MANAGEMENT INFORMATION SYSTEMS CAPABILITIES AND ORGANIZATIONAL PERFORMANCE OF KENYA ELECTRICITY GENERATING COMPANY

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ABSTRACT

Enhancing company performance is crucial for the Kenya Electricity Generating Company (KenGen) to maintain competitiveness, operational efficiency, and effective resource utilization in the dynamic energy sector. Despite the potential benefits, KenGen faces challenges in leveraging the capabilities of its management information systems (MIS) to optimize performance. This research analyzes four core MIS dimensions; data analytics, digital power generation, information storage, and digital communication and their contribution to performance outcomes. Guided by the Technology Acceptance Model (TAM), the Resource-Based View (RBV), and the Unified Theory of Acceptance and Use of Technology (UTAUT), the study employs a descriptive research design. Primary data was gathered through a structured questionnaire distributed to 85 KenGen employees drawn from operations, ICT, finance, strategy, and projects departments; 83 responses were analyzed (97% response rate). The data collected was analyzed using descriptive and inferential statistics, including multiple regression analysis, with SPSS v25 and all ethical considerations were duly followed. The findings disclosed that data analytics ($\beta = 0.425$, $p = 0.002$) and digital power generation ($\beta = 0.294$, $p = 0.005$) significantly enhance organizational performance, whereas information storage ($\beta = 0.109$, $p = 0.390$) and digital communication ($\beta = 0.096$, $p = 0.537$), though positive, are statistically insignificant. These findings confirm that data-driven decision-making and digitized generation systems play a decisive role in improving efficiency and profitability. The study recommends that KenGen adopt a holistic MIS integration strategy emphasizing advanced analytics, smart-grid digitalization, and cross-functional system connectivity to sustain competitiveness and operational excellence.

Keywords: Management Information Systems, Data Analytics, Digital Power Generation, Information Storage, Digital Communication, Organizational Performance, KenGen.

INTRODUCTION

The use of management information systems (MIS) has become a central feature of modern organizational strategy. MIS integrates technology, processes, and people to generate timely and actionable information that supports decision-making, resource allocation, and competitive positioning (Gupta, 2011; Mithas et al., 2011). In the power sector, automation, predictive analytics, and digital infrastructure have transformed energy production and delivery, improving both efficiency and customer satisfaction (Dabic et al., 2018).

In Kenya, KenGen, the largest electricity producer, faces performance pressures related to rising operational costs and service inefficiencies despite heavy investment in multiple MIS platforms including enterprise resource planning (ERP), customer relationship management (CRM), and geographical information systems (GIS) (Esri, 2024). Integration bottlenecks have hindered real-time data transfer and decision quality, evidenced by recent surges in expenses and customer dissatisfaction.

Global utilities such as Duke Energy (USA) and Huaneng Power (China) demonstrate that data analytics, predictive maintenance, and digital power-generation systems can markedly enhance output efficiency and cost control. The Kenyan context, however, presents unique resource, policy, and infrastructural constraints that may limit the full realization of these benefits. Understanding how MIS capabilities relate to actual performance outcomes in KenGen is therefore essential for guiding both organizational strategy and public-sector digital policy.

This study investigates how four MIS components; data analytics, digital power generation, information storage, and digital communication affect the organizational performance of KenGen. It aims to generate empirical evidence linking technology capabilities with operational efficiency, profitability, and service delivery in Kenya's primary power-production company.

Statement of the Problem

Improving the performance of state-owned enterprises, especially in the energy sector remains difficult because of the complexity of operations which demand robust management information systems (MIS) capable of handling large data volumes. Many state-owned enterprises, including the Kenya Electricity Generating Company (KenGen), struggle to effectively exploit MIS components such as data analytics, digital power generation, information storage, and digital communication, resulting in inefficiencies, rising operational costs, and declining profitability (Anderson & Eddy, 2022; Hastings, 2021).

KenGen's financial statements indicate ongoing performance constraints, showing a 12 percent drop in profit in 2022 and a 16.4 percent surge in operating expenses to KSh 10.1 billion by 2023 (KenGen, 2022; 2023). These burdens have restricted the company's ability to invest in modern digital infrastructure, maintain competitive electricity tariffs, and deliver consistent service. Comparatively, utilities in South Africa and Egypt that have fully integrated MIS have achieved lower generation costs and improved grid efficiency (Mackenzie, 2023).

Globally, research underscores the positive influence of MIS on performance, yet studies in East Africa remain limited and narrowly focused on specific subsystems such as Human Resource Information Systems (Wambui, 2018) or isolated communication platforms (Mahmoud, 2021). There is little empirical evidence on the combined effect of MIS capabilities on performance within Kenya's power-generation context.

This study therefore seeks to bridge this gap by examining how data analytics, digital power generation, information storage, and digital communication collectively influence organizational performance at KenGen, generating insights to guide digital transformation across Kenya's energy sector.

Objectives of the Study

The main objective of the study is to ascertain the effect of management information systems capabilities and performance of Kenya Electricity Generating Company. The specific objectives include:

(i) To determine the influence of data analytics on the performance of the Kenya Electricity Generating Company.
(ii) To evaluate the effect of digital power generation on the performance of Kenya Electricity Generating Company.
(iii) To assess the influence of information storage on the performance of the Kenya Electricity Generating Company.
(iv) To establish the effect of digital communication on performance of the Kenya Electricity Generating Company.

Research Hypotheses

H_{01}: Data analytics has no significant effect on the organizational performance of the Kenya Electricity Generating Company.
H_{02}: Digital power generation has no significant effect on the organizational performance of Kenya Electricity Generating Company.
H_{03}: Information storage has no significant effect on the organizational performance of Kenya Electricity Generating Company.
H_{04}: Digital communication has no significant effect on the organizational performance of Kenya Electricity Generating Company

Scope of the Study.

This study focuses on the Kenya Electricity Generating Company (KenGen) and examines how management information system (MIS) capabilities influence its organizational performance. The research specifically investigates four dimensions of MIS—data analytics, digital power generation, information storage, and digital communication—and how each contributes to efficiency, profitability, and service delivery. The investigation covers departments directly involved in MIS use, including Operations, ICT, Finance, Strategy, and Project Management. The analysis is based on primary data collected from employees through structured questionnaires and on secondary data from company reports and official publications. Temporal scope centers on the firm's recent operational years, a period marking significant digital transformation initiatives within the Kenyan energy sector.

LITERATURE REVIEW

Theoretical Review

The theories selected for the present investigation are the Unified Theory of Acceptance and Use of Technology (UTAUT), the Resource-Based View (RBV) and the Contingency Theory.

Unified Theory of Acceptance and Use of Technology

Unified Theory of Acceptance and Use of Technology is a theory of technology acceptance and usage originally developed by three researchers: Tony Fishbein, Daniel Abela, and Deborah Mehra. It is a combination of eight models into a single powerful framework which was originally postulated by Venkatesh et al. (2003). The framework outlines four main determinants of behavioral intention and technology use, which are perceived performance benefits, expected ease of use, social pressures, and enabling conditions. Moreover, the UTAUT encompasses moderating factors including gender, age, and experience to describe the differences in the adoption of technology in different environments. The validity of technology adoption across industries and sectors indicates that performance expectancy on job performance is a strong predictor of technology adoption (Nugroho, 2024).

As a Management Information Systems researcher working in the energy industry, specifically in KenGen, UTAUT would offer an excellent prism through which to view the issue of employee acceptance and adoption as a means of using digital tools to enhance organizational performance. MIS components such as information storage and retrieval systems, communication platforms, and data analytics align with UTAUT constructs. Performance expectancy provides improved operational decision-making; effort expectancy, on the contrary, shows how simple it is to use. Peer support, leadership, and enabling factors like encouragement and feedback all contribute to social influence. Given the high-stakes and infrastructure-intensive nature of energy production, particularly at KenGen, the successful acceptance and use of MIS technologies directly influence organizational efficiency, responsiveness, and service delivery outcomes.

Resource Based View

The resource based view (RBV) theory was introduced by Jay Barney in 1991. The RBV asserts that a firm's enduring competitive advantage arises from its distinctive collection of resources and capabilities that meet the requirements of being valuable, rare, inimitable, and non-substitutable (VRIN). According to RBV, these strategic resources allow firms to achieve superior performance and create barriers to imitation by competitors. The theory emphasizes that resources such as Management Information Systems (MIS) can be a source of competitive edge if they enable firms to achieve efficiency, improve decision-making, and enhance operational effectiveness beyond what competitors can replicate.

Within the framework of MIS capabilities and organizational success, RBV implies that MIS may become a useful tool in the situation when it serves to increase the efficiency of operations, improve decision-making procedures, and allow planning the strategies better.

As an example, MIS can be used to streamline operations in an organization such as Kenya Electricity Generating Company (KenGen) to make its resources easier to manage, its production processes efficient, and its operations less costly. Such productivity may result in better services provision, increased customer satisfaction, and eventually better organizational performance Wambui (2018).

Jay Barney has been central to the conceptualisation of the RBV, arguing that it provides an integrated approach to understanding how firms achieve sustainable competitive advantage through valuable resources, which are rare, inimitable and non-substitutable, but he acknowledges the inability of the concept to capture dynamic capabilities and changes in the external environment. Critiques of Richard Priem and John Butler noted that RBV is tautological and tends to assume what it tries to establish and challenge the empirical testability and practical viability of the theory of strategic management (Priem & Butler, 2011). Peteraf and Barney puts forward a critical evaluation of RBV, noting that the theory does not take into account the problems of resources heterogeneity and the intricacies of developing and deploying resources in firms (Peteraf & Barney, 2013).

Contingency Theory

The Theory was presented by Fred Fiedler in the 1960s. This theory assumes that organizational practices and structures can be effective depending on whether the practices and the organizational structure are fit within the certain circumstances or contingencies that the organization is in. Organizational size, technology, environment and workforce characteristics are some of the variables that form part of contingency. According to the Contingency Theory, there is no one best way to organize or manage an organization, but the best strategy would be dependent on a particular combination of a series of factors.

The contingency Theory is also very pertinent to the subject on Management Information Systems (MIS) capabilities and organizational performance as it focuses on the significance of ensuring that organizational strategies, such as the deployment of MIS, are aligned with the certain environmental and internal contingencies. Within the framework of MIS capabilities, Contingency Theory implies that the success of MIS implementation in the Kenya Electricity Generating Company (KenGen) will be affected by a range of factors including the organizational structure of the company, technological capabilities, and regulatory environment of the company. As an example, MIS systems, design, and implementation strategies must be aligned with the operation requirements of KenGen, workforce specifics, and technology infrastructure that is present. The contingency theory explains that MIS deployment requires flexibility, and thus KenGen can adopt its information systems to alterations in the external environment or internal dynamics of the organization as time goes by (Wambui, 2018).

Paul Lawrence and Jay Lorsch believe that an effective organizational performance is a product of adjusting the organizational structure to diverse environmental contingencies. Nevertheless, they agree that predictive power of the theory is not very high because the contingencies it contains are very general and even vague in some cases. According to Donaldson, Contingency Theory was also perceived to be lacking in theoretical coherence

and empirical support because it does not give a consistent framework of prediction of organizational behavior and performance. Conversely, Otley (2020) criticizes the theory because it has a simplistic assumption that one-size-fits-all solution exists to organizational design, which implies that the theory overestimates the simplicity and uniformity of organizational contexts.

Empirical Review

Data Analytics and Organizational Performance

Orero-Blat et al. (2025) examined digital transformation and data analytics among 183 Spanish SMEs using PLS-SEM and fsQCA techniques. Their findings showed that big-data analytics mediates the relationship between digital transformation and both innovation and performance outcomes. Riipa et al. (2025) also confirmed the positive effect of data-analytics maturity on operational efficiency and profitability in 200 U.S. firms, noting a 15 percent profit increase for each unit rise in analytics capability.

In Kenya, Mutuku and Muathe (2016) found that big data analytics improved decision-making, reduced operational costs, and raised customer satisfaction at Kenya Power. Although the study demonstrated the value of analytics, it concentrated on a distribution company rather than a generation firm. The present study extends this line of inquiry by focusing on KenGen to determine whether similar benefits apply within the power-generation context.

Digital Power Generation and Organizational Performance

Ullah et al. (2021) analyzed automatic generation-control (AGC) strategies and underscored the importance of advanced digital systems for stability and operational efficiency in modern power grids. Kola-Lawal and Akinwale (2017) studied digitalization in Nigerian power firms, finding moderate performance improvement resulting from digital generation technologies.

In Kenya, Nyang'ori (2018) observed that adopting digital systems at KenGen enhanced operational efficiency and reduced downtime, though challenges remained regarding high implementation costs and technical-skills shortages. The present study builds on these insights by quantifying how such digital-generation technologies relate to overall organizational performance.

Information Storage and Organizational Performance

Shi et al. (2021) investigated intelligent material-management systems in China's power industry and found that digital storage technologies improved data accuracy, security, and traceability. Similarly, Ajibade (2017) linked efficient information management in South African public organizations to improved service delivery and decision-making.

Locally, Kamau (2016) examined information storage at Kenya Power and concluded that effective data-storage systems minimize operational errors and improve managerial decisions. However, these studies focused on distribution rather than generation entities,

leaving a contextual gap that this research addresses by exploring information-storage effects within KenGen.

Digital Communication and Organizational Performance

Nasidi et al. (2024) conducted a systematic review of 55 studies and established that corporate digital communication enhances stakeholder engagement, productivity, and brand reputation. Maloka (2024) found that ICT-based communication systems increase operational coordination and efficiency in South African public institutions.

Wanjiku (2017), studying KenGen, reported that digital communication tools improved internal coordination and decision-making but noted that the assessment covered only the early implementation stage. The current study therefore re-examines this dimension to capture its sustained effect on performance after several years of adoption.

RESEARCH METHODOLOGY

Research Design

The study adopted a descriptive research design, appropriate for examining relationships among multiple variables without manipulating the research environment (Bougie & Sekaran, 2019). This design enabled detailed analysis of how various Management Information System (MIS) capabilities influence the performance of the Kenya Electricity Generating Company (KenGen).

Target Population

The target population comprised 146 KenGen employees drawn from the Operations, Project Management, ICT, Finance, and Strategy departments. Using stratified random sampling, the researcher selected 85 respondents, ensuring all departments using MIS were adequately represented.

Table 1: Target Population

Department	Sample	Percentage
Operations	22	26 %
Project Management	18	21 %
ICT	17	20 %
Finance	15	18 %
Strategy	13	15 %
Total	**85**	**100 %**

Source: Author's computation (2025)

Empirical Model

A structured Likert-scale questionnaire (1 = Strongly Disagree → 5 = Strongly Agree) captured perceptions on the four MIS constructs and performance indicators. Reliability exceeded the Cronbach's α threshold of 0.7 for all scales. Data were analyzed using descriptive statistics, Pearson correlations, and multiple regression in SPSS v25.
The regression model estimated:

$$Y=\beta 0+\beta 1X1+\beta 2X2+\beta 3X3+\beta 4X4+\varepsilon$$

Where
Y = Organizational performance,
X_1 = Data analytics, X_2 = Digital power generation, X_3 = Information storage, X_4 = Digital communication.

RESULTS AND DISCUSSIONS

Response Rate and Data Reliability

Out of 85 questionnaires distributed, 83 were returned and analyzed, representing a 97 percent response rate—well above the 60 percent minimum threshold for representativeness (Babbie, 2010). Reliability and validity tests produced Cronbach's alpha values exceeding 0.8 for all constructs and KMO statistics above 0.85, confirming data adequacy and internal consistency.

Descriptive Analysis

Respondents rated all four MIS capabilities positively, with overall mean scores between 3.5 and 3.8 on a five-point Likert scale, indicating moderate to high adoption levels across departments.

Table 2: Descriptive Results

Variable	N	Min	Max	Mean	Std. Dev.	Interpretation
Data Analytics	83	1	5	3.64	0.69	Moderate to High Adoption
Digital Power Generation	83	1	5	3.61	0.74	Improved Efficiency and Reliability
Information Storage	83	1	5	3.64	0.72	Adequate and Secure Data Systems
Digital Communication	83	1	5	3.64	0.73	Effective but Needs More Integration
Organizational Performance	83	1	5	3.56	0.76	Moderate Performance Improvement

Source: Author's computation (2025)

The descriptive statistics show that all MIS capability variables recorded mean scores above 3.5, suggesting that KenGen staff perceive a moderate to high level of MIS adoption and usefulness. Among them, data analytics (Mean = 3.64) and information storage (Mean = 3.64) received the strongest agreement, indicating these tools are widely applied to improve data quality and decision-making. Digital power generation (Mean = 3.61) also scored highly, reflecting positive perceptions of efficiency and reliability gains from automation and predictive control.

Digital communication (Mean = 3.64) shows a fairly strong approval but highlights room for further system integration and technological updates.

The relatively low standard deviations (0.69 – 0.76) demonstrate low variability in responses, meaning participants generally shared similar views across departments. Overall, these findings imply that MIS capabilities are well-established at KenGen and contribute positively to organizational operations, though additional efforts in inter-system integration and real-time communication could strengthen overall performance outcomes.

The descriptive analysis found out that the respondents tended to have a positive view of digital technologies in terms of data analytics, power generation, and data storage and communication, although the agreement was not consistent at all constructs. Respondents in the data analytics area indicated that analytics were useful in decision-making, enhancing processes and were frequently updated but respondents were more ambivalent regarding the quality and effectiveness of the tools. Likewise, the digital generation of power was perceived favorably in regard to efficiency and reliability and ongoing investment albeit the respondents were not as convinced on decreased disruption.

The respondents had a consistently positive attitude on information storage with their agreement being that storage capacity was adequate to meet the current demands, the system was scalable, and the data was secure and accessible. Respondents in digital communication recognized the use of tools to be effective and efficiency was enhanced although they were more neutral in relation to access to more than one platform and frequent system updates. In the case of organizational performance, it was identified that analytics have increased profitability, efficiency in service delivery, and financial gain was gained through power generation, but respondents were indifferent about communication improving customer service, better customer satisfaction, and fewer complaints.

Correlation Analysis

Correlation results revealed positive and significant associations between each MIS component and organizational performance:

Table 3: Correlation Analysis

	Organizational Performance	Data Analytics	Digital Power Generation	Information Storage	Digital Communication
Organizational Performance	1				
Data Analytics	.488**	1			
Significance	.001				
Digital Power Generation	.415**	.193	1		
Significance	.000	.251			
Information Storage	.298**	.308**	.235*	1	
Significance	.000				
Digital Communication	.444**	.567**	.434**	.408**	1
Significance	.000				

Source: Author's computation (2025)

Correlation analysis shows that there is an average good relationship between data analytics and organizational performance ($r = .488$, $p < 0.01$). This can be justified by the fact that data analytics can increase the effectiveness of evidence-based decision-making, which can elevate the accuracy of the forecasts and can optimize the allocation of resources. Through analytics, organizations can use raw data to turn them into actionable insights to aid in strategic and operational decisions. This helps them predict the market trends, address properly the changes in the business environment, and prevent inefficiencies in the processes. Moreover, data analytics can help in the identification of growth opportunities and risk management strategies that, in their turn, can enhance the results of the organization. In turn, the analytics application enhances the ability of the organization to increase its productivity, competitiveness, and general performance. The positive correlation of moderate value ($r = .415$, $p < 0.01$) between the digital power generation and the organizational performance could be explained by the contribution of digital technologies to streamline the energy production processes. The combination of new systems including smart grids, sensors, and automated controls results in efficiency since it will make sure that the resources will be effectively utilized and that output will be in line with the demand. Increased reliability minimizes the disruption rate and time, thus, minimizing losses in production and delay in processes. Moreover, lowered maintenance requirements, predictive monitoring, and energy efficiency are directly related to improved financial results because of cost-effectiveness. This implies that online power production in cases where it is aided by management information systems and other online infrastructures helps to enhance organizational ability to run smoothly, cut down on costs, and sustain a high degree of service provision, which has a positive effect on overall performance.

The correlation study found a marginally positive relationship between the information storage and organizational performance ($r = .298$, $p < 0.01$). This may be due to the fact that information storage systems are mostly supporting systems as opposed to drivers of performance. Although characteristics like security, scalability, and data accessibility will enable smooth running, their impact on the final outcomes of the organization will be minimal in case they are not strategically exploited. The real worth of information storage becomes actual in case it is supplemented with the high-level utilization strategies like data analytics, process automation, and integration into the decision-making structures. In the lack of such complementary applications, the storage systems only offer support in their operations and have a minor impact on overall performance.
The correlation analysis demonstrated that there was a positive relationship between digital communication and organizational performance, which was moderate and significant ($r = .444$, $p < 0.01$). This can be attributed to the fact that communication technologies are essential in improving the coordination, collaboration and sharing of information among departments. Digital communication can help decrease delays in workflow processes, make sure that employees receive the necessary information in time and become more aligned with each other. Besides, digital communication can be beneficial to operational efficiency and service quality by making customer services more responsive and allowing decision-making faster.

Regression Analysis

The multiple-regression model recorded $R = 0.598$ and $R^2 = 0.358$, showing that 35.8 percent of variation in performance is explained jointly by the four MIS variables. The model was statistically significant ($F = 10.858$, $p < 0.001$).

Table 4: Regression Model Summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.598	.358	.325	3.083

Source: Author's computation (2025)

The model summary showed that the predictors data analytics, digital power generation, information storage, and digital communication had a combined correlation of R = .598 with organizational performance. The R Square value of .358 indicated that the model explained 35.8% of the variation in organizational performance, while the adjusted R Square of .325 confirmed a good fit after adjusting for the number of predictors. The standard error of the estimate was 3.083, suggesting a good level of prediction accuracy.

ANOVA Analysis

Table 5: ANOVA Analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	412.936	4	103.234	10.858	.000[b]
	Residual	741.618	78	9.508		
	Total	1154.554	82			

Source: Author's computation (2025)

The ANOVA results indicated that the regression model was statistically significant in predicting organizational performance, yielding an F-statistic of 10.858 and a p-value of 0.000 ($p<0.05$). This outcome demonstrates that the predictors; data analytics, digital power generation, information storage, and digital communication collectively accounted for a substantial portion of the variation in organizational performance.

Regression Coefficients

Table 6: Regression Coefficient

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.950	3.053		.639	.525
	Data Analytics	.425	.131	.361	3.252	.002
	Digital Power Generation	.294	.102	.292	2.881	.005
	Information Storage	.109	.126	.087	.865	.390
	Digital Communication	.096	.155	.077	.620	.537

a. Dependent Variable: Organizational Performance

Source: Author's computation (2025)

The regression analysis provided the positive statistically significant impact of data analytics on the organizational performance ($B = 0.425$, $t = 3.252$, $p = 0.002$). This could probably have been so because analytics helped organizations make evidence-based decisions, allocate resources optimally and better prediction, thus improving efficiency and the determination of growth

opportunities. Similarly, the regression analysis revealed that the digital generation of power had a significant and positive impact on the organizational performance (B = 0.294, t = 2.881, p = 0.005). Predictive monitoring was incorporated, smart grids, sensors and automated controls helped in the optimization of the use of resources, minimizing disruptions, and minimizing the cost of maintenance which enhanced efficiency of operations and financial performance. This shows that the digital generation of power increased organizational ability to work efficiently and provide services. On the contrary, the positive effects of information storage (B = 0.109, t = 0.865, p = 0.390) and digital communication (B = 0.096, t = 0.620, p = 0.537) were statistically non-significant. Information storage was more of an operational support, and its effect in organizational performance was limited because there was no complete integration with the analytics or strategy making. The digital communication enhanced coordination and flow of information, but its impact on the organizational performance was not significant as it was not supported with the effective workflow management and customer service approaches.
The regression equation $Y=\beta0+\beta1X1+\beta2X2+\beta3X3+\beta4X4+\varepsilon$ is therefore transformed into:
Y = 1.95 + .425 X1 + .294 X2 + 3.053

CONCLUSION AND RECOMMENDATIONS

Conclusions

Data Analytics emerged as the most influential factor, confirming that advanced analytics enhance evidence-based decision-making and forecasting accuracy. This aligns with Mutuku and Muathe (2016) and Orero-Blat et al. (2025), who linked analytics maturity to higher productivity and profitability.

Digital Power Generation significantly improved performance by optimizing energy-production efficiency, echoing Nyang'ori (2018) and Ullah et al. (2021), who showed similar benefits from automation and predictive control systems.
Conversely, Information Storage and Digital Communication exhibited positive but statistically insignificant coefficients. Although these systems enhance internal coordination and data security (Ajibade, 2017; Wanjiku, 2017), their full potential appears unrealized at KenGen due to partial integration and limited analytical linkage.

This study has observed that Management information systems (MIS) have a significant impact on the performance of an organization because they allow the timely access to correct information, evidence-based decisions, and operational efficiency. MIS critical elements, including data analytics and digital power generation systems, show that it has a high positive impact on organizational performance outcomes, cost optimization, productivity, and service delivery. Nevertheless, the supporting functions such as information storage and digital communication although significant, have a more oblique effect unless they are incorporated comprehensively with analytics and strategic decision-making processes.

The study concludes that the holistic approach of MIS in terms of data analytics, digital power generation, information storage, and digital communication has an impact on organization performance. Some of the factors like analytics and generation of digital power have stronger

and statistically significant impacts, whereas others like information storage and digital communication are facilitator enablers. Companies are thus advised to consider using a holistic MIS strategy, where there would be synergy among these elements. Through the use of MIS as a binding system as opposed to individual technologies, organizations would enjoy efficiency, competitiveness, customer satisfaction, and greater profitability.

Overall, the findings support the Resource-Based View, which positions MIS capabilities as strategic resources that foster competitive advantage when fully leveraged. They also align with UTAUT, demonstrating that system benefits depend on user acceptance and effective institutional support.

Recommendations

The research results indicated moderate positive correlation between data analytics and organizational performance and are determined to indicate that organizations that can use analytics can make evidence-based decisions, improve the level of forecasting, and optimize the use of resources. The regression analysis also indicated that the impact of data analytics on the performance of an organization was positive and statistically significant. Resting on these reports, organizations should proceed with investing in advanced analytics tools and training employees so that they can be capable of interpreting and using information. The use of analytics in strategic planning and operational decision-making allows organizations to improve efficiency, address growth opportunities, and improve performance.

In the case of digital power generation, the correlation analysis revealed a moderate positive relation with organizational performance, and it means that digital technologies are the best way to optimize energy production processes and enhance reliability. Regression outcomes also showed that there is a positive and significant performance impact. The organizations are therefore advised to incorporate and continue using smart grids, sensors, automated control, and predictive monitoring systems. The consistent modernization of the digital power infrastructure is able to minimize disruptions, increase energy efficiency, decrease maintenance, and elevate service delivery, which can add to more robust organizational results. In terms of information storage, the correlation analysis showed that it is weakly related to organizational performance, which suggests that it is mainly involved in supporting operations. The regression model showed that the effect was positive but significant at a level of $p=0.05$ which shows that the storage of information on its own does not have a significant effect on performance. The organizations are hence advised to incorporate information storage solutions with analytics solutions and process automation as well as decision-support solutions to convert the stored data into actionable insights that help in strategic decision making and improve overall performance.

In the case of digital communication, the correlation analysis revealed a moderate positive correlation with the organizational performance, implying that good communication enhances the coordination, collaboration, and flow of information. Nevertheless, the regression outcomes identified a positive but insignificant impact, which means that communication technologies are not enough to promote the performance changes. Organizations ought to thus complement

digital communication with formal workflow management, team coordination protocols, and customer service strategies to provide a well-timed and effective exchange of information that can result in a more efficient and responsive organization.

Suggestions for Further Research

Future research could examine multiple organizations within the power and energy sector, including comparing MIS and its impact on organizational performance. The current study examined four main areas which include data analytics and digital power generation and information storage and digital communication. Future studies could examine other MIS dimensions such as cybersecurity, cloud computing, and artificial intelligence, and enterprise resource planning (ERP) systems which will provide a broader understanding of MIS contributions.

Future studies will investigate how mediating factors, including organizational culture and leadership style and employee digital skills, will affect the link between MIS adoption and organizational success while examining how firm size and regulatory constraints affect this relationship. The study evaluated organizational performance, but future research needs to examine how MIS affects customer satisfaction and loyalty and service quality because organizations must prioritize customer experience to compete effectively in their markets. Researchers should study how organizations use MIS systems to achieve financial results because that research will help decision-makers to understand which financial performance indicators matter most for their business

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