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Management Information Systems Capability and Sustainability Outcomes among Informal Manufacturing SMEs in Calabar, Nigeria

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Abstract

This study examined the effect of management information systems (MIS) capability on sustainability outcomes among informal manufacturing SMEs in Calabar, Cross River State. Specifically, the study assessed the influence of digital infrastructure capability, management support capability, and human resource information capability on sustainability outcomes. The study adopted a cross-sectional survey research design. A sample size of 234 manufacturing SMEs was determined using the Krejcie and Morgan (1970) sample size determination table. Purposive and convenience sampling techniques were employed to select respondents. Primary data were collected from 228 valid respondents using a structured five-point Likert-scale questionnaire and analysed using descriptive statistics and multiple linear regression analysis in SPSS. The regression model was statistically significant ($F = 43.249$, $p < 0.001$) and explained 36.7 percent of the variation in sustainability outcomes ($R^2 = 0.367$). Human resource information capability emerged as the strongest predictor of sustainability outcomes ($\beta = 0.670$, $p < 0.001$), followed by digital infrastructure capability ($\beta = 0.441$, $p < 0.001$) and management support capability ($\beta = 0.354$, $p < 0.001$). The findings indicate that MIS capability significantly enhances sustainability outcomes among manufacturing SMEs in the informal business sector. The study concludes that strengthening MIS capabilities is critical for improving the sustainability of manufacturing SMEs. Accordingly, manufacturing SME operators should deepen the integration of digital infrastructure,

intensify the use of information systems in managerial decision-making, and broaden the application of human resource information systems to enhance sustainability outcomes.

Keywords: Management Information Systems Capability, Digital Infrastructure Capability, Management Support Capability, Human Resource Information Capability, Sustainability Outcomes, Manufacturing SMEs.

Introduction

In traditional management systems, business organizations relied heavily on manual record-keeping, paper-based files, and managers' personal experience to collect, process, and disseminate information for decision-making. This approach often resulted in slow information flow, limited access to timely data, and inefficiencies in coordinating organizational activities (Kariuki & Nzuki, 2019). As such, organizations could not efficiently streamline business processes, coordinate operational activities, manage information flows, or make timely and informed decisions to enhance organizational effectiveness and long-term growth (Wanyoike, 2022). This undermined business sustainability, precisely because organizations lacked the timely, accurate, and integrated information required to optimize resource utilization, improve operational efficiency, and maintain long-term competitiveness (Gitahi & Kyalo, 2024). As digital technologies advanced, organizations increasingly adopted management information systems (MIS) to address the limitations of traditional management systems (Masika & Kyalo, 2025). These systems were applied with the aim of enabling the efficient collection, processing, storage, and dissemination of information, thereby improving coordination, decision-making, and overall organizational effectiveness (Nwiyii et al., 2022). In the view of Wandili (2022), the integration of management information systems in business has resulted in strategic capabilities that enhance information management, support data-driven decision-making, facilitate operational integration, and strengthen organizational adaptability in dynamic business environments.

For the purpose of this study, MIS capability entails the ability of a firm to effectively deploy, integrate, and utilize digital infrastructure, management support mechanisms, and human resource information systems to enhance information processing, operational efficiency, and organizational decision-making (Mayowa et al., 2025). These capabilities are increasingly relevant to informal manufacturing SMEs because, despite operating with limited financial and technological resources, they still depend on timely information to coordinate production activities, monitor inventory, manage sales, and supervise workers efficiently. Rather than requiring sophisticated enterprise systems, many informal manufacturing SMEs rely on affordable digital technologies and simple information systems that support day-to-day operational control while remaining

within their resource capacity. As production activities expand and market conditions become more dynamic, SME operators require reliable systems for managing operational data, coordinating activities, and monitoring business performance (Ankumah & Bans-Akutey, 2021). The rising volume of business information generated through procurement, production, inventory management, sales, and workforce administration further necessitates the deployment of digital infrastructure capabilities to support information processing and operational coordination (Sunday et al., 2022). In addition, increasing customer expectations, intensifying competition, and the need to respond more rapidly to market changes have compelled many manufacturing SMEs to adopt information-based approaches to managing their operations. The availability of managerial commitment and support influences the extent to which these systems are integrated into business processes, while human resource information capability enables owner-managers to organise employee records, coordinate work schedules, monitor labour utilisation, and support workforce decisions using accessible digital tools rather than complex enterprise applications (Yusuf et al., 2025). Consequently, manufacturing SMEs are increasingly applying MIS capabilities as practical mechanisms for coping with information-intensive operations, changing market demands, and the evolving technological requirements of contemporary business environments (Abdullahi, 2025).

Despite the increasing adoption of management information systems capabilities, manufacturing SMEs remain among the most vulnerable business categories in Nigeria, with a substantial proportion failing within a few years of establishment (Abdulrahman et al., 2025; Monday & Joseph, 2026). Recent evidence indicates that nearly 80 percent of Nigerian SMEs do not survive beyond their first five years of operation, while many cease operations within their first three years, highlighting persistent challenges in achieving long-term sustainability (Egwu, 2026). This situation persists despite growing investments in digital technologies and information systems, suggesting that the availability of MIS resources alone may be insufficient to guarantee sustainability outcomes unless such resources are effectively developed into organizational capabilities. Existing empirical evidence has largely demonstrated the positive influence of management information systems on organizational performance, profitability, customer satisfaction, innovation, operational efficiency, supply chain performance, and competitive advantage (Aduhor, 2026; Lawal & Afolayan, 2023; Ezeibe et al., 2024; Nwiyii et al., 2022; Ghaleb & Basri, 2024; Wandili, 2022). However, limited empirical attention has been devoted to understanding whether specific MIS capability dimensions such as digital infrastructure capability, management support capability, and human resource information capability contribute to the sustainability outcomes of manufacturing SMEs, particularly within Nigeria's informal business sector (Tsalwa & Kyalo, 2024; Masika & Kyalo, 2025; Onyiego & Kyalo, 2026). As a result, there remains insufficient empirical evidence regarding whether these MIS capability dimensions can enhance the long-term viability and sustainability outcomes of manufacturing SMEs operating in the informal business sector. Consequently, many manufacturing SMEs continue to experience difficulties in managing business information, coordinating operations, adapting to environmental

changes, optimizing resources, and maintaining long-term viability, all of which threaten their ability to survive and grow in an increasingly competitive business environment. If this situation remains unresolved, the high failure rate of manufacturing SMEs may persist, undermining employment generation, industrial development, poverty reduction, and economic growth. It is against this backdrop that this study was conducted to achieve the following specific objectives:

i. To determine the effect of digital infrastructure capability on sustainability outcomes among manufacturing SMEs in the informal business sector.
ii. To assess the effect of management support capability on sustainability outcomes among manufacturing SMEs in the informal business sector.
iii. To examine the effect of human resource information capability on sustainability outcomes among manufacturing SMEs in the informal business sector.

LITERATURE REVIEW

Management Information Systems Capability in the Manufacturing Sector

Management information systems capability in the manufacturing sector** refers to the ability of manufacturing firms to deploy, integrate, and utilize information system resources and technologies to support business operations and decision-making (Ghaleb & Basri, 2024). It is also defined as the capacity to leverage digital infrastructure and information resources to facilitate information processing and organizational coordination (Tsalwa & Kyalo, 2024). Similarly, Wandili (2022) described it as the ability of firms to utilize information systems capabilities to enhance operational effectiveness. Common to these definitions is the view that MIS capability enables firms to effectively generate, process, store, and utilize information for organizational purposes. This capability has become increasingly important in the manufacturing sector due to growing operational complexity, rising competition, and increasing information requirements (Okeke, 2021; Nwiyii et al., 2022). Consequently, manufacturing firms are integrating digital infrastructure, database management systems, decision support systems, process control technologies, and human resource information systems into their operations (Ezeibe et al., 2024; Nworie & Oguejiofor, 2023; Mayowa et al., 2025). However, the effective deployment of MIS capability continues to face challenges such as inadequate digital infrastructure, weak data governance practices, limited financial resources, insufficient technical expertise, poor strategic alignment, and inadequate information management systems (Silas et al., 2025; Ankumah & Bans-Akutey, 2021; Vinya & Nzuki, 2025). These challenges often constrain the ability of manufacturing firms, particularly SMEs, to fully exploit the benefits of management information systems in achieving their organizational objectives.

Sustainability of Manufacturing Smes in the Informal Business Sector

Sustainability of manufacturing SMEs refers to the ability of manufacturing enterprises to maintain business operations and remain viable over time despite changing economic and

market conditions (Aduhor, 2026). It is also defined as the capacity of firms to achieve long-term growth and competitiveness through effective resource utilization and adaptation to environmental changes (Ghaleb & Basri, 2024). Similarly, Ezeibe et al. (2024) describe sustainability as the ability of enterprises to sustain productivity, profitability, and operational continuity over time. Common to these definitions is the emphasis on long-term survival, continuity, and resilience in the face of business challenges. Sustainability is particularly important for manufacturing SMEs in the informal business sector because these enterprises contribute significantly to employment, production, and local economic development while operating in highly uncertain environments. Increasing competition, rising production costs, changing customer demands, and rapid technological developments are driving many SMEs to pursue sustainable business practices (Ali et al., 2024; Aduhor, 2026). However, achieving sustainability remains difficult due to financial constraints, inadequate technological infrastructure, weak information systems, and limited managerial capabilities (Silas et al., 2025; Ankumah & Bans-Akutey, 2021). Consequently, the long-term viability of manufacturing SMEs depends on their ability to effectively utilize organizational capabilities and adapt to changing business conditions.

Digital Infrastructure Capability and Sustainability Outcomes

Digital infrastructure capability is the ability of an organization to deploy and utilize digital technologies, information systems infrastructure, and network resources to support business operations and information management (Kariuki & Nzuki, 2019). It also refers to a firm's capacity to establish technological platforms and digital systems that facilitate information processing and communication (Tsalwa & Kyalo, 2024). Similarly, Wangai (2024) defined it as the availability and effective use of digital facilities and technological resources that support organizational activities and decision-making. Common to these definitions is the view that digital infrastructure capability provides the technological foundation for generating, storing, processing, and sharing information. In the context of manufacturing SMEs in the Nigerian informal business sector, this capability is important because increasing operational complexity, growing information needs, and changing market demands require firms to adopt digital solutions for managing production, inventory, transactions, and communication (Tsalwa & Kyalo, 2024; Gitahi & Kyalo, 2024).

By enabling timely access to information and more efficient coordination of business activities, digital infrastructure capability can enhance economic sustainability through improved business continuity and financial stability, while also supporting social sustainability through better responsiveness to employees and customers (Onyiego & Kyalo, 2026; Wangai, 2024). Consequently, it has become an important capability for sustaining the operations and competitiveness of manufacturing SMEs in the informal business sector. The foregoing viewpoints suggest that as an MIS capability, digital infrastructure capability could substantially enhance the sustainability outcomes of business organizations. These viewpoints are backed by the study of Gitahi and Kyalo (2024), which revealed that digital infrastructure

capability had a significant positive effect on hospital performance. The viewpoints are also backed by the study of Wangai (2024), which revealed that digital infrastructure capability significantly influenced hospital performance. Hence, it was hypothesized that:

H_1: Digital infrastructure capability has a significant effect on sustainability outcomes among manufacturing SMEs in the informal business sector.

Management Support Capability and Sustainability Outcomes

Management support capability refers to the ability of an organization to leverage information systems in providing managers with timely, relevant, and accurate information for planning, controlling, monitoring, and decision-making activities (Gitahi & Kyalo, 2024). It is also described as the extent to which information systems facilitate managerial oversight, strategic direction, and organizational coordination through effective information provision (Wangai, 2024). Similarly, Vinya and Nzuki (2025) viewed management support capability as the capacity of information systems to support managerial functions by improving access to information needed for resource allocation and operational control. A common theme across these definitions is that management support capability enhances the ability of managers to make informed decisions and effectively coordinate organizational activities through the use of information resources. In the context of manufacturing SMEs in the Nigerian informal business sector, this capability is particularly important because managers often operate in environments characterized by limited resources, market uncertainty, and increasing operational demands. Consequently, these enterprises utilize management support capability to obtain reliable information for production planning, inventory management, workforce supervision, and resource deployment (Gitahi & Kyalo, 2024; Vinya & Nzuki, 2025).

By improving the quality and timeliness of managerial decisions, management support capability can strengthen economic sustainability through better financial stability and business continuity, while also promoting social sustainability through improved employee and customer retention (Wangai, 2024; Onyiego & Kyalo, 2026). As a result, it serves as an important information-based capability for sustaining the long-term viability of manufacturing SMEs in the informal business sector. The foregoing viewpoints suggest that as an MIS capability, management support capability could substantially enhance the sustainability outcomes of business organizations. These viewpoints are backed by the study of Gitahi and Kyalo (2024), which revealed that management support capability had a significant positive effect on hospital performance. The viewpoint is also in alignment with the study of Wangai (2024), which revealed that management support capability significantly influenced hospital performance. Hence, it was hypothesized that:

H_2: Management support capability has a significant effect on sustainability outcomes among manufacturing SMEs in the informal business sector.

Human Resource Information Capability and Sustainability Outcomes

Human resource information capability refers to the ability of an organization to acquire, manage, and utilize employee-related information to support workforce administration and organizational decision-making (Wanyoike, 2022). It is also defined as the capacity to maintain accurate personnel records and generate relevant workforce information for planning, monitoring, and coordinating employee activities (Mayowa et al., 2025). Similarly, Wandili (2022) described it as the ability of a firm to leverage human resource information systems and employee knowledge resources to improve organizational effectiveness. In the context of manufacturing SMEs in the Nigerian informal business sector, this capability is important because the effective management of employee information has become increasingly necessary for coordinating labour-intensive production activities, monitoring workforce performance, and addressing changing human resource needs. Consequently, these enterprises utilize human resource information capability to facilitate personnel administration, workforce planning, performance monitoring, and employee-related decision-making (Mayowa et al., 2025; Wandili, 2022).

By improving the management and utilization of workforce information, this capability can enhance economic sustainability through improved operational continuity and productivity, while also strengthening social sustainability by fostering employee retention and stable workplace relationships (Masika & Kyalo, 2025; Wanyoike, 2022). Therefore, human resource information capability represents an important organizational capability for supporting the sustainability of manufacturing SMEs in the informal business sector. The foregoing viewpoints suggest that as an MIS capability, human resource information capability could substantially enhance the sustainability outcomes of business organizations. These viewpoints are backed by the study of Wandili (2022), which revealed that human resource capabilities had a significant positive effect on supply chain performance. The viewpoints are also supported by the study of Wanyoike (2022), which revealed that human resource management had a significant positive effect on organizational performance. Hence, it was hypothesized that:

H_3: Human resource information capability has a significant effect on sustainability outcomes among manufacturing SMEs in the informal business sector.

Theoretical Framework

This study is anchored on the Resource-Based View (RBV) Theory developed by Barney (1991). The theory posits that firms achieve superior and sustained outcomes through the possession and effective utilization of valuable, rare, inimitable, and non-substitutable resources and capabilities. According to RBV, organizational success depends not only on external market conditions but also on the firm's ability to develop and deploy internal resources that competitors cannot easily replicate (Barney, 1991). Such resources include technological infrastructure, managerial capabilities, organizational processes, and human capital, all of which contribute to long-term competitiveness and sustainability (Barney et al.,

2021; Chen et al., 2021).

The Resource-Based View has received considerable empirical support in recent studies. For instance, Civelek et al. (2023) found that organizational capabilities developed through digital transformation significantly enhance SME competitiveness and performance. Similarly, Madhala et al. (2024) reported that data analytics capabilities and information resources contribute significantly to organizational performance, supporting the RBV argument that information-based capabilities are strategic assets capable of generating superior outcomes.

The theory is relevant to this study because management information systems capability represents a strategic organizational capability that can enhance sustainability outcomes among manufacturing SMEs. Specifically, digital infrastructure capability, management support capability, and human resource information capability provide firms with the information resources required for effective planning, decision-making, coordination, and resource management. Consistent with RBV, these capabilities can strengthen economic sustainability through improved business continuity and financial stability, while also enhancing social sustainability through employee retention and customer retention. The theory therefore provides a suitable framework for explaining how management information systems capability influences sustainability outcomes among manufacturing SMEs in the Nigerian informal business sector.

Review of Empirical Studies and Conceptual Framework

The empirical literature on management information systems and management information systems capability (See Table 1) shows a strong concentration of research on organizational performance and efficiency outcomes rather than sustainability outcomes among manufacturing SMEs in the Nigerian informal business sector. Collectively, Nigerian studies (Aduhor, 2026; Lawal & Afolayan, 2023; Ezeibe et al., 2024; Ali et al., 2024; Nwiyii et al., 2022; Sunday et al., 2022; Mayowa et al., 2025; Onodi et al., 2021; Okeke, 2021) consistently demonstrate that management information systems enhance organizational performance, profitability, innovation, decision-making, operational efficiency, and return on investment. However, this body of work remains conceptually narrow because most studies treat management information systems as a general construct or focus on isolated system applications rather than an integrated management information systems capability framework. Even where specific dimensions such as database management systems, decision support systems, transaction processing systems, and executive support systems are examined (Ezeibe et al., 2024; Mayowa et al., 2025; Nworie & Oguejiofor, 2023; Okeke, 2021), they are considered independently rather than as interconnected organizational capabilities.

A more critical limitation is that most studies focus on short-term outcomes such as organizational performance, productivity, profitability, customer satisfaction, customer retention, innovation, and service delivery (Abdullahi, 2025; Yusuf et al., 2025; Sunday et al., 2022; Onodi et al., 2021; Silas et al., 2025), while sustainability outcomes remain largely under-examined. Although Aduhor (2026) examined business sustainability, the study focused

on general MIS utilization rather than management information systems capability as a multidimensional construct. This reveals a clear conceptual gap regarding how MIS capability influences sustainability outcomes. More importantly, there is a strong contextual gap because existing studies are concentrated in banks, hospitals, energy firms, agro-businesses, supermarkets, public institutions, and large manufacturing organizations (Ankumah & Bans-Akutey, 2021; Masika & Kyalo, 2025; Onyiego & Kyalo, 2026; Wanyoike, 2022; Kariuki & Nzuki, 2019; Wandili, 2022). Consequently, little is known about the role of MIS capability in manufacturing SMEs operating within the Nigerian informal business sector.

In contrast, studies from non-Nigerian contexts (Ghaleb & Basri, 2024; Tsalwa & Kyalo, 2024; Masika & Kyalo, 2025; Gitahi & Kyalo, 2024; Wangai, 2024; Kariuki & Nzuki, 2019) show that dimensions such as digital infrastructure, data management, information security, systems integration, and management support jointly influence organizational outcomes. However, comparable evidence is largely absent in Nigeria, particularly among informal-sector manufacturing SMEs. Therefore, what is missing in the literature is a structured understanding of how management information systems capability dimensions collectively influence sustainability outcomes among manufacturing SMEs in the Nigerian informal business sector.

Table 1: Summary of relevant empirical studies

SN	Author(s)	Study Objectives	Methodology	Key Findings
1	Aduhor (2026)	To determine the relationship between management information systems, decision making, and business sustainability in Edo State, Nigeria	The study adopted a correlational survey design involving 120 staff of selected registered business organizations in Benin City. Data were collected through a structured questionnaire and analysed using Mean, Standard Deviation, and Pearson Product Moment Correlation (PPMC)	The study found a significant relationship between the utilization of management information systems and business sustainability. It further revealed that effective information-based decision making enhances business growth and sustainability
2	Abdullahi (2025)	To investigate the role of information systems in enhancing quality assurance and customer retention in small and medium-sized enterprises (SMEs)	The study adopted a mixed-method approach, combining surveys, interviews, case studies, and secondary data from industry reports and academic literature	The study found that SMEs that adopted information systems improved quality assurance, customer satisfaction, operational efficiency, and customer retention. It also revealed that quality assurance practices contribute significantly to sustainable business growth
3	Lawal and Afolayan (2023)	To examine the effect of management information systems on organisational performance in the Nigerian service industry	The study adopted a survey research design. Data were collected from 50 randomly selected participants and analysed using Pearson Product Moment Correlation (PPMC)	The study found that management information systems significantly improve organisational performance, employee performance, and analytical skills in service organizations
4	Yusuf et al. (2025)	To examine the effect of MIS reliability and accessibility on customer satisfaction among SMEs in Karu LGA, Nasarawa State	The study adopted a survey research design. Data were collected from 384 SME customers using a structured questionnaire and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM)	The study found that system reliability had a positive but insignificant effect on customer satisfaction, while system accessibility had a positive and significant effect on customer satisfaction among SMEs in Karu LGA

SN	Author(s)	Study Objectives	Methodology	Key Findings
5	Okeke (2021)	To examine the effect of management information systems on organizational performance in manufacturing firms in Anambra State, Nigeria	The study adopted a survey research design. Data were collected through questionnaires administered to manager-owners and key officers of 15 selected manufacturing firms. A sample size of 334 was selected using purposive sampling	The study found that decision support systems significantly affect performance effectiveness, while process control systems and artificial intelligence significantly affect performance efficiency in manufacturing firms
6	Ezeibe et al. (2024)	To examine the effect of management information systems on the growth of agro-firms in Anambra State, specifically the effects of decision-making information systems and database management systems on return on investment (ROI)	The study adopted a survey research design. Data were collected through questionnaires administered to staff of selected agro-firms. From a population of 6,727, a sample of 1,293 was selected, with 929 valid responses analysed using multiple regression	The study found that decision-making information systems and database management systems had significant positive effects on the ROI of agro-businesses in Anambra State
7	Silas et al. (2025)	To examine the role of management information systems in enhancing the competitive advantage of energy firms in Nigeria	The study adopted a secondary data approach, relying on existing literature, industry reports, and empirical studies for analysis	The study found that management information systems improve cost efficiency, innovation, customer service, and strategic decision-making. However, challenges such as poor strategic alignment, inadequate digital infrastructure, and weak data governance hinder effective MIS implementation in many energy firms
8	Nworie and Oguejiofor (2023)	To examine the influence of transaction processing systems, decision support systems, and executive support systems on the performance of cement-producing firms in Southeast Nigeria	The study adopted a descriptive survey design. Data were collected through structured questionnaires from 141 staff of selected cement firms and analysed using Pearson Product Moment Correlation	The study found that transaction processing systems, decision support systems, and executive support systems have significant positive effects on the performance of cement-producing firms in Southeast Nigeria
9	Ali et al. (2024)	To investigate the impact of management information systems on the performance of selected business organizations in Adamawa State, Nigeria	The study adopted a survey research design. A sample of 119 business enterprises was selected from a population of 167 registered enterprises using simple random sampling. Data were analysed using descriptive statistics, Z-test, and chi-square	The study found that management information systems improve business performance through enhanced staff monitoring, process optimization, strategic decision-making, operational efficiency, and error reduction
10	Nwiyii et al. (2022)	To examine the relationship between management information systems and organizational performance in terms of market expansion, product innovation, and customer satisfaction among selected production companies in Southern Nigeria	The study adopted an explanatory cross-sectional survey design. Data were collected from 167 managers of 36 production companies and analysed using Spearman's Rank Order Correlation Coefficient	The study found that management information systems have strong positive relationships with market expansion, product innovation, and customer satisfaction among production companies
11	Sunday et al. (2022)	To examine the relationship between management information systems and corporate decision making, focusing on quality of decision making, business innovativeness, and service	The study adopted a survey research design. Data were collected from staff of selected energy and power companies using structured questionnaires and analysed using chi-square statistics	The study found that management information systems positively influence decision making, business innovativeness, and service delivery in energy and power firms

SN	Author(s)	Study Objectives	Methodology	Key Findings
		delivery among energy and power firms in Delta State, Nigeria		
12	Mayowa et al. (2025)	To examine the relationship between management information systems and employee performance in selected banks in Lokoja Local Government Area, Kogi State, focusing on decision support systems, human resource information systems, and financial reporting systems	The study adopted a survey research design. Using a census sampling approach, data were collected from 100 employees of selected banks and analysed using Ordinary Least Squares (OLS) regression	The study found that decision support systems and financial reporting systems significantly influence employee performance, while human resource information systems have no significant relationship with employee performance
13	Onodi et al. (2021)	To examine the effect of management accounting information systems on the financial performance of listed consumer goods companies in Nigeria, focusing on sales management systems, management accounting reporting systems, and budgetary management systems	The study adopted a survey research design. Data were collected from top and middle management staff of listed consumer goods companies and analysed using simple regression and ANOVA	The study found that sales management systems, management accounting reporting systems, and budgetary management systems have significant positive effects on the profitability of listed consumer goods companies in Nigeria
14	Ankumah and Bans-Akutey (2021)	To investigate the effect of management information systems on the productivity of livestock farming in Ghana	The study adopted a quantitative case study design using a survey method. Data were collected through structured questionnaires from 40 purposively selected livestock farmers	The study found that access to information on disease control, livestock protection, shelter, and production improves livestock farming productivity. It also revealed that inaccurate information and lack of IT skills hinder effective MIS implementation
15	Ghaleb and Basri (2024)	To examine the effect of management information system capabilities on business operations performance, with operations decision-making performance as a mediator and process automation as a moderator among textile companies in Saudi Arabia	The study adopted a cross-sectional quantitative research design. Data were collected from 299 employees of textile companies and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM)	The study found that management information system capabilities have a significant positive effect on business operations performance. Operations decision-making performance partially mediates this relationship, while process automation significantly moderates it
16	Tsalwa and Kyalo (2024)	To investigate the effect of management information systems capabilities on the performance of the shipbuilding industry in Kenya	The study adopted a quantitative research approach. Data were collected through questionnaires and analysed using regression analysis	The study found that centralized databases, service delivery, information security, and digital infrastructure significantly improve the performance of shipbuilding firms. Digital infrastructure had the strongest effect on performance
17	Masika and Kyalo (2025)	To examine the influence of MIS capabilities on the performance of public and private hospitals in Mombasa County, Kenya, focusing on service delivery automation, system management, data security, and information quality	The study adopted a descriptive research design. Data were collected from 96 ICT specialists in hospitals using semi-structured questionnaires and analysed using descriptive and inferential statistics	The study found that service delivery automation, system management, data security, and information quality have significant positive effects on hospital performance

SN	Author(s)	Study Objectives	Methodology	Key Findings
18	Onyiego and Kyalo (2026)	To examine the influence of management information systems capabilities (data analytics, digital power generation, information storage, and digital communication) on the organizational performance of Kenya Electricity Generating Company (KenGen)	The study adopted a descriptive research design. Data were collected through structured questionnaires from 83 employees and analysed using descriptive statistics and multiple regression analysis	The study found that data analytics and digital power generation significantly enhance organizational performance, while information storage and digital communication have positive but insignificant effects on performance
19	Vinya and Nzuki (2025)	To examine the influence of user input and customization, resource availability, MIS system security, and ICT organization on MIS performance in tier-1 commercial banks in Nairobi City County, Kenya	The study adopted a descriptive research design. Data were collected from 45 bank personnel using structured questionnaires and analysed using descriptive and inferential statistics	The study found that user satisfaction, system customization, resource availability, MIS security, and ICT infrastructure significantly enhance MIS performance. Banks with stronger IT departments recorded higher MIS effectiveness
20	Wanyoike (2022)	To determine the influence of MIS capabilities (communication capabilities, accounting capabilities, human resource management capabilities, and data management capabilities) on the performance of the Teachers Service Commission (TSC) of Kenya	The study adopted a descriptive research design. Data were collected from a stratified random sample of 130 staff using questionnaires and analysed using descriptive and inferential statistics	The study found that communication capabilities, accounting information systems, human resource management systems, and electronic data management systems have significant positive effects on the performance of TSC
21	Gitahi and Kyalo (2024)	To establish the relationship between health management information system capabilities and the performance of Catholic Mission Hospitals in selected counties in Kenya	The study adopted a descriptive research design. Data were collected from 150 managerial, non-managerial, and ICT staff of 25 Catholic Mission Hospitals using questionnaires and analysed using regression analysis	The study found that digital infrastructure, information security, data storage, and management support have significant positive effects on hospital performance. Management support exerted the strongest influence on performance
22	Wangai (2024)	To determine the effect of digital infrastructure, data storage, information security, and management support on the performance of Catholic Mission Hospitals in selected counties in Kenya	The study adopted a descriptive research design. Data were collected from 150 ICT specialists and system users in Catholic Mission Hospitals using questionnaires and analysed using regression analysis	The study found that digital infrastructure, data storage, information security, and management support significantly influence hospital performance. Management support exerted the strongest effect on performance
23	Kariuki and Nzuki (2019)	To establish the relationship between management information systems capabilities and organizational performance of supermarkets in Nairobi City County, Kenya, focusing on information systems infrastructure, information systems flexibility, information systems security, and information systems automation	The study adopted a descriptive research design. Data were collected through semi-structured questionnaires from managers of 121 supermarkets selected using simple random sampling and analysed statistically	The study found that information systems infrastructure, information systems flexibility, information systems security, and information systems automation positively influence the performance of supermarkets, particularly in terms of market share

SN	Author(s)	Study Objectives	Methodology	Key Findings
24	Wandili (2022)	To establish the influence of information systems capabilities on the supply chain performance of listed manufacturing firms in Kenya	The study adopted a positivist philosophy and a descriptive cross-sectional survey design. Primary data were collected from 156 employees in the IT and procurement departments of listed manufacturing firms and analysed using correlation and regression analysis	The study found that information systems infrastructure, human resource capabilities, and information systems integration capabilities have significant positive effects on supply chain performance. The results also showed that the integration of information systems enhances operational efficiency and collaborative decision-making across the supply chain

Source: Researchers' literature review

Based on the gaps identified in existing relevant studies, this study investigated the relationship between management information systems capability and economic and social sustainability outcomes among manufacturing SMEs in the Nigerian informal business sector. The independent variable, management information systems capability, was conceptualized as a multidimensional construct comprising digital infrastructure capability, management support capability, and human resource information capability. Digital infrastructure capability reflected the availability and effective utilization of information technology resources that support information processing, communication, data storage, and business operations, including ICT infrastructure, information systems infrastructure, digital platforms, and centralized databases (Tsalwa & Kyalo, 2024; Wangai, 2024; Kariuki & Nzuki, 2019). Management support capability captured the extent to which organizational leadership provides strategic direction, resources, commitment, and oversight for the effective implementation and utilization of management information systems (Gitahi & Kyalo, 2024; Wangai, 2024; Vinya & Nzuki, 2025). Human resource information capability represented the firm's ability to leverage employee information, competencies, and information-based human resource systems to support workforce management, coordination, and organizational decision-making (Wanyoike, 2022; Wandili, 2022; Mayowa et al., 2025).

The dependent variable was conceptualized as economic and social sustainability outcomes, reflecting the dimensions most directly associated with the operational realities of manufacturing SMEs in the informal business sector and the aspects of sustainability most likely to be influenced by management information systems capability. Environmental sustainability was not included because the study focused on organisational capabilities that primarily affect business continuity, operational performance, workforce management, and stakeholder value creation rather than environmental management practices. Accordingly, economic sustainability reflected the ability of manufacturing SMEs to maintain long-term business viability through improved productivity, profitability, operational efficiency, and business growth (Aduhor, 2026; Ezeibe et al., 2024; Ghaleb & Basri, 2024). Social sustainability captured the extent to which manufacturing SMEs create value for employees, customers, and other stakeholders through enhanced service quality, employee well-being,

customer satisfaction, and responsible business practices (Abdullahi, 2025; Sunday et al., 2022; Masika & Kyalo, 2025). As conceptualized in the study framework (Fig. 1), it was expected that digital infrastructure capability, management support capability, and human resource information capability would jointly influence the economic and social sustainability outcomes of manufacturing SMEs in the Nigerian informal business sector.

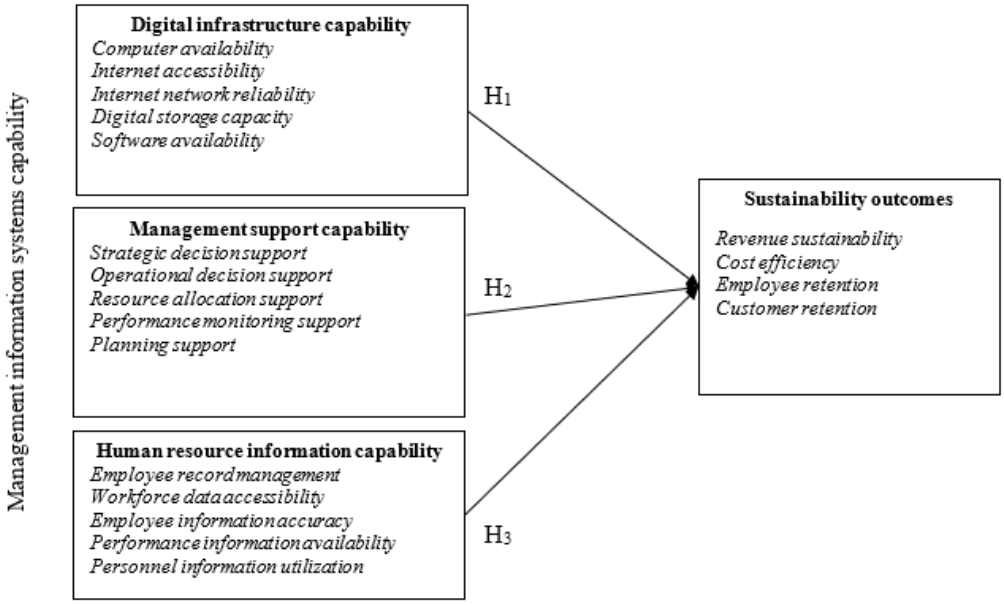


FIG. 1: Conceptual model of the study

Source: Independent variable parameters adapted from Tsalwa and Kyalo (2024); Gitahi and Kyalo (2024); Wanyoike (2022). Dependent variable parameters adapted from Aduhor (2026); Masika and Kyalo (2025).

MATERIALS AND METHODS

Research Design

This study adopted a cross-sectional survey research design. The design was appropriate because it enabled the collection of quantitative data from manufacturing SMEs in the informal business sector in Calabar, Cross River State, at a single point in time. It was used to examine the relationship between management information systems capability and sustainability outcomes. The design was also suitable because the study investigated naturally occurring phenomena without manipulating any of the variables. In addition, it facilitated the collection of data from a relatively large number of SMEs and provided a basis for statistically testing the relationships among the study variables.

Population and Sample

The target population comprised 574 registered manufacturing SMEs operating in the informal

business sector in Calabar, Cross River State (CRSMSME, 2026). Although these enterprises operate within the informal business sector, the sampling frame was developed from the register maintained by the Cross River State Ministry of Small and Medium Enterprises, which provided an accessible listing of eligible manufacturing SMEs within Calabar Municipality and Calabar South Local Government Areas. These enterprises constituted the unit of analysis because they possessed the relevant information required to assess management information systems capability and sustainability outcomes. The sample size for the study was determined using the sample size determination table developed by Krejcie and Morgan (1970). The table is widely used in social and management science research because it provides statistically appropriate sample sizes for finite populations at a 95 percent confidence level and a 5 percent margin of error. Based on the Krejcie and Morgan (1970) table, a population of 574 corresponds to a sample size of 234 respondents. Therefore, 234 manufacturing SMEs were selected for the study.

Sampling Technique, Data Collection, Instrument Validity and Reliability

To select respondents for the survey, a combination of purposive and convenience sampling techniques was employed. First, purposive sampling was used to identify manufacturing SMEs operating in the informal business sector within Calabar Municipality and Calabar South Local Government Areas from the available sampling frame. This ensured that only enterprises relevant to the study were included. Thereafter, convenience sampling was used to select SME operators who were readily accessible and willing to participate in the survey. The combination of these techniques was considered appropriate because it enabled the researcher to focus on manufacturing SMEs while ensuring access to respondents with adequate knowledge of management information systems capability and sustainability outcomes. While the use of convenience sampling may limit the statistical generalisability of the findings to all informal manufacturing SMEs beyond the study area, the purposive selection of eligible enterprises enhanced the relevance of the data obtained and the validity of the relationships examined within the target population.

Primary data were obtained through a structured questionnaire. The instrument was designed using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The questionnaire contained items measuring digital infrastructure capability, management support capability, human resource information capability, and sustainability outcomes. The items were adapted from relevant empirical studies on management information systems capability and organizational outcomes to ensure consistency with established measures in the literature (Wandili, 2022; Tsalwa & Kyalo, 2024; Gitahi & Kyalo, 2024; Wangai, 2024; Ghaleb & Basri, 2024; Wanyoike, 2022). During the adaptation process, the questionnaire items were modified to reflect the operational context of manufacturing SMEs in the informal business sector while ensuring that the original meaning of the constructs was preserved.

Prior to field administration, the instrument was subjected to content validity by experts in the Department of Marketing, University of Calabar. The experts carefully examined the

questionnaire to determine whether the items adequately represented the study constructs, were relevant to the research objectives, and were expressed in clear, simple, and unambiguous language suitable for SME operators. Based on their observations, minor revisions were made to the wording, sequencing, and presentation of some questionnaire items to improve clarity, eliminate ambiguity, and enhance the overall comprehensibility of the instrument.

Furthermore, the reliability of the instrument was determined using the Cronbach's alpha reliability method based on data obtained from a pilot survey conducted among 30 manufacturing SMEs outside the study sample. The pilot survey provided an opportunity to evaluate the clarity of the questionnaire, identify items that respondents found difficult to interpret, assess the appropriateness of the response format, and estimate the average time required to complete the instrument. Feedback obtained during the pilot exercise was incorporated into the final version of the questionnaire before its administration to the study respondents. The reliability coefficients obtained exceeded the minimum acceptable threshold of 0.70 (see Table 2), indicating satisfactory internal consistency among the measurement items and confirming that the instrument was sufficiently reliable for the main survey.

Table 2: Summary of reliability test (Cronbach's alpha)

Construct	Number of Items	Cronbach's Alpha
Digital infrastructure capability	5	0.801
Management support capability	5	0.763
Human resource information capability	5	0.874
Sustainability outcomes	4	0.727
	19	

Source: Researchers' analysis via SPSS (2026)

Data Analysis Techniques

The data obtained from the respondents were coded and analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistical techniques, including frequencies, percentages, means, and standard deviations, were used to summarize the demographic characteristics of respondents and describe their perceptions of digital infrastructure capability, management support capability, human resource information capability, and sustainability outcomes. Furthermore, multiple linear regression analysis was employed to test the study hypotheses and determine the individual and combined effects of the management information systems capability dimensions on sustainability outcomes among manufacturing SMEs in the informal business sector in Calabar, Cross River State. The technique was considered appropriate because it enabled the study to assess the influence of multiple independent variables on the dependent variable simultaneously. The regression model states thus:

$Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e$

Where:

Y = Dependent variable (Sustainability outcomes)

a = The intercept

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients of the independent variable

X_1, X_2, X_3, X_4 = Parameters of independent variable (Digital infrastructure capability, management support capability, and human resource information capability)

e = Error margin (5 percent)

ANALYSIS AND FINDINGS

A total of 234 questionnaire copies were administered to manufacturing SME operators in the informal business sector in Calabar, Cross River State. At the end of the data collection exercise, 228 completed copies were retrieved and adjudged suitable for analysis, representing a response rate of 97.4 percent. However, 6 copies (2.6 percent) were either not retrieved or were improperly completed and, therefore, excluded from the analysis. Consequently, the study was based on the 228 valid questionnaire copies returned by the respondents.

Table 3: Descriptive statistics of the study's variables

	No. of items	N	Mean	Std. Deviation
Digital infrastructure capability	5	228	4.0623	.70253
Management support capability	5	228	4.0658	.33852
Human resource information capability	5	228	4.1228	.35021
Sustainability outcomes	4	228	4.0757	.27672
Valid N (listwise)		228		

Source: Researchers' analysis via SPSS (2026)

The descriptive statistics presented in Table 3 were obtained from responses measured on a 5-point Likert scale, where 5 = Strongly Agree and 1 = Strongly Disagree. The table summarizes respondents' perceptions of digital infrastructure capability, management support capability, human resource information capability, and sustainability outcomes among manufacturing SMEs in the informal business sector in Calabar, Cross River State. The mean scores for all the variables are above the criterion mean of 3.0, indicating that respondents generally agreed that their enterprises possess the identified MIS capabilities and exhibit favourable sustainability outcomes.

Among the MIS capability dimensions, human resource information capability recorded the highest mean score (M = 4.1228), suggesting that respondents perceived employee-related information systems and workforce information management practices to be relatively well established within their enterprises. This was followed by management support capability (M = 4.0658) and digital infrastructure capability (M = 4.0623), indicating positive assessments of the availability and utilization of information resources for managerial and operational purposes. Sustainability outcomes recorded a mean score of 4.0757, implying that the surveyed SMEs generally reported favourable levels of economic and social sustainability.

The standard deviation values indicate a relatively low level of variation in respondents' opinions. Digital infrastructure capability recorded the highest standard deviation (SD = 0.70253), suggesting comparatively greater differences in the availability and utilization of digital infrastructure across the SMEs. In contrast, sustainability outcomes exhibited the lowest standard deviation (SD = 0.27672), indicating a high degree of agreement among respondents regarding the sustainability status of their enterprises. Overall, the results suggest that manufacturing SMEs in the informal business sector possess relatively strong MIS capabilities and favourable sustainability outcomes.

Hypothesis one:

Ho: Digital infrastructure capability has no significant effect on sustainability outcomes among manufacturing SMEs in the informal business sector.

Hypothesis two:

Ho: Management support capability has no significant effect on sustainability outcomes among manufacturing SMEs in the informal business sector.

Hypothesis three:

Ho: Human resource information capability has no significant effect on sustainability outcomes among manufacturing SMEs in the informal business sector.

Independent variables: Digital infrastructure capability, management support capability and human resource information capability

Dependent variable: Sustainability outcomes

Test statistic: Multiple linear regression

Decision criteria: Accept the alternative hypothesis if ($P < .05$) and reject the null hypothesis, if otherwise.

Table 4: Model summary of the effect of management information systems capability on sustainability outcomes among manufacturing SMEs in the informal business sector

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.606[a]	.367	.358	.22167

a. Predictors: (Constant), Digital infrastructure capability, management support capability and human resource information capability

Source: Researchers' analysis via SPSS (2026)

Table 5: ANOVA[a] of the effect of management information systems capability on sustainability outcomes among manufacturing SMEs in the informal business sector

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.376	3	2.125	43.249	.000[b]
	Residual	11.007	224	.049		
	Total	17.382	227			

a. Dependent Variable: Sustainability outcomes
b. Predictors: (Constant), Digital infrastructure capability, management support capability and human resource information capability
Source: Researchers' analysis via SPSS (2026)

Table 6: Coefficients[a] of the effect of management information systems capability on sustainability outcomes among manufacturing SMEs in the informal business sector

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.892	.204		28.943	.000
	Digital infrastructure capability	.134	.024	.441	5.560	.000
	Management support capability	.144	.050	.354	4.875	.000
	Human resource information capability	.530	.053	.670	10.012	.000

a. Dependent Variable: Sustainability outcomes
Source: Researchers' analysis via SPSS (2026)

Interpretation

Tables 4, 5, and 6 present the results of the multiple regression analysis on the effect of management information systems capability on sustainability outcomes among manufacturing SMEs in the informal business sector in Calabar, Cross River State. As shown in Table 4, the correlation coefficient ($R = 0.606$) indicates a positive relationship between the study variables. The coefficient of determination ($R^2 = 0.367$) shows that digital infrastructure capability, management support capability, and human resource information capability jointly explain 36.7 percent of the variation in sustainability outcomes, while the remaining 63.3 percent is attributable to other factors not included in the model. Although the explanatory power of the model is moderate, it demonstrates that management information systems capability makes a meaningful practical contribution to improving sustainability outcomes among manufacturing SMEs. At the same time, the unexplained variation suggests that sustainability outcomes are also influenced by other organisational, environmental, and managerial factors beyond the scope of the present study.

The ANOVA result in Table 5 reveals that the regression model is statistically significant ($F = 43.249$, $p = 0.000$). This indicates that the combined effect of the three MIS capability dimensions on sustainability outcomes is significant. The coefficient estimates in Table 6 show that all three dimensions exert positive and significant effects on sustainability outcomes. Digital infrastructure capability has a positive and significant effect ($\beta = 0.441$, $p = 0.000$), while management support capability also exerts a positive and significant influence ($\beta = 0.354$, $p = 0.000$). Similarly, human resource information capability has a positive and significant effect ($\beta = 0.670$, $p = 0.000$). Since the p-values for all variables are below 0.05, the null hypotheses are rejected. Furthermore, among the predictors, human resource

information capability is the strongest determinant of sustainability outcomes, followed by digital infrastructure capability and management support capability. This finding has practical significance because it suggests that strengthening employee information management and the effective use of human resource information systems may yield greater improvements in sustainability outcomes than focusing on digital infrastructure or management support alone. Nevertheless, the significance of all three dimensions indicates that improvements in sustainability outcomes are more likely to be achieved when manufacturing SMEs develop these MIS capabilities in a complementary manner rather than in isolation. The findings therefore indicate that management information systems capability significantly enhances sustainability outcomes among manufacturing SMEs in the informal business sector.

DISCUSSION OF FINDINGS

Digital Infrastructure Capability and Sustainability Outcomes

The first finding of the study revealed that digital infrastructure capability exerts a significant positive influence on sustainability outcomes among manufacturing SMEs in the informal business sector. This indicates that SMEs with adequate digital facilities and technological resources are more capable of maintaining stable business activities and adapting to changing operating conditions. In a business environment where timely information and connectivity are increasingly important, digital infrastructure provides the foundation upon which sustainable operations can be achieved. The result supports the studies of Gitahi and Kyalo (2024) and Wangai (2024), both of which established that digital infrastructure capability contributes significantly to organizational performance.

It is noteworthy that digital infrastructure capability ranked second among the MIS capability dimensions investigated ($\beta = 0.441$). This suggests that the sustainability of manufacturing SMEs depends considerably on the availability of technologies that facilitate communication, information access, and operational coordination. Consistent with the assumptions of the Resource-Based View (Barney, 1991), digital infrastructure constitutes a strategic organizational resource capable of strengthening a firm's capacity to achieve enduring outcomes. The result therefore demonstrates that digital infrastructure is not merely a technological asset but an important capability for sustaining SME operations.

From a practical perspective, the finding suggests that manufacturing SME operators should prioritise investments in affordable digital infrastructure that supports communication, information storage, inventory management, and production coordination. Policymakers should facilitate access to digital technologies through targeted support programmes, digital infrastructure development, and capacity-building initiatives for informal manufacturing SMEs. Likewise, technology providers should develop cost-effective and user-friendly digital solutions tailored to the operational needs and financial constraints of SMEs operating in the informal business sector.

Management Support Capability and Sustainability Outcomes

The second finding indicated that management support capability significantly enhances sustainability outcomes among manufacturing SMEs in the informal business sector. This implies that when information systems effectively support managerial activities, SMEs are better positioned to make informed decisions that promote business continuity and long-term stability. Access to accurate and timely information enables managers to anticipate challenges, allocate resources efficiently, and respond appropriately to environmental changes. The result is in agreement with the findings of Gitahi and Kyalo (2024) and Wangai (2024), which reported a significant contribution of management support capability to organizational performance.

Although management support capability recorded the smallest coefficient among the explanatory variables ($\beta = 0.354$), its contribution remained statistically significant. This underscores the importance of information-enabled managerial functions in fostering sustainable business outcomes. Viewed through the lens of the Resource-Based View (Barney, 1991), management support capability represents an internal capability that enhances the effective deployment of organizational resources. The finding therefore affirms the strategic role of information-supported management practices in sustaining manufacturing SMEs.

The finding also has important practical implications for SME managers, who should strengthen their commitment to integrating information systems into routine planning, decision-making, and operational control. Beyond investing in technology, managers should promote a culture that values information-based decision-making and supports the effective use of management information systems. Government agencies and SME support institutions can reinforce these efforts by providing managerial training programmes that enhance digital leadership and information management capabilities. Technology providers should complement these initiatives by offering practical user support and training that enable SME managers to maximise the benefits of available information systems.

Human Resource Information Capability and Sustainability Outcomes

The third finding revealed that human resource information capability significantly improves sustainability outcomes among manufacturing SMEs in the informal business sector. This suggests that SMEs that effectively manage employee-related information are more likely to sustain productive workforces and maintain long-term organizational stability. Since employees remain central to manufacturing activities, the ability to capture, organize, and utilize workforce information enhances continuity and strengthens sustainability efforts. The result is supported by the studies of Wandili (2022) and Wanyoike (2022), which found that human resource capabilities positively influence organizational performance.

Interestingly, human resource information capability emerged as the most influential predictor of sustainability outcomes ($\beta = 0.670$). This demonstrates that workforce-related information systems contribute more strongly to sustainability than the other MIS capability dimensions examined in the study. From the standpoint of the Resource-Based View (Barney, 1991),

organizational success depends heavily on the effective management of valuable internal resources, particularly human resources. The finding therefore highlights the critical importance of human resource information capability as a strategic mechanism for enhancing sustainability among manufacturing SMEs in the informal business sector.

Given that human resource information capability emerged as the strongest predictor of sustainability outcomes, manufacturing SME operators should place greater emphasis on maintaining accurate employee records, monitoring workforce performance, and utilising employee information to support operational decisions. Policymakers should encourage the adoption of simple digital human resource management practices through technical assistance and SME development programmes, particularly for enterprises operating in the informal business sector. Technology providers should also design affordable and easy-to-use human resource information applications that address the workforce management needs of small manufacturing firms with limited financial and technical resources.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study investigated the effect of management information systems capability on sustainability outcomes among manufacturing SMEs in the informal business sector in Calabar, Cross River State. It was motivated by the growing need for manufacturing SMEs to achieve sustainable business outcomes in an increasingly competitive and information-driven environment. Using data obtained through a cross-sectional survey and analysed with multiple regression techniques, the study established that digital infrastructure capability, management support capability, and human resource information capability each exert significant positive effects on sustainability outcomes. The findings further revealed that human resource information capability is the most influential predictor of sustainability outcomes among the MIS capability dimensions examined.

Despite these findings, certain limitations should be acknowledged. The study relied on data collected from respondents at a single point in time and focused exclusively on manufacturing SMEs operating within the informal business sector in Calabar, Cross River State. As such, the findings may not be fully generalizable to manufacturing SMEs in other geographical locations or business contexts. In addition, the cross-sectional nature of the study limits the extent to which definitive causal conclusions can be drawn. Nonetheless, the evidence suggests that manufacturing SMEs with stronger management information systems capabilities tend to exhibit more favourable sustainability outcomes. Future studies should extend the scope of investigation to other sectors and locations and employ longitudinal research designs to provide deeper insights into the relationship between management information systems capability and sustainability outcomes over time.

Recommendations

Based on the findings of the study, the following recommendations were made:

i. Manufacturing SME operators should deepen the integration of digital infrastructure capability by expanding the use of existing digital systems beyond basic record keeping to include production monitoring, inventory control, supplier coordination, customer management, and real-time information sharing across business functions. A more comprehensive utilization of digital infrastructure will enhance operational continuity, resource efficiency, and adaptability, thereby improving sustainability outcomes.

ii. Manufacturing SME operators should intensify management support capability by ensuring that information generated through MIS is consistently incorporated into strategic planning, budgeting, forecasting, performance evaluation, and day-to-day managerial decisions. Greater reliance on information-driven decision-making will improve organizational responsiveness and resource allocation, thereby strengthening long-term sustainability outcomes.

iii. There is need for manufacturing SME to broaden the application of human resource information capability by integrating employee information systems into recruitment, training, performance appraisal, workforce planning, and retention decisions. This will support a more stable and productive workforce, enhance employee retention, and ultimately improve the sustainability outcomes of the enterprise.

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