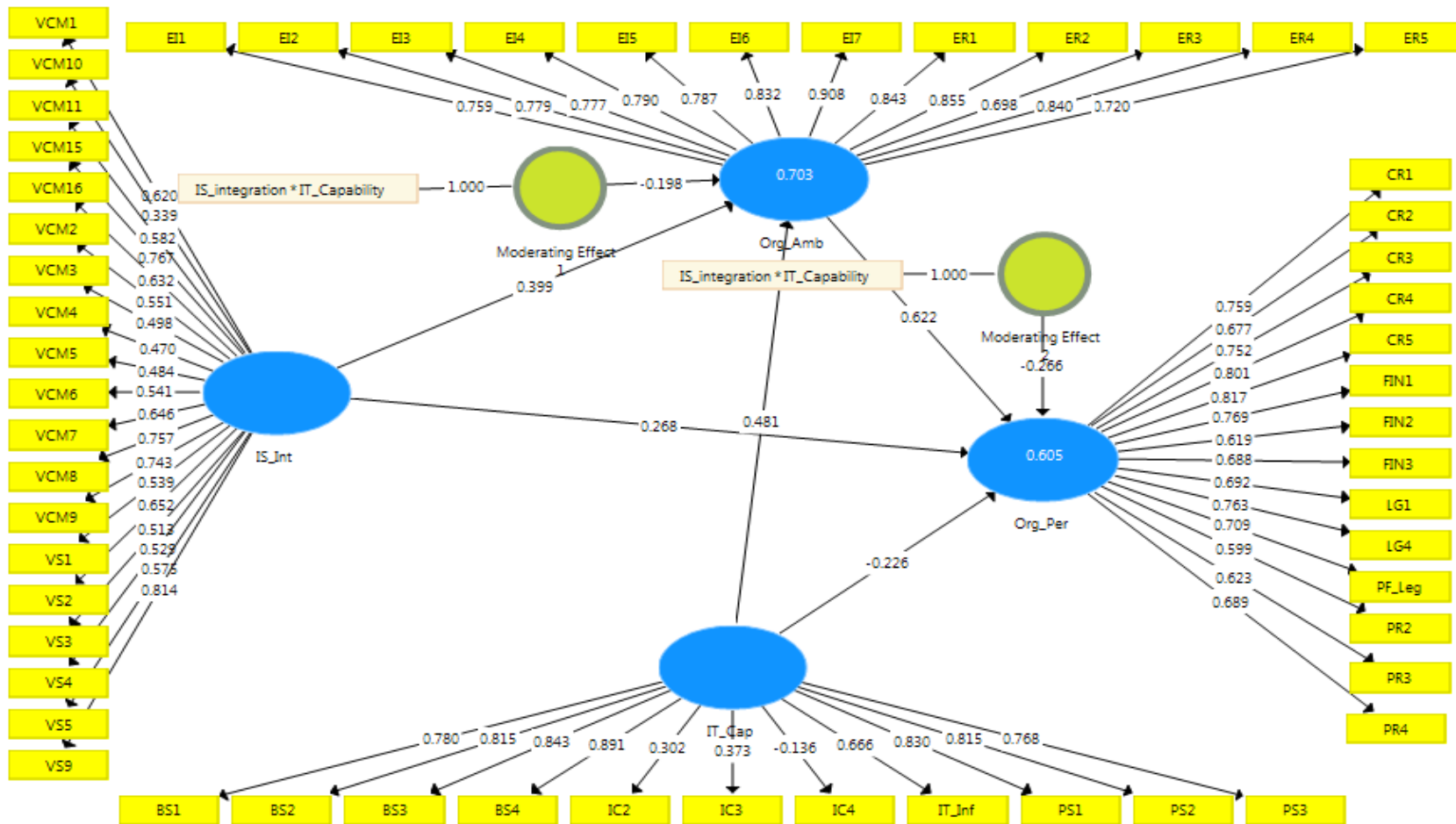


Figure 4.4 The Initial Measurement Model

4.7.1 Item Parceling and Measurement Model Re-specification

Item parceling is the process of aggregating scale items to provide a single indicator from a group of scale items for a given latent construct. According to (Edwards et al., 2000), item parceling leads to few indicators and is useful in small sample size with comparatively lesser model parameters. Item parceling enables measurement model re-specification and provides a better measurement model fit. However, since item parceling leads to fewer indicators, SEM tests based on reduced indicators may not be as rigorous and may also lead to biased estimates of some parameters (Fletcher & Perry, 2007). If the objective is to improve model fit, item parceling technique is discouraged, however, if the purpose is to aggregate item scales measuring the same construct variable, the parceling technique is known to strengthen the results (Marsh et al., 2007). The later was the goal for performing item parceling in the current study. The parceling process was based on a sound theoretical review of the respective latent construct of the study.

To cater for multidimensionality of the latent variables' measures, multiple item scales were used in the questionnaire to ensure respondents provided the sought information. Segment 4.6 above evaluated the quality of these measurement scale items through EFA and reliability. This was to confirm and validate that the measures were appropriate for measuring the underlying constructs. The study had 56 scale items (IS integration 19, 11 for IT capability, ambidexterity 12 and organizational performance 14). To re-specify the measurement model, these scale items needed to be reduced to the appropriate indicators while ensuring high psychometric characteristics for the final measurement model. After the initial reliability testing, three items measuring IT capability were marked for elimination, these are; IT Infrastructure capability- Always h/w change due to application changes (IC2), IT Infrastructure capability-Operational/process changes always leads to applications changes (IC3) and IT Infrastructure capability-Always changes in bank processes/operations leads to changes in applications & hardware (IC4). Based on the analysis results on Figure 4.1 above, the three items had the lowest factor loading (IC2 0.302, IC3 0.373 and IC4 -0.136). These 3 items had to be dropped. The 56 item scales were organized into groupings representing theorized indicators. To reduce the theorized indicators, the arithmetic means of the grouping of the item scales was used to provide a

single value for each grouping as shown in Table 4.19 below. Table 4.19 shows the reduced item scale of indicators for the new measurement (CFA) model. The re-specified model has 12 indicators from the 56 of the initial model

Latent Variable	Questionnaire Item Codes	Indicator	Description
Information systems integration (IS_Int)	VCM1,VCM2,VCM3, VCM4,VCM5 VCM7 VCM8, VCM15, VCM16	VC_Pri	Porter's value chain's primary, support activities & the industry value chain activities
	VCM6,VCM9,VCM10, VCM11	VC_Sup	
	VS1,VS2,VS3,VS4,VS5,VS9	VS_Ind	
Information technology capability (IT_Cap)	IC1	IT_Inf	IT infrastructure capability, IT business spanning and IT proactive stance
	BS1,BS2,BS3,BS4	IT_Bus	
	PS1,PS2,PS3	IT_Pro	
Organizational ambidexterity (Org_Amb)	ER1,ER2,ER3,ER4,ER5	EX_Lor	Firms explorative & exploitative activities
	EI1,EI2,EI3,EI4,EI5,EI6,EI7	EX_Loi	
Organizational performance (Org_Per)	FIN1,FIN2,FIN3,CR1CR2, CR4,CR5,	PF_Fin	Performance based on the BSC four perspectives
	PR2,PR3,PR4,LG4	PF_Pro	
	CR3, LG1	PF_Cus	
	LG5	PF_Leg	

Table 4.19 Item Parceling and Models Indicators

The above derivation of indicators from the scale items for the latent variables is based on the variables operationalization and the supporting literature as indicated in chapter 3 of this study.

4.7.2 Assessment of Model Fit

For CB-SEM, model fit is assessed through the global goodness of fit. However, PLS-SEM does not provide the overall fit measures. Global goodness gauges the difference between model-implied covariance matrix and the observed covariance matrix. The goal is on duplicating the associations between the variables. Conversely the overall gauge of fit in PLS-SEM comparable to ordinary least squares analysis emphasizes on the

variations or difference between the projected values and the observed values of the dependent variables. Consequently, prediction is PLS-SEM emphasis. This is a fundamental resolve commonly cited alluding the suitability of covariance-based SEM in hypotheses inspection and causality models and preference for PLS-SEM for prediction oriented studies like the current study.

Despite lack of an overall fit index in PLS-SEM, SmartPLS software tool analysis provides several statistics associated with model quality. From the set of SEM model statistics displayed by SmartPLS as a result of PLS-SEM analysis, three models fit statistics are vital, these are i) Fitness measures for reflectively modeled constructs like the case of the current study; ii) Fitness measures for formatively modeled constructs and finally iii) Structural fit statistics, concerned with the measures assessing the hypothetical relationships as specified on the structural model represented by the constructs' relationships.

4.7.3 Estimation of the Final Measurement Model

Complete SEM models are evaluated through a two-phased procedure. The first phase evaluates the measurement model also known as the CFA model. Successful evaluation of the measurement model is validation of the measures to imply that they capture the measures for the underlying constructs. The measurement model validation is a guarantee that the measures can be used to estimate the structural model which is the inner model.

The second phase is the estimation of the of the structural model. The goal of model justification is to establish that mutually, the measurement and structural model can achieve the requisite standard for observed phenomena (Urbach & Ahlemann, 2010). Based on previous studies the diagnostic tests or the overall fit statistics suitable for reflectively modeled construct measures can be established by testing the measurement model's internal consistency of the model's indicators, model's indicator reliability, model's convergent and discriminant validity (Gefen et al., 2000).

The current study's outer model's validity and reliability was based on the tests highlighted above. In PLS-SEM as implemented in SmartPLS software tool, multicollinearity is measured using the variance inflation factor (VIF) statistics. Reflectively modeled constructs are conceptualized as the cause of the manifest variables (indicator). The manifest variables are treated as the dependent variables while the latent variables (constructs) are the predictor variable. Therefore, in reflective measurement model, multicollinearity is not relevant and therefore will not be considered in the evaluation of the measurement model for this study.

However, in both reflectively and formatively modeled constructs, there exists some likelihood of multicollinearity of the exogenous latent variables as they relate with the endogenous latent variables at the structural level, the inner model. The latent variables modeled as origins of an endogenous latent variable have the potential to exhibit multicollinearity amongst them. Therefore, structural multicollinearity is a concern in both reflectively and formatively modeled constructs.

The structural multicollinearity concerns in PLS-SEM are similar to the concerns in ordinary least squares regression models. In SmartPLS version 3.2.1, VIF coefficients for the structural model are reported as the "Inner VIF Values". Appropriately fitting structural model's VIF coefficients should not exceed a value of 4.0. However, it is not uncommon to have VIF values of 5.0 for more lenient criterion (Garson, 2016; Hair et al., 2014). The subsequent sections below presents the results of validity evaluations for the re-specified measurement model as shown in Fig 4.2 below.

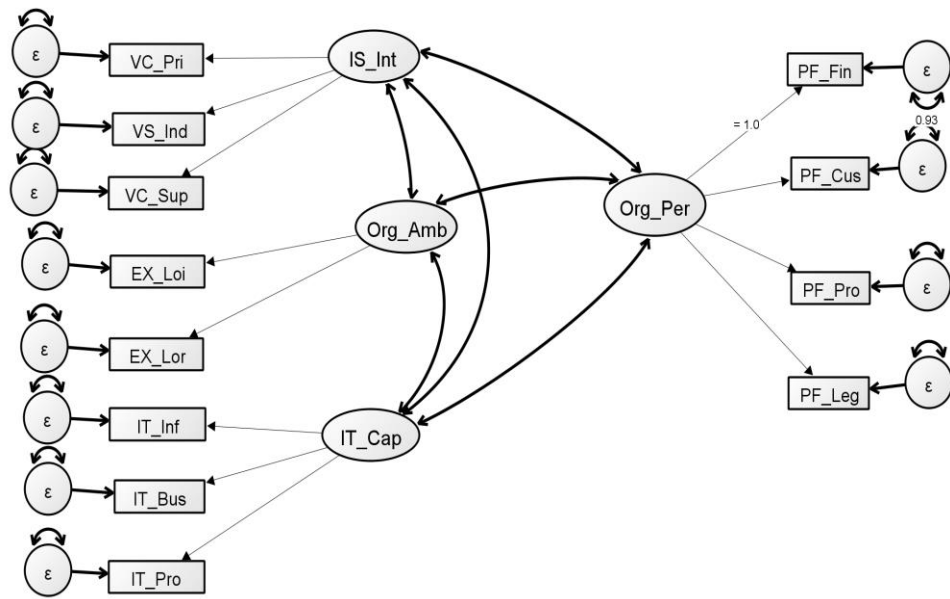


Figure 4.5 Final Measurement (CFA) Model

4.7.3.1 Measurement Model's Internal Consistency Reliability

Acceptable internal consistency reliability for a measurement model is achieved once the composite reliability (CR) of every construct surpasses the cutoff value of 0.7 (Garson, 2016). The CR for the four constructs on the current study's SEM model recorded values of between 0.872 and 0.961. These values are beyond the recommended cutoff value of 0.7. Therefore, based on these values, the indicators (observed variables) used to reflect the constructs in this study have very high internal consistency reliability. Table 4.20 below shows the CR values for the four constructs.

Construct	Composite Reliability(CR)	Indicators	Loading	t Statistics	AVE
IS Integration	.872	VC_Pri	.926	37.510	.696
		VC_Sup	.781	7.685	
		VS_Ind	.786	9.910	
IT Capability	.892	IT_Inf	.730	8.338	.741
		IT_Bus	.938	47.841	
		IT_Pro	.900	32.371	
Organizational Ambidexterity	.961	EX_Loi	.967	123.690	.925
		EX_Lor	.957	61.651	
Organizational Performance	.903	PF_Fin	.845	13.608	.699
		PF_Cus	.892	23.03	
		PF_Pro	.815	10.395	
		PF_Leg	.788	9.108	

Table 4.20 Composite Reliability and Indicator Loadings

4.7.3.2 Measurement Model's Indicator Reliability

The measurement model's indicator reliability is appraised through the valuation of the items loadings. For reflective CFA model, construct loading estimates the direct effects of constructs on indicators and are interpreted as regression coefficients. For example, if unstandardized construct loading is 4.0 for the direct effect $A \rightarrow X_1$, implies a 4-point difference on indicator X_1 given a difference of 1 point on construct A. For indicators specified to a single construct, standardized construct loadings are estimated correlations between the construct and its indicators. Thus, the squared standardized loadings are proportions of the explained variance or R^2_{SMC} . For example, if a standardized loading is 0.90, the construct explains $0.90^2 = 0.81$ or 81% of the variance of the indicator and the remaining 19% unexplained is taken care by the error term associated with the indicator as shown on CFA Figure 4.2 above. Preferably a CFA model should explain a larger proportion of the variance ($R^2_{SMC} > 0.5$) (Kline, 2011).

Measurement model's tolerable indicator reliability is attained if all the items loading records a value of 0.7 or higher and statistically significant at p-value of less than 0.05. The study's item loading recorded values of between 0.730 and 0.967 at significant level of $p=0.001$. The study's indicators loaded satisfactorily above the requisite level and therefore demonstrated satisfactory indicator reliability. The recording for construct and the associated indicator item's loadings statistics are shown on Table 4.20 above.

4.7.3.3 Measurement Model's Convergent Validity

The measurement model's average variance extracted (AVE) value is applied to assess the model's convergent validity. AVE is the average amount of explained variation on the manifest variable (indicator) by the latent variable (construct) relative to the cumulative variance of the indicator. The difference is usually absorbed by the error term associated with each indicator. Tolerable convergent validity is attained when all latent variables have an AVE value of 0.5 and above.

All the study's latent variables registered AVE values of between 0.696 and 0.925. These values are beyond the recommended threshold of 0.5. Consequently, study's measurement model established the requisite convergent validity. Table 4.20 above shows the respective latent variables' respective average variance extracted values.

4.7.3.4 Measurement Model's Discriminant Validity

The objective of discriminant validity assessment is to guarantee that a reflective construct has the strongest relationships with its own indicators contrasting from the rest of the indicators reflecting the other constructs in the SEM model (Hair et al., 2014). Discriminant validity is now among the common evaluation requirements for assessing constructs' manifest variables uniqueness in variance-based SEM modeling like PLS. Fornell and Larcker (1981) criterion measure and the inspection of cross-loadings are the most commonly used techniques for determining discriminant validity. Nevertheless, Henseler, Ringle, and Sarstedt (2015) through simulation study demonstrated these techniques are unreliable in detecting the discriminant validity deficiency of manifest variable in ordinary research circumstances. Therefore, Henseler, Ringle, and Sarstedt (

2015) suggest an alternate method founded on the multitrait-multimethod matrix. They recommend heterotrait-monotrait ratio of correlations (HTMT) as a more accurate measure of discriminant validity. Henseler, Ringle, and Sarstedt demonstrated superiority of this approach through Monte Carlo study. Comparison of result of HTMT with the Fornell-Larcker criterion and cross-loadings evaluation indicates that the performance of HTMT was found superior. Henseler, Ringle, and Sarstedt (2015) have provided the guidelines on dealing with discriminant validity matters in variance-based SEM modeling.

The importance of the measurement model in the testing of hypothesis cannot be overemphasized. Therefore, three tests of discriminant validity measures were employed in this study to guarantee the quality of the outer model. The discriminant validity tested carried were; i) the HTMT, ii) the Fornell and Larcker and iii) The constructs' manifest variables' cross loading. For discriminant validity to be established between two reflectively modeled constructs, the HTMT value must be lower than 0.90. As Table 4.21 below shows, all the constructs for this study have passed the discriminant validity test on the account of HTMT criterion. On the other hand, for Fornell-Larcker criterion, discriminant validity is confirmed when the following conditions are met; i) the square root of the average variance explain value (AVE) of the constructs surpasses the associations of the other constructs, and ii) the manifest variables' loadings associated with the respective constructs are higher for these constructs in comparison of their loading to other constructs in the SEM model. As shown on Table 4.22, the constructs' AVE square roots shown on the diagonal and bolded surpassed the off-diagonal intercorrelations values of the constructs' in their respective rows and columns.

Table 4.21 below confirms that all latent variable combinations had a HTMT value less than 0.90 and therefore proving the discriminant validity according to Henseler, Ringle, and Sarstedt (2015).

Latent variable/Construct	HTMT Values < 0.90
IT Capability → IS Integration	0.858
Organizational Ambidexterity → IT Capability	0.803
Organizational Ambidexterity → IS Integration	0.833
Organizational Performance → IS Integration	0.632
Organizational Performance → IT Capability	0.467
Organizational Performance → Organizational Ambidexterity	0.771

Table 4.21 Latent variables HTMT values

Latent variable/Construct	IS Integration	IT Capability	Organizational Ambidexterity	Organizational Performance
IS Integration	.834			
IT Capability	.693	.861		
Organizational Ambidexterity	.691	.745	.962	
Organizational Performance	.521	.412	.694	.836

Table 4.22 Fornell-Larcker Criterion

All latent variables AVE square roots shown in the diagonal of Table 4.22 above are larger than off-diagonal elements consequently demonstrating that Fornell and Larcker's criterion was attained and therefore establishing discriminant validity of the latent variable.

The third approach of discriminant validity is to scrutinize the manifest variables' loadings on their associated latent variables correlations. The results of the manifest variables loadings on the latent variables are shown on Table 4.23 below. All manifest variables recorded high loadings on the associated latent variable in comparison to the other latent variables on the SEM model. From the results on Table 4.23, it is clear that the loadings of respective block is greater compared to other block in the same rows and columns (with one exception of EX_Loi that loads a bit higher at 0.787 than the lowest indicator for IT capability IT_Inf at 0.730 though much lower than the lowest loading in Organizational ambidexterity that it associated with) *. The loadings clearly separate each construct as theorized in the SEM model. Therefore, the cross-loading outcomes uphold the HTMT and Fornell Larcker discriminant validity tests. Consequently, it was confidently concluded that the study's measurement model attained discriminant validity satisfactorily.

Constructs Indicators	IS Integration	IT Capability	Organizational Ambidexterity	Organizational Performance
EX_Loi	0.743	0.787*	0.967	0.674
EX_Lor	0.576	0.637	0.957	0.661
IT_Bus	0.640	0.938	0.681	0.363
IT_Inf	0.508	0.730	0.494	0.115
IT_Pro	0.633	0.900	0.715	0.496
PF_Cus	0.417	0.245	0.609	0.892
PF_Fin	0.405	0.341	0.658	0.845
PF_Leg	0.475	0.419	0.529	0.788
PF_Pro	0.472	0.413	0.499	0.815
VC_Pri	0.926	0.715	0.680	0.522
VC_Su	0.781	0.360	0.506	0.472
VS_Ind	0.786	0.652	0.526	0.277

Table 4.23 Indicators Cross Loading on Constructs

The study's measurement model recorded strong and satisfactory results on all reliability and validity diagnostic examinations. This therefore is an affirmation that the measurement model was valid and fit to be applied for the estimation of the structural model parameters.

4.8 Structural Model Evaluation

SEM's inner model representing the hypothetical constructs association is referred as the structural model. It is the schematic depiction of the underlying theoretical or conceptualization of constructs' relationships schematically represented by the path model. The results of structural model estimation permit the researcher to establish the degree to which the empirical data vindicates the extant theoretical exposition as presented by the researcher's literature. Consequently, on the basis on the structural model evaluation results, it is possible to interrogate and authenticate or invalidate the empirical legitimacy of the researcher's conceptualization as exhibited on the researcher's structural model.

Bounded by the measurement model, the quality of the structural model is entirely dependent on the quality of the measurement model. Consequently, the measurement model should be qualified prior to structural model evaluation. For the current study, the structural model's path coefficients and the coefficient of determination (R^2) values are some of the evaluation measures that are examined at specified significant levels. PLS-SEM models' main objective is prediction and theory development rather than theory validation, therefore, Stone-Gleisser Q^2 value as a measure of the model's predictive relevancy is also analyzed. The validity of structural model analysis depends on the quality of the associated measurement model.

4.8.1 Goodness of Fit for the Structural Model

Structural equation modeling analysis is executed in two phases. The first carried out in section 4.6 above is the evaluation and scrutiny of the measurement model. The quality of measurement model impacts greatly on the outcome of the structural model and subsequently on the overall rigor of the study. After successful qualification of the measurement model, the next stage in SEM analysis is the evaluation and estimation of the structural model. The structural model illustrates the study's constructs relationships as conceptualized. The model's structural fitness is examined only after measurement model's fitness has been proved tolerable. Hadi, Abdullah, and Ilham, (2016) in

corroboration with other scholars submit that for evaluation of the measurement and structural models, researchers must look at reliability, construct validity (convergent and discriminant), collinearity, the relations' coefficients, R^2 value, Q^2 value as measure of predictive capability of the model and the change effect sizes f^2 and q^2 values to determine the contribution of each of the constructs on the model's coefficient of determination R^2 and the predictive relevance Q^2

The structural model's fit criteria considered for this study are multicollinearity based on variance inflation factor (VIF), predictive relevance (predictive accuracy) based on Stone-Gleisser Q^2 value, the effect size measure q^2 to determine individual exogenous latent variables' contribution on the predict relevance of the model. The examination of the relations amongst the constructs as theoretically hypothesized on the conceptual model was achieved through the evaluation of the structural model's significance of the relation coefficients, the coefficient of determination R^2 values and the evaluation of the R^2 change effect sizes f^2 values to assess the contribution of individual exogenous latent variables on the overall R^2 . Reliability and construct validity were dealt with in the previous section above on the evaluation of the measurement model.

Equivalent to linear regression, if multicollinearity is present, the structural path coefficients cannot be used to consistently and reliably to evaluate the comparative standing of independent variables. This is true with exogenous variables in SEM structural model analysis. Structural multicollinearity is a concern for reflectively and formatively modeled construct for similar reasons as it is in ordinal least square regression models (Garson, 2016). The variance inflation factor value is used to measure multicollinearity in PLS-SEM. In an aptly fitting model, the VIF coefficients value should be 4.0 or less, however, VIF value 5.0 is common on more tolerant criterion (Garson, 2016; Hair et al., 2013). As Table 4.24 below shows, the study's VIF coefficients for the structural model are within the acceptable limits.

Latent variable	Organizational Performance	Organizational Performance
IS Integration	1.939	2.367
IT Capability	1.928	2.726
Organizational Ambidexterity		3.187
Organizational Performance		

Table 4.24 Structural Model Collinearity Statistics (VIF)

In PLS-SEM analysis, blindfolding employs a cross-validation approach and displays cross-validated communality and cross-validated redundancy as output of both the latent and manifest variables. The cross-validated communality and cross-validated redundancy provides the measures for predictive accuracy criteria of the model (Garson, 2016; Hair et al., 2014). The goal is to compute the four cross-validated appraisals of the model's predictive accuracy or its dependability, these appraisals are; i) The latent variables' cross-validated redundancy; ii) The latent variables' cross-validated communality; iii) The manifest variables' cross-validated redundancy and iv) The manifest variables' cross-validated communality.

The Stone-Gleisser Q^2 value is the measure used to assess cross-validated redundancy of endogenous latent variable in a model with reflective manifest variables. The current study has two reflectively modeled endogenous latent variables, Organizational Ambidexterity and Organizational Performance. A Stone-Gleisser Q^2 value of higher than 0 is an indication that the model with its associated exogenous variables can provide prediction of the specified endogenous variable under investigation, correspondingly a Q^2 with a value of 0 or negative value is an indication of the model's inappropriateness for prediction of the variable. Based on Hair et al. (2014), guideline, Stone-Gleisser Q^2 value of 0.02 signifies minimal effect size, while Q^2 value of 0.15 signifies an average effect size with Stone-Gleisser value of 0.35 implying a high effect size.

4.8.1 Models' Coefficient of Determination R^2 and Predictive Relevance Q^2

The current study's SEM model had two endogenous latent variables, Organizational Ambidexterity and the Organizational Performance. The following are the coefficient of determination, R^2 values for the two variables at $p < 0.05$ significant level; Organizational Ambidexterity with $R^2=0.686$, $t=8.909$, $p=0.000$ and Organizational Performance at $R^2=0.567$, $t=4.750$, $p=0.000$. This implies that the model accounts for 68.6% variance in Organizational Ambidexterity and 56.7% variance in Organizational Performance. The explained variance for both endogenous latent variables are statistically significant at $p < 0.05$ level. Consistent with Hair et al. (2013) and ; Pallant (2001) recommendations, R^2 value higher than 0.67 is regarded substantial, while a value of 0.33 being regarded as moderate and 0.19 considered as weak. Based on this categorization, the coefficient of determination for the two endogenous variables was relatively substantial.

The predictive relevancy of PLS-SEM models assesses the degree to which the model's endogenous latent variables can be projected by the associated model's exogenous latent variables. Following Cohen 1988 as cited by Hair et al. (2014) classification of Stone-Gleisser Q^2 values, the current study's model registered a strong predictive relevance for the organizational ambidexterity endogenous variable with Q^2 value of 0.579 and a relatively high predictive relevance with regard to the organizational performance with Q^2 value of 0.300.

Structural equation modeling categorizes variables as either exogenous or endogenous variable. Depending on the orientation of the path represented by arrow-headed lines indicating the direction of the relationship, a latent variable can be either an exogenous or an endogenous variable. An exogenous variable originates the relationship lines and has no arrows pointing to it, while an endogenous variable has arrows pointing to it and can also have arrows originating from it if it plays a mediating role as well. As a result of this categorization of variables, the moderation variable is drawn with the direct path to the dependent variable of the moderated relationships and then a virtual latent variable is created to represent the moderation effect. This virtual latent variable is represented as a

product of the predictor variable and the exogenous variable moderating the relationship and the direction of the association points to the endogenous variable of the moderated relationship as shown in Figure 4.3 below. The Moderation1 and Moderation2 are represented as a product of IS integration and IT capability ($IS_Int * IT_Cap$) and points to an endogenous variable for moderated relationship, in this case, Organizational Ambidexterity (Org_Amb) and Organizational Performance (Org_Per) respectively.

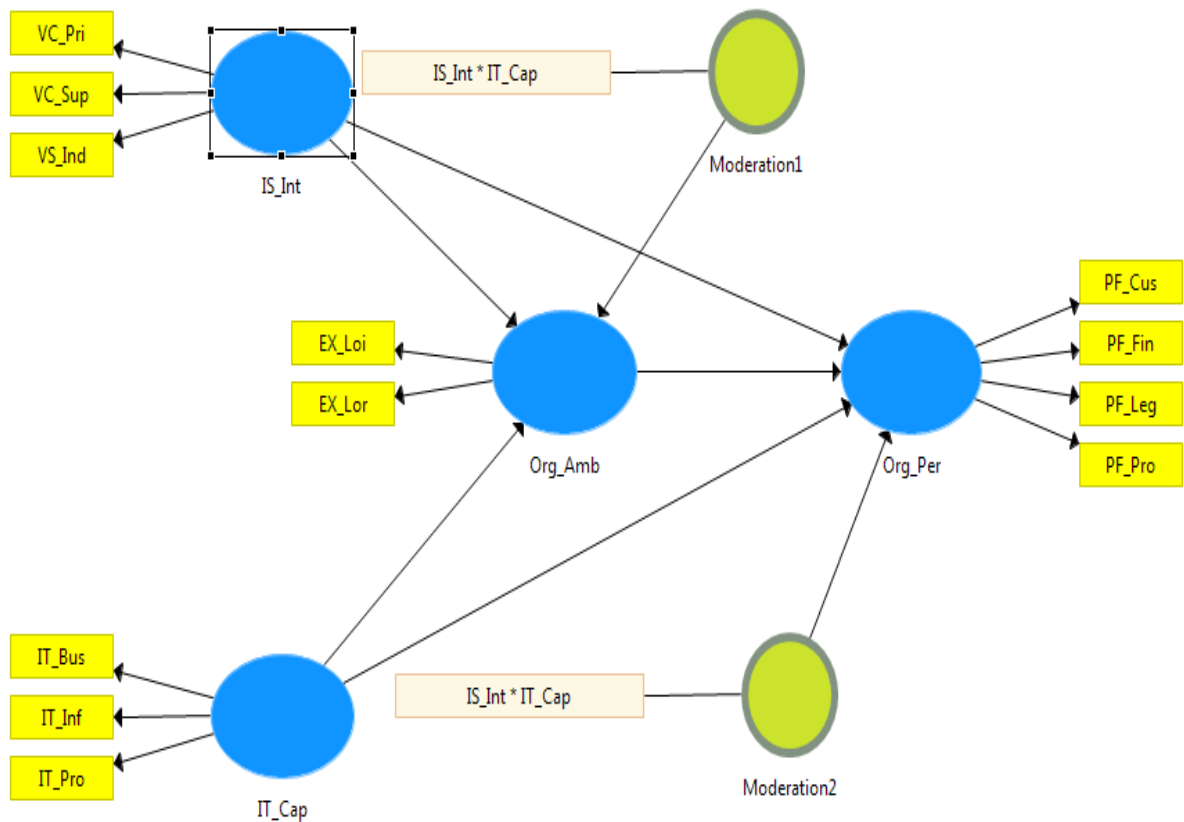


Figure 4.6 SmartPLS Structural Model

Structural equation modeling analysis usually gives results for all relationships represented in the SEM model. Table 4.25 below is a summary representing all the outcomes of the study's SEM model analysis of all latent variables' relationships. The summary of hypotheses testing resulting from PLS analysis is shown in table 4.26.

Relationships	Path Coefficients	t-Statistics	P-Values
IS integration → Organizational Ambidexterity	0.366	2.158	0.031
IS integration → Organizational Performance	0.267	1.257	0.210(ns)
IT Capability → Organizational Ambidexterity	0.500	3.839	0.000
IT Capability → Organizational Performance	-0.238	1.394	0.164(ns)
Moderation1 → Organizational Ambidexterity	-0.237	2.821	0.005
Moderation2 → Organizational Performance	-0.206	1.358	0.175(ns)
Organizational Ambidexterity → Organizational Performance	0.635	3.127	0.002

Table 4.25 PLS Model Path Coefficients and associated Statistics (Two tailed),
ns: Not significant

4.9 Hypotheses Testing

The study's SEM structural model was estimated by means of the relationships' coefficients and the associated p values computed by partial least square analysis as implemented in SmartPLS software. In keeping with Chin (1998) recommendation, a bootstrapping technique with 500 resampling was performed to compute standard errors and t statistics. Through this computation of the standard error and the t statistics, it was possible to calculate coefficients' statistical significance. The normal PLS algorithm does not compute the statistical significance measures. The degree of freedom for the bootstrap analysis is usually resampling less 1 in this case 499, (500-1).

The change effect of the SEM model's coefficient of determination R^2 was measured by f^2 values and the change effect of the SEM model's predictive relevancy was assessed by q^2 values. The change effect values were applied to gauge the variations of both R^2 and Q^2 values respectively on the account of the latent variables categorized as exogenous variables in the study structural model.

The analytical goal of PLS is to reveal high values of coefficient of determination, R^2 and corresponding significant t-values, thus confirming the proposition as theoretically hypothesized. Statistical values with absolute t-value higher than 1.65 imply statistical significance at p-value less than 0.1 ($p < 0.1$) while t-values greater than 1.96 infer statistical significance at p-value less than 0.05 ($p < 0.05$). Absolute of t-value higher than 2.58 but less than present 3.26 have significance at p-value less than 0.01 ($p < 0.01$) and finally those recording absolute t-value greater than 3.26 register statistical significance at $p < 0.001$. Figure 4.4, through to figure 4.6 is the presentation of the study's structural model's t statistics, p-values and path coefficients respectively.

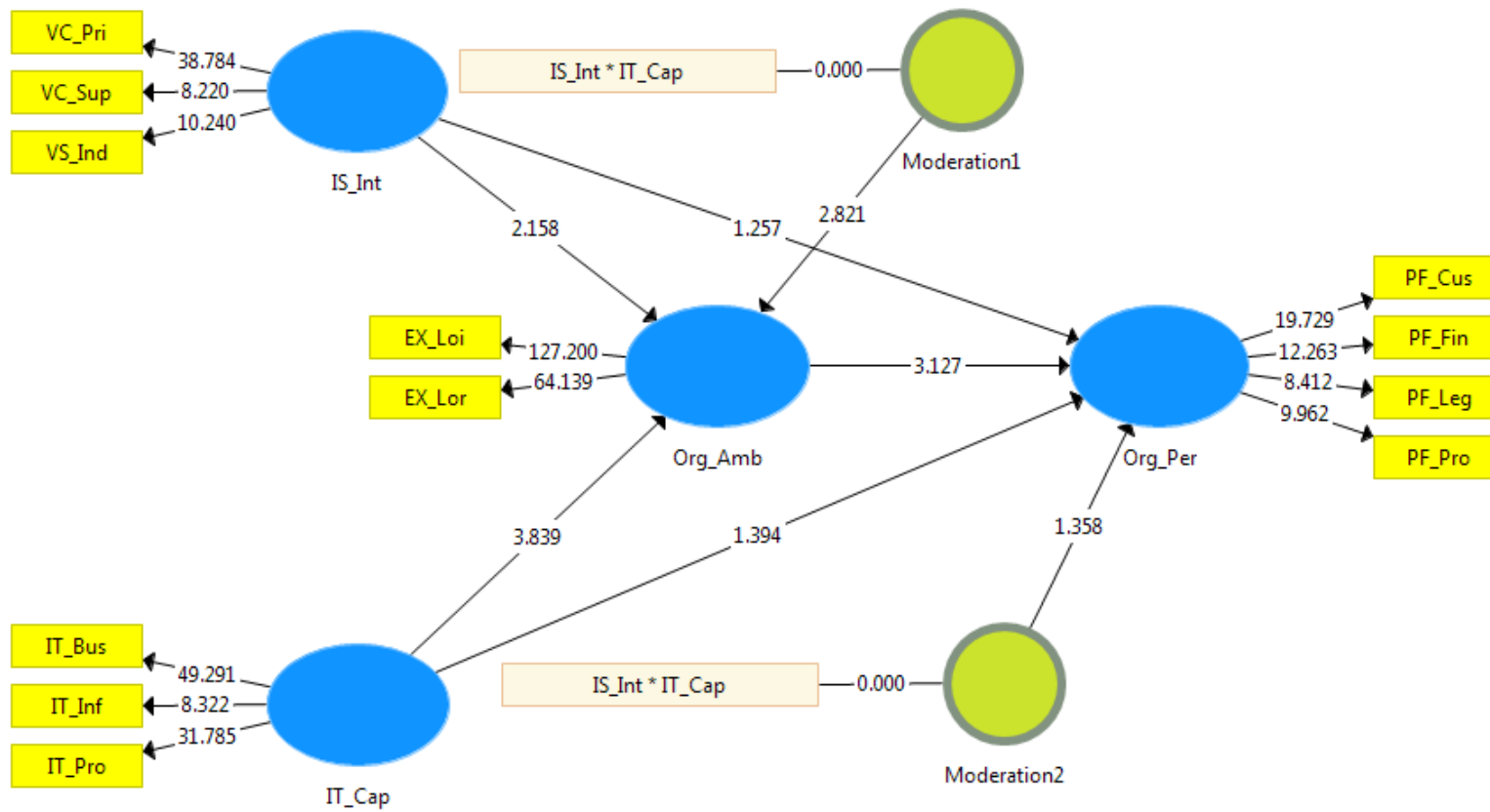


Figure 4.7 Study Model's t-Statistics

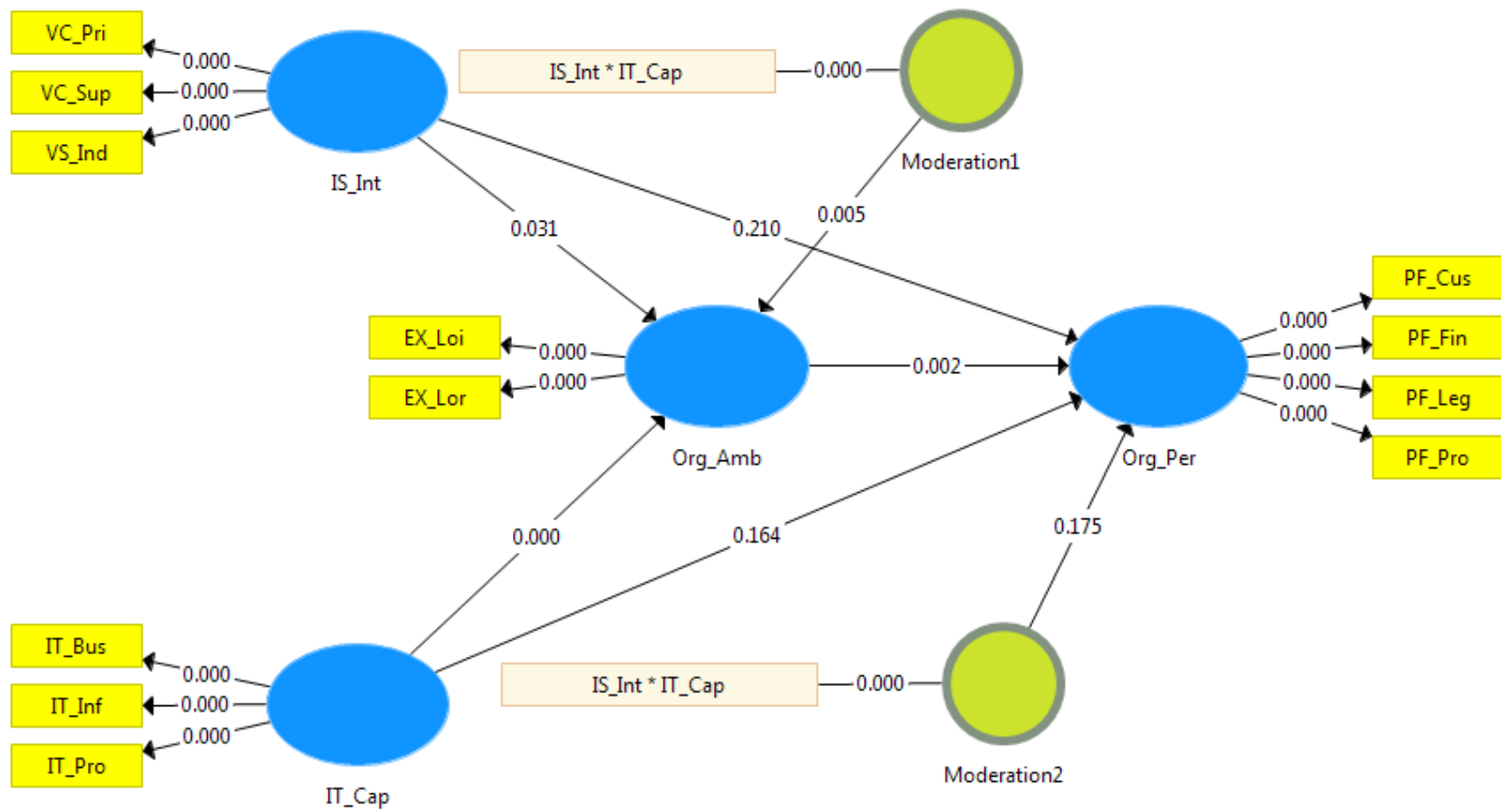


Figure 4.8 Study Model's P-Values

The path coefficients were analyzed for their significance using t tests. The evaluation of the comparative importance of the associations represented by path coefficients provided as shown on in Table 4.25 above is essential for understanding outcomes of the analysis and drawing deductions (Hair, Ringle, & Sarstedt, 2013).

The current study's general objective was to examine information systems integration, IT capability effects on organizational ambidexterity and their subsequent effect on the performance of Kenya's banking institutions. To address the research questions, a conceptual model and the corresponding SEM model with the associated hypotheses were developed a priori in line with a positivist approach which was the underlying paradigm. The proposed model had IS integrated as the predictor of banking institution's performance, with organizational ambidexterity construct as the mediator in the conceptualized model. IT capability construct was providing the interactive effect on the relationship between IS Integration, Organizational Ambidexterity and Organizational Performance respectively.

PLS-SEM as implemented in SmartPLS version 3.2.1 was employed to carry out hypotheses tests. The paths within the structural model amongst the latent variables symbolized the hypotheses. The model paths coefficients representing the associations between the latent variables were also tested for their statistical significance. The study's SEM model with path coefficients and indicator loadings is shown in Figure 4.6 below. The following subsections provide hypotheses testing outcome.

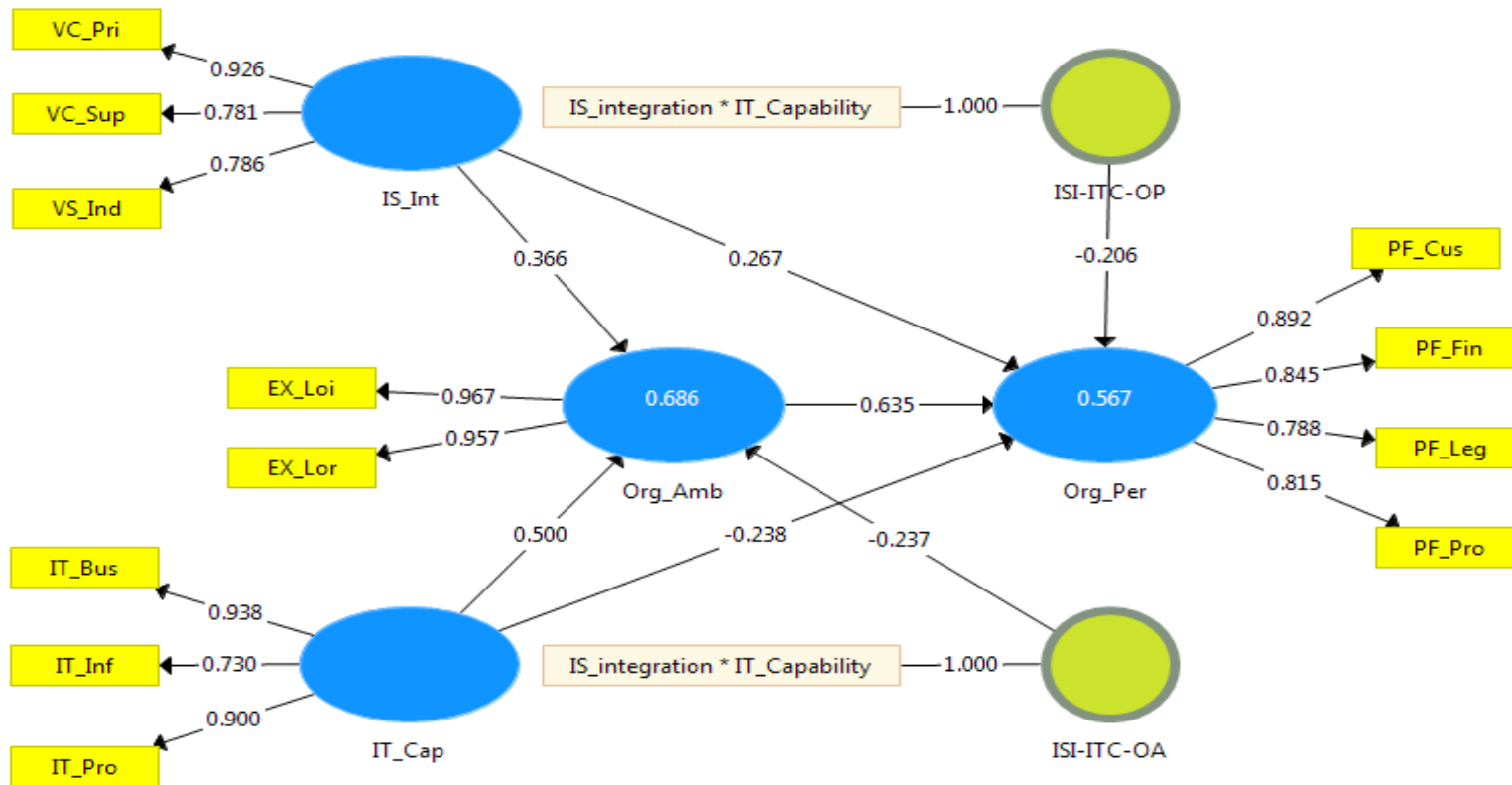


Figure 4.9 Study Model's Path Coefficient and Indicator Loadings

4.9.1 Information Systems Integration, Organizational Ambidexterity and Banks' Performance

The current study general objective was to establish IS integration effect on organizational performance of banking institutions in Kenya. To develop the conceptual associations of the study's latent variables under investigation, several aspects in the use of information systems from extant literature were identified. The respondents who were mainly in IT management in the respective banks were required to assess the degree to which their organizations demonstrated IS integration, IT capability and exploitative and explorative aspects in their operations in a structured questionnaire.

The effect of IS integration and organizational ambidexterity on banking institution's organizational performance was analyzed by PLS-SEM analysis. Initial psychometric analysis for the scale items through exploratory factor analysis gave credence for further analysis of the study's four constructs with their associated indicators. The study's measurement and the structural models were developed by the study's manifest variables and the four latent variables respectively. Both the measurement and structural models were subjected to PLS analysis.

In PLS analysis, path coefficients depict the direction and strength of the latent variables' relationships and the corresponding t-statistics revealed the statistical significance of the relationships. The coefficient of determination R^2 values for the study's two endogenous latent variables was also computed. To assess individual exogenous contribution to the explained variance on the respective endogenous variable the f^2 values were computed. Change effect size values of f^2 equal to 0.02, 0.05 and 0.35 implies small, medium and large effects (Hair, Ringle, & Sarstedt, 2013; Hair et al., 2014). The study's summary path coefficients, significance tests, exogenous variables and their associated change effect sizes are shown on Table 4.26 below. The results of the hypotheses testing are discussed thereafter.

With sample size of 50 which constituted the actual cases used for analysis, the degree of freedom (df) will be one less the sample size ($50-1= 49$). The normal confidence two tailed t-test is $\alpha= 0.05$. Based on this df, the tabulated t value at the 90% confidence interval $\{(1-\alpha) * 100\}$, the latent variable relationships were evaluated at the t-value greater than 1.676 and a corresponding $p<0.05$ significant level.

Relationships	Std. Error	t-Statistics	P-Values	f² Values
IS Integration→Organizational Ambidexterity	0.170	2.158	0.031	0.221
IS Integration →Organizational Performance	0.213	1.257	0.210(ns)	0.070
IT Capability→ Organizational Ambidexterity	0.130	3.839	0.000	0.414
IT Capability→ Organizational Performance	0.171	1.394	0.164(ns)	0.048
Moderation1→ Organizational Ambidexterity	0.084	2.821	0.005	0.231
Moderation2→ Organizational Performance	0.152	1.358	0.175(ns)	0.103
Organizational Ambidexterity → Organizational Performance	0.203	3.127	0.002	0.292

Table 4.26 t-Statistics and the associated p-Values of the Model's Relationships at $t > 1.676$ sig $p < 0.05$; **ns**: Not significant

4.9.1.1 The Hypothesized Relationship between IS Integration and Firm's Performance

Hypothesis H₁ predicted the presumed existence of a significant relationship between information systems integration and firm's performance. To investigate this proposition, the collected data was subjected to PLS analysis. The outcome of this examination is presented on Table 4.26 above.

Based on the analysis outcome, IS integration with its associated measures registered a statistically insignificant relationship with organizational performance. Though the association coefficient was positive, it was insignificant at p-value less than 0.05. The following were the statistical values of this hypothesis test; $\beta = 0.267$, $p = 0.210$, $t = 1.257$ and $f^2 = 0.070$. Information systems integration is therefore confirmed not to significantly contribute to the overall organizational performance directly. With f^2 value of 0.070, IS

integration has the second lowest change effect size on organizational performance as an endogenous latent variable compared to the highest in the model (IT capability) with an f^2 value of 0.414. Therefore, H_1 is rejected at $p < 0.05$ significance level.

4.9.1.2 IT Capability Moderation Effect on the Relationship between IS Integration and Firm's Performance.

Hypothesis H_2 , supposed that information technology capability moderates the relationship between IS integration and organizational overall outcome. Applying the partial least squares two-stage methodology of PLS algorithm analysis for moderation, the PLS analysis results as shown in table 4.26 above are as follows at $p < 0.05$ level; $\beta = -0.206$, $p = 0.175$, $t = 1.358$ and $f^2 = 0.103$).

These PLS analysis results empirically reveal that IT capability has a statistically insignificant moderation consequence on the relationship between IS integration and organizational overall outcome. The path coefficient is negative indicating that should the relationship be significant, it would have abridged the effect of IS integration on organizational overall outcome. The effect size is marginal compared to the other constructs on the model. IT capability f^2 value was 0.103 at $p < 0.05$ level of significance. This therefore implies that, hypothesis H_2 with the supposition that IT capability influences the relationship between IS integration and organizational performance does not hold true.

Structural equation modeling categorizes latent variable as either exogenous or endogenous. Therefore, as well as analyzing the interaction effect of the moderating latent variable, it is also treated as an exogenous latent variable and its direct relationship with endogenous latent variable is also analyzed. In this case, IT capability moderates the relationship between IS integration and the overall outcome of the organization. PLS analyzes the interactive effect using the selected moderation methodology, in this case, two-stage as indicated in the result above and also analyzes the direct relationship between IT capability and organizational performance. The outcome of the direct effect (exogenous -endogenous) can be used to corroborate the moderation effects.

The relationship between IT capability and organizational performance at p-value of less than 0.05 level revealed the following statistical outcome; $\beta = -0.238$, $p = 0.164$, $t = 1.394$ and $f^2 = 0.048$. The result validates the results of the moderation. Since it is not statistically significant and incidentally its effect of change f^2 value of 0.048 is the lowest in the model affirming negligible effect on the coefficient of determination R^2 of organizational performance variable. These findings affirm the rejection of H_2 as alluded above.

4.9.1.3 IT Capability Moderation Effect on the Relationship between IS Integration and Organizational Ambidexterity

Hypothesis H_3 envisaged that IT capability moderates the relationship between IS integration and organizational ambidexterity. The following are the results of PLS analysis using the two-stage method process at $p < 0.05$ level; $\beta = -0.237$, $p = 0.005$, $t = 2.821$ and $f^2 = 0.231$. These outcomes reveal IT capability's statistically substantial constraining interactive influence on the association between IS integration and organizational ambidexterity. The change effect size is relatively high in comparison with the other variables' f^2 value at 0.231. This analysis outcome therefore supports hypothesis H_3 , though unexpectedly constraints the relationship.

As indicated in H_2 above, SEM analysis also evaluates the direct relationship between the moderator (considering it as an exogenous) and endogenous latent variable. In this case, the direct relationship between IS integration, IT capability as the exogenous latent variables and the organizational ambidexterity as an endogenous latent variable is analyzed.

The following is the PLS analysis results of the direct relationship between IS integration, IT capability, and organizational ambidexterity respectively. i) IS integration and organizational ambidexterity at $P < 0.05$ level had the following outcome; $\beta = 0.366$, $p = 0.031$, $t = 2.158$ and $f^2 = 0.221$. These statistical outcomes indicate IS integration has a direct relationship with organizational ambidexterity. The change effect size is relatively high at f^2 value of 0.221 confirming the significant IS integration contribution to the overall R^2 of the organizational ambidexterity as an endogenous latent variable and ii) the

relationship between IT capability and organizational ambidexterity at $p < 0.05$ recorded the following analytical values; $\beta = 0.500$, $p = 0.000$, $t = 3.839$ and $f^2 = 0.414$. This reveals that IT capability has a significantly strong positive relationship with organizational ambidexterity. The change effect size is the highest in the model confirming the strength of this association at f^2 value of 0.414.

4.9.1.4 Organizational Ambidexterity Mediation Test: The Bootstrap Approach

Hypothesis H₄: conjectured that organizational ambidexterity has a substantial intervening influence on the relationship between IS integration and organizational performance. The bootstrap approach was applied to test the mediation effect. The path model was estimated via bootstrapping without the interaction of the mediator (organizational ambidexterity). The results were as follows; $\beta = 0.538$, $p = 0.000$, $t = 4.052$, which reveals that the direct paths (IS integration \rightarrow organizational performance = 0.087) is statistically significant and therefore, the inclusion of organizational ambidexterity as a mediator was meaningful. The significance of indirect paths is required in order to verify that organizational ambidexterity arbitrates the association of IS integration and organizational overall outcome. To ascertain the significance of this indirect path computed as $(0.691 * 0.632 = 0.437)$ where 0.691 and 0.632 are the path coefficients between IS integration and organizational performance and organizational ambidexterity and organizational performance with mediator included in the model (Hadi et al., 2016). The t value of the indirect paths had to be obtained. The t value of the indirect path was calculated as follows (indirect path/Std error) $\{0.437/0.140\} = 3.121$, with a p-value of 0.0002. Note that, the standard deviation equals the standard error in bootstrapping (Hair et al., 2014). It was concluded that organizational ambidexterity mediates the relationship between IS integration and organizational performance.

The next step was to establish strength of mediation effect. The strength of mediation is computed via variance accounted for (VAF), as suggested by Garson (2016). VAF value is the ratio of indirect effect to the total effect. $VAF = \text{indirect effect} / \text{total effect}$ multiplied by 100. Total effect = indirect path (effect) + direct path (effect) $(0.437 + 0.087 = 0.524)$. Therefore, $VAF = 0.437/0.524 * 100$, this reveals that 83.4% of the

effect of IS integration on organizational performance is explained through organizational ambidexterity. Since the value of VAF is larger than 80%, it is therefore concluded that organizational ambidexterity fully mediates the relationship between IS integration and organizational overall outcome (Garson, 2016; Hair, Ringle, & Sarstedt, 2013). Hypothesis H₄; which proposed that organizational ambidexterity mediates the relationship between IS integration is therefore sustained by these statistical findings.

4.9.1.5 IS Integration, IT Capability, Ambidexterity and Firm Performance.

The combined effect of IS integration, IT capability, and organizational ambidexterity is significantly greater than the individual predictor variables on firm's performance based on the postulation of hypothesis H₅. This hypothesis is associated with objective 5 of the study. Specific objective 5 of the study intended to establish whether the all-inclusive effect of IS integration, IT capability, and organizational ambidexterity is greater than that of discrete exogenous latent variables' effect on the model. To determine this, each exogenous latent variable's effect change on R² and the cross-validated redundancy for endogenous latent variables Q² values were analyzed. The Q² value is a model fit measure also referred as the predictive accuracy of the model. The effect change of R² for each latent variable is measured by f² values while the effect change of Q² is measured by the q² values (Garson, 2016). The f² and q² measures for the respective latent variables are shown in Table 4.27 below

Variable	R ² & Q ² Values	IS Integration	IT Capability	Moderation1	Moderation2	Organizational Ambidexterity
Organizational Ambidexterity	R ² = 0.686	f ² =0.221	f ² =0.414	f ² =0.231		
	Q ² =0.579	q ² =0.221	q ² =0.385			
Organizational Performance	R ² = 0.567	f ² =0.070	f ² = 0.048		f ² =0.103	f ² =0.292
	Q ² =0.300	q ² =0.021	q ² =0.054			

Table 4.27 The Model's Change Effect Values

From Table 4.27 above, the f^2 values show the effect change on R^2 should the respective exogenous variables be omitted from the model, each exogenous variable has varying level of individual contribution to the overall R^2 of the endogenous variables but none of the values exceeds the values of overall R^2 of either of the two endogenous variables (Organizational Ambidexterity and Organizational Performance). The Q^2 effect change of the predictive relevance of the model, the q^2 values indicate the changes in model fit or model reliability associated with the omission of the respective exogenous variables. Principally the q^2 values measure the contribution of the exogenous variable in the prediction of the endogenous variables in the model. All the q^2 values of the exogenous variables are lower than the overall Q^2 of both endogenous variables indicating that the predictive relevance of the model is superior with all exogenous variables included in the model.

Note that IT capability has the greatest f^2 and q^2 for organizational ambidexterity. This is an indication of the degree of its contribution to the overall R^2 and predictive accuracy for Organizational Ambidexterity. These results sanction the finding of H_4 above. The above results ascertain the propositions of hypothesis H_5 that the overall effect of IS integration, IT capability, and firm's Ambidexterity on organizational performance is greater than the individual variables'. This also applies for IS Integration and IT Capability on both Organizational Ambidexterity and Performance. Table 4.28 below is a summary of the hypotheses testing and their conclusions.

Objective	Hypotheses	Findings	Conclusion
Examine the relationship between IS integration and firm's performance.	H ₁ : There is a relationship between IS integration and banks' performance.	t=1.257 p=0.210	The result revealed statistically insignificant relationship. H₁ rejected.
Establish the influence of IT capability on the relationship between IS integration and firm's performance	H ₂ : IT capability moderates the relationship between IS integration and banks' performance.	t=1.358 p= 0.175	The result showed statistically insignificant relationship. H₂ rejected. This result verifies H₁ results above. If no significant relationships exists, the moderation of thereof is subsequently insignificant
Establish the influence of IT capability on the relationship between IS integration and bank's ambidexterity	H ₃ : IT capability moderates the relationship between IS integration and banks' ambidexterity.	t=2.821 p=0.005	The analysis revealed statistically significant relationship. H₃ accepted.
Establish the influence of organizational ambidexterity on the relationship between IS integration and firm's performance.	H ₄ : Organizational ambidexterity mediates the relationship between IS integration and banks' performance.	VAF=83.4% t=3.121 p=0.002	The bootstrap approach revealed significant mediation. VAF of 83.4% indicates full Mediation H₄: accepted.
Determine the overall effect of IS integration, IT capability and organizational ambidexterity on firms' performance.	H ₅ : The overall effect of IS integration, IT capability, and organizational ambidexterity on organizational performance is statistically significant at p < 0.05 level	Firm performance R ² = 0.567 Q ² = 0.300	H ₅ was accepted as the result of R ² and Q ² values of organizational performance were significant at <0.05

Table 4.28 Summary of Hypotheses Testing $t > 1.676$ significance level $p < 0.05$ (two tailed)

4.10 The Final Model with Established Significant Latent Variable Relationships

Table 4.28 above summarizes results of the test for the study's theorized latent variables' relationships. Only four of the seven conceptualized relationships are significant. Information systems integration has a statistically significant relationship with organizational ambidexterity with a path coefficient of 0.0366 at a p-value less than 0.05. IT capability influences organizational ambidexterity with a path coefficient of 0.5 at the $p < 0.05$. IT capability constrains the relationship between IS integration and organizational ambidexterity with a path coefficient of -0.237 at a p-value of less than 0.05. There is a significantly strong correlation between ambidexterity and performance, with path coefficient of 0.635 $p < 0.05$. The actual values in Table 4.23 earlier revealed this solid relationship.

The analysis empirically revealed the insignificance of the three of hypothesized linkages among the latent variables. From Table 4.26 above, the relationships between IS integration, IT capability and organizational performance are statistically insignificant both at $t > 1.65$ and a p-value less than 0.05. The actual values depict the weakness of the conceptualized linkages. The moderation influence of IT capability between IS integration and organizational performance is also debunked as shown earlier in Table 4.26. From the summary of Table 4.28, the final conceptual and SEM models representing the established statistically significant conceptualized latent variables relationships are shown in Figure 4.7 and Figure 4.8 below.

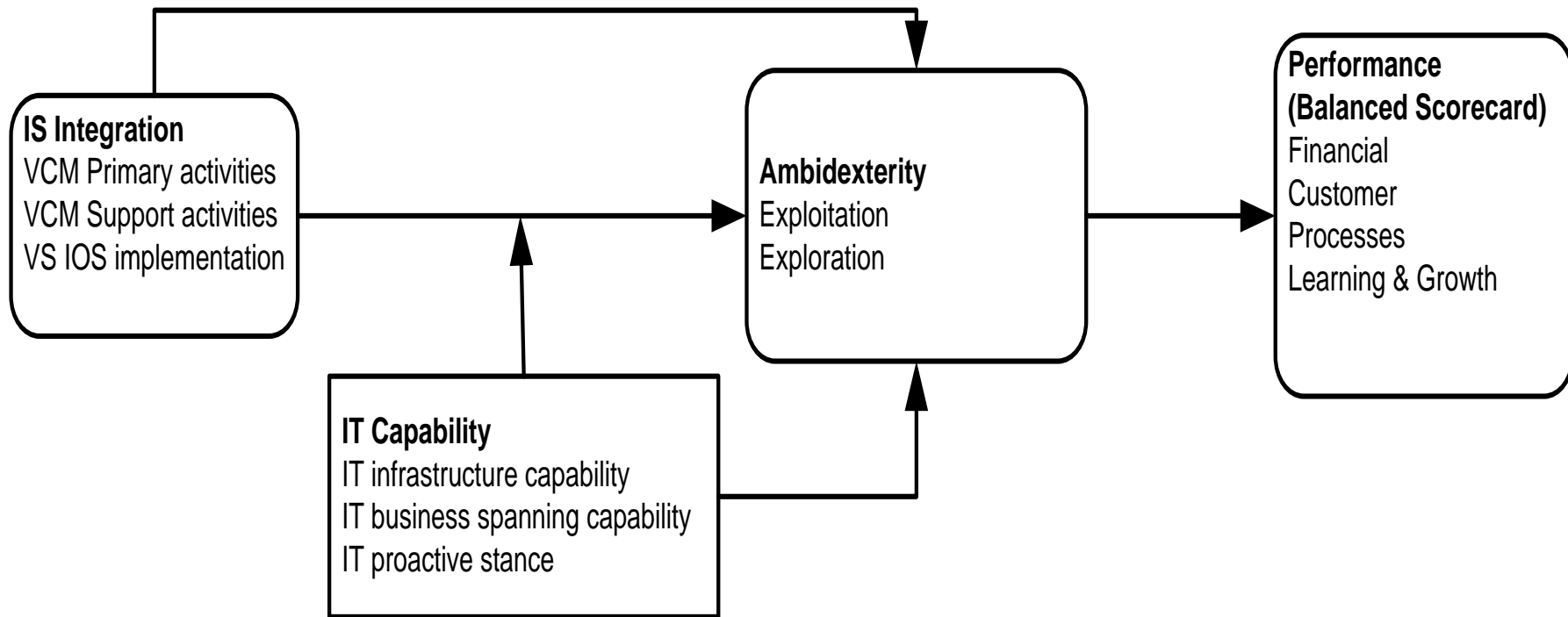


Figure 4.10 The conceptual model with significant relationships

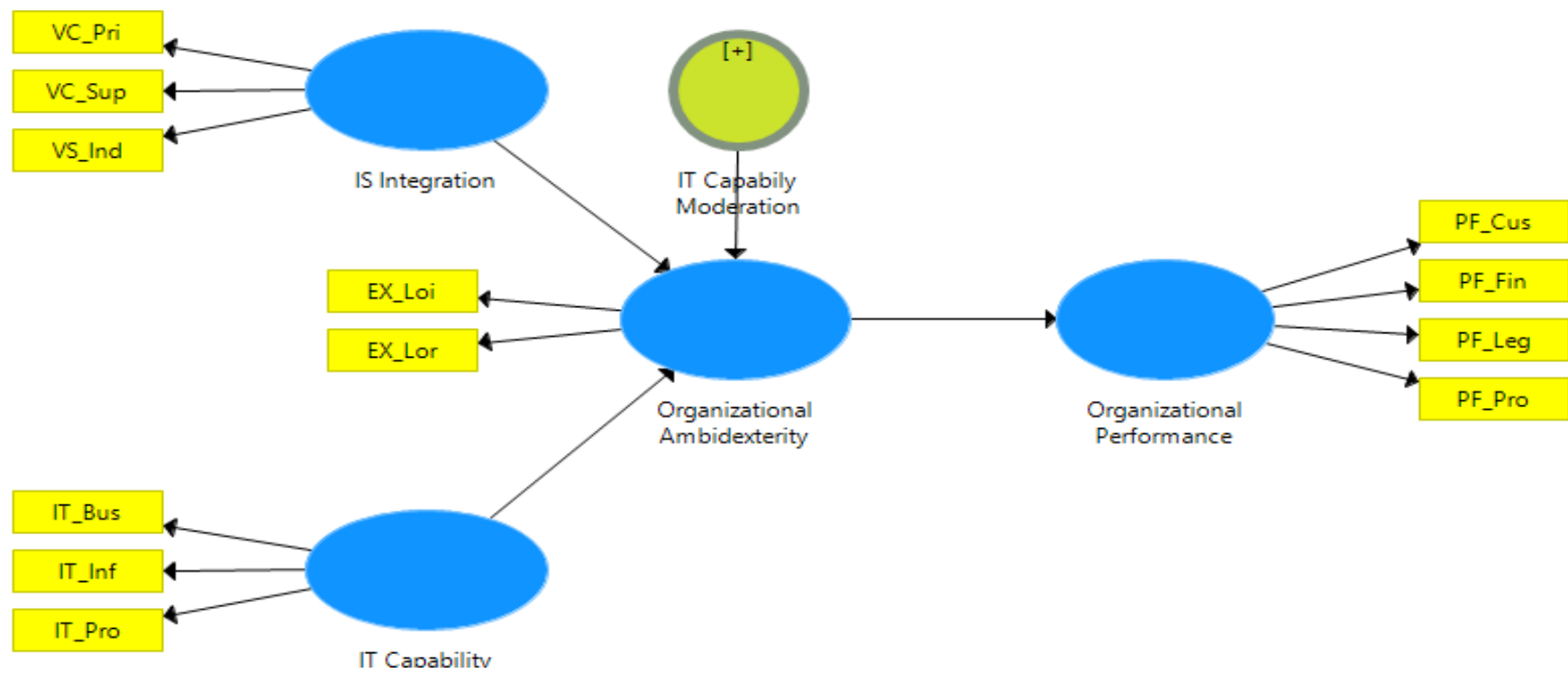


Figure 4.11 The Final SEM Model with Significant Relationships

4.11 Chapter Summary

The overall objective of the study was to investigate the influence of information systems integration, IT capability on organizational ambidexterity and subsequent organizational performance. To achieve this, five specific objectives were formulated with their associated hypotheses. To study the objectives, data was obtained from all banking institutions in Kenya as regulated and supervised by the Central Bank of Kenya as at 2014 using a structured questionnaire for primary data and secondary data was obtained from CBK annual reports and banks' websites.

This chapter has presented the study findings as guided by the research designed outlined in chapter three. The findings are based on the data collected from 50 banking institutions in Kenya. The chapter started with the descriptive statistics of the respondents and the study units' characteristics. This was followed by preliminary analysis of the collected data and the evaluation of psychometric characteristics to ensure the quality of the measures before using them for analysis. The initial SEM measurement model was developed and re-specified after it was found unfit to evaluate the structural model. The re-specified measurement model was evaluated through CFA analysis by testing the validity and reliability of its indicators and thereafter the measurement model was used to evaluate the structural model. The structural model evaluation constituted analyzing, the relationships or path coefficients, moderation and mediation of the constructs as depicted by the study's SEM model. The overall model goodness of fit was also analyzed by use Predictive Relevance value Q^2 and the Coefficient of Determination value R^2 . The chapter concluded with summary of the outcome of hypotheses testing as stated in chapter two of the study. The final SEM and conceptual models with the established relationships as proved by the hypotheses tests results are presented.

CHAPTER FIVE: DISCUSSION OF THE FINDINGS

5.1 Introduction

The study's findings and the related discussion as it relates to the specific objectives subsumed on the study's general objective is presented in this chapter. The main goal of the current study was to establish the implication of IS integration on organizational ambidexterity and organizational performance of banking institutions regulated by the Central Bank of Kenya. The interactive effect of IT capability on these relationships was of interest too. The sections in this chapter evaluate the study's finding in relations to the extant literature, especially the linkage between IS and organizational performance which has proved inconsistent.

The following is the layout of the chapter. Section 5.2 is the discussion of the analysis results of IS integration and firm performance of hypothesis H_1 . This hypothesis is associated with objective i) of the study. The influence of IT capability on the association between IS and firm performance is deliberated on section 5.3. Section 5.4 discusses the moderation effect of IT capability on the relationship between IS integration and organizational ambidexterity as set out on hypothesis H_3 associated with object iii). Related to object iv) and H_4 , is the organizational ambidexterity mediates the relationship between IS integration and firm performance. This is the content of section 5.5. Concluding this is chapter is section 5.6 which addresses objective v) and H_5 . Section 5.6 discusses the overall collective effect of IS integration, IT capability and organizational ambidexterity on firm performance. The individual contribution of each of the former latent variable on the latter is reflected upon.

5.2 Information Systems Integration and Firm's Performance

In recent years, there has been an increased investment in information systems by organizations. The need for automation of most organizational processes and operations has been unprecedented as organization pursues digitalization. The banking sector in Kenya has been one of the leading sectors to increasingly automate back office and front office operations as ICT sector increasingly rollout various IS innovations in an

unprecedented pace. These accelerated investments in information systems have provoked a debate among researchers. The interest is trying to unearth the organizational performance benefits associated with huge IS investments (Bostrom et al., 2009; Mahmood & Mann, 2005). The huge spending in IS in recent years notwithstanding, demonstrating the corresponding firm performance benefits has proved difficult (Adam et al., 2000). With findings from different studies showing mixed results Mithas, Tafti, Bardhan, et al. (2012), the current study intended to establishing the scenario in the Kenyan banking sector. The banking industry in Kenya has been one of the sectors that have heavily invested in IS innovations across all operational areas.

The test result of hypothesis H_1 no direct linkage between IS integration and bank performance with negligible contribution to the overall R^2 . This resonates with other studies evaluating this relationship as indicated by Kohli and Grover, (2008); Sandberg et al., (2014). The results from these studies indicated mixed finding ranging from positive, to null and to a negative association. The current findings confirm empirical studies by Ghobakhloo et al., (2014); Mithas, Tafti, Bardhan, et al., (2012) that alludes to an indirect IT contribution to firm profitability. Though Magutu et al., (2011) through an empirical study on commercial banks in Kenya revealed that IT offers potential and limitless opportunities through cost-effectiveness and rapid systematic service provision.

Various studies such as Mithas, Tafti, Bardhan, et al., (2012) as pointed above seem to contradict this direct effect of IS and performance, however, the studies are in agreement that IT does influence firm performance through other revenue growth channel rather than directly. For example, Lang and Colgate (2003) found that improved customer relationship marketing through the enablement of multiple channels have a direct impact on bank profitability. However, such improvement is pegged on the base of IS innovations in this case online-banking. The benefits are easily linked to accrue from marketing efforts rather from information systems' perverseness in enabling such marketing channels. The findings of insignificant direct association between IS integration and the overall organizational outcome confirms earlier studies in this area.

Bostrom, Gupta, and Thomas, (2009) pointed out that one of the major sources of mixed findings is the lack of an integrated approach of both social and technical subsystems of the organization when investigating how IS leads to firm outcomes. According to sociotechnical systems theories, an organization is made up of the social and technical subsystems that perpetually interact with and influence each other throughout the life of the organization. Sociotechnical systems theories accords researchers the ability to mitigate the asymmetry between the elements of the two organizational subsystems when examining the effect of IS use in the organization. Too much focus on the technology while depriving attention to the social aspects of information systems or inadequate attention to the technological artifact of IS will always yield inconsistent results. Adoption of STS theories, especially AST accords researchers the ability to link the social and the technical domains thereby comprehending how technology structures trigger organizational change. This eventually mitigates the skewed analysis which subsequently addresses the incoherency of findings when examining the effect of IS usage in organizations (Bostrom et al., 2009; Furumo & Melcher, 2006).

5.3 IT Capability Interactive effect on IS Integration and Firm Performance

Lu and Ramamurthy (2011) conceptualization of IT capability construct is typified in three ways in an organization, these are; information technology infrastructure capability; information technology business spanning capability; and information technology proactive stance. Based on the theoretical presupposition in this study, IT Capability was expected to significantly moderate IS integration, firm performance, and ambidexterity relationships. These proposed associations were stated in hypotheses H₂ and H₃ of the study respectively.

The moderation influence of IT capability on the relationship between IS integration and organizational performance was statistically insignificant with the following outcome, $\beta = -0.206$, $p = 0.175$, $t = 1.358$ and contribution to the overall R^2 with effect change value of $f^2 = 0.103$. The negative path coefficient indicates IT capability's constraining influence between IS integration and firm performance association.

SEM analyzes the direct link between the moderator and the endogenous latent variable as well. The results can be used to affirm the interactive effect outcome or reveal some unexpected results when the moderation and direct outcomes are incongruent. In this case, the direct association of IT capability and overall organizational outcome findings corroborated the moderation effect with the following statistics at $p < 0.05$ level; $\beta = -0.238$, $p = 0.164$, $t = 1.394$. IT capability had the least contribution to overall R^2 of organizational performance with effect change value of $f^2 = 0.048$. Mithas et al., (2011) empirically found out that IT capability is critical IS ingredient in the development of other antecedents of firm performance. According to this finding, IT capability plays a fundamental role in the creation of other firm competences that directly influences the performance of firm. Chae et al., (2014) in a study to reexamine the link between IT capability and firm performance also found out a statistically insignificant link between the two. This therefore plausibly validates the current study finding that IT capability neither influences firm performance directly or indirectly through moderation of the relationship between IS integration and firm performance.

5.4 IT Capability Moderation Effect on IS Integration and Firm Ambidexterity

The moderating effect of IT capability and organizational ambidexterity H_3 proved significant though negative at $p < 0.05$ level. The following were the results of the analysis of this interaction; $\beta = -0.237$, $p = 0.005$, $t = 2.821$ and $f^2 = 0.231$. As indicated in section 5.3 above, SEM also analyzed the direct relationship between IT capability as the moderator and organizational ambidexterity as the endogenous variable. The following were the results of the direct relationship at $p < 0.05$ level; $\beta = 0.5000$, $p = 0.000$, $t = 3.839$ and $f^2 = 0.414$.

The negative moderation influence of IT capability on the relationship between IS integration and ambidexterity can be due to the systemic rigidity of process level IS integration versus the quest of the flexibility that is required of ambidexterity. IT capability as postulated by Lu and Ramamurthy (2011) when combined with IS integration is at variance with fluid and flexible organizational forms as advance by Schreyögg and Sydow (2010) which are reminiscent characteristics of ambidextrous

organization. This discrepancy could be partly accounting for the revealed ITC moderation effect on relationship between IS integration and organizational ambidexterity.

However, the direct link between IT capability and organizational ambidexterity confirms that IT capability as indicated by Mithas et al., (2011) is a builder of other firm capabilities. In this case, IT capability enables organizational ambidexterity that subsequently influences firm performance directly as confirmed by the results of H₄ below. Chae et al., (2014) also found out empirically an insignificant direct link between IT capability and overall organizational outcome. Bharadwaj (2000) on the other hand, using a matched comparison methodology on IT capability and overall organizational outcome discovered that organizations exhibiting a greater degree of IT capability outperformed a controlled group on a number performance parameters. Bharadwaj (2000), however did not allude to direct or indirect correlation between IT capability and the various firm performance metrics.

Mithas, Tafti, Bardhan, et al., (2012) findings that IT support firm performance through other avenues that they refer as IT-enabled revenue growth directly seems to resonate with the finding of this hypothesis test and other studies like (Mithas et al., 2011). Lang and Colgate (2003) investigation on customer relationship quality, found that improved customer relationship management contributes to improved profitability for commercial banks. However, while this was as a result of multiple channels enabled by technology through online banking, the accrued benefits are more easily associated with marketing and sales efforts through enhanced customer relationship rather than the underlying technology.

5.5 Ambidexterity Mediation Effect on IS Integration and Firm Performance

The bootstrap approach resulted to variance account for (VAF) value of 83.4 % which reveals that over 80% of IS integration effect on performance is explained through organizational ambidexterity. This, therefore, implies that organizational ambidexterity mediates completely the relationship between information systems integration and

organizational performance. This analysis outcome confirms hypothesis H₄ which presumed that organizational ambidexterity has a statistically significant intervening influence on the relationship between IS integration and firm performance.

Prieto et al., (2007) found out that at business unit level, IT significantly facilitates explorative and exploitative activities and subsequently performance. Similarly, Tallon and Pinsonneault, (2011) recorded significant facilitative covariation of IT, agility and subsequent overall organizational outcome. Magutu et al., (2011) from the study of commercial banks in Kenya concluded that IT-enabled banks' responsiveness to customer needs among other IT enabled explorative and exploitative activities. Patel et al., (2013) also found out high-performance work systems are an important antecedent to facilitate ambidexterity which results to subsequent better firm performance. In a multistage study on structural and contextual ambidexterity, Gibson and Birkinshaw,(2004) found a positively high correlation of ambidexterity and firm performance.

The computed VAF value of 83.4% reveals that 83.4% of IS integration correlation with organizational performance is explained through organizational ambidexterity. This finding while echoing with several studies discussed above, confirms earlier results of hypothesis H₁ which found out that IS indirectly influences organizational performance. H₄, therefore, demonstrates that organizational ambidexterity is undoubtedly one of the IT enabled organizational capabilities that subsequently have a direct linkage with organizational performance.

5.6 IS Integration, IT Capability, Ambidexterity and Firm Performance

One of strength of SEM analysis technique is the ability to permit flexibility in the type of variables relationships that can be tested. This is achieved by the multiple combinations of both observed and observed variables (Kline, 2011). Hypothesis H₅ is a test of various variables relationship combinations and the overall collective effect of all the exogenous variables on the endogenous variable. This essentially analyzed the effect of IS integration, IT capability and organizational ambidexterity on the organizational

performance as the dependent variable and evaluating the contribution of each variable to the overall strength to predict the variables' relationships in the model.

The model's values of coefficient of determination R^2 , the predictive relevance Q^2 and their associated effect change values f^2 and q^2 respectively reveal these statistics. Table 4.27 in chapter 4 showed f^2 values which revealed the effect change on R^2 should the respective exogenous variables be omitted on the model. Table 4.27 summarized the variables' contributions to the coefficient of determination and the predictive relevance of the SEM model.

Each exogenous variable has varying level of individual contribution to the overall R^2 of the endogenous variables but none of the values exceeds the values of the overall R^2 of either of the two endogenous variables (Organizational Ambidexterity and Organizational Performance). The Q^2 effect change of the predictive relevance of the model, the q^2 values indicate the changes in model fit or model reliability associated with the omission of the respective exogenous variables. Principally the q^2 values measure the contribution of the exogenous variable in the prediction accuracy of the endogenous variables in the model. All the q^2 values of the exogenous variables are lower than the overall Q^2 of both endogenous variables indicating that the predictive relevance of the model is superior with all exogenous variables included in the model.

IT capability has the greatest f^2 and q^2 for organizational ambidexterity. This is an indication of the level of its contribution to the overall R^2 and predictive accuracy for Organizational Ambidexterity. These results consent the finding of H_4 above. The above findings ascertain the proposition of hypothesis H_5 that the overall effect of IS Integration, IT capability, and Ambidexterity on the overall organizational outcome is greater than the individual exogenous variables'. This also applies for IS Integration and IT Capability on both Organizational Ambidexterity and Performance.

These findings corroborate the complementarity theory proposition. Organizational activities and practices are mutual complements in nature if adopted and done in combination enhance the overall contribution of each other (Choi et al., 2008). This is the

resultant of the synergistic effect of bundling all the exogenous variables together for a bigger impact on organizational ambidexterity and performance than the sum of the individual variables for both R^2 and Q^2 values.

5.7 The Findings and implications on IS Research

The findings of nonexistence relationship between IS integration and firm performance conforms to some earlier studies at the same time contradicting those that conclude the existence of these relationship. This inconsistency has partly been blamed on the different theoretical underpinnings that guide these studies as well as different conceptualizations and methodological approach employed by these studies.

To improve on the coherency and inference of IS and organizational studies' findings, there should be guidance on the conceptualizations of the studies' variables, the employed theory should be capable of addressing the social and the technical subsystem of the organization. Linking of the IS and organization domains is also critical for any research attempting to investigate the effect of IS deployment in organization.

In response to Bostrom et al. (2009) suggestion, the current study employed sociotechnical systems theory to address the balancing of the sociotechnical aspects of the organization. Adaptive structuration theory guided the study. In addition to addressing the balancing of the social and technical constructs of an organization as a sociotechnical system that AST burrows from structuration theory, adaptive structuration theory is a meta-theory that provides the bridge between IS and organizational domains in the study. This linkage facilitates factoring of both IS and organizational aspects during investigation. AST provides a framework for sociotechnical construct conceptualizations enable the required balancing of the social and technical aspects of IS and organization. IT capability and organizational ambidexterity constructs addressed the sociotechnical aspects of the current study on IS and organization. This was proved when IS integration and performance relationship revealed significant with the absence of organizational ambidexterity construct during Bootstrap Approach mediation analysis.

In response to Adams (2000) call, the current study employed SEM analysis to investigate the relationship between IS and organizational performance which Adam alluded may not necessarily mean causality and the need to employ other non-parametric rather than the conventional statistical methods to investigate this relationship. The use of sociotechnical systems theories with appropriate conceptualization and employing other robust analysis approach like SEM coupled with used of proper philosophical orientation should be expected to improve the outcome and consistency of IS and organization studies. This is what the current study endeavored to do to contribute the existing body of knowledge in this area.

5.8 Chapter Summary

This chapter is the discussion of the findings in relation to the extant literature and theories. The study's findings and the related discussions in relation to the five specific objectives subsumed on the study's general objective was the main goal of this chapter.

The chapter began with the findings of hypothesis H_1 with its associated objective which presumed existence of a relationship between IS integration and banks' performance and linking the study's outcome with existing literature and theories. By applying this approach, the chapter discusses the findings of all study's specific objectives and their associated hypotheses stating points of congruent or departure with earlier studies and theories. The chapter concludes with the discussion of outcome of the overall effect of the all the exogenous variables; IS integration, IT capability and organizational ambidexterity on the overall performance of banks in Kenya.

CHAPTER SIX: SUMMARY, CONCLUSION AND IMPLICATIONS

6.1 Introduction

This chapter presents a summary of the findings for each of the research hypotheses and their associated objectives, conclusions from the study findings and the study's contributions. Additionally, the study's limitations are discussed as well as possible areas of imminent areas of research. The following is the layout of the chapter. Section 6.2 below highlights the summary of the research findings followed by study's conclusions in section 6.3. The study's contributions are discussed in section 6.4 while section 6.5 describes the limitation of the study. Finally, section 6.6 provides suggestions for further research, some of the suggestions would address some of the limitations of the current study and 6.7 is the summary of the chapter.

6.2 Summary of the Findings

The overall goal of the current research was to investigate how information systems integration and IT capability influences firm's ambidexterity and subsequently overall organizational performance in the banking sector in Kenya. To achieve the main objective, a conceptual model based on the extant reviewed literature was created. An associated SEM model aligning with the conceptual model was also designed. These two models were the blue print to answering the study's questions and addressing the associated study's objectives. Five specific objectives and corresponding hypotheses were used to test the conceptualized relationships.

The following relationships were analyzed; the linkage between IS integration and organizational performance; the moderation effect of IT capability on the relationship between IS integration, ambidexterity and the overall organizational performance. The combination impact of IS integration, information technology capability and organizational ambidexterity on organizational performance was also investigated. A mix method research design was used to collect secondary and primary data. Primary data was collected from IT management and other management staff from the commercial and

microfinance banks in Kenya with combined total of 56 institutions. Secondary data was sourced from the Central Bank reports and the institutions' official Websites. The study achieved 92.86 percent response rate 81.6 percent of the response was from commercial banks while 18.4 percent was from microfinance institution. 71.4 percent of the respondents were in IT management while 28.6 percent were from other business management.

The five research objectives each had a corresponding hypothesis. These hypotheses were tested. The study focused on the effect of information systems integration and organizational ambidexterity on organizational performance and the interactive effect of IT capability on these relationships. Specifically the study's hypotheses were testing the following; i) the direct effect of IS integration on organizational performance of CBK regulated banking institutions in Kenya; ii) The moderation effect of IT capability on the relationships between IS integration in banking institutions and their performance and IS integration and banks' ability to simultaneously exploit and explore, the ambidexterity capability of the banks iii) The intervening influence of ambidexterity on the association between IS integration and organizational overall outcome iv) The impact of organizational ambidexterity on the performance of banks in Kenya and v) The overall effect of IS integration, IT capability and organizational ambidexterity on banks' performance was evaluated. The study considered all commercial and microfinance banks in Kenya regulated by CBK as at December 2014 with exception of three commercial banks which were under receivership at the time of data collection.

Structural equation modeling specifically PLS-SEM, as implemented in SmartPLS 3.2.1 software was employed to investigate the relationships as theorized in study's conceptual and SEM models. The suitability of PLS-SEM as the appropriate method was based on three main reasons; i) The current study's goal was prediction of the covariance of the model variables rather than theory testing or authentication ii) Due to the small population of the study units, normality of the data would have been a challenge and iii) The small sample size of commercial and microfinance banks in Kenya rendered PLS-SEM as the most appropriate SEM approach for the current study since it works with

small sample sizes compared to CBSEM. Exploratory factor analysis (EFA) was done using various procedures including factor analysis and reliability tests on the scale items to ensure good psychometric characteristics before using the measures in SEM analysis. A few scale items were dropped and others grouped for subsequent PLS-SEM analysis.

SEM analysis uses two-phase process; the measurement model is analyzed in phase one through a diagnostic test to ensure the quality of the indicators. The structural model is analyzed in phase two and relies on the measurement model. The measurement model had to be re-specified after it proved weak on diagnostic tests. This was achieved by means of item parceling technique through a theoretically sound indicators' reduction process. The final measurement model had 12 indicators down from the 56 indicators of the initial measurement model.

The re-specified measurement model established acceptable reliability and validity of the manifest variables. For internal consistency, the four constructs CR values surpassed the cutoff value of 0.7. Item loadings recorded high values than 0.7 at p-value of 0.05, signifying the reliability of all the indicators. The structural model similarly was verified for suitable convergent and discriminant validity registering AVE values above 0.50 and other tests including Fornier-Larcker and HTMT being above the acceptable cut-off points. The study's indicators loaded on their corresponding constructs and the square roots of AVE individual constructs recorded higher values compared to the inter-correlation as required.

The evaluation of the structural model which necessarily follows the measurement model validation revealed acceptable outcomes. The coefficients of determination R^2 were significant for the two endogenous variables of the study with a value of 0.686 and 0.567 for organizational ambidexterity and organizational performance respectively. This demonstrated strong explanatory power. The SEM model's predictive relevance for both organizational ambidexterity and organizational performance had Q^2 values of 0.579 and 0.300 respectively beyond the zero value that implies null predictive power.

Four out of seven presupposed relationships within the structural associations were significantly validated. Applying bootstrapping approach of mediation analysis, the proposed mediating role of organizational ambidexterity between IS integration and organizational performance was analyzed and revealed full mediation with over 83% of IS integration effect on performance being channeled through organizational ambidexterity. Finally, based on the analysis of the overall model fit values of R^2 and predictive relevance Q^2 and their associated f^2 and q^2 effect change values respectively, the model has stronger explanatory and predictive accuracy when all three constructs are included and none of individual construct's contribution to either R^2 or Q^2 is close to the overall values of the combined constructs taken together.

6.3 Conclusions of the Study

The results from hypotheses testing were largely congruent with earlier studies. Nonetheless, there are a few studies whose findings negates the current findings vindicating Bostrom et al. (2009) assertion of mix findings. This inconsistent of the various studies is what Dedrick et al. (2003) referred as the profitability paradox of information systems.

In conformity with earlier empirical studies like Patel et al., (2013), based on the result of H_1 , the current study results confirm the insignificant direct effect of IS and firm performance, this is despite the notion and intuition that automation is expected to improve organizational performance directly. As proved by other studies, IS does influence firm performance, however, this influence is through other IS enabled capabilities and not direct (Lang & Colgate, 2003). Organizational performance benefits accruing from IS integration should be traced through other proxy performance enablers enhanced through automation and not directly from IS integration. Information systems should be viewed as enablers and facilitators of other business processes and activities that directly affect organizational performance. With H_1 , rejected, the subsequent moderation influence of H_2 , would be inconsequential as proved the outcome.

The results of hypotheses H₃ to H₅ were not rejected, indicating statistical significance of the conceptualized relationships. These hypotheses were associated with objectives 3 to 5 respectively. H₃ was testing the moderation influence of information technology capability on the relationship between IS integration and the organization's ability to exploit and explore simultaneously. As revealed by PLS-SEM analysis, IT capability has a statistically substantial positive direct correlation with organizational ambidexterity. As stated by Grover (2003); and Sambamurthy, Lim, Lee, Lee, and Lim (2007), IT capability implicitly facilitates agility in business operation which essentially promotes the flexibility within the organization. The statistically significant positive direct relationship of information technology capability and organizational ambidexterity, confirms that IT capability strongly facilitate the prerequisite for supple and adaptable organizational forms that are enshrined on persistently varying patterns, rapid inventiveness, and impromptu reaction that are reminiscent of organizational ambidexterity (Schreyögg & Sydow, 2010).

However, the findings that IT capability having a constraining moderation influence on the relationship between IS integration and organizational ambidexterity, confounds the findings above about IT capability and ambidexterity. The plausible way to explain IT capability constraining interactive effect between IS integration and organizational ambidexterity relationship is to allude that deep automation at business process and sub-process level could potentially constrain flexibility and inherently introduce rigidity. This proposition is corroborated by Ignatiadis and Nandhakumar (2007) in a case study in which they found out that the introduction of the enterprise system in an organization resulted in augmented inflexibility and probable decline of organizational suppleness and resilience. This rigidity could account for the negative moderation influence of IT capability on the association of IS integration and firm's ambidexterity.

While IT capability as conceptualized by Lu and Ramamurthy (2011) is a desirable attribute for any organization, the finding of objectives ii) and iii) of this study reveals inadvertent consequence of IT capability that should be keenly considered in pursuit of IT capability. IT capability implies the fluidity of IT deployment and application of IS in supporting agile business operations, while deeply automated processes might be in divergence with the required flexibility.

Associated with objective iv) is hypothesis H₄ findings. PLS analysis reveals that organizational ambidexterity provide complete mediation on the relationship between IS integration and firm performance. The full mediation revelation corroborates with earlier studies like Prieto et al. (2007) and Raisch et al.(2009) findings which confirmed that at departmental level, ambidexterity demonstrated full mediation of the association of IS and the overall product development performance. This is consistent with H₁ test result which implied that IS influences firm performance, however, this influence is not direct as concluded by Mithas, Tafti, Bardhan, et al., (2012 and Patel et al. (2013), but through other IS enabled organizational capabilities. Lang and Colgate (2003) findings of increased profitability of banks as a result improved quality of customer relations efforts enable by online banking is another empirical confirmation of this finding from the banking sector perspective. The analysis of the intervening reveals that over 83% of IS integration influence on organizational performance is explained through organizational ambidexterity.

To address the incoherency and nonintegrated approach when examining and investigating the effect of IS in organizations as acknowledged by Bostrom et al. (2009), the current study was guided by sociotechnical systems theories specifically the adaptive structuration theory. As a linkage theory of different domains, AST guarantees equality of focus between social and technical subsystems of the organization (Bostrom et al., 2009). The inclusion of information technology capability as conceptualized by Lu and Ramamurthy (2011) together with the incorporation of ambidexterity construct in the current study permitted the factoring of both social and technical elements of the work system. According to Bostrom et al.(2009), there is evidence that many studies point to this persistent absence of cohesive and integrative attention to the two organizational subsystem, the social and technical components. While not claiming to have addressed this limitation fully, the current study has, however, within the confine of the scope taken a more holistic, balanced and integrative approach when investigating the effect of IS in the organization. This kind of approach based on Bostrom et al.(2009) proposition produces more consistent and generalizable understanding of the effect of information systems adoption in organizations.

Empirical studies have proved that organizational ambidexterity augment firm performance. Many studies like He and Wong (2004) including Lin, Yang, and Demirkan (2007) among other researchers are in agreement about this conclusion. However, sources of organizational ambidexterity are of great interest to both scholar and practitioners. Research is now focused on how firms can achieve ambidexterity.

In an effort to establish the origin of ambidexterity in organizations, Gibson and Birkinshaw (2004) conceptualized contextual approach in achieving the balance between exploitation exploration, and adaptability. This was termed contextual ambidexterity. The two suggested that organizational performance can be enhanced through developing prudently identified collection of systems and processes to create the requisite setup for contextual ambidexterity. These systems and processes mutually outline a framework that permit meta-capabilities of exploitation and exploration successfully coexist in the organization and thereby sustaining business unit performance.

The current study found significantly direct positive relationships between IS integration, IT capability, and organizational ambidexterity. These findings demonstrate that IS and its perverseness across all aspects of organizational processes and operations is a source of the ability of alignment and adaptability in organization. This is one of the origin of ambidexterity based on the organizational context as postulated by Gibson and Birkinshaw (2004). This finding strengthens the conclusion of hypothesis H₁ that IS influences performance indirectly. This also is in congruence with H₄ that revealed that over 83% of IS effect of performance is explained through organizational ambidexterity. AS confirmed by a number of preceding research findings, the influence of IS on overall organizational performance should be observed through other IS enhanced performance enablers rather than directly.

The positive result of H₅, the overall effect of IS integration, IT capability and organizational ambidexterity on performance can be explained by the concept of complementarity theory (Choi et al., 2008). The effect change size values of f^2 and q^2 on R^2 and Q^2 respectively revealed that none of the constructs' contribution to the overall

model fit of either was greater than the combined outcome. This results from synergies as postulated by the complementarity theory. Despite the constraining IT capability moderation on the relationships between information systems integration and organizational ambidexterity, the overall model's R^2 and the predictive relevance Q^2 is better with all constructs included.

6.4 Implications of the study

The study sought to establish the effect of information systems integration and information technology capability on organizational ambidexterity and the subsequent effect on the organizational performance of banking institutions in Kenya. From the findings and in conformity with some earlier studies it was established that IS does indirectly affect firm performance through other IS enabled organizational capabilities. Further, the findings contribute to the extant literature especially in IS and firm performance and in search of antecedent of firm ambidexterity. This is either by revealing new insight, validating or interrogating earlier findings that incorporated similar constructs especially information technology and organizational performance. The following subsection deliberates the theoretical, practical and policy that the current study contributes to.

6.4.1 Implications for Theoretical

Information systems scholars have done substantial work in research studies in examining the linkage of information systems and firm performance. However as Chae et al., (2014); and Mithas, Tafti, Bardhan, et al.,(2012) posit critical gaps still remain, with some studies revealing mixed outcomes. Bostrom et al. (2009) argued that IS studies have difficulties in yielding comprehensible and extrapolatable results of the effect of information systems in the organization. The genesis of this long-time inadequacy has partly been due to individual research studies either focusing heavily on the technology and paying little attention to the social aspects of information systems or inadequately addressing the technical part of IS as an artifact. The approach of these skewed studies are guided by significant number of theories spanning the two different domains that

constitute IS and organization (Holland, 2003). There has been lack of an integrated approach to equally emphasize on the social and technical components of the organization as a work systems when examining the effects of IS on the organization (Bostrom et al., 2009).

The current study's finding has contributed to the gap on knowledge of the linkage of IS and firm performance by validating some earlier conclusions that found insignificant relations between IS and organizational performance, equally the findings contradict other conclusions that established this relationship.

The application of mixed theories dynamic capability, creative destructive, complementarity and adaptive structuration theories, enabled the multi-disciplinary approach of the current study to address the sociotechnical imbalance. Information systems is a cross-discipline subject and therefore a cross discipline study approach is encouraged aided by meta-theories like AST to bridge the IS and the organizational domain. Validation of Schumpeter's creative destruction theory has also be revealed through the literature on the rate of IS innovation adoptions in the banking industry. Further, the findings has revealed that of ISI and IT capability as some of the sought antecedent precursors of contextual ambidexterity in organization

Sociotechnical systems theories (STS) view an organization as a combination of the social and technical components that are ceaselessly interacting and affecting each other. The theories that IS researchers have frequently used seem to emphasize on a subset of the STS constructs that focus on the technical or the social components in exclusion. This skewed approach can only envisage experimental findings within a constraint context that limits the generalizability of the findings. Consequently, sociotechnical systems theories afford a probable resolution for the long-term necessity in information systems research for robust all-inclusive theories that will combine the two domains; IS and organization disciplines.

Adopting adaptive structuration (AST) theory of Desanctis et al. (1994) as a meta-theory has been proposed by Bostrom et al. (2009). Guided by the AST that links IS and organization domains, the current study advances and validates the application of STS theories specifically the AST theory. AST draws on some assumptions of structuration theory and of great importance to its usage, is the inclusion IT artifacts in the information systems structures to constitute the social context. The current study achieved by inclusion of IT capability. This greatly improves the outcome of examining and investigating the effect of IS usage in the organization (Bostrom et al.,2009).

The current study was guided by the adaptive structuration theory as a meta-theory to mitigate the imbalance of sociotechnical aspects of information systems studies and therefore provide more reliable results of the effect of IS in organizations. Additionally, AST as a linking theory between IS and organizational domains facilitated the comprehension of the dynamic process involved in technology innovation paradigm shifts (Furumo & Melcher, 2006). Guided by the AST theory, the findings support the conclusions as proclaimed by some other researchers, of the insignificant of the direct link of IS to the overall organizational outcome. However the findings strongly reveal the proxying effect of IS on organizational performance through other information systems' enabled organizational capability as asserted by Choi et al., (2008). This is demonstrated by the finding that over 83% of the indirect effect of IS integration is explained through organizational ambidexterity.

The study found that over 83% of IS effect on organizational performance is explained through organizational ambidexterity, further information technology capability recorded very strong and positive direct relationship with organizational ambidexterity. It, therefore, follows that information systems is one of the sought antecedents of the context based organizational ambidexterity as conceptualized by Gibson and Birkinshaw (2004). This corroborates with earlier studies' conclusions that IS affects firm performance through other IS enabled firm capabilities. In this case, organizational ambidexterity has been proved to fully mediate the relationship between information systems integration and firm performance.

Insofar as the linkage of IS and performance is concerned, the study has established that organizational ambidexterity is one such link through which information systems positively impacts on organizational performance. Gibson & Birkinshaw, (2004) and Prieto et al., (2007) demonstrated that IS positively affect firm performance through ambidexterity but at the business unit or departmental level. Prieto verified that at product development level IS does facilitate ambidexterity and ambidexterity mediates the relationship between IS and performance. Inferring these departmental findings to the entire organization is an important contribution to existing knowledge about IS, ambidexterity, and firm performance. The current study's findings affirm Prieto et al., (2007) departmental findings that IS facilitates ambidexterity with ambidexterity subsequently influencing firm performance though at the organizational level.

Consensus subsists from a number of empirical studies, like Rothaermel and Alexandre, (2009); Prieto et al., (2007) among others that ambidexterity positively influences firm performance, as attested by the current findings. Therefore, the sources of ambidexterity within organizations have attracted interest from various researchers. Prieto et al., (2007) alludes research is now focused on how firms can achieve ambidexterity. The findings in this study reveal that IS integration and IT capability are precursors of contextual organizational ambidexterity as conceptualized by Gibson and Birkinshaw (2004).

The pace of IS innovation adoption, especially in the banking sector, is unprecedented. The introduction of new revolutionary information systems innovations attacks the very foundation of existing ones and destroys the prevailing equilibrium at rare and irregular intervals. Profit advantage that such innovations capture invites imitators who eventually competes away the innovators' gains and establishes new equilibrium and the cycle iterates as new innovations are introduced in the industry. These are the tenets of creative destruction theory as postulated by Schumpeter (Parker, 2012).

Scholars studying technological change innovations' phenomenon have described how radical innovations are often accompanied by shake ups in the industry structure as Spencer and Kirchhoff (2006) noted as a result of discontinuity of equilibrium leading to the competitive destruction of the old innovations. The replacement of the old technologies benefits the firms introducing the new innovations at the expense of incumbents whose operations is tied to the older technologies which now becomes obsolete. Schumpeter creative destructive theory explains the phenomenon that is currently being experienced in the financial sector especially in Kenya. Adoption and application of new IS innovations in the financial services with mobile ICTs taking the center stage has caused a number of traditional technologies that gave competitive advantages to be rendered obsolete as financial institutions deploy new IS innovations being availed by ICT industry in an accelerated pace.

6.4.2 Implications for Managerial Practice

The validation of insignificant direct effect of information systems on firm performance has a number of implications to IS manager and business management. When considering IS investment for improving organizational performance, the focus should not be on the direct effect between IS investments and firm performance, but at other performance enablers enhanced by IS innovations (Lang & Colgate, 2003). Organizational value chain capabilities or industry value activities with a direct facilitative influence on the overall organizational performance should be the focus of information systems related innovations that are geared towards enhancing organizational performance. IS managers should work with business managers in identifying areas within the organizations' operations that can leverage on IS to create the greatest impact on organizational performance. Employing Porter's value chain model, organizational value chain processes can be prudently selected as candidates for automation for maximum firm performance impact. The focus should be on the identification of organizational capabilities that IS can enable to act as a proxy to improve organizational performance as a result of automation. Organizational ambidexterity is one such capability as the findings of the current study reveal.

When assessing the ROI or the overall IS contribution to the organizational performance, it should be noted that IS has an insignificant direct effect on performance. Therefore, the focus should be on IS enabling effect on the proxy processes or activities that consequently influence organizational performance directly. To have an authentic evaluation, the proxy process and or activities need to be evaluated before and after automation and comparison made with prior automation measures acting as the baseline for the evaluation. From the findings of this study, IS managers need to work collaboratively with business process owners to identify the appropriate candidates for automation that will have the greatest impact on overall performance including nonfinancial as espoused by the Kaplan and Norton balanced scorecard framework.

The banking sector IS enabled operations like online banking, mobile financial services have proved to be a significant contributor to the performance of financial institutions in Kenya. Mobile and Internet banking innovations have enabled timeless and location independent transactions for customers coupled with self-service capabilities all made possible by IS contributes greatly to the satisfaction and retention of customers. These are some of the key contributors to banks' overall performance as proved by Lang and Colgate (2003). A brief preview of the annual reports from various banks in Kenya and also from the Central Bank supervisory reports reveals a deliberate progressive adoption of IS by banks with the aimed of reducing operational costs and enhancing institutions' performance. To evaluate ROI of such investment, attention should be focused on the contribution of IS enabled innovations on the overall performance and not IS direct contribution. As Aduda and Kingoo (2012) and Magutu et al. (2011) affirm, in addition to the core banking systems, others internal areas of IS integrations have proved to contribute greatly to banks overall performance.

The role of IS interventions in organizations as vehicles of enhanced business performance is unprecedented. As organizations strive to take advantage associated with digital transformation, huge investments of resources in terms of time, money and human capital has been expensed (Bostrom et al., 2009). As management make decisions to invest and deploy IS innovations, considerations should be made about the life span of

competitive advantages accruing from these innovations. Schumpeter's creative destruction theory phenomenon should inform such decisions. The life span of IS innovations should be expected to last long enough for firms to recoup investments before imitations competes away the profits. However, information systems enabled competitive advantages are known to be short-lived a phenomenon that is explicitly captured by Schumpeter's creative destruction theory.

6.4.3 Implications for Policy

Financial institutions and the banking industry in is one of the leading sectors in exploiting the versatility of IS innovations. There is an increasing trend of ICT-enabled innovations in the provision of financial services in Kenya and globally. New IS enabled channels of provisioning of financial services has enabled institutions to serve wide reach with minimal or no expense in contrast with a conventional approach where physical presence was required. The agency banking, mobile banking in Kenya and the Internet banking in use in many countries, are some of the key IS enabled innovations in the sector. From these key innovations, a number of value-added services to the customers have been superimposed to extend service provision. For example, in Kenya, some of these include unconventional mobile based loaning like Mshwari, Equitel, Mbenki, PesaLink for customer interbank transfers, M-Akiba enabling the common citizens and low income earners to participate in government bonds among others.

These services do not require any physical interaction between the bank and the customer. The seamless integration of mobile banking with GSM-enabled money transfer services has made the basic mobile phones to become a financial services tool. The mobile is being used for most banking services including account opening and operations, settlement of financial transactions between individuals and organizations.

These IS enabled innovations is a hallmark and a new way of provisioning financial services and widening the scope and reach to conventionally unbanked populations especially in the remote rural areas in Africa. However, the ubiquitous provisioning of financial services through non-conventional way pose a challenge to the established

regulatory and supervisory framework. The IS enabled innovations while augmenting the performance of these institutions have introduced a range of risks that did exist on the traditional conventional banking. These risks need to be addressed to protect the public and ensure public confidence against financial fraudsters taking advantage of new loopholes not sealed by the existing frameworks. Recently the CBK and National treasury announced the need to regulate the mobile loans that financial institutions are providing to their customers.

Mobile loans have been in existence for several years in Kenya, however, currently there no clear regulatory framework that control pertinent issues like interest rates, security and even taxation of these transactions. These coupled with infiltration of cybercrime as a result of increasing ecosystem of automation in the banks has exacerbated the ineffectiveness of conventional regulatory framework.

The above issues are some the customer facing policy concerns that IS enabled innovations has brought to the fore. There are also intra and inter-financial institutions operations that have been transformed by the pervasiveness of information systems. Some of these requires an appraisal of existing controls and monitoring mechanism on the way some of the processes and procedures are carried out. For example, the paperless banking transactions that some banks have implemented demands that the way transactions were monitored and controlled be changed, the absence of traditional physical paper slip that acted as source document should need arise to audit some transactions is no longer available in paperless banking.

Conventionally banks' transactions could have definite timeframes and location limitation and therefore much easier to monitor and control operations, however, IS innovations have dismantled these and created new channels of service delivery that has availed banking services anytime, anywhere. This ubiquitousness of services need a new way of monitoring and controlling that is robust to take care of the 24/7 banking transactions that are location independent. This, therefore, means the regulatory and supervisory authorities need to review the existing frameworks continuously to mitigate

any associated risks that might come as a result of the ever progressive IS enabled innovations in the banking sector. These regulatory challenges have informed some countries like India to delay the authorization of mobile based financial services.

Mobile financial services are posing a regulatory and supervisory challenge to both the Central Bank as a financial regulatory authority and Communication Authority as a telecommunication regulatory authority here in Kenya. In the 2017 Financial Times conference proceeding on the theme ‘Payment Innovations’ held in Nairobi, it was argued that mobile financial services traverse both the telecom and financial services sector domains. This trans-sector scenario creates lapses and confusion on how to regulate the mobile financial services subsector. This is a challenge globally. There is need to review the regulatory to ensure full coverage of this progressively expanding hybrid subsector.

6.5 Limitations of the Study

Predictably, as in any given human driven activity, limitations and opportunities for improvement always exist. Research work is no exception, some of these limitations are due to the inherent nature of the study among other things. This could result from the methodology used, tools, and uncontrollable issues with the study units and the timing of the study. The study used PLS-SEM, even though this variant of SEM works with small sample size, generally when using SEM having large sample sizes is advisable as it increases the precision of the estimated parameters. However, there were only 56 banking institutions in Kenya and this is the reason the study used the census rather than a sampling with PLS-SEM.

PLS-SEM is preferably used for prediction Q^2 and therefore the findings do not indicate the explanatory capacity of the model. However, the model can be employed for predictive accuracy. The foregoing notwithstanding, the findings of study as indicated in the earlier resonate with earlier empirical studies considering similar variables.

The study had a limited scope addressing itself to only CBK regulated financial institutions and specifically the commercial and microfinance banks with the inclusion of Postbank. This therefore, limits the generalization of the findings. Although the finding can be generalized to the financial sector in Kenya caution need to be taken since the regulated and the unregulated financial institutions like SACCOs, non-deposit taking microfinance and other financial institutions might reveal different results compared to the regulated institutions. The inclusion of all financial institutions while addressing the sample limitations would embolden the generalization within the entire financial sector in the Kenya.

The nature of the unit of analysis can have some inherent challenges. The commercial and microfinance banks operating in Kenya and regulated by the Central Bank of Kenya as at December 2014 were the study's unit of analysis. Due to the sensitivity and tight regulations in this sector, respondents are usually apprehensive about sharing information and sometimes might provide incorrect information. The time of data collection of the study coincided with a turbulent period in the banking sector in Kenya with about three banks being closed and later placed under receivership within a period of less than three months. As a result of this data collection was difficult, but more significant was the concern of the frankness of the respondents. This, however, was mitigated by not asking absolute financial performance data from the respondents. Despite the above concerned, the fact that the findings corroborated with earlier studies is a clear justification of the study objectivity.

6.6 Suggestions for Further Research

The current study addressed itself to commercial and microfinance banks in Kenya as regulated by the Central Bank of Kenya. Though it is possible to generalize the findings within the financial sector, a study covering both regulated and unregulated financial institutions in Kenya would provide a more inclusive generalization within the financial sector. Such study would include SACCOs, non-deposit taking microfinance institutions, insurance companies, financial investment firms among others.

The research though validating other findings on IS and firm performance, cannot be generalized to firms in other sectors of the economy. A multi-sectorial study would address the limited scope and offer robust findings that can be generalizable across all the sectors of the economy. Such findings would be beneficial to all sectors of the economy and be a basis for practice and policy direction on automation within business organizations in the country.

The current trends in IS based mobile financial services innovations within the financial sector, need to be evaluated in regards to financial service inclusivity in the country. The impact of these mobile financial services innovations on firm performance will be an interesting discovery as firms accelerate the adoption of these IS innovations. Such studies can extend the scope and investigate the effect of these services at macroeconomic level in terms of job creation, poverty eradication among other key constructs of economic importance to the country. This is informed by the tremendous diffusion of mobile telephony and the accompanying mobile apps application across all sectors. The mobile telephony penetration in Kenya is now at 94.4% according to the ICT access gap report by the Communication Authority of Kenya, (2016) and still growing.

6.7 Chapter Summary

Chapter six is the concluding chapter and it presented the summary of the findings and the implications of these findings. The chapter started with a summary of the findings depicting on the analyzed relationships as guided the five specific objectives and associated hypotheses and how data was obtained to enable the required analysis. The discussion on the data analysis methodology using PLS-SEM and tool used to accomplish the data analysis was presented. In the conclusion part the study's findings are compared with other earlier studies findings and conclusions. The findings confirm and therefore validates some earlier studies, while equally contradicting others. This evaluation was based on the study's hypotheses testing's outcome.

The chapter also presented theoretical, managerial practice and policy and regulatory implications of the study on the relation of IS and organization. Further, the study's limitations which did not affect the validity of the findings are presented. This was followed by suggested areas of further studies to enrich the body of knowledge of information systems in organizations.

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APPENDICES

C/N.....

Appendix A: The Research Questionnaire

Introduction

*This questionnaire aims to collect data on information systems integration, information technology capability and the resource exploitative & explorative characteristics and the performance of banks in Kenya for a Ph.D. Thesis. You are kindly requested to participate in the study by responding to the items given in the various sections as indicated. There is no right or wrong answers to the questions. We are interested in your general assessment. The information provided shall be used **strictly** for academic purpose only. Your participation in facilitating the study is highly appreciated. The information provided will be treated with utmost confidentiality.*

PART ONE: GENERAL INFORMATION

- a) Title/designation
- b) How many years have you worked in the banking industry?
- c) How many years have you worked in this bank?

PART TWO: INFORMATION SYSTEMS INTEGRATION

2.1 i) To what extent is ICT applied in the execution of the following processes/operations in this bank?

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent
5= to a great extent (Tick)

Indicator	Process/Operation	1	2	3	4	5
VCM1	Account Management					
VCM2	Loan Management					
VCM3	Cash Management					
VCM4	Customer Relationship Management					
VCM5	Treasury Management					
VCM6	Human Resource Management					
VCM7	Compliance Management					
VCM8	Risk Management					
VCM9	Research & Development					

VCM10	Asset Management					
VCM11	Procurement					

ii) **Any other process/operation implemented by use of ICT in the bank?** (List the additional processes in the table below)

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent
5= to a great extent (Tick)

Indicator	Process/operation	1	2	3	4	5
VCM12						
VCM13						
VCM14						

2.2 i) To what extent is ICT applied in the execution of the following inter-organizational bank processes/operations in this bank?

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent
5= to a great extent (Tick)

Indicator	Process/Operation	1	2	3	4	5
VS1	Inter-bank operations (e.g cheque clearance, overnight borrowing, cash transfers)					
VS2	Operations with other stakeholders (e.g clients, fund transfer agents, Credit/Debit card Merchants, banking Agencies, e-commerce actors)					
VS3	Transactions with clients (eg. check-off for loan & other related transactions)					
VS4	Inter-linkages with money remittance providers/GSM to offer financial services to customers					
VS5	Credit/Risk management					

ii) **Other cross-organizational process/operation that ICT is applied in the execution in the bank?** (List the additional processes in the table below)

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent 5= to a great extent (Tick)

Indicator	Process/Operation	1	2	3	4	5
VS6						
VS7						
VS8						

2.3 i) To what extent does the bank use ICT to interconnect (integrate/interlink) the following processes & operations?

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent 5= to a great extent (Tick)

Indicator	Processes/Operation	1	2	3	4	5
VCM15	Internal bank processes & operations (e.g cash management, treasury, Account management, loan management, HR, Compliance, Risk management, R&D)					
VCM16	Customer oriented processes & operations (e.g Customer relationship management, Customer accounts)					
VS9	Inter-organizational processes & operations with other stakeholders as listed in 2.2 VS1 to VS5 above					

ii) **Any other processes or operations interlinked/integrated using ICTs within the bank?** (List the additional processes in the table below)

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent 5= to a great extent (Tick)

Indicator	Process/Operation	1	2	3	4	5
VS10						
VS11						
VS12						

PART THREE: ORGANIZATIONAL INFORMATION TECHNOLOGY CAPABILITY

3. To what extent does IT within the bank conforms to the following characteristics?

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent
5= to a great extent (Tick)

Indicator	Characteristic	1	2	3	4	5
IC1	Application within the bank runs on the same platform (servers & desktops, printers, networks, OS). No specific hardware for certain applications					
IC2	There are changes in hardware whenever there is new applications					
IC3	Changes in bank operations/processes requires changes in business applications to accommodate operational/process changes					
IC4	Business application changes/upgrades require changes on hardware too					
BS1	IT and Business are equally involved in the development & implementation of the bank's organizational strategy.					
BS2	Business units' plans and IT plans are done in a collaborative manner					
BS3	Head of IT is part of the senior management of the bank					
BS4	There is a strong partnering relationship between IT and business management teams					
PS1	There are deliberate efforts to discover new opportunities to utilize existing IT solutions in business operations					
PS2	The bank leadership deliberately search IT innovations that can enhance bank's operations					
PS3	The bank is among the leading group in trying out new IT innovations in the industry					

PART FOUR: ORGANIZATIONAL AMBIDEXTERITY

4. Specify to what extent the bank exhibits the following characteristics in its operations.

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent
5= to a great extent (Tick)

Indicator	Characteristic	1	2	3	4	5
ER1	There is deliberate continuous pursuit of new knowledge & skills to develop new product/service offerings					
ER2	There is continuous pursuit of drastic innovations designed to meet the needs of emerging customers or markets					
ER3	There are efforts to continuously develop new knowledge and progressively departure from existing knowledge					
ER4	There is deliberate efforts to create new markets					
ER5	The bank is constantly developing new products & services delivery channels					
EI1	The bank concentrates on building existing knowledge & extending existing products & services to customers					
EI2	The bank habitually concentrates on broadening existing knowledge & skills					
EI3	There is incremental innovations designed to meet the needs of existing customers or market					
EI4	There is constant efforts to improve established products & services designs					
EI5	The bank concentration on expanding existing products/services portfolio					
EI6	The bank concentrates on increasing the efficiency of existing products/services distribution channels					
EI7	The bank concentrates on building existing knowledge & reinforce existing skills, processes & structures					

PART FIVE: ORGANIZATIONAL PERFORMANCE

5.1 i) Between 2012 to date specify to what extent the bank registered improvements on the listed aspects.

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent
5= to a great extent (Tick)

Indicator	Aspects of improvement	1	2	3	4	5
FN1	Net assets					
FN2	Return on assets					
FN3	Capital & reserves					
CR1	Market share					
CR2	No. Loan accounts					
CR3	Customer satisfaction					
CR4	No. Customer accounts					
CR5	Amount of customer deposits					
PR2	Compliance requirements					
PR3	intra & inter functional coordination					
PR4	Stakeholder engagement (GSM, other financial institutions, regulatory/supervisory agencies)					
LG1	Quality service delivery					
LG4	Credit/Risk management					
LG5	Overall employee productivity					

ii) **Any other bank related aspect of improvement not listed above?** (List the additional processes in the table below)

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent 5= to a great extent (Tick)

Indicator	Aspects of improvement	1	2	3	4	5
LG						
LG						
LG						

5.2 i) Specify to what extent ICTs usage in the banking sector contributes to the following

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent 5= to a great extent (Tick)

Indicator	Bank related concerns	1	2	3	4	5
BR1	Banking related risks					
BR2	Management of banking related risks					
BR3	Internal bank frauds					
BR4	External bank fraud					
BR5	Significant increase in capital investment					

ii) **Any other positive or negative effects resulting from ICTs usage in the banking sector?** (List the additional processes in the table below)

Use the scale where 1= Not at all 2= to less extent 3=moderately 4= to high extent 5= to a great extent (Tick)

Indicator	Bank related concerns	1	2	3	4	5
BR6						
BR7						
BR8						

Appendix B: Latent Constructs and the Associated Coded Scale Items

Latent Construct/Variables	Scale Items	Item Codes
Information Systems Integration	Account Management	VCM1
	Loan Management	VCM2
	Cash Management	VCM3
	Customer Relationship Management	VCM4
	Treasury Management	VCM5
	Human Resource Management	VCM6
	Compliance Management	VCM7
	Risk Management	VCM8
	Research & Development	VCM9
	Asset Management	VCM10
	Procurement	VCM11
	Inter-bank operations (e.g cheque clearance, overnight borrowing, cash transfers)	VS1
	Operations with other stakeholders (e.g clients, fund transfer agents, Credit/Debit card Merchants, banking Agencies, e-commerce actors)	VS2
	Transactions with clients (eg. check-off for loan & other related transactions)	VS3
	Inter-linkages with money remittance providers/GSM to offer financial services to customers	VS4
	Credit/Risk management	VS5
	Internal bank processes & operations (e.g cash management, treasury, Account management, loan management, HR, Compliance, Risk management, R&D)	VCM15
	Customer oriented processes & operations (e.g Customer relationship management, Customer accounts)	VCM16
	Inter-organizational processes & operations with other stakeholders as listed in 2.2 VS1 to VS5 above	VS9

Latent Construct/Variables	Scale Items	Item Codes
Organizational Information Technology Capability	Application within the bank runs on the same platform (servers & desktops, printers, networks, OS). No specific hardware for certain applications	IC1
	There are changes in hardware whenever there is new applications	IC2
	Changes in bank operations/processes requires changes in business applications to accommodate operational/process changes	IC3
	Business application changes/upgrades require changes on hardware too	IC4
	IT and Business are equally involved in the development & implementation of the bank's organizational strategy.	BS1
	Business units' plans and IT plans are done in a collaborative manner	BS2
	Head of IT is part of the senior management of the bank	BS3
	There is a strong partnering relationship between IT and business management teams	BS4
	There are deliberate efforts to discover new opportunities to utilize existing IT solutions in business operations	PS1
	The bank leadership deliberately search IT innovations that can enhance bank's operations	PS2
	The bank is among the leading group in trying out new IT innovations in the industry	PS3
Organizational Ambidexterity	There is deliberate continuous pursuit of new knowledge & skills to develop new product/service offerings	ER1
	There is continuous pursuit of drastic innovations designed to meet the needs of emerging customers or markets	ER2
	There are efforts to continuously develop new knowledge and progressively departure from existing knowledge	ER3
	There is deliberate efforts to create new markets	ER4
	The bank is constantly developing new products & services delivery channels	ER5
	The bank concentrates on building existing knowledge & extending existing products & services to customers	EI1
	The bank habitually concentrates on broadening existing knowledge & skills	EI2

Latent Construct/Variables	Scale Items	Item Codes
	There is incremental innovations designed to meet the needs of existing customers or market	EI3
	There is constant efforts to improve established products & services designs	EI4
	The bank concentration on expanding existing products/services portfolio	EI5
	The bank concentrates on increasing the efficiency of existing products/services distribution channels	EI6
	The bank concentrates on building existing knowledge & reinforce existing skills, processes & structures	EI7
Organizational Performance	Net assets	FN1
	Return on assets	FN2
	Capital & reserves	FN3
	Market share	CR1
	No. Loan accounts	CR2
	Customer satisfaction	CR3
	No. Customer accounts	CR4
	Amount of customer deposits	CR5
	Compliance requirements	PR2
	intra & inter functional coordination	PR3
	Stakeholder engagement (GSM, other financial institutions, regulatory/supervisory agencies)	PR4
	Quality service delivery	LG1
	Credit/Risk management	LG4
	Overall employee productivity	LG5

Table 4.1 Summary of the Coded Scale items

Appendix C: Descriptive Statistics of Survey Measurements

Information systems integration		
Items	Mean	Std. Deviation
VCM1	4.0400	.57000
VCM2	4.1000	.50508
VCM3	4.1200	.62727
VCM4	4.1200	.87225
VCM5	3.7400	.82833
VCM6	4.3400	.79821
VCM7	3.7200	.78350
VCM8	3.5400	.70595
VCM9	3.4490	.79218
VCM10	3.7600	.55549
VCM11	3.6600	.68839
VS1	3.7959	.70651
VS2	3.6327	.78246
VS3	3.6531	.80496
VS4	3.6939	.89452
VS5	3.4694	.79325
VCM15	3.7200	.64015
VCM16	3.5600	.64397
VS9	3.5600	.67491
Information technology capability		
Items	Mean	St. Deviation
IC1	3.3400	.77222
IC2	2.6800	.68333
IC3	2.9200	.72393
IC4	3.5800	4.34290
BS1	3.4200	.70247
BS2	3.5200	.67733
BS3	3.9000	.93131
BS4	3.6000	1.12486
PS1	3.4600	.78792
PS2	3.5200	.70682
PS3	3.3200	.86756

Organizational Ambidexterity		
Items	Mean	St. Deviation
ER1	3.7200	.67128
ER2	3.5200	.67733
ER3	3.7800	.70826
ER4	4.0000	1.01015
ER5	3.6200	1.06694
EI1	3.7755	.84817
EI2	3.5800	.92780
EI3	3.6327	.63554
EI4	3.5800	.81039
EI5	3.5600	.70450
EI6	3.7000	.70711
EI7	3.5417	.68287
Organizational Performance		
	Mean	St. Deviation
FN1	3.7857	.64527
FN2	3.7400	.69429
FN3	3.6000	.72843
CR1	3.6667	.87420
CR2	4.0816	.73134
CR3	4.4000	.69985
CR4	4.4082	.83960
CR5	4.1837	.92811
PR2	3.5800	.67279
PR3	3.4800	.67733
PR4	3.6600	.71742
LG1	3.7600	.68690
LG4	3.6000	.69985
LG5	3.9000	.64681

Table 4.5: Descriptive Statistics of Survey Measurements

Appendix D: Study Population

a) Privately owned commercial banks

1. African Banking Corporation Ltd
2. Bank of Africa Kenya
3. Bank of Baroda (K) Ltd
4. Bank of India
5. Barclays Bank of Kenya Ltd
6. CFC Stanbic Bank Ltd
7. Charterhouse Bank Ltd
8. Chase Bank (K) Ltd
9. Citibank N. A Kenya
10. Commercial Bank Africa Ltd
11. Co-operative Bank of Kenya Ltd
12. Credit Bank Ltd
13. Diamond Trust Bank Kenya Ltd
14. Dubai Bank Kenya Ltd
15. Ecobank Kenya Ltd
16. Equatorial Commercial Bank Ltd
17. Equity Bank Ltd
18. Family Bank Ltd
19. Fidelity Commercial Bank Ltd
20. Fina/GTbank Ltd
21. First Community Bank Limited
22. Giro Commercial Bank Ltd
23. Guardian Bank Ltd
24. Gulf African Bank Ltd
25. Habib Bank A. G Zurich
26. Habib Bank Ltd
27. Imperial Bank Ltd
28. I & M Bank Ltd
29. Jamii Bora Bank
30. Kenya Commercial Bank Ltd

- 31. K-Rep Bank Ltd
- 32. Middle East Bank (K) Ltd
- 33. NIC bank Ltd
- 34. Oriental Commercial Bank Ltd
- 35. Paramount Universal Bank Ltd
- 36. Prime Bank Ltd
- 37. Standard Chartered Bank Kenya Ltd
- 38. Trans-national Bank Ltd
- 39. UBA Kenya Bank Limited
- 40. Victoria Commercial bank ltd

b) Publicly owned commercial banks

- 41. National Bank of Kenya Ltd
- 42. Development Bank Kenya Ltd
- 43. Consolidated Bank of Kenya Ltd

I. Mortgage Finance Companies

- 44. Housing finance Ltd

II. Licensed Microfinance Banks (MFB)

- 45. Choice Microfinance Bank Limited
- 46. Faulu Microfinance Ltd
- 47. Kenya Women Microfinance Bank Ltd
- 48. SMEP Microfinance Bank Ltd
- 49. Remu Microfinance Bank Ltd
- 50. Rafiki Microfinance Bank Ltd
- 51. Uwezo Microfinance Bank Ltd
- 52. Century Microfinance Bank Ltd
- 53. Sumac Microfinance Bank Ltd
- 54. U&I Microfinance Bank Ltd
- 55. Daraja Microfinance Bank Ltd
- 56. Caritas Microfinance Bank Ltd

III. The Kenya Post Office Savings Bank Act Cap 493B

- 57. Kenya Post Office Savings Bank (Postbank)

Representative Offices of Foreign Banks

58. Mauritius Commercial Bank Ltd

59. HDFC Bank Ltd

60. Nedbank Ltd

61. FirstRand Bank Ltd


62. Bank of China Ltd

63. Bank of Kigali Ltd

64. Central Bank of India

65. Rabobank Nederland

Appendix E: Data Collection Approval Letter



UNIVERSITY OF NAIROBI
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10th March, 2016

TO WHOM IT MAY CONCERN

Dear Sir/Madam,


INTRODUCTORY LETTER FOR RESEARCH
KAMAU MWANGI – REGISTRATION NO.D80/80016/2008


The above named is a registered PhD candidate at the University of Nairobi, School of Business. He is conducting a study on *"Information Systems Integration, Information Technology Capability, Organizational Ambidexterity and the Performance of Banks in Kenya "*.

I request your organisation to assist the student with necessary data which forms an integral part of the research project. The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your co-operation will be highly appreciated.

Thank you.


Dr. Mary Kinoti
Associate Dean, Graduate Business Studies
School Of Business



MK/m