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The Influence of Information Technology System Quality on Business Value Creation in Commercial Banks in Tanzania: The Moderating Role of Information Technology Knowledge Management

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Abstract
This study examines the influence of IT system quality on business value creation in commercial banks in Tanzania. Moreover, the study tests the moderating role of IT knowledge management on the influence of IT system quality on business value creation. Data was collected using a questionnaire filled by heads of marketing and finance from all 35 commercial banks in Tanzania and analysed using Structural Equation Modelling through SmartPLS. The findings revealed that there is a positive and significant influence of IT systems quality on business value creation and IT knowledge management moderates the influence. The findings suggest that a bank with better IT quality has a high chance of creating value for the business and a bank that empowers business managers with IT knowledge has a better chance to improve the role of its IT systems in enhancing business value creation. The study provides insights into the role of business managers' IT knowledge and skills in creating value in technology-dependent organizations in developing countries. Banks are therefore encouraged to create an environment for business managers to develop and apply their IT knowledge in executing their responsibilities.

Key Words: *IT quality, System quality, Business value, IT knowledge management, Commercial banks.*

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Introduction

The advancement of technology has led to rapid changes in the way firms operate (Côrte-Real *et al*., 2020). Currently, IT plays a critical role in business value, which has shifted from being a support service to an enabler of business value creation (Masele & Kagoma, 2021; Mikalef *et al*., 2021). For example, the use of IT has enabled banks to integrate with telecoms and hence improve service delivery by banks. In addition, banks expand their markets using point of sales (POS), which increases customer satisfaction and bank value. Nevertheless, technological advancement increases competitive pressure in the markets and system quality issues, which led to survival challenges for many banks in developing countries (Ringim et al., 2015; Shagari et al., 2015). This IT system quality (the desired characteristics of systems) issues were also linked to the challenges of compliance reporting and security, and hence impact banking performance and value (Assensoh-Kodua & Msosa, 2020; Kaur & Arora, 2021; Shagari *et al*., 2015). These market and regulatory compliance demands bring challenges for banks, which weaken the value creation ability in banks (Gurung & Perlman, 2018).

There are ongoing scholarly debates on the exact link between IT systems quality and business value. Business value is referred to as the end of business outcome(s) expected after investment is made where such outcomes may be financial, non-financial or both (Ahmad & Arshad, 2014). IT system quality in particular has been receiving significant attention in many literatures. Generally, scholars agree on the potential of IT systems quality in creating business value (Braojos et al., 2020; Gao et al., 2020; Kartika & Heny, 2020; Masele & Kagoma, 2021; Sabah et al., 2021; Zheng & Liang, 2017). However, the main contention is how to utilize IT resources to improve the potential of IT systems quality to create value (Kaur & Arora, 2021; Mahboub, 2018; Otim et al., 2012; Sharma & Sharma, 2019). According to Jeyaraj (2020), it is possible to moderate the quality of the system if the system is used heavily by users but is not report significant benefits since usage may have been prolonged due to a difficult task.

The ability to build quality IT is vital for bank business value creation (Al-Busaidi & Al-Muharrami, 2021). However, IT systems alone might not be sufficient to enhance business value to a greater level because not all the knowledge applied to the organization comes from the IT systems. It is often argued that the shared knowledge and experience between business and IT managers determine the strategic use of IT (Elly, 2011). Thus, business managers with both IT and business knowledge will likely be able to advise, innovate and suggest the best ways to improve IT systems quality and the continuation of the utilization of IT for business value creation.

Furthermore, Almomani and Rahman (2021) found the existence of the influence of IT knowledge on the usage and business value of IT systems. These observations suggest that IT knowledge management may moderate the relationship between IT systems quality and business value creation. IT knowledge management is the practice of making sure IT knowledge is created, shared, stored, and utilized across the organization for better performance. In this regard, integrating these two perspectives, IT system quality and knowledge management can complement each other to provide a more robust framework for explaining the relationship between IT system quality and business value creation. Furthermore, the majority of literature investigates knowledge as the independent variable

(Hu & Plant, 2001; Ray *et al.*, 2004; Wang *et al.*, 2014) or mediating variable (Pinjani & Palvia, 2013), with few investigating it as a moderator variable (Abd Rahman et al., 2013; Almomani & Rahman, 2021).

Against this background, this study aims to examine how the IT system quality influences business value creation in commercial banks in Tanzania. Specifically, the study investigates the direct effect of IT systems quality on banks' value creation and the moderating role of IT knowledge management in enhancing the effect of systems quality on business value creation. According to the Bank of Tanzania (2021), commercial banks owning more than 75% of the banks' market share are among the 46 banks in Tanzania, and the major users of IT. In addition, the majority of the studies on IT quality in Tanzania have focused on external customers to measure service quality (Sichone & Mbamba, 2021; Wilson & Mbamba, 2017) and very few measure internal systems quality (Masele & Kagoma, 2021).

Studies examining IT quality and business value in Tanzania are focusing more on external customers' service delivery and have little attention to how IT system quality has been used for internal banking operations, Given this potential IT contribution to the banking business, the purpose of this study, therefore, was to examine the influence of system quality on business value creation in Tanzanian commercial banks and test the moderating effect on the relationship between system quality and business value creation.

This paper begins with a discussion of systems in the banks, highlighting the issues facing the banks and the aim of the paper. Then a detailed discussion of the theoretical and conceptual framework of the paper is presented. Methodology and the discussion of results are presented and finally, the paper concludes on the value creation from system quality and IT knowledge management in banks.

Literature

Theoretical Framework

The Information Systems (IS) Success Model proposed by DeLone and McLean (2003) posits that the success of IT in delivering business value is mostly determined by the quality of IT systems and services. The DeLone and McLean's (2003) model has been one of the most cited models to assess the value of IS. Accordingly, system quality refers to the desired characteristics of systems that produce information. The model describes system quality using five indicators, namely, flexibility, availability, reliability, response time, and usability. Wamba et al. (2019) define system (Technology) quality characteristics as flexibility, integration, privacy, response time, and system reliability. Combining these indicators provide a deep understanding of system quality. The model is useful to support business value creation by improving IT system quality. Despite being widely used as a model in IT system quality literature in measuring business value (Ji-fan Ren *et al.*, 2017), the model focused more on system concepts (Masele & Kagoma, 2021) and has an insufficient explanation of intangible IT knowledge management as a factor that influences the value creation.

The Knowledge-Based Theory (KBT) emphasizes that knowledge is a significant resource for enterprises' competitiveness because it is difficult to imitate (Kogut & Zander, 1992). The KBT suggests that knowledge is the primary source of value, and a firm's value creation is primarily a function of its ability to accumulate and use knowledge (Wang *et al.,* 2014). The

believers of the KBT argue that knowledge is a valuable resource for organizations and cannot be easily imitated (Heisig *et al.*, 2016; Skačkauskienė *et al.*, 2017). KBT depicts the importance of knowledge in value creation as adopted for this study.

Using KBT, Kearns and Sabherwal (2007) suggest that when business managers participate in IT activities, they are likely to develop knowledge about IT and enhance relationship across business and IT, which cannot be easily imitated. On the other note, according to Wang *et al.* (2014), a firm that encourages employees to share job-related knowledge and experience will have better performance compared to those that do not. Since not all knowledge applied to the organization is obtained from the system, having this IT knowledge external to the systems, users will have a chance to advise and be more equipped with technology and hence improve systems and processes. Thus, business managers with both IT knowledge and business knowledge will likely be able to advise, innovate and suggest ways to improve IT quality systems and the continuation of the utilization of IT for business value creation. From this notion, KBT can be used to explain the role of IT knowledge management to improve the relationship between IT system quality and business value. Therefore, this study introduces IT knowledge as a factor that moderates the relationship between IT quality and business value creation

KBT is consistent with DeLone and McLean's (2003) model as both focus on competencies of internal management activities to influence performance (Wang *et al.*, 2014). However, the theory differs from DeLone and McLean (2003) in the way they develop and evaluate resources. While KBT provides a comprehensive framework for assessing the strategic value of IT knowledge resources, the DeLone model measures the value of IT system resources. Previous literature combined both system quality and knowledge management as independent variables to explain performance but few have considered internal operations (Wamba et al., 2019). By combining these theoretical perspectives, the study brings about assessing IT with a more comprehensive model for business value creation in commercial banks.

Hypotheses Development

IT System Quality and Business Value

In understanding IT system quality, some studies focused on the technical aspects of the system, while others focused on the performance aspect of the system and its ability to provide quality information. This study conceptualizes IT system quality to focus on the performance aspect because of the nature of the study to measure the business value. DeLone and McLean (2003) developed an updated model as a framework of study the relationship between system quality and net benefits to business (business value). It examines the quality characteristic of the IT system that produces information. Accordingly, system quality includes characteristics such as flexibility, availability, reliability, usability and response time. Other studies have included integration as a characteristic of system quality due to the nature of the requirements to integrate internal and external systems (Gao *et al.*, 2020; Von Solms, 2021; Wamba *et al.*, 2019). Since the current article examines banking IT system quality, integration is also an important item to include to measure the system quality, especially in the Tanzanian context. The current study complemented indicators from DeLone and McLean (2003) with Wamba et al. (2019)to form a more useful construct for measuring system quality.

This study conceptualizes business value as the business benefits to minimize cost, reduce processing time, and expand market and security (DeLone & McLean, 2003). Studies highlighted various domains of business value but these value domains are grouped into two dimensional facets, the internal operational value and the external market value (Ahmad & Arshad, 2014; Melville et al., 2004). Accordingly, the internal operational value focused on efficiency, which mainly aim at improving productivity and security, and reducing risk, time and cost, while the external market value focused on effectiveness, which mainly focused on market expansion and increasing sales.

There are conflicting debates regarding the value of systems quality about value. While Von Solms (2021) conclude the value of systems in banking, Shagari et al. (2015) identify persistent system failure in Nigerian banks. In addition, Sharma & Sharma (2019) find that system quality is not on the priority list of Omani residents. This creates conflicting results with Jaafreh (2017) on the effect of system quality on value creation while both studies were done in the same banking environment with the same middle east context. The main issue of concern in this conundrum is not IT investment but rather how to utilize available IT systems for value creation (Elly, 2011; Kaur & Arora, 2021). This highlighted a need to do the same in Tanzania's banking sector. In Tanzania, more studies are being done to measure service quality (Koloseni, 2021; Sichone & Mbamba, 2021). Therefore, the current study focuses to examine how system quality can assist banks in value creation in the Tanzanian context

The aspect relationship between system quality and business value has been studied with conflicting results (Kartika & Heny, 2020; Sabah *et al*., 2021). Thus, from the above discussion, it can be urged that banks with high levels of IT system quality, banks will be able to reduce the cost of operations and can use quality information decision-making and market expansion. Therefore, it is hypothesized that:

H_1: System Quality has a positive influence on business value creation.

IT Knowledge Management and Business Value

Knowledge resources in an organization are considered a unique and inimitable resource for a firm's competitiveness (Côrte-Real *et al*., 2020). Deriving from Wang *et al*. (2014), knowledge is divided into explicit knowledge and tacit knowledge. Explicit knowledge can be easily captured, codified and transmitted (shared) through procedures, rules and other forms of documents. On the other hand, tacit knowledge is gained from experience and other intrinsic values that cannot be easily shared. The presence of knowledge and experience helps to improve organisational activities and performance (Skačkauskienė *et al*., 2017). Abd Rahman *et al*. (2013) conceptualize knowledge management as a process to acquire, apply, convert and protect knowledge. Accordingly, the organization can effectively compete if the acquired knowledge is converted, applied and protected. This means that organizations that create an environment for their employees to get, apply and share knowledge are likely to have a good chance to improve performance.

This study has conceptualized IT knowledge management by adopting the idea from Abd Rahman et al. (2013) as the process of acquiring, utilizing, storing and protecting IT knowledge. According to Elly (2011), IT knowledge was specifically meant for IT managers to help in executing their roles. Ray *et al*. (2004) use the term managerial IT knowledge to

include knowledge and relationship among business and IT teams as a factor that may create business value. This study extends this concept arguing that having mixed knowledge between IT and business teams and sharing among them will improve business value (Elbashir *et al*., 2013). The idea behind this notion is that business manager shall not have technical details of IT knowledge but rather basic IT management knowledge that make them understand the basics of management information system. This IT knowledge can shape business managers in the way they operate toward IT usage and business value creation.

IT knowledge was treated in previous studies as an independent variable that may influence business value (Côrte-Real *et al*., 2020; Håkanson, 2010; Ray *et al*., 2004; Skačkauskienė *et al*., 2017) and some have treated IT knowledge as mediator (Pinjani & Palvia, 2013). However, according to Abd Rahman et al. (2013), not all the knowledge applied to the organization comes from the IT systems. This external IT knowledge and experience will make users more creative and equipped with technology and hence improve systems and processes, which moderate the relationship. In addition, Almomani & Rahman (2021) reveals that IT knowledge affects the adoption and use of IT. Several other studies have treated education, knowledge and experience as the moderators (Almomani & Rahman, 2021).

According to Jeyaraj (2020), it is possible to consider a moderator of the DeLone and McLean Model in three scenarios. First, where quality is rated high but individuals are unsatisfied because it does not effectively serve their needs. Second, an information system is rated as low quality but system usage is high since users are mandated to use the system to complete their everyday tasks. Third, an information system is used heavily by users but is not report significant benefits since usage may have been prolonged due to a difficult task. Thus, based on the inconsistent result found in systems quality, this study urges that the bank with a high level of IT knowledge management across the organization is like to gain more IT-aware business managers, who are capable of improving the quality of IT system operated by banks. Therefore, it is hypothesized that:

H_2: IT knowledge management is positively moderating the relationship between IT system quality and business value creation.

Methodology

Data

This study adopted an explanatory, cross-sectional survey research design because it collects cross-sectional data to examine the causal relationship between variables (Saunders & Lewis, 2019). The study collected data from selected heads of departments from the headquarters of commercial banks in Tanzania. The study selected the commercial banks as a representative of the banking sector because they consist of 75% of the banks in Tanzania (BOT, 2021) and their high adoption and intensive use of IT (Swai, 2019). Since the population of commercial banks was 35 (BOT, 2021), the study enumerated all commercial banks as recommended by literature when the population size is less than 50 (Kitchenham & Pfleeger, 2002).

The study adopted multiple key-respondents approach per bank for data collection to avoid single informant biases and systematic errors (Bou-Llusar *et al*., 2016) and most researchers use two (Kumar *et al.*, 1993). Purposive sampling was used to select two heads of key

departments, one from finance and one from marketing, to fill two respective questionnaires. Selection criteria is based on capacity to share information and their knowledge on the subject (Wagner et al., 2010), which is much related to the use of IT to assist in financial reporting activities as well as the use of IT to assist in market expansion.

Data collection used a questionnaire adopted from previous literature measurement items (DeLone & McLean, 2003; Ray et al., 2004; Wamba et al., 2019; Wang et al., 2014) and editing according to Tanzania environment. The questionnaire was administered by researcher himself, discussing in-person and sometimes made online with key-respondents for clear understanding. Meetings and follow-up were used as techniques to eliminate the missing data and improve the response rate. Due to small population, the researcher targeted to have 70 respondents, but took four months to receive 68 questionnaires (97%). The data collection exercise was a bit difficult and demanding. Some of the banks directly participated in the process of data collection, while others raised concerns regarding the confidentiality of the data to be collected. To overcome the problem, the researcher had to contact the BOT officials for support. In addition, the researcher traced the key personnel within the banks who worked with the researcher to understand the aim and assist in getting respect and responses

Operationalization and Measurement of Constructs

IT system quality (SYSQ) is operationalized as the quality characteristics of desired systems and is measured by six items adopted from DeLone and McLean (2003) and Wamba et al. (2019) Measures include flexibility, integration, availability, reliability, response time, and usability of the information system. The study excludes privacy measurement as the study measure operational performance and not protection of personal information as used by Wamba et al. (2019). IT knowledge management (ITKWM) is operationalized as the existence of IT knowledge management practices across organizations and the sharing of such knowledge among employees in order to help improve IT quality and business value. It is measured by eight indicators adapted from Ray *et al*. (2004), Wang *et al*. (2014), and Gao *et al.* (2020). These indicators include IT knowledge for managers, relationships between business and IT, recognition of IT use, organizational flexibility to respond to business reporting requirements, organizational training on digital platforms to run business IT systems, sharing of IT knowledge among employees, encouraging knowledge sharing mechanisms, and sharing lessons learned after failure. In this study business value creation (BVC) is operationalized as the value created for internal or external customers as a result of using quality IT systems. The BVC is measured by five indicators adapted from DeLone and McLean (2003) and Ahmad and Arshad (2014). These measures include increased sales, risk reduction, security protection, expanded markets, and reduced cost. The questionnaire includes closed-ended questions with a 5-point Likert Scale. To measure IT system quality, the study uses 1 to represent very low and 5 is very high. To measure IT knowledge management and business value creation, the study uses 1 as strongly disagree and 5 as strongly agree.

Data Analysis

To ensure content validity, University lecturers, banks experts and central bank experts used to validate the questionnaire before using it. Additionally, the pilot study was done before data collection to validate construct and content validity. Statistical Package for Social

Sciences (SPSS) was used to clean and provide a descriptive analysis of collected data. Cohen's Kappa (κ) index analysis in the SPSS tool was used to validate each pair of bank responses to measure the inter-rater agreement index among their responses (Homburg *et al.,* 2012), where Cohen value of above 0.8 considered to be a strong agreement between key informants. More on reliability and validity are discussed in the analysis section.

In testing the relationships, Partial Least Square Structural Equation Modelling (PLS-SEM) was used with SmartPLS3. PLS-SEM can simultaneously estimate the relationship between the observed variables and their constructs in the measurement equations and between one construct and another in the structural equation The two-stage approach used for moderation analysis, where independent variable and moderator scores from stage one are multiplied to form a single item used to measure interaction. The study uses the SmartPLS tool since it is applicable for small sample sizes, widely used, but has flexibility, especially when dealing with moderation (Sarstedt et al., 2021). Construct operationalized as below.

Results and Analysis

Respondents Profiles

The results show that 60.3% of the respondents were male and 39.7% were female, meaning about 40% of females were trusted to represent banks and possibly involved in decision-making. In addition, the results indicate that 36.8% of the respondents have an undergraduate degree while 63.2% possesses master's degree. This means that all respondents have the required level of education and understanding of the study requirements and can perfectly answer the questions since there was no respondent below undergraduate. The results indicate that none of the respondents had less than 5 years of experience with the bank, regardless of which bank he previously worked since experience is inherent within the employee himself. The working experience of more than five years implies that all respondents possess adequate knowledge and experience in the banking environment and, therefore, have adequate data and information to be used in the current study

Measurement Model for Direct Relationship

The study performed several analyses to test the reliability and validity of the constructs. Composite reliability was done to check internal consistency. A value greater or equal to 0.7 indicates internal consistency (Sarstedt et al., 2021). Table 1 shows that all values for the composite reliability were greater than 0.7, indicating internal consistency in the constructs.

Convergent validity is done by observing the resulting value of the average variance extracted (AVE), which is the average value of the squared loadings of the indicators associated with the construct (Sarstedt et al., 2021). All values of AVE were above the threshold of 0.5.

Table 1: Constructs Validity and Reliability Measures

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BVC	0.861	0.866	0.900	0.643
SYSQ	0.871	0.883	0.903	0.611

The Fornell-Larcker criterion is used to measure discriminant validity. It compares the square of construct correlation and the AVE and needs approximately to be equal (Fornell & Larcker,

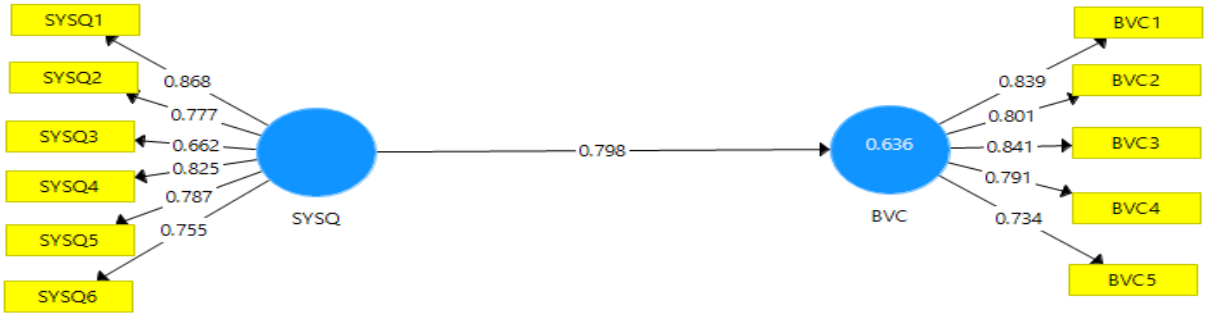
1981). Analysis reveals that the square root of AVE values of BVC (0.643) and SYSQ (0.611) is equal to Fornell-Larcker values of BVC (0.802) and SYSQ (0.781) respectively as shown in Table 2. Therefore, obeyed the Fornell-Larcker criterion.

Table 2: Fornell-Larcker Criterion for Model Variables

Construct	BVC	SYSQ
BVC	**0.802**	
SYSQ	0.798	**0.781**

Indicator reliability is determined through loading to examine how a variable contributes to a factor. According to Sarstedt et al. (202the 1), indicator loading value should be 0.4 or higher, the value less than 0.4 should be eliminated. Also, loading between 0.4 and 0.7 is only eliminated if doing so will raise the AVE. During indicator analysis, it was found that all indicators' loadings were above 0.4 (Figure 1) and AVE was above 0.5 (Table 1), meaning that indicators are reliable. Figure 1 shows the path coefficient for SYSQ is 0.798. This means that there is a positive relationship between system quality and business value creation.

Figure 1: Measurement Model for Direct Relationship



Structural Model for Direct Relationship

The study uses five measures used to analyse the strength of model relationship as described below.

Coefficient of Determination (R^2)

This measures the proportion of the dependent variable predicted by independent variable. The R^2 below 0.25 indicates weak, 0.5 indicates moderate, and above 0.75 indicates substantial determination. In this study, the R^2 value is 0.636, meaning that IT system quality explains 63.6% of variance in business value of the bank while 36.4% is explained by other factors. It also indicates the moderate predictive accuracy of SYSQ on BVC.

Effect Size (f^2)

This measures the extent of contribution of independent variable to the R^2 of dependent variable, the f^2 below 0.02 indicates small contribution, from 0.15 indicates medium, and above 0.35 indicates large contribution. In this study, the f^2 effect size 0.75, meaning that SYSQ has greater contribution to R^2 of BVC.

Variance inflation factor (VIF)

This measures of multi-collinearity to check if independent variables have collinearity problems. If a problem appeared, it either dropped or merged with other indicators. The

indicators having multi-collinearity values equal to or less than five (5) are said to have no multi-collinearity problem. In this study, both the independent and moderator variables' indicator VIF values are lower than five (appendix 1), meaning that the model does not have multi-collinearity problem.

Predictive relevance (Q^2)

This measures of predictive relevance of the model. If Q^2 value for the latent variable is positive, the path model demonstrates the predictive relevance for the endogenous construct. In this study, the Q^2 value calculated using blindfolding tool available in SmartPLS and found to be positive (0.617), meaning that the model has predictive relevance on BVC.

Predictive Power

This measures the ability to anticipate data correctly out of sample. When assessing predictive power of models, Shmueli *et al.* (2019) define a rule that compare PLS with LM (Linear Model) values. The rule states that the model's predictive power is high if all indicators' PLS values are lower than LM values. Predictive power is medium if majority (or equal number) of indicators' PLS values are lower than the LM values. Predictive power is low if minority of indicators' PLS values are lower than the LM values. Lack of predictive power if none of the indicators' PLS values is lower than the LM benchmark. Table 3 indicates many indicators' PLS values are lower than the LM benchmark, meaning that the direct model has medium predictive power.

Table 3 The Predictive Power of the Direct Model

Indicators Predictions	PLS	Less/ Greater	LM	Predict Power
BVC1	0.931	<	1.062	
BVC2	1.144	<	1.221	
BVC3	0.992	>	0.915	Medium
BVC4	1.124	<	1.283	
BVC5	1.093	>	0.978	

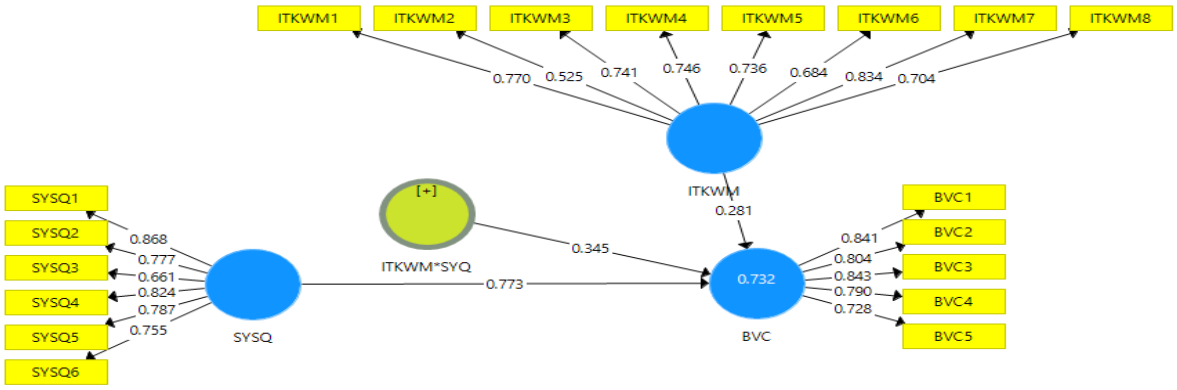
Significance Testing for Direct Relationship

A significant test of the direct model was done by evaluating path coefficient, t-values, and p-values. The t-value above 1.645 considered acceptable, and the p-value below 0.05 considered significant. Table 4 shows that SYSQ has a positive and significant influence on business value creation (β=0.296, t-value=3.454, p-value <0.001), thus, H_1 is accepted at 0.05 significant level.

Moderation Analysis

Two-stage approach was used in the analysis because the objective was to examine whether or not the moderator exerts a significant effect on the relationship (Ramayah et al., 2018). Secondly, it provides more accurate estimate of the single effects with higher statistical power (Becker *et al.*, 2018; Ramayah *et al.*, 2018). Third, it has an advantage in estimating latent variable scores (Becker *et al.*, 2018). Forth, more flexible and is recommended in most situation when creating interaction term (Sarstedt et al., 2021). Figure 2 shows the model with moderators.

Figure 2: Final Model after Moderation



Significance Testing of the Moderated Model

The significance of moderating effect of ITKWM was tested by running the boot strapping using 500 bootstrap samples. For H_2 (SYSQ*ITKWM -> BVC), Table 4 shows that ITKWM have positive and significant moderation on system quality and business value creation (β=0.784, t-value=13.146, p-value <0.000), thus, H2 is accepted at 0.05 significant level.

Table 4: Significant Test of Model and Moderation Effect of ITKWM

Relationship	Hypothesis	Original Sample (O) β	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|) t-value	p-Value	Comment
ITKWM -> BVC		0.281	0.280	0.093	3.035	**0.001**	accepted
SYSQ -> BVC	H1	0.296	0.256	0.086	3.454	**0.000**	accepted
SYSQ*ITKWM -> BVC	H2	0.784	0.787	0.060	13.146	**0.000**	accepted

Predictive Power after Moderation

Furthermore, using Shmueli et al. (2019) rule to assess the predictive, Table 5 indicates the all indicators' PLS values are lower than the LM values, meaning that the moderated relationship has strong predictive power.

Table 5: The Predictive Power of the Direct Model

Indicators Predictions	PLS	Less/ Greater	LM	Predict Power
BVC1	0.921	<	1.066	
BVC2	1.197	<	1.275	
BVC3	0.978	<	1.001	Strong
BVC4	1.051	<	1.103	
BVC5	1.035	<	1.160	

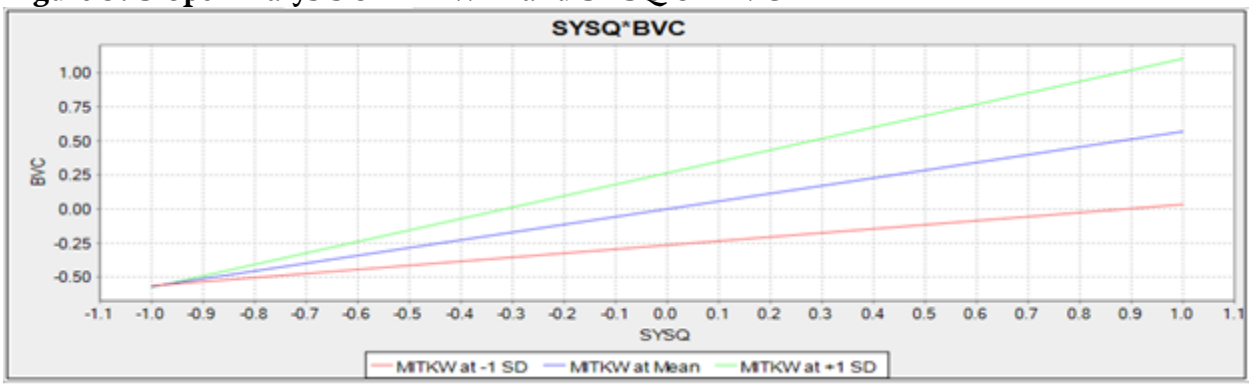
Slope Analysis

The three lines in slope analysis represent the relationship between independent variable (*x*-axis) and dependent variable (*y*-axis) in the presence of moderator (Figure 2). The middle line

represents the relationship between SYSQ and BVC for the average level of moderator ITKWM. The other two lines depict the relationship for higher and lower levels of moderation.

The analysis depicts that SYSQ and BVC have positive slope in all three scenarios. At average levels of interaction, SYSQ goes hand in hand with levels of BVC (Figure 3). At high levels of interaction, the effect of SYSQ on BVC is becoming strong positive (steep slope). At lower levels of moderation, the effect of SYSQ on BVC is weak positive (gentle slope). This is due to positive moderation, meaning that the higher the level of ITKWM will results in more value compared to low level of ITKWM.

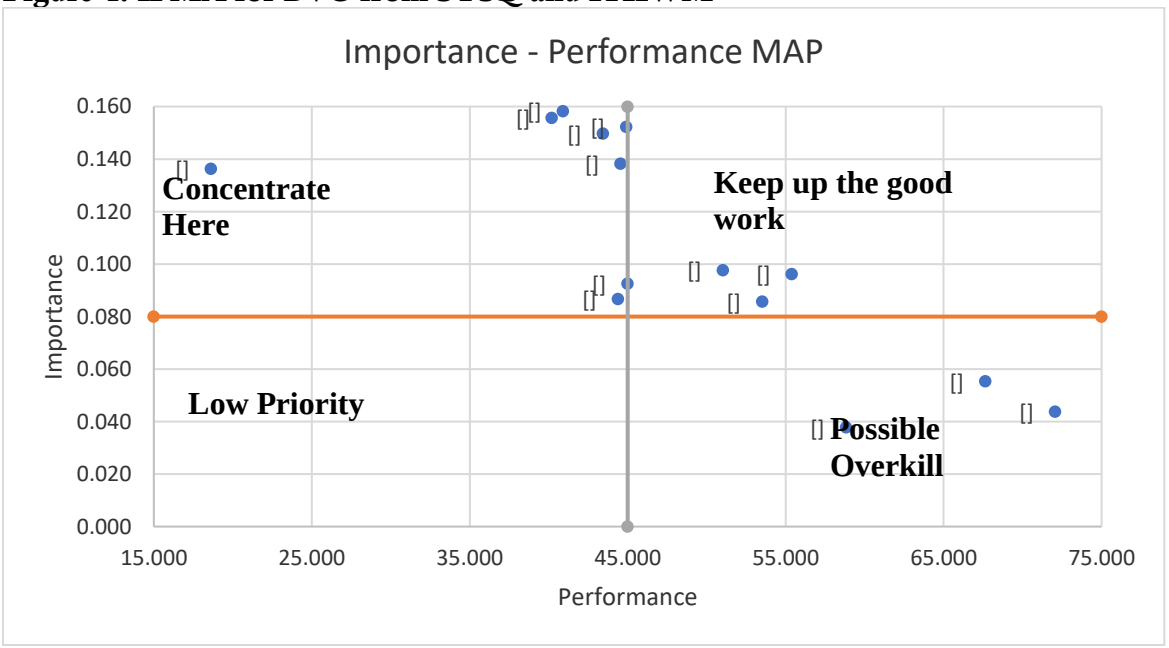
Figure 3: Slope Analysis of ITKWM and SYSQ on BVC



Importance – Performance Map Analysis

The model was further analysed by using the importance-performance map (IPMA) in Smart PLS3.2.8. The IPMA is divided into four quadrants.

Figure 4: IPMA for BVC from SYSQ and ITKWM



The top-left quadrant described as "Concentrate Here", top-right quadrant described as "Keep up with the good work", the bottom-left quadrant described as "low priority" and the bottom-right quadrant described as "possible overkill" as shown in Figure 4. The quadrants are divided using performance mean, and the importance mean. The performance mean and the importance mean are approximately 45 and 0.08 respectively. According to Sarstedt et al. (2021), it is advised to pay more attention to indicators under "concentrate here" to achieve the desired value. As indicated in Figure 4, this indicates the dominance of IT system quality in the "concentrate here" quadrant. According to Sarstedt *et al.* (2021), management to pay more attention to improving the quality of systems to achieve business value. Furthermore, management needs to continue with IT knowledge management practice across organization that will encourage business managers to have and apply their IT knowledge.

Discussion

This study provides insight on the influence of IT system quality on business value creation. Specifically, the study examines how IT system quality influences the creation of business value, and also tests the moderating effect of IT knowledge management on system quality and business value. The results demonstrate that IT system quality has a significant influence on business value creation. The results suggest that the bank with systems that are highly integrated, flexible, reliable, good response times, and are user friendly, will have a high chance of creating value to business. The results are consistent with the DeLone and McLean (2003) model, where the level of system quality is positively related to net business benefits. The results are also supported by Petter *et al.* (2008) who thoroughly examined the influence of system quality on business benefits and conclude that system quality has a positive influence on business benefits. This implies that the value from IT systems is influence by the quality of available systems, which improve operational efficiency. In addition, the results concur with Wamba *et al.* (2019), who conclude that system quality is very important predictor of big data quality and bank performance. This concurs Similarly, the results concur with Kartika and Heny (2020), who concluded that the quality systems will increase users comfortability on system and affect usability, which improve business value.

On contrary, the results are inconsistent with other studies of system quality in relation to performance and business value (Sabah et al., 2021; Sharma & Sharma, 2019). Sharma and Sharma (2019) revealed that system quality is not a priority for customers in the Oman mobile banking system but value creation is influenced by usage and satisfaction. This assertion is possible where system quality is measured from an external customer service delivery perspective (Jaafreh, 2017). However, more priorities need to be maintained to ensure systems are of good quality. In different occasions, Braojos *et al*. (2020), Gao *et al*. (2020), and Von Solms (2021) highlighted the importance of flexibility and availability to enhance quality of IT systems. Management can improve system flexibility by improving service level agreement with vendors and enhance system availability by using redundant IT infrastructure.

Furthermore, IT knowledge management was found to significantly moderate the influence of IT system quality on business value creation. This results suggest that business managers with IT knowledge have chance to improve systems quality, and hence business value. The results are consistent with knowledge-based theory (KBT), which emphasizes that the organization creates value due to its ability to utilize knowledge more efficiently than others

(Kogut & Zander, 1992). This means that an organization that can utilize its IT knowledge management practice more efficiently can have a chance to create more value for the bank by improving IT systems quality and value. The findings are consistent with the Almomani and Rahman (2021), who contend that basic IT knowledge for users is a critical factor in moderating IT adoption in a technological context. They contend that users with basic IT knowledge will be more creative in advising and using system and create value out of it. The results are also consistent with previous studies that examine the direct relationship between IT knowledge and business performance (Braojos et al., 2020; Huang et al., 2006; Ray et al., 2004; Wang et al., 2014). The findings contribute to the ongoing debate on IT quality and business value, looking into factors that promote the value creation process.

Conclusion

This study examines the influence of IT system quality on business value creation in commercial banks in Tanzania. Moreover, the study tests the moderating role of IT knowledge management on the influence of IT system quality on business value creation. This study contributes to the body of knowledge by showing that IT system quality is directly influences business value creation. Also, this study extends research in emerging technologies based on quality and knowledge management theories by exploring key predictors of business value in the IT environment. Specifically, the findings validate the integration of system quality and IT knowledge management in improving the business value. For instance, the importance of knowledge management has been recognized as moderator of training activities (Abd Rahman et al., 2013). This study extends the moderating role to test its effect on IT system quality, and find that IT system quality has substantial effect in value creation under the moderation of IT knowledge management.

In addition, IT knowledge management practice has significant influence on improving the systems quality factors such as integration, flexibility, availability and ease of use. So, management that has and embraces IT knowledge management across organization and having business managers with basic IT knowledge will likely be able to advise, innovate, and suggest best ways to improve IT systems quality and encourage the continuation of utilization of IT for business value creation. Thus, the organization that ensure their business manager have IT knowledge, have good relationship with IT, share knowledge with others, and given flexibility to use IT systems in their operations will improve the quality system functionalities as well as create more value to business by reducing time and cost of operations.

Furthermore, the study provides management important factors such as availability, integration and flexibility of systems, managers flexibility, sharing of knowledge and experience to ensure that value is created through IT systems. These factors may serve as a guide for managers during IT implementation. Also, banks are urged to create an environment that will encourage business managers to have and apply their IT knowledge including motivation to attend IT soft skills, encourage automations and use of IT. Also management could develop policies to retain these IT knowledgeable employees.

Despite the present study limitations, measures were taken to ensure the results from this study remain reliable and valid and remain useful in organizations, particularly, technology-dependent organizations. First, there is scanty literature in the conceptualization with respect

to the local context of the study, particularly business value creation via IT quality. This has resulted in the limited number of literature and measurement items. Furthermore, despite using two sources of respondents to avoid single respondent biasness, it is still a user perception that could not be sufficient to represent the entire bank. To overcome this limitation, the study used tools to measure the response reliability and validity, and check the robustness of the model results. Finally, during data collection, it was realized the is process integration challenges that might be affecting the value creation process. However, this study was limited only to IT systems integration. Future study may focus on process and people integrations, which are not part of the IT system but may affect business value.

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