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INFORMATION SYSTEMS' EFFECTIVENESS AND ORGANISATIONAL PERFORMANCE: A STUDY AMONG SMALL AND MEDIUM-SIZED ENTERPRISES IN NORTH KIVU PROVINCE, DR-CONGO

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Abstract:

This study aims to empirically investigate the concept of information systems' (IS) effectiveness and its relationship with organisational performance in Small and Medium-Sized Enterprises (SMEs). Based on a literature review, the study identifies three dimensions of IS effectiveness: technological context (system quality and information quality), organisational context (users' IS knowledge, users' IS involvement, and top management's IS support), and environmental context (external expertise). Data were collected from 496 SMEs and analysed using structural equation modelling (SEM) with SmartPLS 4.The results indicate that system quality, top management support, and external expertise significantly influence organisational performance. Specifically, management involvement (β=0.098, p<0.05), system quality (β=0.316, p<0.05), and external expertise (β=0.391, p<0.05) are positively associated with performance, explaining approximately 60% of its variance (R2=0.594). These findings underscore the importance of enhancing IS quality and leveraging external expertise for Congolese Small and Medium Enterprises to improve their performance through effective information system utilisation.

Keywords: information system; organisational; performance; small and medium-sized entreprises; North-KIVU, Democratic Republic of Congo.

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1. Introduction

Small and medium-sized enterprises (SMEs) are recognised in the literature as important to the economies of developing countries (Wang, 2016). SMEs are the main route to poverty reduction and are perceived as the main drivers of development (The International Telecommunication Union, 2016; Zafar & Mustafa, 2017). Wang (2016) argues that the original idea that large firms were the mainstay of an economy was abandoned in the 1950s. It has since been established that SMEs are the primary source of economic growth, dynamism and flexibility regardless of the economy's level of development (Robu, 2013).

SMEs are credited with one-third of all jobs created worldwide (Bureau International du Travail, 2015). In Organisation for Economic Co-operation and Development (OECD) countries, for example, around 60% of jobs are generated by SMEs, which account for 99% of all businesses (OECD, 2019). The World Bank argues that the importance of SMEs is even more apparent in emerging and developing countries. SMEs contribute more than 40% of the Gross Domestic Product in these countries. SMEs are indispensable within an economy because they can quickly adapt to major transformations, including globalisation, digitalisation and environmental pressures (OECD, 2019).

Pedauga et al. (2022) have also acknowledged the critical role played by SMEs, asserting their success to be one of the most widely discussed topics among researchers. Consequently, several studies, such as that by Kemayel (2015), are continually being carried out worldwide to analyse SMEs' success. Most of these studies focus on identifying critical SME success factors (Rodrigues et al., 2021). For their success, SMEs should continually emphasise these factors (Ng & Kee, 2012).

New technologies have been identified in the literature as being among the critical success factors for SMEs (Rahman et al., 2016; Mwila & Ngoyi, 2019; Bala & Feng, 2019). Information and Communication Technology (ICT) is a preferred tool SMEs use worldwide (Rao & Kumar, 2019; Lecerf & Omrani, 2020) to enhance their performance.

There are several reasons why SMEs are interested in new technologies. Firstly, the availability of microcomputers has given SMEs access to computerised information systems (IS) despite their limited resources (DeLone, 1981). Secondly, like large companies, SMEs invest in acquiring new technologies because of the many benefits they offer (Croteau & Bergeron, 2001).

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By introducing computerised IS, businesses have effectively increased productivity and managed intra- and inter-organisational affairs (Zhang et al., 2016). Lipaj & Vida (2013) identifies and classifies several IS benefits into two main categories. Tangible benefits and intangible ones. Tangible benefits include but are not limited to reducing paperwork, improving customer service (Ashhari et al, 2010; Khera & Gulati, 2012), reducing various costs (Lipaj & Vida, 2013), optimising personnel management (Elhazzam, 2015), enhancing competitiveness (Ivanaa et al,2018; Lewandowska, 2021), facilitating the practice of marketing (Miklosik & Evans, 2020), good management of relations with suppliers and supply chain management (Mathu, 2019).

In addition to tangible benefits, which can be measured, Lipaj & Vida (2013) identify intangible benefits of IS. These include but are not limited to, user satisfaction, improved teamwork, better decision-making, more precise information and greater flexibility and adaptability. By using IS, companies hope to achieve tangible and intangible benefits (Lipaj & Vida, 2013).

Despite the clear benefits that can be derived from the use of information systems by SMEs, the dynamic is not the same in the Democratic Republic of Congo, where companies are not yet adopting information systems. One of the reasons for this lack of momentum is that companies are still unaware of the benefits of information systems and their impact on performance (Kalumendo, 2022a). This raises the question of the relationship between information systems and performance in the context of SMEs in the DRC.

1.1. Research objective

This study aimes to establish the relationships between information systems' effectiveness (technological context, organisational context, environmental context) and organisational performance.

1.2. Hypothesis

Technological context, organisational context and IS context factors influence the organisational performance of SMEs.

1.3. Litterature review

The growing level of spending on the acquisition of ICT by businesses around the world reflects a clear interest in IS (Weiyu et al., 2022). This interest has attracted several researchers, such as (Lipaj & Vida, 2013 , Agustri & Sensuse, 2020), Jeyaraj, 2020) who have demonstrated that measuring IS success is one of the most widely discussed topics in IS management in recent decades.

Several models for evaluating information system effectiveness have been proposed by Delone & McLean (1992), Seddon (1997), Thong J. (2001), DeLone & McLean (2003); Petter et al., 2001; DeLone & McLean, 2003; Petter et al., 2008; Gable et al., 2008). Each model is based on the Delone and McLean (D&M) model, first proposed in 1992 and revised in 2003. In the quest for variables to measure IS success, Delone and McLean (1992) proposed a model based on six interdependent IS success variables. These are system quality, information quality, usage, user satisfaction, individual impact and organisational impact.

Initially proposed in 1992, the D&M model was revised in 2003 following several criticisms, notably those of (Seddon, 1997; Petter et al., 2008; and Gable et al., 2008). Despite the criticisms and revisions, it has been subjected to, the D&M model remains one of the most widely used in the study of IS success (Goundar et al., 2021).

The D&M model, like those proposed by Seddon (1997), Petter et al. (2008) and Gable et al. (2008), has been tested and validated by studies carried out in large companies Thong J. (2001). However, small companies have different characteristics from large companies (Thong & Yap, 1997). It is, therefore, difficult to generalise the results from large companies to SMEs.

Thong (2001) proposed an IS evaluation model that includes SME-specific features after this difficulty. This new model's main characteristics are management support, user involvement, level of IS knowledge and external support, which are considered predictors of IS success in SMEs. Thong's model was tested in Singapore and then validated in a study conducted in Canada (De Guinea et al., 2005).

However, the Singapore and Canadian technological contexts are markedly different from those of the Democratic Republic of Congo, where this study is being conducted. Yet, the technological context in which a company operates influences the success of IS (Thong & Yap, 1997; Ghobakhlooa & Tanga, 2015).

Regarding introducing information technology in DRC SMEs, our two surveys (Kalumendo, 2022b; Kalumendo, 2022a) revealed a deficient level of technology adoption. According to these studies, this low level is explained by several factors, including the lack of involvement from government and SME management, the financial and technical constraints faced by Congolese SMEs, the high cost of computer hardware and software, and the lack of both internal and external expertise.

To compensate for the low level of computerisation, the Congolese government has decided to make digitisation one of its priorities. It has proposed a digitisation plan to help businesses migrate to computerised information. While the government focuses on this sector, SME managers do not fully support it (Kalumendo, 2022c). Some of these managers are unaware of the benefits of ICTs and do not consider them essential for the day-to-day running of their businesses (Kalumendo, 2022c).

While several studies on the adoption of IS have been conducted elsewhere, research on this topic is only at an early stage in the DRC (Cirera et al., 2016). There are very few studies on the subject (Kalumendo, 2022c), resulting in a research gap in SMEs' adoption and use of IT. However, as mentioned, the Congolese technological context alone justifies this study. Therefore, this study aims to fill this

research gap by examining IS effectiveness factors and their relationship with organisational performance in the DRC context.

2. Methodology

The initial step involved proposing a study model from existing literature. A comprehensive literature review was conducted, with a focus on articles pertaining to the evaluation of information systems. Priority was given to sources from several databases, including IEEE Xplore, Scopus, Elsevier, and Google Scholar. Keywords such as Technology Acceptance Model (TAM), DeLone & McLean Model, Thong Model, and information system effectiveness were utilised in the search process. The identified literature was systematically classified and analysed to develop of the proposed study model.

In adittion to literature review,this research adopts a quantitative approach since it aims to quantify the variables under study to conclude (Apuke, 2017). The quantitative approach was preferred because, the aim was to study their relationships with organisational performance. Thus, this study is both descriptive and correlational.

A research model (Figure 1) based on existing literature was developed. This model consists of three main concepts of IS effectiveness that impact organisational performance. Each of the three effectiveness concepts is measured by one or more variables – technological context (Information Quality, System Quality), – organisational context (Management Support, User Involvement, User IS Knowledge) and environmental context (External Expertise).

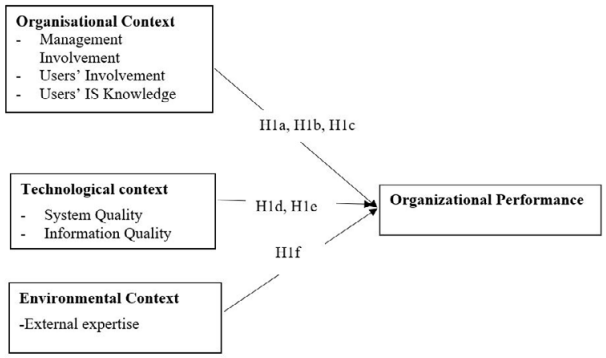

Figure 1: Research Model.

2.1. Data collection

For this study, primary data were collected using a self-administered offline questionnaire that was distributed to the 350 SMEs that confirmed the use of computerized information systems. For each SME, two questionnaires were distributed, one to the owner/manager and the other to the information systems manager or user. Thus, the total number of questionnaires distributed is 700. The convenience sampling technique was used, involving all SMEs that reported using computerised information systems in their daily management.

The questionnaire focuses on three main contexts that affect IS effectiveness: technological, organisational, and environmental. The technological context includes variables such as information quality and system quality. The organisational context encompasses management support, user involvement, and user IS knowledge. The environmental context includes external expertise. Each variable is measured by at least three items, and organisational performance is measured by six items. The questionnaire uses a Likert scale from 5 (strongly agree) to 1 (strongly disagree). 496 valid responses were received, representing a response rate of 70.86%. Given that this response rate is acceptable for similar studies Ghobakhlooa & Tanga, 2015), and considering that for a SEM study, the minimum sample size of 200 (Kelloway 1998) was exceeded, we considered the sample size appropriate for our analyses.

2.2. Data analysis

A PLS-SEM(Partial Least Squares Structural Equation Modeling) analysis was performed using Smart-PLS 4 software. PLS-SEM is a statistical technique used to analyse complex relationships among multiple variables and to predict outcomes such as organisational performance. This method evaluates the strength of these relationships through path coefficients and assesses the proportion of variance explained by the model using the R^2 value. Path coefficients indicate significant relationships with p-values less than 0.05 (Hair et al., 2022).

Before testing the hypotheses, we first analysed the reliability and validity of the model, focusing on the reliability of the indicators and then on the external and external validity of the model.

3. Results and discussion

3.1. Model assessment

3.1.1. Indicator reliability

When evaluating a model, it is essential to measure the reliability of the indicators, which measures the proportion of the variance of each indicator that is explained by its construct (Hair et al., 2021). The researcher is recommended to calculate the indicator's value, ideally 0.708, to assess the indicator's reliability (Hair et al. et al., 2021).

Researchers frequently obtain lower indicator coefficients (< 0.708) for their measurement models in social science studies, particularly when newly developed scales are used (Hulland, 1999). Thus, instead of automatically deleting indicators with lower coefficients, it is recommended to delete them if this improves the model's validity or reliability (Hair et al., 2021). In all cases, the authors agree that indicators with a coefficient of less than 0.40 should be deleted (Hair et al., 2022).

Following this principle and to improve the validity and reliability of the model, four items were removed from the model.

Table 1: Indicator reliability.

Variable	Factor	Value
Users' knowledge	**The users**	
	Are familiar with information technology	0.825
	Are familiar with the requirements of the system in use	0.835
	Have attended IT training sessions	0.751
	Have satisfactory experience in handling technology	0.841
Management involvement	**Management**	
	Attends technology awareness meetings	0.756
	Is involved in analysing information system requirements	0.718
	Is involved in information system decision-making	0.681
	Monitors the information system	0.720

Table 2: Indicator reliability Cont.

Variable	Factor	Value
Users' involvement	**Users**	
	attend technology awareness meetings	0.758
	are involved in analysing information system requirements	0.767
	are involved in information system decision-making	0.802
	Monitor the information system	0.843
	Participate in reviewing consultants' recommendations	0.740
Information Quality	**The information produced by the system is**	
	Relevant	0.766
	Understandable	0.710
	Useful	0.666
	Accurate	0.794
System Quality	**Our system**	
	Is easy to use	0.556
	Can be adapted to the context of the organization	0.811
	Is sophisticated	0.730
	Is fast	0.821
Expertise Externe	**External consultants**	
	Provide adequate support during system implementation	0.731
	Provide adequate support after system implementation	0.794
	Provide adequate training to users	0.727
	Are available to respond to users' needs	0.762
	Consultants have a good relationship with users	0.833
Organisational Performance	**The system**	
	Improved relations with customers	0.765
	Enabled efficient monitoring of transactions with suppliers	0.698
	Facilitated marketing	0.770
	Improved the decision-making process	0.727
	Reduced paperwork	0.612

3.2. Model validity

Validity explains the extent to which the data collected covers the domain under study (Ghauri & Grønhaug, 2005). Thus, validity analyses whether a proposed measure measures the situation it is intended to measure (Field, 2005). For Taherdoost (2016), research instrument or dataset validity measures the coverage of actual information from the dataset collected or analysed. According to this author, it is essential to establish the validity of the model under investigation. As part of an SEM analysis, two measures are recommended for examining the viability of tools: Convergent validity and Discriminant validity (Jain & Chetty, 2021).

Convergent validity refers to the close relationship between variables explaining the same concept. Conceptually, the construct must be correlated with related variables but must not be correlated with dissimilar and unrelated variables (Krabbe, 2017). More simply, convergent validity ensures that the variables being measured belong to the latent variable being measured (Wang et al., 2015).

Hair et al. (2019) recommend the average variance extracted (AVE) to measure convergent validity. AVE could, therefore, explain the degree of item sharing between the construct in structural equation modelling (SEM). The recommended value of AVE should be greater than 0.5 to express good validity (Hair et al., 2019). However, Fornell and Larcker (1981) note that an AVE of less than 0.5 can be accepted if the composite reliability (CR) is more significant than 0.6.

The results in Table 2 show an AVE Value greater than 0.50 (AVE<0.50), which reflects good convergent validity.

Discriminant validity refers to the distinction between the model's constructs (Rasoolimanesh, 2022). Also known as divergent validity, discriminant validity distinguishes a latent variable from the other variables in the model (Taherdoost, 2016). Divergent validity, therefore, indicates that the constructs of the study have their identity and are not too strongly correlated with other constructs in the model examined.

The correlation between latent variables can be used (Sujati et al., 2020) to assess discriminant validity. If the correlation value between the two constructs is less than the square root of the AVE value, discriminant validity exists (Fornell & Larcker, 1981; Engellant et al., 2016).

We applied the previously mentioned principle of (Fornell & Larcker, 1981) for this study, and the results in Table 3 show the square roots of the mean variances extracted to be greater than the values of the different correlations between the constructs, indicating the existence of discriminant validity.

3.3. Model reliability

In addition to validity, the researcher needs to look at reliability, which leads to consistency of outcome measurement (Karakaya-Ozyer & Aksu-Dunya, 2018). Sujati et al. (2020) state that a reliable instrument can maintain the consistency of the measured data to a

Table 3: Reliability and validity coefficients.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
PERF	0.762	0.772	0.840	0.513
MANINV	0.701	0.700	0.811	0.517
INFOQUAL	0.719	0.736	0.825	0.542
SYSQUAL	0.709	0.726	0.823	0.544
EXP	0.829	0.834	0.879	0.594
USERINV	0.843	0.863	0.888	0.613
USERKW	0.830	0.842	0.887	0.662

SYSQYUAL: System Quality; USERINV: Users' involvement; INFOQUAL: Information Quality; EXP: External Expertise; USERKW: Users' IS Knowladge; PERF: Organisational Performance.

Table 4: Fornell & Larcker criterion.

	USERKW	EXP	MANINV	USERINV	INFOQUAL	PERF	SYSQUAL
USERKW	**0.814***						
EXP	0.536	**0.771***					
MANINV	0.430	0.503	**0.719***				
USERINV	0.697	0.669	0.423	**0.783***			
INFOQUAL	0.482	0.630	0.461	0.568	**0.736***		
PERF	0.517	0.688	0.503	0.610	0.563	**0.717***	
SYSQUAL	0.607	0.537	0.499	0.630	0.609	0.649	**0.737***

SYSQYUAL: System Quality; USERINV: Users' involvement; INFOQUAL: Information Quality; EXP: External Expertise; USERKW: Users' IS Knowladge; PERF: Organisational Performance. * Square roots of average variances extracted.

certain extent. Following Sujati et al. (2020), the reliability coefficient determines the consistency degree. Margono (2015) asserts that an instrument is reliable if it can measure the same phenomenon repeatedly while giving relatively consistent results. The reliability of a data set or construct can be measured by internal consistency and composite reliability (Jain & Chetty, 2021).

Internal consistency measures the extent to which items in a test produce similar scores (Anselmi et al., 2019). For Hajjar (2018), the internal consistency test is applied to evaluate different characteristics of a concept. Hence, according to the same source, if the internal consistency is good, the proposed factors adequately measure the same construct.

The most commonly used measure of internal consistency is Cronbach's alpha (Jain & Chetty, 2021). The authors note that when the Likert scale is used, Cronbach's alpha is considered the most widely accepted measure of consistency. This coefficient is one of the most widely used for several types of analysis, including analysis using data structural equations.

A Cronbach Alpha value of 0.7 or more is recommended for an SEM analysis (Yana et al., 2015); however, for an exploratory study, values of 0.6 may be accepted (Hair et al., 2010). Table 3 shows Cronbach's alpha values greater than 0.70, indicating a good reliability level for this indicator.

Another of the most widely used reliability measures in PLS-SEM is the composite-rhoc reliability (Hair et al., 2021) proposed by Jöreskog (1971). As with Cronbach's alpha, a high value of rhoc indicates good reliability (Hair et al., 2021). According to the same source, reliability values between 0.60 and 0.70 are considered "acceptable in the context of exploratory research", while values between 0.70 and 0.90 range from "satisfactory to good". However, a value of more than 0.9 is problematic since it indicates indicator redundancy, reducing the construct's validity (Diamantopoulos et al., 2012).

Similar to the Cronbach's alpha values obtained, the values in 3 indicate rhoc values greater than 0.8, confirming a good reliability level.

Despite their frequent use, Cronbach's alpha and rhoc coefficients suffer from specific criticisms. According to Hair et al. (2021), the actual reliability of the variable lies between Cronbach's alpha and rhoc. This situation can be explained by the fact that Cronbach's alpha is perceived as conservative, whereas the rhoc composite reliability may be too liberal (Hair et al., 2021). Researchers have proposed, as an alternative to the two coefficients, the exact (or consistent) reliability coefficient rhoA, which generally lies between Cronbach's alpha (conservative) and composite reliability (liberal) and is therefore considered to be an acceptable compromise between these two measures (Hair et al., 2021).

Similarly, to Cronbach's alpha and the rhoc coefficient, the desirable rhoa value is between 0.8 and 0.9, but values of 0.6 or 0.7 are accepted for an exploratory study (Hair et al., 2021).

The rhoa values given in Table 10 show a good level of reliability, being between 0.70 and 0.86.

3.4. The relationship between the effectiveness of information systems and organisational performance

The validity and reliability analyses in the previous section show that with the data obtained, it is possible to test the proposed hypotheses and thus identify the relationships between the study variables. This section deals with the testing of the proposed model. The aim is to present the relationships between the various information system effectiveness factors (system quality, information quality, user knowledge of IS, user involvement, management involvement, and external support) and organisational performance.

3.5. Testing the research hypotheses

The validity of each theoretical relationship is tested in the hypothesis testing step by assessing the statistical significance of the value of each structural parameter (Table 5, Figure 2).

H1a: *Management Involvement (MANINV) -> Performance (PERF)*

The hypothesis that management involvement positively impacts organisational performance was supported by the data. A positive path coefficient (β=0.098) and a significant *p*-value ($p<0.05$) indicate that greater involvement of management in IS-related activities leads to better organisational performance.

H1b: *User Involvement (USERINV) -> Performance (PERF)*

Following estimated parameters, the hypothesis that user involvement positively impacts organisational performance was not supported. Although the path coefficient is positive (β=0.098), the p-value ($p>0.05$) is not significant, indicating that user involvement does not have a meaningful impact on organisational performance in this study.

Hypothesis H1c: *User Knowledge (USERKW) -> Performance (PERF)*

The result of analysis path (β=-0.008 and $p>0.05$) show that that user knowledge does not significantly influence organisational performance. Thus, the hypothesis that user IS knowledge positively impacts organisational performance was rejected.

H1d: *System Quality (SYSQUAL) -> Performance (PERF)*

Findings from the study revealed a significant ($p<0.05$) and positive (β=0.316) correlation between system quality positively and organisational performance. The hypothesis that system quality positively impacts organisational performance was supported. Consequently, higher system quality is associated with better organisational performance

H1e: *Information Quality (INFOQUAL) -> Performance (PERF)*

The hypothesis that information quality positively impacts organisational performance was not supported. The path coefficient (β=0.027) is not significant ($p>0.05$), indicating that information quality does not have a significant impact on organisational performance.

H1f: *External Expertise (EXP) -> Performance (PERF)*

With path coefficient (β=0.391) is positive and significant ($p<0.05$), result suggest that external expertise significantly enhances organisational performance The results in Table 4 indicate that management involvement, system quality and information quality positively impact organisational performance. It also emerges that system quality and external expertise have the most significant impact on organisational performance.

Overall, as shown in Figure 2, the R2 value (0.594) suggests that approximately 60% of the variation in organisational performance is explained by significant factors, namely external expertise, system quality and management involvement.

Table 5: Hypothesis testing.

Hypothesis	Path	B	Sample mean (M)	Std	*P*	Observation
H1a	MANINV -> PERF	0.098	0.099	0.041	0.016*	Accepted
H1b	USERINV -> PERF	0.098	0.097	0.051	0.055	Rejected
H1c	USERKW -> PERF	-0.008	-0.008	0.042	0.846	Rejected
H1d	SYSQUAL -> PERF	0.316	0.316	0.050	0.000*	Accepted
H1e	INFOQUAL -> PERF	0.027	0.030	0.047	0.568	Rejected
H1f	EXP -> PERF	0.391	0.392	0.048	0.000*	Accepted

Note: N=496; *p<0,05; MANINV: Management Involvement, PERF: Performance, USERKW: Users' knowledge; SYQUAL: System Quality; INFOQUAL: Information Quality; EXP: External Expertise; USERINV: Users' Involvement; std: Standard deviation.

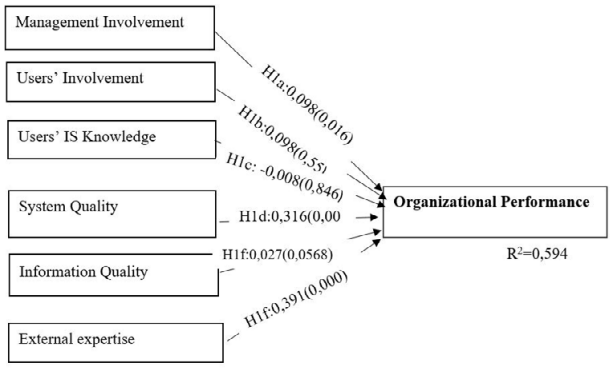

Figure 2: Tested Model.

4. Discussion

Technologies continue to play an increasingly important role in the daily lives of businesses, and a study of their adoption in the DRC proved timely. In fact, in this Central African country, the adoption of ICTs by SMEs still slow. In this research, we have attempted to address this particular situation of the DRC.

The study aimed to analyse the relationship between IS effectiveness factors (technological context, organisational context and environmental context) and organisational performance and to describe these different factors. The central hypothesis of the research is formulated as follows: "Technological factors, organisational factors and IS environmental factors influence organisational performance".

The research proposed a structural equation model to examine the relationships between information systems effectiveness factors and organisational performance. It examined the technological, organisational, and environmental contexts associated with IS and their impact on organisational performance.

The results suggest that system quality, management involvement and external expertise are determinants of organisational performance in the context of IS. Information quality, user involvement and IS knowledge were insignificant in their relationship with organisational performance.

The Beta coefficient value (β=0.391) indicates that external expertise is the leading predictive factor in organisational performance in the context of the SMEs studied. These findings are supported by other comparable studies (Thong et al., 1996; Ifinedo, 2011). Indeed, since SMEs often lack the necessary internal expertise (Thong, 2001), they often rely on external experts to support their strategy and migration to computerised IS (Ghobakhlooa & Tanga, 2015). Therefore, the surveyed SMEs resorted to external expertise more than other factors to benefit from the performance induced by IS. The abovementioned situation may be explained by a lack of confidence in internal skills (Kalumendo, 2022c) and by the fact that Congolese SMEs are still at the IS implementation stage (Kalumendo, 2022c); at this stage, it is common for companies relay external expertise (Burns, 2002).

Another significant factor in its relationship with organisational performance is the quality of the IT system in place. This conclusion is supported by several information system studies (Gorla et al., 2010; Al-Mamary et al., 2014). In SMEs, where users are unfamiliar with IT systems, the system's quality, particularly user-friendliness, is a critical success factor (Ghobakhlooa & Tanga, 2015). In the particular context of North Kivu, it is not surprising to see system quality being a critical factor in organisational performance, as mentioned by our respondents. Research conducted on factors predictive of technology adoption by employees in North Kivu (Kalumendo, 2022c) identified ease of use as a factor in the adoption of technology by these employees. Nevertheless, the ease of use of a system is linked to its quality (Brown, 2017).

Besides system quality, several studies have demonstrated that information quality is a factor in organisational performance (Petter et al., 2008; Shim & Jo, 2020). However, this relationship was not confirmed in our analyses. Our analyses show no relationship between organisational performance and the quality of the information produced by the system. These results can be explained by the fact that, in most cases, Congolese SMEs operate in a context where they produce a small quantity of information and, therefore, give little thought to the importance of the information produced by the IS. We were only interested in TPS since these are low-level information systems whose information does not concern decision-making and does not directly link with organisational performance.

Unlike our initial hypotheses, we observed that users' level of knowledge in terms of IS and their implications do not determine organisational performance in the SMEs surveyed. However, empirical studies have already shown that the level of user knowledge is one of the success factors of IS and, consequently, organisational performance (Ghobakhlooa & Tanga, 2015). The same is true for user involvement, perceived in several research studies as a factor in IS success and, consequently, a performance factor (Abusamhadana & Elias, 2018). These results obtained in our context can be justified by users' weak role in implementing Information Systems. Indeed, it has been established in the context of the SMEs studied that users would play a not very crucial role in terms of IS, which is, moreover, the reason why a large majority of these SMEs continually resort to external expertise.

The R2 value (0.594) suggests that others could explain organisational performance and the factors studied. The literature identifies other IS success factors that should be included in our research model. These include perceived usefulness, service quality, external pressure (Ghobakhlooa & Tanga, 2015) or self-efficacy, subjective norm, pleasure, anxiety, facilitating conditions, social influence, innovation and satisfaction (Alsharida & Hammond, 2021). Including these variables in the model could improve the value of the R2 coefficient. We should also mention other factors that are not linked to technologies but can influence organisational performance. These include environmental factors, the work environment, organisational culture, organisational assets, human resource management, organisational structure and leadership (Mabai & Hove, 2020).

5. Conclusion

This research analysed the relationship between information system effectiveness factors and organisational performance. Based on a quantitative analysis using structural equations for the data, the system's quality, external expertise and management involvement should be considered when implementing information systems in small and medium-sized enterprises. External expertise is the factor most closely linked to organisational performance.

With small and medium-sized enterprises playing such a vital role in the economy, it was essential to investigate the factors driving their performance. We have studied the factors linked to information systems effectiveness in this digital age. As technological developments have become inescapable for businesses, several companies worldwide have turned to information systems, and the results in terms of performance have been clear to see. The trend must be faster in the DRC, with too few companies turning to computerised information systems. It was thus appropriate to conduct this study in this very particular context.

496 individuals were interviewed in SMEs using computerised information systems. The data were mainly analysed using SmartPLS 4 and SPSS 21. The analysis consisted of examining the data's structural equation model and testing the relationships between the factors of information system effectiveness and organisational performance. It emerged that the main determinants of organisational performance in terms of IS were the use of external expertise and the quality of the IT system. Management involvement in the information system was also identified as a factor that could lead to organisational performance. The other hypotheses initially proposed were not accepted. Thus, it is noted that the information quality, the level of user knowledge and user involvement did not influence organisational performance in the SMEs studied.

The main limitation of this research is that it should have included all the information system effectiveness factors which can influence organisational performance. These factors include perceived ease of use, service quality, external pressure and other factors not directly related to new technologies. Another significant limitation is that the study was conducted only on SMEs. Nevertheless, IT can also help many businesses beyond SMEs.

As a contribution, the research proposed a model that can be tested empirically in other contexts different from the one in this study. This model's uniqueness directly links IS effectiveness factors and organisational performance. Until now, most of the models proposed have included intermediate variables. Furthermore, the research is unique in terms of the context in which it was conducted. In the Democratic Republic of Congo, there is a low level of technology adoption. This slow adoption is explained by several factors, including the low level of awareness of the benefits of integrating technologies into the daily lives of SMEs. A study demonstrating the positive relationship between information systems and organisational performance could be the long-awaited trigger for the use of IS by SMEs. The results of this research could be used to help Congolese SMEs migrate to computerised information systems. Business managers, the government and players in the Congolese digital sector now know which factors to focus on when installing new information systems.

Future research could extend the study to the other provinces of the DRC to obtain a larger population. Researchers could also include in the model other variables such as perceived usefulness, service quality, external pressure, self-efficacy, subjective norm, pleasure, anxiety, facilitating conditions, social influence, innovation, external pressure and satisfaction in the model.

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