Digital Product Innovation Strategies and Organizational Performance of Public Universities in Kenya

Imosi Linet Sambu[1], Dr. Fred Gichana Atandi (Phd)[2]

Kibabii University

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ABSTRACT

This paper adopts a conceptual and desk-review approach in examining the influence of digital product innovation strategies on organizational performance of public universities in Kenya. The increasing pressure on universities to remain competitive in an increasingly digital environment has necessitated the adoption of innovative approaches aimed at improving organizational performance. This study examined the influence of digital product innovation strategies on organizational performance of public universities in Kenya. Digital product innovation strategies were operationalized through research and development initiatives, innovation centers and hubs, and intellectual property management. Organizational performance was measured using student enrollment, employee turnover, and access to information. The study focused on Resource-Based View Theory proposed by Barney (1991) and Dynamic Capabilities Theory advanced by Teece et al. (1997). These theories explain how organizations use internal resources, innovation skills, and flexible abilities to gain a lasting edge over competitors. Recent research has highlighted the importance of these theories in understanding organizational performance and digital changes in fast-moving environments. (Civelek et al., 2023; Gohr et al., 2023); Heaton et al., 2023). This study utilized Desktop review methodology through narrative literature synthesis. Findings indicate that digital product innovation strategies positively influence organizational competitiveness, accessibility of university services, and institutional attractiveness to prospective students.

Keywords: Digital product innovation, organizational performance, public universities, innovation strategies, higher education

INTRODUCTION

Organizational performance has increasingly become a major concern among public universities in Kenya due to growing financial constraints, declining government funding, increasing competition for student enrollment, and rapidly changing technological demands. "Commission for University Education" [CUE], 2024). Universities are expected to enhance service delivery, improve access to information, attract and retain students, and maintain operational efficiency despite operating within increasingly complex and resource-constrained environments (Pierre & Pierre, 2023). Recent trends indicate that many public universities continue to experience challenges such as declining student enrollment, financial instability, increased employee turnover, and reduced competitiveness, raising concerns about their long-term sustainability and performance (CUE, 2024). Consequently, there is growing pressure on universities to adopt innovative digital strategies that can enhance institutional effectiveness, improve stakeholder satisfaction, and strengthen organizational performance in a dynamic higher education environment (Pierre & Pierre, 2023).

Organizational performance refers to the extent to which an institution achieves its strategic goals and objectives efficiently and effectively Pierre & Pierre, 2023). In the context of public universities, organizational performance reflects the institution's ability to attract and retain students, maintain a stable and productive workforce, and facilitate timely access to information for decision-making and service delivery. As universities increasingly adopt digital product innovation strategies, assessing organizational performance becomes essential in determining whether such innovations contribute to improved institutional outcomes.

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Globally, Universities have increasingly embraced digital transformation as a strategic approach for improving institutional competitiveness and organizational performance through technology-enabled service delivery and operational efficiency (Yu & Moon, 2023). The higher education sector has experienced substantial transformations driven by globalization, technological advancements, changing stakeholder expectations, and intensified competition among institutions, forcing universities to shift from traditional operational approaches toward digitally enabled systems (Fernández et al., 2023).

Organizational performance is a critical indicator of the effectiveness and sustainability of institutions in achieving their strategic objectives (Adnan et al., 2018). In the higher education sector, organizational performance reflects the ability of universities to efficiently utilize resources, deliver quality education, attract and retain students, support employees, and provide timely access to information for decision-making (Onyango & Ondiek, 2021). As public universities in Kenya operate in an increasingly competitive and technology-driven environment, measuring organizational performance has become essential for evaluating institutional success and long-term viability (Pierre & Pierre, 2023). Furthermore, organizational performance provides a basis for assessing how effectively institutions adapt to environmental changes, leverage technological innovations, and achieve desired outcomes for their stakeholders (Teece et al., 1997; Barney, 1991).

In addition, public universities in Kenya continue to face increasing pressure to improve performance amidst declining funding levels, evolving educational demands, and increasing competition from both local and international institutions (Coupet & Ba, 2022). These challenges have created the need for universities to adopt innovative digital strategies capable of enhancing institutional sustainability, competitiveness, and performance (Langat, 2025).

Digital product innovation strategies, which involve developing new digital products, improving existing services, and creating innovative technological solutions, have emerged as potential mechanisms for improving institutional performance (Nyamao & Tari, 2023). Such strategies provide opportunities for enhancing service delivery efficiency, operational effectiveness, and stakeholder engagement through innovation initiatives such as research and development activities, innovation ecosystems, and technological capabilities (Shakhovskaya & Goncharova, 2022).

Kenyan public universities play a significant role in promoting national development through teaching, research, innovation, and community service. However, these institutions continue to face challenges such as declining government funding, increased competition from private universities, changing student expectations, and rapid technological advancements. Consequently, universities are increasingly adopting digital transformation initiatives and innovation strategies to improve operational efficiency and service delivery. Recent evidence suggests that organizational innovations contribute significantly to enhanced institutional performance by improving service quality, stakeholder satisfaction, and overall effectiveness in public universities (Cyrus et al., 2024).

In the context of public universities, organizational performance can be assessed using both financial and non-financial indicators. This study measures organizational performance through student enrolment, employee turnover, and access to information. Student enrolment is a key indicator of institutional attractiveness, reputation, and competitiveness. According to the 2024/2025 University Statistics Report by the Commission for University Education (CUE), total university enrolment in Kenya increased from 559,620 students in 2023 to 628,541 students in 2024, representing a growth of approximately 12 percent. Public chartered universities accounted for the largest share of enrolment, highlighting their continued importance in expanding access to higher education in Kenya.

Employee turnover is another important measure of organizational performance because it reflects an institution's ability to retain skilled and experienced staff (Adnan et al., 2018). High employee turnover may lead to increased recruitment costs, loss of institutional knowledge, reduced productivity, and disruptions in service delivery, thereby negatively affecting organizational effectiveness and long-term sustainability (Pierre & Pierre, 2023). Recent studies on Kenyan public universities emphasize the importance of employee welfare, work-life balance, and supportive organizational practices in enhancing employee performance and retention (Onyango &

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Ondiek, 2021; Cyrus et al., 2024). Universities that create conducive working environments are more likely to maintain a stable workforce, enhance employee commitment, and achieve superior organizational outcomes through improved service delivery and institutional effectiveness (Cyrus et al., 2024; Adnan et al., 2018).

Access to information has become increasingly important in modern universities due to the growing reliance on digital technologies for teaching, learning, administration, and decision-making. Effective access to accurate, timely, and relevant information enhances transparency, operational efficiency, and responsiveness to stakeholder needs. The Commission for University Education has continued to emphasize quality assurance, digital learning systems, and competency-based education as key performance areas for universities, demonstrating the growing importance of information accessibility in institutional performance Pierre, K., & Pierre, L. (2023)

Although organizational performance in universities extends beyond financial outcomes to include indicators such as student enrollment, employee retention, and access to information (Abdul Hannan, 2023), evidence on how digital product innovation strategies influence organizational performance within public universities in Kenya remains limited. Existing studies have primarily focused on private organizations, financial institutions, manufacturing sectors, or student outcomes rather than organizational performance within public universities. Consequently, there remains insufficient empirical evidence regarding the extent to which digital product innovation strategies influence organizational performance among public universities in Kenya, creating a contextual and empirical gap that this study sought to address.

This study measures organizational performance using three key indicators: **student enrolment, employee turnover, and access to information**. Student enrolment serves as an indicator of the university's attractiveness, competitiveness, and ability to meet the educational needs of prospective learners. An increase in enrolment suggests improved institutional reputation, enhanced service delivery, and greater stakeholder satisfaction. Employee turnover measures the rate at which employees leave the institution and reflects the university's ability to retain skilled personnel. Lower turnover rates are generally associated with improved job satisfaction, organizational commitment, and a stable workforce, all of which contribute positively to performance. Access to information refers to the availability, accuracy, and timeliness of information required by students, staff, and management for effective decision-making and service delivery. Enhanced access to information supports operational efficiency, transparency, and responsiveness within the university.

LITERATURE REVIEW

Theoretical Review

Dynamic Capabilities Theory

Dynamic capabilities theory argues that organizations achieve competitive advantage through continuous adaptation, innovation, and reconfiguration of resources in changing environments (Teece et al., 1997). The theory suggests that institutions capable of continuously developing new capabilities are better positioned to respond effectively to technological changes (Mele et al., 2024).

In relation to universities, innovation of digital products allows universities to design systems that will enhance their operations and increase their competitiveness. Organizations that are more digitally capable stand higher chances of improving their performance through greater adaptability and innovation (Samad et al., 2022).

Assumptions of Dynamic Capabilities Theory

The first assumption of Dynamic Capabilities Theory is that organizational environments are dynamic and continuously changing due to technological advancement, competition, globalization, and changing customer needs. Therefore, organizations must continuously adapt to survive and remain competitive.

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The second assumption is that possessing valuable resources alone is insufficient for achieving superior performance. Organizations must develop capabilities that enable them to integrate, reconfigure, and deploy resources effectively in response to environmental changes (Teece et al., 1997).

The third assumption suggests that organizations possessing strong innovation capabilities, learning capabilities, and adaptive competencies are more likely to sustain competitive advantage because they can continuously renew and transform their operations according to environmental demands.

Criticisms of Dynamic Capabilities Theory

Despite its popularity, Dynamic Capabilities Theory has received several criticisms. First, critics argue that the theory lacks clear operationalization because dynamic capabilities are difficult to define and measure empirically. Researchers often experience difficulties distinguishing between organizational capabilities and dynamic capabilities.

Secondly, critics suggest that the theory focuses heavily on organizational adaptability while paying less attention to external environmental constraints such as government regulations, economic conditions, and institutional barriers that may influence organizational performance.

Thirdly, the theory has been criticized for assuming that organizations possess sufficient resources to continuously reconfigure capabilities. In reality, resource limitations may restrict institutions from implementing continuous innovation and adaptation.

Finally, some scholars argue that Dynamic Capabilities Theory may overemphasize change and innovation while underestimating the importance of stability and routine organizational processes that equally contribute to performance.

Relevance of Dynamic Capabilities Theory to the Study

Dynamic Capabilities Theory is relevant to this study because it explains how public universities can improve organizational performance through continuous development and deployment of digital product innovation strategies. Universities operate in highly dynamic environments characterized by technological change, increasing competition, changing student expectations, and evolving educational demands.

The theory therefore provides an appropriate foundation for understanding how digital product innovation strategies enable universities to continuously adapt, develop new capabilities, improve service delivery, and enhance organizational performance. Public universities that effectively integrate and reconfigure digital capabilities are more likely to improve student enrollment, enhance access to information, and strengthen institutional competitiveness.

Resource-Based View Theory

Resource-Based View theory argues that organizational performance depends on possession and utilization of valuable, rare, and difficult-to-imitate resources (Barney, 1991). Universities possessing strong innovation capabilities, intellectual property systems, and digital infrastructure may therefore create sustainable competitive advantage through improved performance outcomes (Oliveira & Martins, 2011).

The theory further suggests that innovation resources become strategic assets when organizations effectively align them with changing environmental conditions (Wambui et al., 2022).

Assumption of Resource Based View

The first assumption of Resource Based View is that organizations that are found in the same industry may be heterogeneous in relation to the resources they control. The organization and resources are unique. They do produce goods and services that are unique which will give them a competitive advantage in the industry. The

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second assumption is that Resource Based View assumes that, the uniqueness of the resources of an organization may continue for some time because they are not perfectly mobile across the organization. This means that some resources are not found in factor market thus are difficult to be imitated and this is the reason as to why they become a source of competitive advantage.

Criticisms of the Resource Based View

The first criticism is that competitive advantage cannot only rely on the Resource Based View but should be aligned to the business environment. Business environment includes; government interventions, political factors and economic factors which can act as a source of competitive advantage to the organization. The advantage of aligning resources with the business environment is business world is too dynamic. If the organization does not align its resources with the environment it will be knocked out of the business. The second criticism is that the organization that over relies on the Resources may have stiff competition when Disruptive innovation is undertaken by the key competitor. This may make an organization to be in a confusion state. The third criticism is that over reliance on the Resource Based View at the expense of other factors that affects performance of an organization. For example, organization culture is one of the determinants of the performance of an organization. The fourth criticism is that Resource Based View ignored dynamic changes in the business world. There are many changes that take place today because of dynamism of the business. These changes are caused by technological advancement and innovations. When these changes take place even if the organization has good resources and cannot adjust to the environmental requirements they will not realize a competitive advantage in the business.

Sustainable competitive advantage and superior performance are key elements of the Resource Based View. An organization that strives to sustain a competitive advantage in the market and does more research to come up with non-imitable resources will remain relevant in the market. These resources will act as a barrier to the new entrants in the market. It will also act as the catalyst of increasing the prices of goods and services in the long run the organization will realize improvement in performance. Adnan, Abdul Hamid and Sohail (2018) posit that there are majorly two essential elements of the Resource Based View they include; sustainable competitive advantage and superior performance. Resources of the organizations seem to be dynamic meaning that they do change. An organization that adjusts to changes, adopts new ways of doing things and become more innovative will remain relevant in the industry. These organizations will have competitive advantage. Organization may have a lot of resources that can be imitated, substituted, and those that are common to every organization but does not have competitive advantage. While another organizations may have very few resources that are unique, cannot be imitated and have competitive advantage.

Integration of Theories

This study is anchored on both the **Resource-Based View (RBV) Theory** and **Dynamic Capabilities Theory (DCT)** because neither theory independently provides a complete explanation of how digital product innovation strategies influence organizational performance in public universities. The two theories are complementary and collectively explain how Universities acquire, develop, and utilize strategic resources to achieve superior performance.

The **Resource-Based View Theory**, developed by Jay Barney (1991), posits that organizations achieve superior performance through the possession and effective utilization of valuable, rare, inimitable, and non-substitutable resources. Within the context of this study, digital product innovation resources such as Research and Development (R&D) capabilities, innovation centres and hubs, intellectual property assets, digital infrastructure, and specialized knowledge constitute strategic resources that can enhance organizational performance. RBV therefore explains **what resources public universities need** to gain a competitive advantage and improve outcomes such as student enrolment, employee retention, and access to information.

However, possessing strategic resources alone does not guarantee superior performance in a rapidly changing technological environment. This limitation is addressed by the **Dynamic Capabilities Theory**, proposed by David Teece (1997). The theory argues that organizations must continuously integrate, build, and reconfigure

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their resources and competencies to respond effectively to environmental changes. In public universities, dynamic capabilities are reflected in the institution's ability to adapt to emerging technologies, develop innovative digital products and services, commercialize research outputs, and continuously improve service delivery. Dynamic Capabilities Theory therefore explains **how universities transform and deploy their strategic resources** to create value and sustain organizational performance.

The integration of the two theories provides a stronger theoretical foundation for this study. RBV explains the strategic resources underpinning digital product innovation strategies, while Dynamic Capabilities Theory explains the processes through which those resources are adapted, renewed, and leveraged to improve organizational performance. Together, the theories suggest that public Universities are more likely to achieve enhanced student enrolment, reduced employee turnover, and improved access to information when they not only possess innovation-related resources but also have the capability to continuously adapt and exploit those resources in a changing digital environment.

Linkage of Theories to Study Variables

Theory	Study Variable Supported	Explanation
Resource-Based View (RBV) Theory	**Digital Product Innovation Strategies** *(R&D, Innovation Centres and Hubs, Intellectual Property Management)*	RBV posits that organizations achieve sustainable competitive advantage through valuable, rare, inimitable, and non-substitutable resources. In universities, digital innovation capabilities such as R&D infrastructure, innovation hubs, technological expertise, and intellectual property assets constitute strategic resources that support the development and implementation of digital product innovation strategies. These resources enable institutions to create unique educational products and services that differentiate them from competitors.
Dynamic Capabilities Theory (DCT)	**Organizational Performance** *(Student Enrolment, Employee Turnover, Access to Information)*	DCT emphasizes an organization's ability to sense opportunities, seize them, and continuously reconfigure resources in response to environmental changes. Universities that effectively develop dynamic capabilities can adapt their innovation initiatives to changing technological and educational demands, leading to improved organizational performance through increased student enrolment, reduced employee turnover, and enhanced access to information.
Combined Contribution of RBV and DCT	**Relationship between Digital Product Innovation Strategies and Organizational Performance**	RBV explains the strategic resources that enable universities to pursue digital product innovation strategies, while DCT explains how these resources are continuously integrated, reconfigured, and leveraged to respond to environmental changes. Together, the theories provide a comprehensive explanation of how digital product innovation strategies translate into improved organizational performance. RBV focuses on resource ownership and capability endowment, whereas DCT focuses on the effective deployment, adaptation, and renewal of those resources to sustain performance improvements over time.

Empirical Review

Zand & Rezaei (2020) studied how process and product innovation strategies affect business performance because of the dynamic role of the environment as a mediator in the Iranian banking sector. Both process and product innovation strategies were investigated in the study. An exploratory research design was employed in this study. Survey-correlation was used for data collection and analysis, and the research methodology was founded on the goal of applied research. 36 managers working in the Iranian banking sector made up the study's statistical population. Data was collected through the use of questionnaires. The data was examined using structural equation modeling. The results demonstrated that strategies for process and product innovation significantly and favorably impacted business performance. Nevertheless, this study focused on the banking industry rather than Universities.

A study by Tsai et al. (2020) on the impact of product innovation on performance of Taiwanese high-tech firms in Tiwan using a path analysis. A descriptive research design was employed in the study. 150 samples were chosen for the study using a random sampling technique. The questionnaires were used to collect the data. To analyze the data, descriptive statistics were employed. The results demonstrated that, through the use of MAIS, product innovation has an indirect impact on organizational performance in addition to a direct one. However, only managers were the subject of the study.

Xiao et al, (2022) carried out a study on how the performance of big manufacturing companies is affected by their product innovation strategy. The goal of the study was to investigate how the performance of major Chinese manufacturing companies was impacted by their approach to product innovation. A descriptive research design was employed in the study. Some of Beijing's major manufacturing companies were among the targeted population. Managers and middle management staff, including supervisors, were part of the observation unit. The questionnaires were used to collect the data. The results of the study demonstrated a positive and significant relationship between performance and product innovation strategy. It was discovered that the strategy of product innovation accounts for the differences in the performance of Chinese manufacturing companies. The study found a positive correlation between performance and product innovation strategy. The results of this study, which examined how digital innovation strategy affected the performance of big manufacturing companies, cannot be applied to Kenya because it was carried out in a different country.

Research on the organizational performance and product innovation of the manufacturing sector in Asaba, Delta State, Nigeria, was carried out by Fidelia (2022). The survey approach was used. From a few chosen companies, the researchers produced primary data. The study used a sample of 124 people out of the 180 total population. The results of the study demonstrated that, as long as the company could manage it effectively, product innovation was both necessary and a good way to introduce new products to the market. The study also showed that product and promotion innovation had a positive impact on the manufacturing sector's organizational performance in Nigeria's Asaba Delta state. But this research was conducted in Nigeria.

A study on Product Innovation and the Performance of Financial Technology Companies in Kenya was carried out by Nyamao & Tari in 2023. Schumpeter's Theory of Innovation served as the foundation for the investigation. To identify the issue being studied, the study used a descriptive research design. The study's target population consisted of thirty-six Kenyan financial technology companies. In this study, a census was taken due to the small population. The main instrument used to collect data was a questionnaire. Both descriptive and inferential statistics were used to analyze the data. Tables were used to display the results. The findings showed that the performance of Kenyan financial technology companies was positively and significantly impacted by product innovation. But only Kenyan financial technology companies were examined by the researchers.

Nathan & Ande (2023) studied how Nigerian manufacturing companies' organizational performance was affected by their product innovation strategy. Using content analysis, a sample size of 40 manufacturing companies was selected from the total population of 43 manufacturing companies. For ten (10) years, STATA was used to analyze and interpret the data. Since every component of the product innovation strategy was favorable and significant in relation to the performance of the companies, the results demonstrated that the strategy had a greater impact on performance. The findings showed that product innovation was more robust, advantageous, and distinctive. However, since this study was carried out in a different country and concentrated

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on the impact of product innovation strategy on the organizational performance of manufacturing companies in Nigeria, the results cannot be applied to Kenya.

A study on the impact of digital product innovations on Kenyan commercial banks' financial performance (Kagendo et al., 2024). The purpose of the study was to examine, using the evolutionary theory of economic change as a guide, how digital product innovations affect financial outcomes and how government policies moderate this relationship. Data was gathered from 315 employees of 39 commercial banks using a descriptive study design. Primary data was obtained through structured questionnaires, while secondary data was obtained from industry reports. The hypothesis that digital product innovations have no discernible effect on financial performance was tested using statistical analysis, including regression models. Key findings show that product innovations like e-wallets and mobile banking solutions have increased market relevance and customer satisfaction. However, obstacles to successful product development were found to include issues with organizational culture and leadership, budgetary limitations, and regulatory compliance. The study found a statistically significant relationship between financial performance and innovations in digital products. However, this study did not apply to Kenyan public universities because it concentrated on the impact of digital product innovation strategy on the financial performance of Kenyan commercial banks.

A study on the relationship between organizational performance and product innovation was carried out by Musyoka (2023). The purpose of this study was to look into how product innovations affected the performance of Kenya's public universities. This study used both the balanced scorecard methodology and the resource-based theory. The study's methodology was cross-sectional. The 31 public universities in Kenya were the study's target participants. Ten public universities made up the sample frame for this study. One hundred responses were selected from the population. Respondents were selected using a stratified random sample method from among Kenya's ten public universities. The Israel (2009) formula was used to calculate the sample size for the 80 responders. Structured questionnaires with both closed-ended and open-ended questions were used to collect primary data. According to the study's conclusions, performance at public universities can be adequately explained by product enhancements. In contrast to the current study's descriptive research design, this study used a cross-sectional study methodology.

Existing studies demonstrate positive relationships between innovation strategies and organizational performance across different contexts. Research conducted among manufacturing firms found that product innovation strategies positively influence organizational performance through increased competitiveness and operational efficiency (Nathan & Ande, 2023).

Digital product innovation strategies, including research and development (R&D), innovation centres and hubs, and intellectual property management, enable universities to develop new digital solutions, improve existing services, and respond effectively to the evolving needs of students, staff, and other stakeholders. Previous studies have demonstrated that innovation strategies contribute significantly to improved organizational performance by enhancing efficiency, competitiveness, service quality, and stakeholder satisfaction (Adnan et al., 2018; Onyango & Ondiek, 2021; Musyoka, 2023; Nyamao & Tari, 2023; Xiao et al., 2022). Consequently, universities that invest in innovation capabilities are better positioned to attract and retain students, improve access to information, and create a conducive working environment that supports employee retention.

In addition, studies conducted among financial technology firms in Kenya found significant positive relationships between product innovation and firm performance (Nyamao & Tari, 2023). However, these studies primarily focused on banking and private-sector organizations.

Studies conducted within higher education environments similarly suggest that product innovation contributes significantly toward institutional performance. Research examining public universities in Kenya established that product innovation positively influences university performance through improved institutional effectiveness and stakeholder satisfaction (Musyoka, 2023).

Furthermore, evidence suggests that emerging digital technologies and innovation ecosystems improve educational effectiveness and institutional competitiveness within higher education institutions (Sembey et al.,

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

2024). Despite these findings, previous studies largely focused on general innovation rather than digital product innovation strategies specifically.

CONCEPTUAL FRAMEWORK

The major role of conceptual framework was to show the relationship between the variables. In this

study, the conceptual framework showed the relationship between independent variable; Digital Product Innovation Strategies- -Research and Development (R&D), Innovation Centers and hubs and Intellectual Property (IP) Management and how they influence dependent variable (organizational performance of public universities in Kenya).

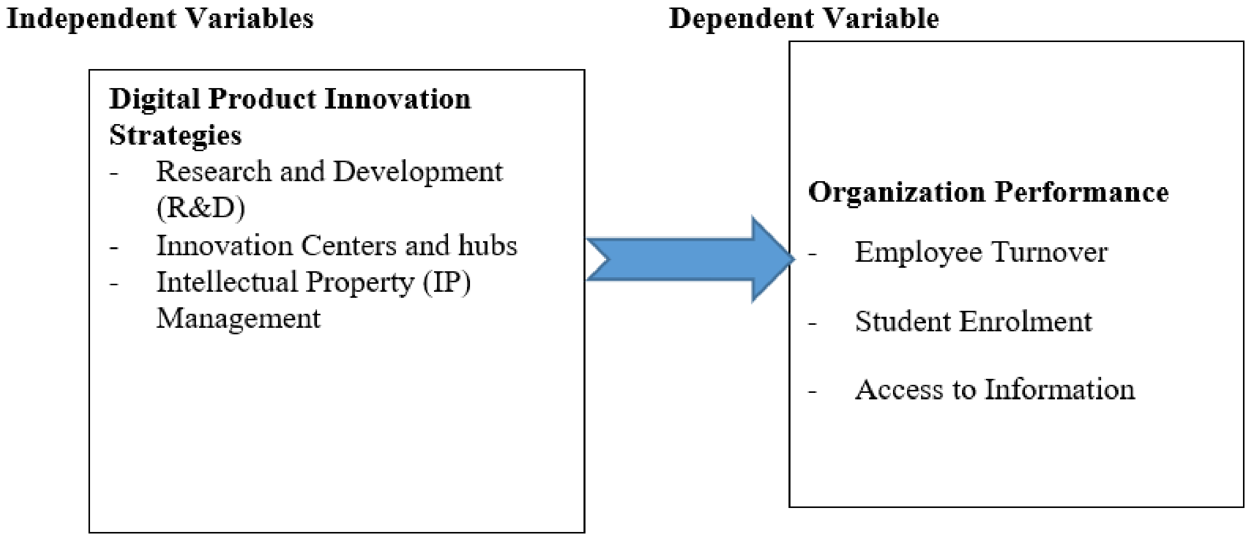

Figure2.1: Conceptual framework showing interaction of Key Variables

Source: Own Conceptualization (2026)

The framework proposes that **Digital Product Innovation Strategies** influence the **Organizational Performance** of public universities. Research and Development (R&D) facilitates the creation of innovative academic and administrative products and services. Innovation centres and hubs promote creativity, collaboration, and commercialization of knowledge, while Intellectual Property (IP) Management enables universities to protect and exploit innovations for institutional growth. These strategies are expected to enhance organizational performance by attracting more students (student enrolment), improving employee satisfaction and retention (reduced employee turnover), and increasing the efficiency and availability of information systems (access to information). This relationship is supported by the **Resource-Based View (RBV) Theory**, which argues that unique and valuable organizational resources such as innovation capabilities create superior performance

Contextual Justification

Organizational performance is a multidimensional construct whose measurement depends on the study context and objectives. In public universities, performance is not solely assessed through financial outcomes because these institutions primarily pursue educational and social objectives. This study focuses on student enrolment, employee turnover, and access to information because they directly reflect the effectiveness of digital product innovation strategies. Student enrolment indicates the university's ability to attract and retain learners through innovative educational products and services. Employee turnover reflects workforce stability and employee satisfaction, which are influenced by the efficiency and usability of digital systems. Access to information measures the extent to which digital innovations enhance communication, knowledge sharing, and decision-making processes. Together, these indicators capture customer, internal process, and human resource dimensions

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

of organizational performance and are therefore appropriate for assessing the impact of digital product innovation strategies in public universities.

DISCUSSION OF FINDINGS

The findings revealed that digital product innovation strategies had a positive and statistically significant effect on organizational performance. Specifically, the Pearson correlation coefficient indicated a strong positive relationship between digital product innovation strategies and organizational performance ($r = 0.930$, $p < 0.05$), suggesting that increased adoption of digital product innovation strategies is associated with improved organizational performance. The regression results further revealed that digital product innovation strategies significantly predicted organizational performance ($\beta = 0.583$, $p = 0.000$), implying that a unit increase in digital product innovation strategies resulted in a corresponding increase in organizational performance. Additionally, the coefficient of determination ($R^2 = 0.865$) indicated that 86.5% of the variation in organizational performance could be explained by digital product innovation strategies. The null hypothesis that digital product innovation strategies have no significant influence on organizational performance was therefore rejected.

These findings imply that investments in Research and Development (R&D), Innovation Centers and Hubs, and Intellectual Property (IP) Management significantly contribute to enhanced organizational performance through improved student enrolment, reduced employee turnover, and better access to information. The descriptive findings further indicated that respondents agreed that their universities had invested substantially in research and development activities, promoted a culture of innovation, continuously improved digital products and services, and established innovation centres and hubs that support creativity and technological advancement.

The findings are consistent with the **Resource-Based View (RBV) Theory**, which argues that organizations achieve superior performance when they possess valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). In the context of public universities, R&D capabilities, innovation hubs, intellectual property assets, technological knowledge, and innovation competencies constitute strategic resources that create competitive advantage and enhance institutional performance. The findings suggest that universities that invest in developing and leveraging these innovation resources are better positioned to improve their performance outcomes.

The findings are also supported by the **Dynamic Capabilities Theory (DCT)** proposed by Teece et al. (1997), which emphasizes an organization's ability to integrate, build, and reconfigure internal and external competencies in response to changing environments. Universities that continuously develop new digital products, strengthen innovation ecosystems, and adapt their innovation processes are more likely to achieve superior performance outcomes. Thus, digital product innovation strategies not only provide resources but also enhance the institution's capacity to respond effectively to technological and educational changes.

The findings corroborate previous empirical studies that established a positive relationship between product innovation and organizational performance. For example, Xiao et al. (2022) found that product innovation strategy positively influenced the performance of large manufacturing firms in China. Similarly, Nyamao and Tari (2023) reported that product innovation significantly improved the performance of financial technology firms in Kenya, while Nathan and Ande (2023) found that product innovation strategy positively affected organizational performance among manufacturing firms in Nigeria. Likewise, Musyoka (2023) established that product innovations significantly enhanced the performance of public universities in Kenya. These studies collectively demonstrate that organizations that continuously innovate their products and services are more likely to achieve superior performance outcomes.

The findings further agree with Kahn and Candi (2021), who argued that digital product innovation strategies significantly influence organizational performance by improving product quality, efficiency, and competitiveness. Similarly, Yang et al. (2022) observed that digital product innovation provides organizations with a framework for developing new products and improving existing ones, thereby enhancing competitiveness, survival, and growth in dynamic environments. The current study therefore extends these findings to the context

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XV, Issue VI, June 2026

of public universities in Kenya, demonstrating that digital product innovation strategies are equally important in educational institutions as they are in commercial organizations.

The findings demonstrate that digital product innovation strategies significantly influence organizational performance among public universities. Universities investing in research and development activities tend to generate innovative educational solutions that improve institutional effectiveness (Kagendo et al., 2024).

Innovation centers and hubs facilitate collaboration, entrepreneurship, and technological advancement, enabling universities to improve competitiveness and responsiveness (Fernández et al., 2023).

Additionally, intellectual property management contributes toward institutional sustainability through commercialization opportunities and protection of innovative outputs (Shakhovskaya & Goncharova, 2022).

Improved digital products enhance access to institutional information, increase student attraction and retention, and contribute toward reducing employee turnover through improved working conditions (Chatterjee et al., 2023).

The findings support Dynamic Capabilities Theory by demonstrating that institutions capable of continuously developing innovation capabilities achieve superior performance outcomes (Teece et al., 1997).

Overall, the findings demonstrate that digital product innovation strategies are a critical determinant of organizational performance in public universities in Kenya. Universities that strengthen their R&D activities, establish innovation centres and hubs, and effectively manage intellectual property are more likely to achieve improved enrolment levels, enhanced information accessibility, and better employee retention. Consequently, public universities should prioritize investments in digital product innovation as a strategic mechanism for sustaining competitiveness and improving institutional performance in an increasingly digital higher education environment.

Gaps on the Literature Review

Most previous studies were conducted in sectors other than public universities such as manufacturing firms, financial technology companies, banking institutions, e-commerce industries, and private universities, making it difficult to generalize findings to public universities in Kenya. For example, studies by Nyamao and Tari (2023) focused on financial technology companies, while Kagendo et al. (2024) concentrated on commercial banks. Similarly, other studies were conducted outside Kenya, including Nigeria and UAE contexts, limiting applicability to Kenyan public universities. Therefore, there was insufficient evidence regarding how digital product innovation strategies influence organizational performance within public universities in Kenya.

Most studies were conducted either outside Kenya or in different regions and sectors within Kenya. Studies conducted within Kenya concentrated on private universities, financial institutions, or broader university contexts rather than specifically focusing on public universities in Western Kenya. Therefore, geographical limitations created the need for research focusing specifically on public universities within Kenya.

Although numerous studies have reported a positive relationship between digital technologies and organizational performance, the evidence is largely drawn from non-university settings, private universities, or institutions outside Kenya. Therefore, the gap is not the absence of evidence generally, but the limited empirical evidence on how digital product innovation strategies affect organizational performance in Kenyan public universities

A review of existing studies indicates that digital technologies and innovation strategies generally have a positive influence on organizational performance (Xiao et al., 2022; Nathan & Ande, 2023; Musyoka, 2023). However, the reviewed studies exhibit several methodological, contextual, and conceptual limitations that justify further investigation.

Methodologically, the studies employed diverse research designs, including descriptive surveys, cross-sectional studies, exploratory research, correlational studies, and systematic literature reviews. For example, Musyoka

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(2023) employed a cross-sectional design to examine the effect of product innovation on the performance of public universities in Kenya, while Nyamao and Tari (2023) utilized a descriptive design in studying financial technology firms in Kenya. Although these approaches provided useful insights, cross-sectional studies are limited in establishing causal relationships, while descriptive studies primarily explain associations without adequately examining causality (Saunders et al., 2019; Musyoka, 2023). Similarly, studies such as Sembey et al. (2024) relied on secondary data through systematic literature reviews, limiting the generation of context-specific evidence from primary respondents.

The reviewed studies also exhibited several strengths. Most studies used structured data collection instruments and applied inferential statistical techniques that enhanced the reliability and validity of their findings (Nyamao & Tari, 2023; Musyoka, 2023). Studies conducted in Kenya, such as Nyamao and Tari (2023) and Musyoka (2023), provide valuable local evidence on the relationship between product innovation and organizational performance. Furthermore, international studies contribute to the generalizability of innovation–performance relationships across different sectors and environments (Xiao et al., 2022; Nathan & Ande, 2023).

Despite these strengths, significant weaknesses remain. Many studies focused on sectors such as banking, manufacturing, financial technology, e-commerce, and telecommunications rather than public universities. For instance, Xiao et al. (2022) examined product innovation in the Iranian banking sector, while Nathan and Ande (2023) focused on Nigerian manufacturing firms. The findings from these sectors may not be directly transferable to public universities because of differences in organizational objectives, governance structures, and performance indicators (Etzkowitz & Leydesdorff, 2000; Xiao et al., 2022). In addition, several studies were conducted outside Kenya, thereby limiting their contextual applicability to Kenyan public universities (Musyoka, 2023; Nyamao & Tari, 2023).

The literature further reveals inconsistencies regarding the measurement of organizational performance. While some studies measured performance using financial indicators such as profitability and revenue growth, others used customer satisfaction, operational efficiency, innovation outcomes, or student enrolment. These variations make comparison of findings difficult and create uncertainty regarding the most appropriate measures of organizational performance within the higher education sector (Musyoka, 2023).

Conceptually, most studies examined isolated dimensions of digital transformation, such as digital marketing, emerging technologies, or product innovation, rather than integrating multiple digital strategies within a single framework (Sembey et al., 2024). Consequently, the interaction between digital product innovation strategies and organizational performance remains insufficiently understood, particularly in public universities.

Therefore, although the existing literature generally supports a positive relationship between innovation strategies and organizational performance (Xiao et al., 2022; Nathan & Ande, 2023), methodological limitations, contextual differences, conceptual fragmentation, and inconsistent performance measures indicate the need for further empirical investigation. This study addresses these gaps by examining the effect of digital product innovation strategies on organizational performance in public universities in Kenya using student enrolment, employee turnover, and access to information as performance indicators (Musyoka, 2023; Nyamao & Tari, 2023).

CONCLUSION

Based on the reviewed literature, it can be concluded that digital product innovation strategies significantly contribute toward improving organizational performance among public universities in Kenya. Institutions investing in research and development activities, innovation ecosystems, and intellectual property management create stronger competitive positions and achieve improved performance outcomes (Musyoka, 2023; Nyamao & Tari, 2023).

RECOMMENDATIONS

The study recommends:

1. Universities should increase investment in research and development initiatives to encourage continuous innovation.

2. Public Universities should establish and strengthen innovation centers and digital hubs to promote product development.

3. Institutions should develop stronger intellectual property policies to maximize commercialization opportunities.

4. Policymakers should provide supportive frameworks that encourage digital innovation within Public Universities.

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