

The Effect of Management Information Systems on Small and Medium Enterprises in Bauchi Metropolis

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Abstract

The increasing influence of management information system on the business activities has played a vital role in enhancing the operational efficiency and strategic decision-making of small businesses. This paper provides an overview of the effect of MIS on small businesses based on existing literature. The adoption of MIS enables small businesses to streamline their operations, improve data management, enhance customer relationships, integrate e-commerce capabilities, and strengthen cybersecurity measures. By leveraging MIS effectively, small businesses can achieve sustainable growth, increase competitiveness, and capitalize on emerging opportunities in the digital economy. This research shed lights on the earnestness of the research problems, its central role and significant effects in the context of the Nigerian economy. The sample of is research use 380 using structured questionnaire for the data collection, and adopting purposive sampling. The proposed empirical model is simple, practical, operational and customizable to other business organisations. This abstract highlight the significance of MIS in empowering small businesses to thrive in a dynamic and competitive business environment.

Keywords: Management information system, decision support system, software service systems, human resource management

1.1 Introduction

Management Information System (MIS) is a planning system part of internal control in business consisting of the use of documents, people, technology, and procedures in management accounting. The goal is to solve various problems in business including are: service, product cost, and business strategy. All these systems are used with a view to analysing other information systems on the application of operational activities in every organization. So many benefits resulting from management information systems. The function of a system is not only limited to management only, but also for the rest of the organization as a whole, push productivity as well as cost savings in an organization, increase the quality of human resources because each unit in the work system is more, coordinated and systematic, providing convenience for the management, supervise and delegate performance in all departments that have coordination and relationships, drive efficiency and effectiveness to produce more real-

time data and accurate (Berisha - Shaqiri, 2014; Meiryani, Siagian, Puspokusumo, & Lusianah, 2020). Information has become an essential resource for managing modern organizations. This is so because today's business environment is volatile, dynamic, turbulent and necessitates the burgeoning demand for accurate, relevant, complete, timely and economical information needed to drive the decision-making process in order to accentuate organizational abilities to manage opportunities and threat (Ghaffarzadeh, 2018). Informational application which depends on the information already input while answering to a given query. For example, a decision support system could provide, comparative sales figures for one week/month and the next projected revenue figures based on new product sales assumptions, consequences of different decision alternatives, given past experience (Nowduri, 2019). Small and Medium Enterprises or also known as SMEs (Small and Medium Enterprises) play an important role in developing the economy, but there has not been much research on the development of management information systems in improving the performance of SMEs. To improve the performance of SMEs, it is very important to be supported by the use of information technology such as the use of information management systems (Lisanti, Luhukay, Veronica, & Mariani, 2019). Gilbert, (2020) indicated that businesses are run with shareholders' capital, long term and short term borrowing whether it is a small or medium enterprise and its performance is mainly measured in terms of profitability. He further reports that business contains exchange of goods and services which generates information for better analysis of business performance which is pivotal to profitability. However, existing literature revealed that the serious information requisite by midlevel and strategic level management is efficiently and precisely provided by MIS, empirically it has pondered that the limitations and deficiencies in the process of MIS performance are the primary reason of fading the efficiency of decision-making process in the organization. This study is aim to identify the factors that influence MIS adoption by the small and medium enterprises in Bauchi Metropolis.

1.2 Statement of the Problem

Problem Statement: In the rapidly evolving landscape of small businesses, the role and impact of management information systems (MIS) remain a critical area of investigation. While larger enterprises have extensively adopted MIS to enhance operational efficiency, decision-making processes, and competitive advantage, the extent to which small businesses can leverage MIS effectively remains unclear. Despite the potential benefits, including improved resource allocation, streamlined processes, and enhanced strategic planning, many small businesses encounter challenges in adopting and implementing MIS due to limited financial resources, technological expertise, and organizational readiness. Moreover, the effectiveness of MIS in improving business performance and sustainability in small enterprises varies significantly across industries and regions, warranting a deeper exploration into the contextual factors that influence their adoption and outcomes. This study seeks to address these gaps by examining the following research questions: What are the factors that influence management information system adoption by the SMEs? What is the effect of those factors on the adoption management

information system by the SMEs? Does the framework improve the management information system adoption by the SMEs? By exploring these questions through empirical research and quantitative analysis, this study aims to provide an insights and practical recommendations for small business owners, policymakers, and researchers interested in optimizing the integration of management information systems to foster sustainable growth and competitive advantage in small enterprises. SMEs are known to be the wheel behind the moving train of the Nigerian economy and as we also know that every large business starts small. It's worthy of note that in spite the importance and the indispensable nature of SMEs in Nigeria, a lot of small and medium scale enterprises have not given much attention to MIS in relation to their business transaction despite its importance in the success of businesses. This could be as a result of lack of sound knowledge in information technology by owners or respective managers (Martin, 2015) this indicated that there is a difficulty in ascertaining whether comprehensive management records that satisfied the laws under which it was incorporated has been kept. This problem statement sets the stage by outlining the significance of MIS, identifying key research questions, and framing the study's objectives to address gaps in understanding and practice within the context of small businesses.

2.1 Literature review

2.1.1 Decision support system

An initial Decision Support (DSS) model was used as a business intelligence tool to streamline the evaluation process. DSS establishes the criteria for SMEs by calculating and measuring weighted indicators using F-AHP. Subsequently, proposed alternatives align with the performance of rubric categories. DSS aids organizational management in analyzing and overseeing decision-making activities (Anderson & Sandlund, 2010). The effectiveness of decision support systems (DSS) in various scientific domains has been proven through empirical testing, demonstrating positive outcomes. Examples include their application in logistics (Gil-Gomez et al., 2020), customer relationship management (Fayoumi, 2018), clinical information systems (Redolfi et al., 2020), enterprise resource planning (Bokovec et al., 2015), and supply chain management. The prediction and assessment of workforce behavior in an organization have been effectively carried out using the measurement known as DSS (Al-Rahmi et al., 2019). Furthermore, Von Helversen et al. (2018) improved the use of DSS by suggesting the appropriate online store based on customer needs when evaluating online shopping. According to Alasiri and Salameh. (2020), financial institutions use DSS to analyze market trends, assess investment opportunities, and manage risks. DSS in finance can help traders make informed decisions, optimize investment portfolios, and predict market fluctuations. Overall, decision support systems play a crucial role in helping individuals and organizations make better decisions by providing timely and relevant information. With advancements in technology and data analytics, DSS continues to evolve and offer new opportunities for improving decision-making processes across various industries.

2.1.2 Software service systems

Software as a Service (SaaS)

"The Software as a Service (SaaS) model involves deploying the application or service from a centralized data center across a network, allowing access and usage for a recurring fee," as defined by Hoch et al. (2001). SaaS is also viewed as a) a marketplace for software services, b) the dynamic provision of software to meet evolving user needs, c) a service supply network where vendors may subcontract their services, and d) providing delivery transparency to its users, focusing on their usage, according to Gold et al. (2004). The SaaS model is seen as a significant technological and business model advancement that offers new prospects for small and medium businesses (Hong et al. 2009). Some of the main advantages of the SaaS model include reducing total cost of ownership, quick deployment, reliability, ensuring data security, maintaining data safety and disaster recovery, as well as mitigating risks by being insulated from ongoing technology upgrades (Waters 2005). A study by McKinsey on SaaS pointed out that SaaS offers more frequent and less disruptive software upgrades, reduces ownership costs, and improves service levels (Dubey and Wagle 2007). Furthermore, research focusing on technology perspectives identified virtualization, service ecosystems, and cloud infrastructure elasticity as the factors driving the importance of SaaS (Sushil et al. 2010). These advantages present specific opportunities for small and medium-sized enterprises to overcome their traditional constraints in IS/IT resources and capabilities. With its multi-tenant design, the SaaS model addresses the shortcomings of the Application Service Provider (ASP) model in terms of provider-side customization, moving the modification effort to the client side of SaaS (Xin & Levina 2008). Although SaaS adoption by SMEs is not anticipated to revolutionize the business landscape for SMEs anytime soon, a recent German study on the topic noted that SaaS is a crucial concept in these companies' IS/IT architecture (Haselmann & Vossen 2011). According to Gartner (2012), the majority of SaaS apps are still far from being widely used, and only a small number of them have reached maturity. These findings provide light on the difficulties SME customers have when utilizing SaaS.

2.1.3 Human resource management

Any organization's HRM operations are typically regarded as informal, and formal HRM practice can be challenging (Hooi & Ngui 2014). Because of this, Chin et al. (2020) recommended that business organization leaders assess the current state of their business environments, implement appropriate HRM practices that ensure improved performance, and be aware of the negative effects of ineffective HRM practices on the execution of their strategic plans and the overall performance of their companies. The study of Chin et al. (2020) has shown that the ability of human resources to provide value through high-quality goods and services is a key factor in SMEs' performance. This research believed that human resource management is the key to a greater business performance, based on this believed a hypothesis was postulated

that H₂ which stated that human resource management has a positive effective on small business performance, and the findings of this study is identical to Muogbo's (2013) report, which identified structured planning mechanisms, sales growth strategies, and differentiation strategies as key components of HRM. His research revealed a significant favorable effect between Anambra State's SMEs' performance and HRM. Similarly, Moamer and Elhwajj (2016) identified important HRM variables, including training and development, human resource planning, and selective recruiting. The study's conclusions showed a favorable influence between the performance of SMEs in the research region and efficient human resource management. Every measure used to investigate efficient HRM showed noteworthy and encouraging characteristics (Fasoro et. al., 2022).

2.1.4 Small Scale Business Performance

Besides the vast and growing literatures on SMEs, there seems to be no universal definition of the concept (Fatoki, 2011). In a global context, a general definition of SMEs using size and scale of operation is not easy, but within fixed co-ordinates of national boundaries, it might be relatively easier (Adebisi & Gbegi, 2013). Most researchers' and policy makers defined it on the basis of total investment, annual sales and number of employees (Kofi, 2014). Generally, the definition is based on either single criteria or a multiple criterion. According to Reid et al. (2020), small and medium-sized businesses (SMEs) in a competitive business environment may not be able to succeed for a considerable amount of time without effective management of their expenditures, cash flows, and information for monitoring and control. Effective budgeting, cost analysis, and decision-making will all benefit from this. However, as Gilbert and Everett (2023) mentioned earlier businesses are run with shareholder capital, short-term and long-term borrowing, which should be adequately accounted for. Additionally, the management system mechanism should be developed to organize a schedule for loan repayment, which will have a negative impact on the growth and expansion of SMEs in the long run because borrowing for expansion and continual existence is inevitable.

3.1 Methodology

3.2 Sample and Data Collection

The total number of SMEs in Bauchi Metropolis are the unit of analysis for this study, which form the total population of the registered SMEs in SMEDAN amounted to 37,968. The sample of 422 SMEs were randomly selected from the study population (Krejcie & Morgan, 1970). The participant are SMEs owners believed to have undertaken various business activities. The Bauchi State region of northern Nigeria is the subject of the research. Given that Bauchi State was included among the states with a high level of poverty, unemployment, and low economic activity, Bauchi State was chosen as the study's case study (Alhaji et al., 2022). A convenience sampling was chosen in this study because is often pragmatic in the area of entrepreneurship (Al-Mamun et al., 2017; Bui et al., 2020; Handayati et al., 2020; Nguyen, 2021; Peter et al.,

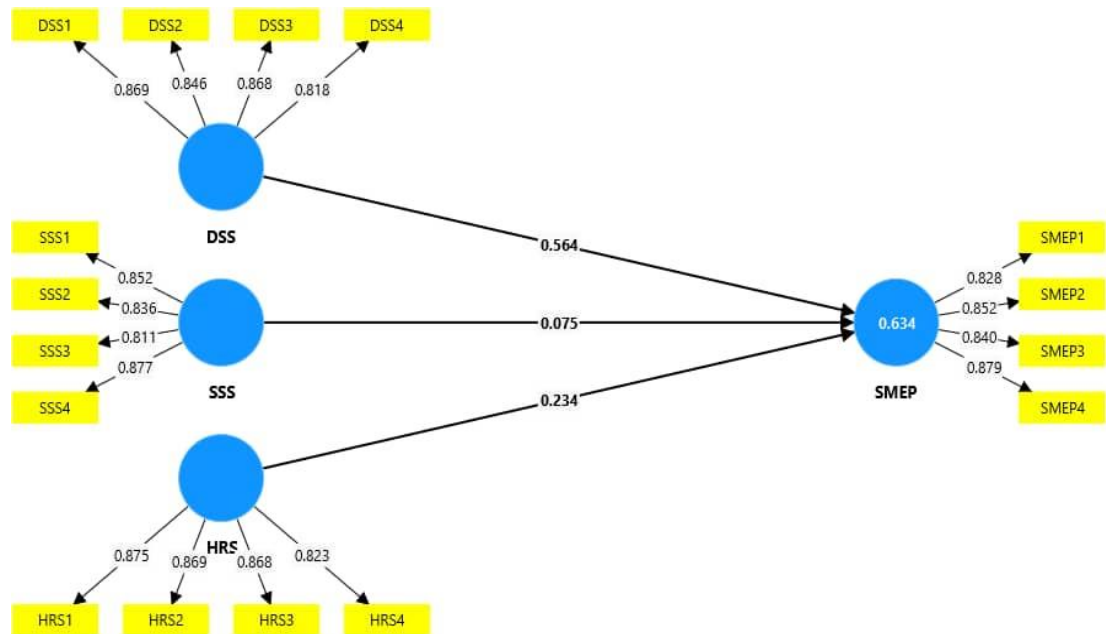
2018). The survey was carried from March to April 2024. A total of 500 questionnaires were distributed and the returned percentage of the questionnaires was 83%. This percentage is acceptable to conduct a survey study (Cohen et al., 2013, 2020).

3.2 Results

The population consist of all SMEs registered with SMEDAN in Bauchi State, the total sample of size was 422 of the SMEs owners in Bauchi Metropolis. The average age is 18, with the age group of 18 to 30 comprising 68.9% of the total, 31 to 40 comprising 23.8%, and 41 to 65 comprising 7.3%. This means that 35.6% of the population are female. Nunnally (1978) argued that reliability and validity are vital aspects of any psychometric assessment. The Cronbach's alpha is used to evaluate the suggested scale's overall reliability. According to Hair et al. (2007), the benchmark for a Cronbach's alpha coefficient in exploratory research is a value of 0.60; a value of 0.70 or higher indicates that the instruments have a high reliability standard (Hair et al., 2010). The variation values from 0.866 to 0.882 on the Cronbach's alpha and from 0.909 to 0.918 values on the composite reliability and the AVE of 0.713 to 0.738 in (Table 1) shows that the scales are considered as reliable.

Table 1. Validity Construct and reliability

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Decision support system	0.873	0.913	0.724
Human resource management	0.882	0.918	0.738
Small scale enterprise performance	0.872	0.912	0.722
Software service systems	0.866	0.909	0.713



4. Individual item reliability

By investigating the outer loadings of each construct's measure, as shown in Figure 1, the discrete item consistency was evaluated (Hair et al., 2013, 2014). According to the Hair et al. (2014) rule of thumb, if an item has a loading between .40 and .70, the analysis of the outer loadings of each separate construct is held, subject to the increase of average variance extracted (AVE) and composite reliability (CR). All 16 items showed loadings that were higher than the threshold of 0.40. (Hair et al., 2014). All the 16 elements in table 2 are therefore retained in the model, and because their loadings fall between 0.811 and 0.879, they are deemed suitable for further investigation.

Table 2. Outer loadings

	DSS	HRS	SMEP	SSS
DSS1	0.869			
DSS2	0.846			
DSS3	0.868			
DSS4	0.818			
HRS1		0.875		
HRS2		0.869		
HRS3		0.868		
HRS4		0.823		
SMEP1			0.828	
SMEP2			0.852	
SMEP3			0.840	
SMEP4			0.879	
SSS1				0.852
SSS2				0.836
SSS3				0.811
SSS4				0.877

Table 3. Path coefficients

	T Statistics	P-Value	F ²	R ²
DSS - SMEP	9.696	0.000	0.367	0.634
HRS – SMEP	4.632	0.000	0.063	
SSS - SMEP	1.137	0.256	0.005	

The path coefficients are appraised in the structural model's hypothesized effect between the endogenous latent constructs (SMEP) and the exogenous latent constructs (DSS, HRS, SSS). The degree and significance of the assessments disclose the strength of the effect. The strong positive effect is shown by the path coefficients that are close to +1, and strong negative associations are usually indicated by path coefficients that go toward -1. (Hair et al, 2014). Using the crucial t-value for significance testing at the 5% level of significance, the bootstrapping procedure in the Smart PLS-SEM program determines the significance of the path estimations. The path coefficients were shown in Table 3 together with their equivalent t-values, p-values, R² and f² values. As shown in the table 3, two of the paths indicated a positive effect with SMEP while one shown negative effect to SMEP. The R² = 0.634 is the value. It was found that the IVs may account for 63.4% of the difference in the SMEP. Other variables outside the scope of this study account for the remaining 36.6% of the variance.

5. Discussion

The main objective of this research is to identify the effect of management information systems on small-scale businesses in the Bauchi metropolis. The general findings identify that most of the respondent are aware of the usage of management information systems but they may probably establish their own MIS in the future. The statistical findings of the first H01 have a t-value of (9.696), which indicates that DSS successfully pushes the small business owner to deploy the usage of a management information system. However, DSS is a very important component of a successful business and also a substantial component in evaluating SMEs' willingness towards digitalization as well as educationally, financial resources, technical infrastructure, and culture. Digital transaction pampers the actions yonder the conservative one. DSS has provided various answers to challenging questions on screening the business environment, how to identify business ideas, and how to store, retrieve, and information for business opportunities and marketing strategy. The study also findings shows that HRS has a t-value of (4.632) which indicates there is a significant effect with SMEP. The study revealed that SME performance was positively correlated with efficient HR management. Two of the variables used to investigate the impact of management information systems have shown significant and positive effects on the performance of SMEs. These factors incorporate choice emotionally supportive networks and human assets for the executives. The standard deviation values, which did not significantly differ from the mean, demonstrated that there were no outliers in the result. According to the findings, these variables play a significant role in explaining how human resources management affects the performance of small businesses in Bauchi. As a result, overall performance will always be guaranteed if the management of SMEs carefully employs these variables when managing human resources in their various businesses.

This finding is consistent with those of Muogbo (2013), Fasoro; et al. (2022), who found a strong positive correlation between HRM and SME performance using a structured planning mechanism, sales growth strategy and differentiation strategy, selective hiring mechanism, attitude and behavior, training and development, cohesive teamwork, and performance appraisal. Similar to this, Moamer and Elhwajj (2016) defined HRM as "variables like human relation planning," "training and development," and "selective hiring." Based on the literature review's insights from SSS adoption studies and our case studies findings, the study concluded that SSS can begin addressing SME implementation challenges based on SSS's technology orientation and operational alignment. Also, the results of our case analysis showed that SSS hurts the performance of small and medium-sized businesses. This could be because they don't know how much management information systems cost to install and maintain, but SSS can add value by focusing on customers and aligning MIS-based solutions strategically. According to Venkatachalam et al. (2013), the empirical analysis of SSS sourcing by German SMEs identified data migration complexities, loss of control over access to data, and integration of SSS with other applications as the top three reasons for SMEs not using SSS. The fear of the

unknown may be supported by this study. These are geared toward the MIS-related operational difficulties of integrating SSS with other applications, losing control over data access, and migrating data.

6. Conclusion and recommendation

Numerous studies have documented SMEs' use of management information systems. It is realized that administration data frameworks give many advantages to SMEs like aiding in the field of creation, catching, putting away, information joining, direction, announcing, asset the board, and methodology definition. This study recommends that all SMEs engage in management information system practices that will enhance performance in all areas. The findings drawn from the secondary and primary sources of data confirm that an effective management information system is essential for improving SMEs' performance. This study suggests that future research should capture additional performance variables and correlate them with the variables of MSEP for more detailed research outcomes due to the significance of MIS in maintaining the implementation of business strategies. In a similar vein, it is proposed that this issue be investigated qualitatively to investigate the individual viewpoints of individuals regarding the issue at hand. Because anyone in the organization could use the information to make timely decisions based on that information at different levels, organizations must implement management information systems in every department on automation in order to compete in today's dynamic and competitive environment. In a similar vein, the company must make use of MIS in order to bridge the communication gap that exists between middle management, lower management, and top management.

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