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Technological Initiatives on Operational Performance of Public Universities in Kenya

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Abstract:

The objective of this study was to determine the effect technological initiatives on operational performance of public universities in Kenya. The study was anchored on technology acceptance theory. Cross-sectional research design was utilized. Target population was 3public universities. Random sampling technique was adopted to select public universities. Systematic sampling technique was also adopted to select respondents of the study who comprised of lectures and administrators in public universities. From a total population of 43 respondents selected from 3 public universities, a sample size of 39 respondents was determined using Israel formula. Self-developed questionnaires were used to collect data. Reliability of the research instrument was tested using Cronbach Alpha threshold of 0.7 while validity was determined using industry experts. Data was analyzed quantitatively with the help of Stata. The results revealed that there existed a positive significant relationship between technological initiatives and operational performance of public universities in Kenya. The study concluded that, for enhanced operational efficiency and effectiveness, university management should prioritize embracing technological initiatives such as equipping employees with ICT skills, activation of websites, development of new academic programs, automation of library and teaching services. The study recommended that, for enhanced operational performance of universities, management of public universities should allocate adequate financial resources in order to facilitate employee training, procurement of modern ICT tools such as computers as well as customized software for enhanced customer service delivery.

Keywords: Technological initiatives, operational performance and public universities

1. Introduction

In the contemporary business environment, organizations are striving to enhance operational efficiency and effectiveness by embracing different strategies (Efendioglu & Karabulut, 2010). Technological initiatives adopted by organizations are not only intended to achieve its short-term and long-term objectives but also to enable the organization navigate in the unpredictable business environment (Agboola, 2011). Operational performance is described as the extent to which an organization can eliminate wastage, reduce cycle time, enhance service efficiency and effectiveness, conform to regulations and manage its resources such as people, information, technology and raw materials in a leaner practice (Nicolaou & Bhattacharya, 2014; Nicol, 2013). Technological initiatives are viewed to be a function of operational performance (Nakhumwa 2013). Managers in organizations can promote the technological culture among workers by encouraging workers to make independent decisions, allocating workers more challenging tasks and encouraging employees to consult or work as a team to achieve organizational goals (Abu & Tareq, 2016).

Subsequently, Arif (2018) and (Karuha, 2015) attested that technology in any systems can be promoted by equipping employees with new skills and knowledge in order to perform their duties in a more efficient and effective manner. For any organization to be globally competitive, prior investment in infrastructure and human capital are inevitable. Diversification, identification of new market opportunities and adoption of new techniques and processes in production are technological practices that enhance operational performance of organization(Karuha, 2015).For any company to attain its global ambitions technology is inevitable (Okotoh, 2015). Individual and systemic challenges experienced when introducing new technologies in any system can be managed by effectively equipping employees with ICT skills and at the same time educating workers the value of technology in the system (Kabagambe, Ogutu & Munyoki, 2012).

Inability of organizations to implement new policies, expand market share and maximize profits is attributed with challenges of technology from one organization to another (Aduda & Kingoo, 2012). Further, Nakhumwa (2013) acknowledged that, poor service delivery, decreased market share and failure of the organization to change operational models are all aspects that reflect the inability of managers to articulate benefits associated with technology.Embracing appropriate technology in any systems not only enhances procurement, financial, logistics and marketing functions but also overall customer experience (Raineri, 2011. Ability of organizations to maximize profits, increase volume of sales,

penetrate new markets and enhance stakeholder values is purely dependent on technological initiatives embraced in the system. Considering the fact that higher institutions of higher learning around the world are striving to invest in training, research and education, adoption of appropriate technology is considered to be a strategic agile driver (Hitt, Keats & De Marie, 2012). Institutions of higher learning are pressurized by internal and external factors to embrace appropriate technologies in order to survive (Achitsa, 2014). Technology in the university context can be viewed by stakeholders from different perspectives: internet accessibility to customers, use of databases to manage customer information (Castillo & Serradell) development of new academic programs, automating library services, introduction of biometric systems, employee literacy on ICT skills, investment in ICT tools such as computers and projectors (Musangu & Kekwaletswe, 2011). Higher education sector in Kenya is considered to be driver of economic stability. However, despite developments in the higher education sector since independent and efforts of the government to maintain high quality standards in higher education, public universities are considered not to live up to the expectations of stakeholders such as students, parents, quality regulatory bodies constituted by the government and other development partners in the education sector such as World bank (WB) and United Nations Development Program (UNDP). Considering that public universities in Kenya are experiencing deteriorating operational performance despite attempts of the government to encourage more students to enroll, it is against this background the researcher was motivated to conduct this study in order to unearth the problem.

1.1. Research Problem

Despite efforts of the government of Kenya to promote higher quality education, public universities are experiencing operational challenges. Inability of the public universities to meet operational standards in service delivery is attributed to constraints such as reduced funding, increased enrolment of students and change or higher education regulations. Student missing marks, slow pace of implementing quality regulatory policies, information management and capacity development are major issue of concern that informed this study. Despite extensive studies have been conducted globally, regionally and locally to examine the link between technological initiatives and operational performance of firms (Nakhumwa, 2013; Aduda & Kingoo, 2012; Sari and Mahmutoglu, 2015; Castillo and Serradell, 2014; Alhadid, 2016), it is noted that there exists insufficient evidence to support the position of the authors. Considering the cultural and geographical differences of these studies, it was impossible to generalize the findings in this study. Therefore, based on conceptual, theoretical, contextual and methodological research gaps of the studies, it is against this premise this study was conducted with an aim of unearthing the link between technological initiatives and operational performance of public universities in Kenya.

1.2. Research Objective

- To determine the effect of technological initiatives on operational performance of public universities in Kenya.

2. Literature Review

2.1. Theoretical Review

Technology Acceptance theory was pioneered by Davis (1989). The theory argues that new methods, process and techniques of production are a function of organizations performance. Achieving organizations excellence, technology is one of the most significant drivers of organizational competitiveness. Davis (1989) contends that success of any technology in any successful systems is purely dependent on perceived usefulness, which is the ability of the user to apply the technology without difficulty in performing duties, perceived ease of use which is regarded as the ability of the technology to be used by the majority of employees and give sustainable solution, attitude towards technology which is described as the innate quality of the user that determine application of the new technology in performing duties and behavioural attention which is viewed as the general conduct of the user towards the new technology (Petter & DeLone, 2013). Alshaher (2013) opines that as organizations continue to experience challenges such as increased costs of products, inability to align policies to changing regulations and behavioural resistance and inability to adopt new technologies in systems will not only boost overall productivity of the organizations but also will contribute to sustainable customer loyalty. Adair (2012) attests that complexity of technology not only make organizations drag behind creativity and innovation but also it contributes to increased costs of production. Equipping employees with appropriate ICT skills will promote organizational productivity in terms of increased returns in investments, profits, volume of sales, diversification and ability to penetrate global markets. This theory was retested in this study based on the notion that public universities can improve their productivity if they embrace appropriate technological initiatives.

2.2. Empirical Review

2.2.1. Technological Initiatives and Organizational Performance

For sustainable global competitiveness of firms, technology is considered to be a predominant factor of operational performance (Salwe, Ahmed, Aloufi & Kabir, 2010; Aduda & Kingoo, 2012; Sari & Mahmutoglu, 2015). Kwamboka (2016) identified a significant relationship between technologies and performance of state owned institutions in Kenya. Descriptive research design and simple random sampling technique were used to select 113 respondents. Linear regression method was used to analyze data. The study concluded that, firms in the 21st century would only survive in the turbulent business environment by automating their systems and processes. Further, the study noted that employee

training on ICT skills was a mandatory competitive practice of dynamic firms. In contrast, this study sought to examine the effect of technological initiatives on operational performance of public universities in Kenya.

Mulinge (2014) found out that there exists a direct relationship between technology and quality customer service delivery in commercial banks in Kenya which is viewed as an element of performance. The study concluded that technology integration in the system can result to increased profits of firms in developing and developed countries. Efficiency of the system is enhanced through adoption of modern technologies. The study concluded that technology has promoted e-commerce practices to modern firms thus enhanced customer loyalty. Moreover, it was noted that companies can cut costs by 50% if they embrace appropriate technology in production, processing and distribution. However, this study sought to address the research gaps by assessing examining the effect of technological initiatives on operational performance public universities in Kenya. Abagambe et al. (2012) in Rwanda assert that automation of systems and processes has not only contributed to improved organizational productivity but also helped firms to minimize costs of operation in key functions such as marketing, procurement, accounting, logistics and production. Firms that embrace appropriate technologies have significantly reduced their costs of operation drastically thus maximization of profits.

Whilst, Agboola, (2011) in Uganda acknowledged that adoption of technologies such as accounting, marketing and procurement information systems can positively influence organizational performance. In Kenya, Okotoh (2015) opined that that organizational agility capabilities such as technology is a function organizational performance. As organizations seek to maximize profits, rethinking on agility practices such as technology, product innovation and employee knowledge are key determinants. Mueni (2014) established technological initiatives in organizations had positive significant results on organizational performance in terms of service efficiency and effectiveness. The results of the study indicated that there existed a difference between technology and performance of organizations. The study pointed out that technology not only contributed to enhanced service delivery but also improved overall efficiency of the organization in terms of time of servicing customers and speed of processing customer enquiries. The study concluded that if technology is not effectively management, it can lead to organizational conflicts and vice versa. In contrast, this study modified operational performance metrics to reflect that of public universities in Kenya.

Yusufu (2013) noted that performance of manufacturing firms in Kenya was influenced by quality management initiatives. Cross-sectional research design and systematic sampling technique were adopted to choose 217 respondents. Factor analysis method was used in data analysis. Findings revealed efficiency and effectiveness in service delivery was largely dependent on system automation even though systemic and behavioral challenges are experienced from one organization to another. Moturi (2010) established that transformational leadership was measured in any system based on the level of technology and its effectiveness in the system in service delivery. The study pointed out that ICT initiatives such as websites, hardware and software technologies were directly correlated with performance of government ministries in Kenya in terms of service delivery. The findings of the study indicated that ICT initiatives in organizations were not only contributed to operational efficiency but also made organizations to minimize costs of production by 53% if effectively managed. The study concluded that effective integration of information technology at the workplace, organizations can have virtual offices which are less costly than physical offices. However, this study addressed this research gaps by examining the effect of technological initiatives on performance pharmaceutical manufacturing firms in Kenya.

Despite extensive studies conducted attempting to investigate the relationship between technology and operational performance, it is evident that each study had conceptualized and operationalized the variables of the current study differently thus non-generalizability of the findings in this study (Salwe, Ahmed, Aloufi & Kabir, 2010; Aduda & Kingoo, 2012; Sari & Mahmutoglu, 2015; Kwamboka, 2016; Yusufu, 2013; Mueni, 2014; Mulinge, 2014)

3. Research Methodology

The study adopted the cross sectional research design. The target population was three public universities. A sample size of 32 respondents was determined using Israel formula. Random and stratified sampling techniques were used select the public universities as well as respondents. The response rate for the study was 77%. The response rate of 77% was considered appropriate as recommended by Black (2012).

4. Results Findings and Discussion

4.1. Descriptive Statistics for Technological Initiatives

Statement	Mean Score	SD	CV%
There is team work in my university	4.21	.314	34.1
My university responds to customer queries on real time without delay	4.23	.513	28.3
Systems of my university are reliable in service delivery	3.53	.653	25.3
My university receive online enquiries from customers	3.11	.566	23.1
My university uses social media platforms such as twitter, Instagram and Facebook	3.43	.433	21.3
My university has an active website	3.23	.413	19.3
My university has techno savvy employees	2.21	.327	19.1
My university has new methods of offering education services	2.11	.234	11.0
My university frequently develops new academic	2.08	.218	10.1
My university has biometric systems	2.13	.527	20.1
I am well equipped with IT skills to perform my duties more effectively	2.09	.613	21.4
Aggregate Mean Score	3.03	0.437	21.19

Table 1: Descriptive Statistics for Technological Initiatives

To ascertain from respondents, the extent to which technological initiatives influenced operational performance of public universities in Kenya, the findings are summarized in Table 1. The results indicated a moderate agreement regarding technological initiatives and operational performance of public universities with an aggregate mean of 3.01 and coefficient of variation (CV) =21.19%. Only 6 of the 11 statements showed a mean score of more than 3.00 indicating a general moderate agreement that technological initiatives had a significant influence on operational performance while 5 of the 11 statements indicate a mean score of less than 2.00 reflecting that some of the workers were in disagreement with the statements. It was reported that universities did not have techno savvy workers, new methods were not used to offer education services, new academic programs were not developed frequently, online platforms were not used to services and some workers did not have computer skills to perform their duties.

4.2. Correlation Analysis

To ascertain the whether there existed a relationship between technological initiatives and operational performance of universities in Kenya, Pearson's product-moment technique was used and the results are presented in Table 2

		Operational Performance	Technological Initiatives
Operational Performance	Pearson Correlation Sig. (2-tailed)	1.000	
Technological Initiatives	Pearson Correlation Sig. (2-tailed)	0.491**	1.000

Table 2: Correlation Coefficients Matrix

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

As depicted in Table 2, the results indicate that there existed a significant positive relationship between technological initiatives and operational performance of public universities. Technological initiative was positively and statistically significant ($r=0.491, p<0.05$). Based on this result, the data was justifiable for further analysis.

4.3. Relationship between Technological Initiatives and Operational Performance

Simple regression method was adopted to ascertain the relationship between technological initiatives and operational performance of public universities in Kenya. The findings are summarized as shown in Table 3.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.331	.081	.079	.49893

Table 3: Model Summary

a. Predictors: (Constant), Technological Initiatives

The regression model $Y = \beta_0 + \beta_1 X_1 + \varepsilon$ was fitted to the data and the model was found to be significant. From Table 3 the value R value of 0.331 showed that there was a positive linear relationship between technological initiatives and operational performance of public universities in Kenya while the R^2 value showed that the explanatory power of the independent variables was 0.081. This means that 8.1% of the variation in operational performance was explained by technological initiatives.

The Analysis of Variance (ANOVA) is depicted in Table 4 as shown below.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.655	1	.655	21.093	0.021
1Residual	50.274	38	.357		
Total	50.929	39			
Dependent Variable: Firm Performance		u			
Predictors: (Constant), Technological Initiatives					

Table 4: ANOVA

Table 4 presents the results on the analysis of the variance (ANOVA) where F statistic of 21.093 showed that the overall model was significant as it was more than the critical F value at 5% level of significance. The p-value of 0.000 was less than 0.05 therefore suggesting that the coefficient in the equation fitted was not equal to zero revealing a good fit thus recognition of the simple regression fitted, technological initiatives had a significant impact on operational performance. The results presented in Table 5 shows the regression analysis for technological initiatives and firm performance.

	Unstandardized Coefficients		Standardize d Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.243	0.104		12.721	0.000
Technological Initiatives	0.284	0.214	0.238	2.399	0.021
Dependent Variable: Operational Performance					

Table 5: Regression Analysis for Technological Initiatives and Firm Performance

Table 5 indicate the results of coefficients to the model $Y = 0.243 + 0.284X_1$ estimates were significant at the 0.05 level of significance as shown on Table 5. This was because the significance was 0.021, which was less than 0.05. The constant term implied that at zero technological initiatives, there will be an increase in operational performance by a magnitude of 0.284 units. The coefficient 0.112 implies that enhancement in technological initiatives will lead to an increase in operational performance by 0.284 units.

5. Conclusion

This study found out that there existed a significant positive relationship between technological initiatives such as website improvement, service automation and new product development and operational performance of public universities in Kenya. It was noted that appropriate application of technology in service delivery not only contributed to reduced costs of operation but also enhanced overall service experience in terms of speed and time saving. Creativity among workers, information sharing and teamwork are all aspects that were found to have a significant impact on operational performance.

6. Recommendations

Based on the findings of this study, it is recommended that:

- Management of public universities should create an enabling environment that will make employees of public universities to be creative and innovate.
- Management of public universities should invest in technologically supported systems to improve the overall service delivery.
- Management of public universities should always engage technocrats to upgrade systems and train workers on how to use new computer programs
- Management of public universities should ensure service delivery models in the university context are integrated with appropriate technologies. These services include: library services, hostel services and teaching services.

- To enhance customer satisfaction in the university context, university managers should prioritize on digitizing student and employee information. Use of biometric systems to capture student information class attendance will also enhance service efficiency and effectiveness.

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