INFORMATION SYSTEMS INTEGRATION, INFORMATION TECHNOLOGY CAPABILITY AND ORGANIZATIONAL

AMBIDEXTERITY OF BANKS IN KENYA

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KeyWords

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ABSTRACT

Many studies points to an insignificant direct correlation between information systems and firm performance. However, it is an established fact that, if deployed appropriately information systems have been proved to positively influence organizational performance. There is unanimous concesus that informations systems influence the overal organizational performance. Findings allude to an indirect influence through proxies that directly affects organizational performance. There is a undisputed agreement across all organizational literature that firm's long-term successful survival is determine by its ability to efficiently exploits its current resources and capabilities while simuteneously exploring new opportunities for future success. Organizations that are able to balance these two seemingly conflicting activities are said to be ambidextrous. The perversiveness of IS across all organizational operations and processes is expected to influence organizational ambidexterity. Subsequently ambidexterity directly correlates with organizational performance. Ambidexterity is one of the proxies of the association between IS and firm performance. The current study endavoured to establish the relationship of IS integration, IT capability and organizational ambidexterity, the interactive influence of IT capability (ITC) on this relationship between IS and ambidexterity was also examined. The overriding objective aimed at verifying whether there exists a significant direct relationship between IS integration and organizational ambidexterity (OA). The current study employed a mix method of descriptive, exploratory and cross-sectional designs to investigate the relationships of the constructs in the study. The current research employed the more robust structural equation modeling specifically PLS-SEM to analyze the relationships between the conceptualized constructs relationships. From the analysis, the direct linkage between IS integration and organizational ambidexterity was found to be statistically significant. IT capability was also found to significantly contribute to OA. However, IT capability was found to inhibit the correlation between IS integration and organizational ambidexterity. The significant linkage between IS and OA is a proof that IS impacts firm performance indirectly. Therefore, ROI of automation should be focused on IS enabled proxies that have a direct link with firm performance like organizational ambidexterity. The study also reveals that IS integration and IT capability are some of the sought antecedents of organizataional ambidexterity.

1. INTRODUCTION

1.1.   Background

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. There has been a great advance in technology and aggressive infusion of information technology in all aspects of life universally. Globally as asserted 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, 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 ICTs especially mobile-based in Kenya.

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 information systems contributes to the strategic and operational success of organizations using assorted lenses and competing theoretical models. This is also corroborated by Bostrom, Gupta and Thomas (2009). Earlier empirical studies such as Bharadwaj (2000); Dehning and Stratopoulos (2003) and Radhika and Hartono (2003) have shown that investments in information systems does translate into improved firm performance. Consequently, corporations allocate and commit huge resources to acquire information systems related resources with a presumption that these investments will provide economic returns in form of improved organization performance.

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 early adopters in leveraging on the robust ICT opportunities in Kenya (Central Bank of Kenya [CBK], 2014). This has brought a paradigm shift in banking operations and service provisioning as confirmed by Aduda and Kingoo (2012). Sharma (2011) asserts that, for banks, technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability. For customers, it is the realization of their anywhere, anytime, anyway banking dream with value added services that were not part of the conventional banking services. Leveraging on robust IT platforms has enabled quality banking services that are efficient and on a wider scope in Kenya as confirmed by the CBK supervisory reports (CBK, 2015; 2014). Banking institutions in Kenya continued to embrace technology to enhance efficiency internally and provide convenience to customers (CBK, 2014; Kamau, 2009; Nyangosi & Arora, 2009).

1.1.1   Information Technology and the Banking Industry

Information and communication technology revolution affects industry competition by changing industry structure thus altering the basis of competition, creating new competitive advantage by according business organizations innovative ways of out performing competion and brooding new businesses opportunities and markets that traditionally would be difficult to reach or access. 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 Equity Bank of Kenya

(Equitel, 2016; Safaricom, 2015).

As Aduda and Kingoo (2012) appropriately assert, the banking industry has been in a process of significant transformation, the potency behind this transformation globally is innovations in information technologies.The developments and evolution of technologies are leading to increasing competition in different financial institutions around the world (Sharma, 2011). 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). 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 authorities need to address (Sharma,2011). Despite these risks associated with IS adoption in the banking sector, appropriate IS deployment coupled with requisite IT capability will ensure the overall benefits far outweigh the associated risks.

1.1.2   Research Objective

The current study's objectives were;

i.   To examine the relationship of information systems integration and the organizational ambidexterity of banking institutions in Kenya;

ii.   To examine the relationship of information technology capability and the organizational ambidexterity of banking institutions in Kenya and

iii.   To establish the influence of information technology capability on the correlation of IS integration and firm's ambidexterity.

1.2   Methodology

1.2.1   Research Design and Population

The study used mixed method of descriptive, exploratory and cross-sectional. These three research designs enabled the achievement of the study's objectives. Cooper and Schindler (2008) argued that a cross-survey design collects data from a select sample of a population to explain a prevailing phenomenon by enquiring form individuals about their views, behaviors attitudes, or ideas. The study also explored whether IS integration and IT capability are part of the sought antecedents of ambidexterity within 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 ambidextrous effects of IS integration and IT capability in the banking institutions in Kenya.

The target population was the 56 banking institutions in Kenya comprising of the Central Bank of Kenya (CBK), 42 commercial banks, 12 microfinance banks and Postbank of Kenya. 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 the study used the census.

1.2.2   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. A structured questionnaire 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 argue, there is a lag period between the creation and realization of any automation initiative in organizations, 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 of various banks. Being in senior management positions in the institutions they are 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.

1.2.3   Data Analysis

The study employed structural equation modeling (SEM), specifically the partial least SEM (PLS-SEM) for analysis including estimation of measurement and structural models, hypotheses testing and the overall model test and model predictive relevance. PLS-SEM as implemented in SmartPLS version 3.2.1 software tool was employed to analyse the primary data. In congruence with the current study's philosophical paradigm, research that applies SEM usually follows a positivist epistemological belief (Urbach & Ahlemann, 2010)

2.   LITERATURE REVIEW

2.1. Information Systems Integration

Information system constitutes all information both internal and external to the organization that affects the organization in some way. There are three elementary organizational activities associated with information systems, these are; data entry, data conversion to information, and the outputing of the processed information needed by the organization to function in the attainment of the mission.The extent to which organizational information and application systems are shared, accessed and utilized by all organizational actors, operations and processes 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.

According to Hasselbring (2000) each organizational unit can be structured vertically in three distinct architectural layers; 1) The business architecture layer defining the organogram and the organizational business workflows as articulated on the established rules and processes; 2) The articulation of business concepts in form of enterprise applications is defined in the application architecture and finally, 3) 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 stakeholders' awareness about the organizational operations to be broadened (Bhatt, 2000).

Organization's stakeholders including the customers, suppliers, distributors, shareholders, and regulatory authorities are in constant interaction with the business organization and its information systems continuously through the life of the organization. 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. Part of this response is to both internal and external stakeholders.

2.2. 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). 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, and employees' business processes knowledge among other organizational specifics competences. All these are geared towards the furtherance of the organizational goals through the application of information systems.

Chae et al. (2014) state 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 dimensions: information technology infrastructure capability, information technology business spanning capability and the information technology proactive stance competence. Consequently, information technology capability is the overriding general construct subsuming the three dimensions. Information technology capability therefore reveals the degree to which an organization excel 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 dimensions. An organization exhibiting greater information technology capability should equally portray a substantial degree of each of the three information technology capability dimensions (Lu & Ramamurthy, 2011).

IT capability is heterogeneous across firms and creates unique competitive advantages and intangible resources in organizations (Bharadwaj, 2000). Erformance and Mithas (2011) apply a progressive gauge of information management capability to address the demand for development of a continuous evaluation of information technology capability to 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 of IT capabilities within organization.

2.3. Organizational Ambidexterity

According to Patel, Messersmith and Lepak (2013), ambidexterity is the capability of a firm of proficiently utilizing the prevailing opportunities within the organization and simultaneously innovating sufficiently to address the future opportunities and challenges. Organizational ambidexterity focuses on the ability of the organization to balance efficient utilization of existing competencies through exploitation and at the sametime foster the innovativeness through exploration to bring forth the products and services that will enhance future firm competitiveness (Patel, Messersmith & Lepak, 2013). 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).

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 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).

Predominantly in several organizational literature, there is consensus about organizational success in a dynamic operating environment and organizational ambidexterity. To be successful organizations in these 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 envisioned to propel organizational agility given it flexibility and scalability it accords organizations. Companies that are moving most aggressively to adopt cloud computing are being rewarded with a competitive advantage through increased business agility based on a recent survey of large and midsize organizations around the world conducted by the Harvard Business Review Analytic (HBR, 2014).

2.4. Information Systems Integration and Organizational Ambidexterity

Strategy 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). The omnipresence of information systems across all organizational operations and processes is expected to impact on organizational ability to exploit existing resources endownmnet and simultaneously exploring new opportunities to guarantee successful survival.

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. IS as one of the ingredients of organization context is often pointed out as the anchor to achieve both exploitation and exploration and develop ambidexterity within the organizations.

Though Prieto et al. (2007) study findings revealed significant evidence confirmed that IS 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 covariation between IS and agility and subsequently on firm performance. However, agility addresses the responsiveness aspects of ambidexterity. In a study of commercial banks, Magutu et al. (2011); and Lang and Colgate (2003) found out that, through information systems, banks ; 1) are able to monitor and optimize the sale-cash circuit; 2) facilitated to timely response to customer evolving requirements; and 3) facilitated the mitigation of exchange rate risks among other IS enabled exploitative and explorative activities in the banks'back office operations.

Information systems are inseparably intertwined with almost all business operations across the value chain and the industry value system. Therefore, it should be expected that information systems would have an influence on 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 in product development. 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 long term organizational performance may 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 thereby sustaining firm performance. Patel et al. (2013) contend that these were 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) restricted their contribution through investigating how human resource management systems contributes to contextual ambidexterity in the organization. Their 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 endeavored to investigate enterprise-wide information systems integration and its influence on contextual ambidexterity. The study employed structural equation modeling (SEM), a more robust analytical technique instead of the conventional statistical method. Combined with IT capability as discussed above, IS integration is expected to greatly influence organizational wide ambidexterity capability for subsequent long-term organizational performance. Equally, the study proposes that; IT capability has a significant facilitative effect on the relationship between IS integration and organizational ambidexterity.

2.5. Information Systems, 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 the 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 infor-

mation-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).

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, (GBhatt, 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 aptitude to deploy shareable foundational IS infrastructure, business-IS strategic partnership and IS proactive stance which is the quest of the firm exploring new ways to adopt IS innovations or exploit prevailing IS resources to generate business opportunities. For example Safaricom, originally a GSM firm using IS innovations has utilized the mobile financial services to emerge as the most profitable firm in the East and Central Africa region for a number of years (Safaricom 2015).

Chae et al.(2014); 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 and performance. 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 found 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) found that, appropriate information management capability plays a crucial role in developing another organizational capability that subsequently directly influence firm performance.

Suzuki (2015) and other scholars have empirically established a positive linkage between ambidexterity capability and organizational performance. This discovery has elicited a growing interest by both researchers and practitioners in this

nascent concept that traverses various fields (Nosella, Cantarello & Filippini, 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 facilitating firm performance though at organizational unit level.

According to Jansen et al. (2012), prior studies on organizational unit ambidexterity fall short of considering interunit 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, either constraining or synergistically contributing to 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 investigated the relationships between IS integration, organizational ambidexterity and IT capability influence on these associations. 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 be investigated. Exploration and exploitation tension were the organizational contrasting goals under review in this study. Therefore, the overriding proposition under examination was that IS integration has a significantly direct relationship with organizational ambidexterity and that IT capability has a significant moderating effect on this relationship.

3. THE RESEARCH HYPOTHESES

Subsequent from a thorough review of information systems, IT capability and organizational ambidexterity literature, the current study proposed the following hypotheses associated with the three research objectives.

H_1: There is a significantly positive relationship between IS integration and organizational ambidexterity.

H_2: There is a significantly positive relationship between IT capability and organizational ambidexterity.

H_3: IT capability has a significant positive moderating effect on the relationship between IS integration and organizational ambidexterity.

4. FINDINGS

4.1. Measurement Model Evaluation

4.1.1. Measurement Model's Internal Consistency Reliability

In PLS-SEM analysis, 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 three constructs on the current study 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 used to reflect the constructs in this study have very high internal consistency reliability. Table 4.1 below shows the CR values for the three constructs IS integration, IT capability and Organizational Ambidexterity.

Construct	Composite Reliability(CR)	Indicators	Loading	t Statistics	AVE
IS Integration	.872	Value chain primary activities VC_Pri	.926	37.510	.696
		Value chain support activities VC_Sup	.781	7.685	
		Industry value chain VS_Ind	.786	9.910	
IT Capability	.892	IT Infrastrcuture capability IT_Inf	.730	8.338	.741
		IT Business spanning cabaility IT_Bus	.938	47.841	
		IT Practive stance capability IT_Pro	.900	32.371	
Organization Ambidexterity	.961	Exploitive activities EX_Loi	.967	123.690	.925
		Explorative activities EX_Lor	.957	61.651	

Table 4.1 Composite Reliability and Indicator Loadings

4.1.2. Measurement Model's Indicator Reliability

The measurement model's indicator reliability is measured through the assessment of the items loadings. For reflective SEM model like is the case for the current study, construct loading estimates the direct effects of constructs on indicators and are interpreted as regression coefficients. Measurement model's acceptable indicator reliability is considered attained if all the items loading records value of 0.7 or higher and statistically significant at $p < 0.05$. The study's item loading recorded values of between 0.781 and 0.967 at significant level of $p=0.001$. The study's items (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 4.1 above.

4.1.3. Measurement Model's Convergent Validity

The measurement model's average variance extracted (AVE) value is used to measure 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. Therefore, the study's measurement model established the requisite convergent validity. Table 4.1 above shows the respective latent variables' respective average variance extracted values.

4.1.4. 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. However, 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. For discriminant validity to be established between two reflectively modeled constructs, the HTMT value must be lower than 0.90. The three constructs of the study had HTMT value of the range of 0.803 to 0.858 as shown on Table 3.2 below 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

Table 4.2 Latent variables HTMT values

The other approach of assessing discriminant validity is to examine the manifest variables' (indicators') loadings on their associated latent variables (constructs) correlations. The result of the manifest variables loadings on the respective latent variables is shown on Table 4.3 below. All manifest variables recorded high loadings on the associated latent variable in comparison to the other latent variables on the SEM model. The loadings clearly separate each construct as theorized in the SEM model. Therefore, the cross-loading outcome upholds the HTMT 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
EX_Loi	0.743	0.787*	**0.967**
EX_Lor	0.576	0.637	**0.957**
IT_Bus	0.640	**0.938**	0.681
IT_Inf	0.508	**0.730**	0.494

IT_Pro	0.633	**0.900**	0.715
PF_Cus	0.417	0.245	0.609
VC_Pri	**0.926**	0.715	0.680
VC_Su	**0.781**	0.360	0.506
VS_Ind	**0.786**	0.652	0.526

Table 4.3 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 which is the second stage of SEM analysis.

4.2. Structural Model Evaluation

Structural equation modeling's inner model representing the hypothetical constructs association is referred as the structural model. It is the schematic depiction of the underlying conceptualization of constructs' relationships schematically represented by the path model. Structural model estimation results permit the researcher to establish the degree to which the empirical data vindicates the extant theoretical exposition as presented by the researcher's literature and condensed on the proposed hypotheses. Consequently, on the basis on the structural model evaluation results, it is possible to interrogate and authenticate or invalidate empirically the researcher's conceptualization.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 as evevaluated on preceeding section above.

4.2.1. Goodness of Fit for the Structural Model

Structural equation modeling analysis is executed in two phases. Section 3.1 above performed the first phase of evaluating the measurement (outer) model. The quality of the measurement model impacts greatly on the outcome of the structural (inner) model and subsequently on the overall rigor of the study. After successful qualification of the measurement model, the next phase in SEM analysis is the evaluation and estimation of the inner or structural model. Corroborating with other scholras, Hadi, Abdullah and Ilham (2016)state that, in the evaluation of the measurement and structural models, researchers must look at reliability, construct validity (convergent and discriminant), collinearity, the associations coefficients, R^2 value and Q^2 value as measure of predictive capability of the model.

The structural model's fit criteria considered for this study are multicollinearity based on variance inflation factor (VIF) and predictive relevance (predictive accuracy) based on Stone-Gleisser Q^2 value.   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 and the coefficient of determination R^2.

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 (Garson, 2016; Hair et al., 2013). IS Integration, IT Capability associations with Organizational Ambidexterity as endogenous constructs for the current study had VIF values of 1.939 and 1.928 respectively.

Therefore, the study's VIF coefficients for the structural model are within the acceptable limit. In PLS-SEM analysis, blind-folding 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 appraisal of the model's predictive accuracy or its dependability, these are; 1) The latent variables' cross-validated redundancy; 2) The latent variables' cross-validated communality; 3) The manifest variables' cross-validated redundancy and 4) The manifest variables' cross-validated communality. The Stone-Gleisser (Q^2) value is the measure used to measure cross-validated redundancy of endogenous latent variable in a model with reflective manifest variables. The current study has one reflectively modeled endogenous latent variable. A Stone-Gleisser Q^2 value of higher than 0 is an indication that model with its associated exogeneous variable(s) can provide prediction of the specified endogenous variable under investigation, correspondingly a Q^2 with a value of 0 or negative value is an implication 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 a average effect size with Stone-Gleisser value of 0.35 implying a high effect size.

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

The current study SEM model had one endogenous latent variable, OrganizationalAmbidexterity. The following isthe coefficient of determination, R^2 value at $p < 0.05$ significant level; R2=0.686, t=8.909, p=0.000. This indicates that the model accounts 68.6% variance in Organizational Ambidexterity of banks in Kenya. The explained variance for the endogenous latent variable is 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 moderate and 0.19 considered as weak. Therefore, the coefficient of determination revealed that IS integration and IT capability within Kenyan banks has a substantial effecton the banks' organizational ambidexterity.

The predictive relevancy of PLS-SEM models measures the degree to which the model's endogenous latent variables can be projected by the associated model's exogenous latent variables. Following Cohen 1988 classification of Stone-Gleisser Q^2 values as cited by (Hair et al., 2014), the current study's model registers a strong predictive relevance of IS integration and IT capability on organizational ambidexterity with Q^2 value of 0.579.

The summary of hypotheses testing resulting from PLS analysis is shown in table 4.4 below.

4.3. Hypthesis Testing

Hypothesis H_1 proposition that IS integration has a significant positive correlation with Organizational Ambidexterity at $t > 1.676$ and $p < 0.05$ is supported with the following results; β= 0.366, p=0.0031, t= 2.158 and change effect size value of f2=0.221.

Hypothesis H_2 proposed that there is a significant positive direct relationship between IT capability and banks' organizational ambidexterity. The direct correlation of IT capability and organizational ambidexterity at $p < 0.005$ and $t > 1.676$ recorded the following analytical values; β=0.500, p=0.000, t= 3.839 and f2=0.414. This reveals that IT capability has a significantly strong positive direct correlation with organizational ambidexterity. The change effect size is the highest in the

model confirming the strength of this association with a value f2 of 0.414.

Hypothesis H_3 envisaged that IT capability positively moderates IS integration and organizational ambidexterity correlation at t> 1.676 and p< 0.05. The following were the analytica results; β= -0.237, p=0.005, t= 2.821 and change effect size value of f2=0.231. These findings reveal that IT capability has a statistically significant constraining (the negative path coefficient) interactive influence on the relationship between IS integration and organizational ambidexterity.

	Hypotheses	Path Coefficients	t-Statistics	P-Values	Supported or Rejected
H_1	IS integration → Organizational Ambidexterity	0.366	2.158	0.031	Supported
H_2	IT Capability→ Organizational Ambidexterity	0.500	3.839	0.000	Supported
H_3	IT Capability positive moderation effect on IS Integration→ Organizational Ambidexterity	-0.237	2.821	0.005	Rejected

Table 4.4 Summary of Hyptheses Test at p<0.05 and t< 1.676

5. DISCUSSIONS

5.1. Information Systems Integration IT Capability and Organizational Ambidexterity

The results of hypothesis H_1 revealed that IS integration and organizational ambidexterity correlations at P< 0.05 level had the following outcome; β=0.366, p=0.031, t= 2.158 and f2=0.221. These statistical outcomes indicate IS integration significantly and positively correlates with organizational ambidexterity. The change effect size is relatively high at f^2 value of 0.221 indicatingthe significant IS integration contribution to the overall R^2 of the organizational ambidexterity.

Strategy and organizational scholars have increasingly shown a great interest in organizational ambidexterity (Kauppila, 2010). 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 is crucial to the survival of any firm (Good & Michel, 2013; Raisch et al., 2009). As confirmed hypothesis H_1, IS 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). Organizational context constitutes the organizational systems, processes, and beliefs that shape individual-level behaviors within the organization (Gibson & Birkinshaw, 2004). Information systems are one of the ingredients of organization context and the anchor to the achievement of both exploitation and exploration and development of firm ambidexterity.

Though at organizational scope, the current findings are in support of Prieto et al. (2007) study findings which revealed significant evidence that IS encourages explorative and exploitative activities at product development. The current results corroborates with a study on IS alignment, agility and firm performance on 241 firms by Tallon and Pinsonneault (2011)

which revealed a significant and positive covariation between IS and agility and subsequently on firm performance. Agility addresses the responsiveness aspects of ambidexterity through the exploitation of current capabilities. As discussed earlier, Magutu et al. (2011) and Lang and Colgate (2003) findings are also validated by the outcome of hypothesis H_1.

The finding has empirically proved that IS being inseparably intertwined with almost all business operations across the value chain and the industry value system positively influence the organizational-wide exploitation and exploration activities. This extends the scope of Prieto et al. (2007) findings that IT encourages exploitation and exploration activities and the subsequent performance at a business unit level. IS integration influences firm adaptiveness and innovation (Bhatt, 2000; He & Wong, 2004; Lavie & Rosenkopf, 2006; Zahra & George, 2002). The result of H_1 provides a response to Patel et al. (2013) quest for empirical work to identify organizational systems that facilitate contextual ambidexterity as conceptualized by Gibson and Birkinshaw (2004). The findings also prove that IS integration is part of the sought antecedent of organizational ambidexterity (Gibson & Birkinshaw, 2004; Prieto et al., 2007).

The second hypothesis proposed a significant direct and postive relationship between IT capability and organizational ambidexterity.The direct link between IT capability and organizational ambidexterity confirms that IT capability as indicated by Mithas, Ramasubbu & Sambamurthy (2011), is a builder of other firm capabilities. In this case, IT capability enables organizational ambidexterity that subsequently influences firm performance directly. Chae et al. (2014) also established empirically an insignificant direct link between IT capability and overall organizational performance. Bharadwaj (2000) on the other hand, using a matched comparison methodology on IT capability and firm performance 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 regarded as IT-enabled revenue growth, seems to resonate with the finding of this outcome and other studies such as (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 enabled by multiple channels enabled by technology through online banking, the accrued benefits are more easily associated with marketing and sales effort through innovative customer relationship rather than the underlying technology.

The moderating effect of IT capability on the association of IS integration and organizational ambidexterity H3, proved significant though negative. The significant constraining moderation influence of IT capability on the correlation of 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 agile operations of ambidexterity. IT capability as postulated by Lu and Ramamurthy (2011) 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 IT capability negative interaction between the IS integration and organizational ambidexterity relationship,

6. SUMMARY & CONCLUSION

6.1. Summary of the Findings

The overall goal of the current research was to investigate the association of IS integration, IT capability and organiza-

tional ambidexterity in Kenyan banks. The interative effect of IT capability on the correlation between IS integration and organizational ambidexterity was examined. Specifically, the study's hypotheses were testing the effect of IS integration and IT capability on organizational ambidexterity. Structural equation modeling specifically PLS-SEM was employed to analyze the relationship as theoretically conceptualized. The suitability of PLS-SEM as the appropriate method was based on two main reasons; 1) for the current study's goal of prediction of the covariance of the model variables rather than theory testing and 2) the small sample size of commercial and microfinance banks in Kenya constraint rendered PLS-SEM as the most appropriate SEM approach for the current study.

The measurement model established acceptable reliability and validity of the manifest variables. For internal consistency, the three constructs CR values surpassed the cutoff value of 0.7. Item loadings recorded high values than 0.7 at p-value of 0.001, signifying the reliability of all the indicators. Equally the outer model similarly was verified for suitable convergent and discriminant validity registering AVE values above 0.50 and HTMT within the acceptable cut-off points. The study's indicators loaded on their corresponding constructs as required. The inner model validation revealed acceptable outcomes. The coefficient of determination R^2 was strong at 68.6%. This demonstrated significant explanatory power. The SEM model's predictive relevance had Q^2 value of 0.579 beyond the zero value that implies null predictive power.

6.2. Conclusion of the study

The results from hypotheses testing were largely in conformity with earlier studies. 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 like ambidexterity enhanced through automation and not directly from IS integration. Information systems should be viewed as enablers and facilitators of other business processes and activities such as exploitative and explorative that directly affects organizational performance. The study also revealed that IS within organization are part of the sought sources of ambidexterity.

6.3. Contribution of the Study

From the findings and in conformity with some earlier studies it was established that IS does indirectly affect long term firm performance through other IS enabled organizational capabilities, in this case ambidexterity. Further, the findings contribute to the extant literature especially in IS and organization in an effort to seek clarity sought by IS scholars in examining the linkage of IS and firm performance. Chae et al., (2014); and Mithas et al.(2012) suggest that critical gaps still remains in this area with some studies revealing mixed outcomes. Bostrom et al. (2009) argued that IS studies have difficulties in yielding comprehensible extrapolatable results of the effect of information systems in the organization.

When considering IS investment for improving organizational performance, the focus should not be on the direct 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 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 performance impact. The focus should be the identification organizational capabilities like in this case ambidexterity that can act as a proxy to improve organizational performance as a result of automation.

When assessing the ROI or the overall IS contribution to the organizational performance, 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 organizational performance.

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