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Effects of Information System Managerial and Technical skills on Strategic Information System Implementation at Africa International University

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Abstract

Strategic information systems (SIS) are information systems developed in response to corporate business initiative. They give competitive advantage to the organization. The strategic information systems assist business organizations in strategic planning, management control, operational control, and transaction processing for effective and efficient service delivery. An organization that has fully automated its operations and services is able to efficiently meet its clientele's needs as compared to the institution, whose operations are manual or partially automated. Currently at Africa International University (AIU) some of the departmental functions are partially automated while others are still manual. The system is characterized by repetitive processes, minimal collaboration among isolated departmental functions, reduced productivity because of redundant processes, and little standardization as each department operates separately. The objective of the study was to find out effects of the implementation to the information system, managerial and technical skills on strategic information system at AIU. The study adopted descriptive research design using a target population of 1034 staff, students and faculty members who were computer users. Sampling design was stratified random sampling using coefficient of variation formulae, which gave a sample size of 136. A pilot study was conducted on three members of AIU to determine the reliability of the questionnaire, and data was collected using online survey software, which was send to the respondents through their emails. Correlation analysis, analysis of variance, coefficient of determination and regression analysis was conducted to determine the relationship of the variables with the help of Statistical Package for Social Sciences (SPSS). The findings indicated that information system managerial and technical skills were positive with a P- value of (0.000) which indicated a statistical significant relationship with strategic information system implementation. The study recommended improvement on the information system managerial and technical skills for successful implementation of strategic information system, especially both enterprise resource planning and knowledge management system in order for AIU to achieve a competitive advantage over its competitors

Keywords: ***Information system, managerial skills, technical skills, strategic***

Introduction

An organization that adopts strategic information systems in response to the dynamic business environment in order to gain a competitive advantage over its competitor by automating is able to achieve effectiveness, efficiency, and control on its operations. According to Oz (2008), strategic information systems (SIS) is

the combination of ideas for making potentially winning business decisions, harnessing information technology to implement the decisions, and assist organization to achieve its goals and works with managers of other functional units. An organization with SIS is able to reap optimal utilization of its resources in terms of equipment, and business processes and above all the personnel. With the advancements witnessed in technology, information systems are becoming part of an organization that needs to develop.

The business environment has become very competitive to a point that any organization that needs to grow cannot afford not to go global. As expounded by Galliers & Leidner (2013) the globalization of competition and the evolving business environment suggest that the success of today's global firms' business and its coordination/control strategies may be linked to a global information management strategy. When organization decides to go global, they cannot afford to do it without strategic information systems. Education sector is not left behind as it is one of the sectors that is embracing the advancements, especially in the developed countries. SIS is slowly becoming part of their operation. Any institution that has embraced this has become strategic in decision-making as well as became effective, productive, and analytical has been able to achieve its objectives.

Regional consideration on information systems is fairly improving as some of the regional states are embracing information technology such as South Africa, Rwanda, Malawi, and Nigeria while some like South Sudan, Burundi are still behind in terms of technological development but they are slowly coming up. As explained by Stimson, Stough, & Roberts, (2010) the regional strategic elements come together to drive the economic and technological development process. With this state of technological advancements, AIU has enjoyed a fairly good share of the clientele from the region, such as Rwanda, Congo, Burundi, Malawi, Nigeria, Madagascar, Uganda, Tanzania, South Sudan, and Sudan. If AIU had an SIS, it would have increased its market base in the region. Locally, in the education sector AIU has made good efforts in terms of building its brand, however, it is faced with the challenge of stiff competition. Nevertheless, for it to compete successfully it has to embrace the technological advancements available, especially the adoption of strategic information system. As elaborated by Tan (2010) the organization that understands how technology and technological changes in the market and competitive position must consider the industry, competitors, competitors' strategies, and the organization's position in the industry.

The implementation of strategic information system is affected by managerial and technical skills. This involves the expert skill or knowledge in information systems that are available in an organization.

Research Objective

The study sought to find out the effects of information system, managerial and technical skills on strategic information system at Africa International University.

Research hypothesis

H_0: There is no significant relationship between information systems, managerial and technical skills, and the implementation of strategic information system at AIU.

H_1: There is significant relationship between information system managerial, technical skills and the implementation of strategic information system at AIU

Statement of the Problem

The strategic information systems especially the technical and managerial skills assist business organizations in strategic planning, management control, operational control, and transaction processing for effective and efficient service provision. An organization that has fully automated its operations and services is able to meet all its clientele's needs as compared to the institution whose operations are partially automated or manual. Currently in AIU some of the departmental functions are partial automated while others are still manual. This has led to inefficiency and ineffectiveness in service delivery due to repetitive processes, minimal collaboration among isolated departmental functions, reduced productivity because of redundant processes, and little standardization as each department operates separately. As supported by DuMoulin (2009) organizations with inefficient service delivery operations create expensive, unnecessary tax on corporate productivity in a number of ways, including duplication of efforts, re-work and employee dissatisfaction with internal services. This study bridges the gap by finding out the effects of information system, managerial and technical skills on implementation of strategic information system at Africa International University

Conceptual Framework

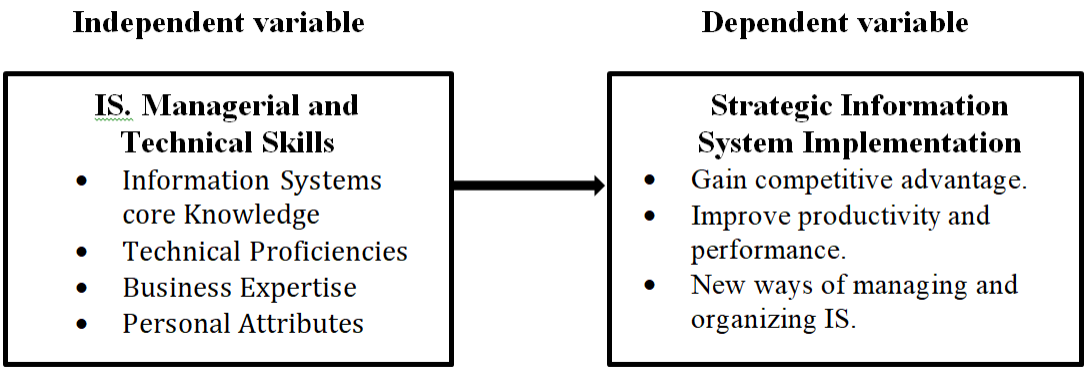

Figure 1: Conceptual Framework

Review of Literature

Resource Based Theory

The author of Resource Based Theory Barney (1991). defines firm resources as all assets, capabilities, organizational processes, firm's attributes, information, knowledge controlled by a firm that enables it to conceive of and implement strategies for efficiency and effectiveness. It is an administrative tool used to enhance the organizational resources with the capability to give an organization a competitive advantage over its competitors. The theory further works on a premise that, for it to achieve the competitive advantage, its resources should be valuable, rare, imitable, non-substitutable, which leads to the thinking that a company's inherent internal resources that determine competitive capabilities are difficult to copy. Assumptions of this theory are that even the organizations in the same industry are differentiated by the uniqueness of the resources they own; on which they capitalize to be able to gain competitive advantage. The resource based theory of the firm suggests that organizations compete and create value on the basis of resources that are unique, rare, valuable, and not easily imitable or substitutable.

Competencies are developed when such resources are combined to create specific organizational abilities. Incorporating concepts of the resource based theory in IS, suggest that organizations can better understand the benefits of using IS by considering how different IS-related competencies generate business value.

The resource based theory asserted that a firm is characterized by its unique resources whose control, use, and disposition by management help to determine its value. Resources are assets that are owned or controlled by the firm. They can be intangible assets, such as managerial and technical skills, business expertise, personal attributes, judgment, insight and experiences of individual employees; brand names and patents. Competencies are created when combinations of resources are applied together to create specific organizational abilities. A competency is, therefore, a firm's ability to deploy resources in combination or bundles, so as to create a capacity for achieving a desired objective. Competencies are a firm's distinctive abilities, developed as a result of the deployment of combinations of individual resources in unique ways, and through specific organizational routines. Competencies assist firms to acquire superior performance because they are specific and distinctive to a firm. They are difficult to imitate because they are embedded within the firm's culture and routines and because their path dependencies to organizational performance are not always transparent (Eisenhardt and Martin, 2000).

An IS competency is developed when processes and structures are designed in non-transparent and inimitable ways to combinations of IS resources, to develop specific abilities for accomplishing IS-related organizational tasks. IS competencies are, therefore, embedded in organizational processes and business routines (Teece, 2000)

Information System Managerial & Technical Skills and SIS Implementation

The implementation of strategic information systems requires quite a considerable amount of information systems managerial skills on top of the technical skills that gets work done. The information systems are composed of people who have the knowledge on how to develop or use as one of its components. The individuals provide the technical or the knowledge on how things or tasks are done. The information systems comprise of diverse categories of expertise from software developer, programming and systems developers, network administrators, database engineer, and security analyst and quality assurance among others. According to Galliers & Leidner (2014) skills refer to the ability to design and develop effective information systems. The IS managerial skills and technical skills encompass information systems, core knowledge, technical proficiencies, business expertise, and personal attributes.

The core knowledge of information systems is the skills for the success of the organization's information system operations. As stated by Gómez, Aboujaoude, Feghali, and Mahmoud (2017) information security, strategic use of IS, privacy in the information age, governance and auditing of IS and enterprise application are operations for firm's concentration. Information security involves measures put in place to protect the institution's information and data from unauthorized access such as eavesdropping, surveillance, industrial espionage, threats such as viruses and malware, computer errors or accidental access disclosure and theft of hardware or the software on which information or data is held. Straub, Goodman, and Baskerville, (2008) explained that information security is a continual managerial process that evolves policies, strategy, and organizational and IS architectures to build resistance to disruptions into the way organization operate. Strategic use of information system enables organization to change their business strategy to cope with the competition in the market. The strategic use of information system is a determining factor on how the organization uses information systems for the optimization of the shareholder wealth. Strategic benefits enable institution to improve the quality of products and services to its clientele. They change the organizations product or the way in which the organization operates and competes. Khan and Zhang (2009), argued that information systems give strategic value to the corporation and are important for the intellectual property of a corporation. Privacy in the modern information age has a delicate balance as it has brought challenges in how the privacy of information upheld as they faced with ethical and legal issues.

According to Manuela (2011) the conception of information systems incorporates those ethical and legal issues that need to be put into consideration. Governance and auditing of information systems deals with the evaluation of the organizations' information systems and making sure that they are well managed. Cascarino (2009) posited that business and corporate governance place the goal of business success within the context of honest business behavior and sound stakeholder relations. The evaluation is important as it determines how the information systems function and the value addition they give to an organization. Strategic alignment creates a connection between the business core functions and

information systems. Value delivery ensures that information systems perform the tasks designed or they purport to do, for the organization to realize the initial objective for which they were acquired. This also calls for the information technology staff to provide the expertise required for the information systems to deliver on the expectations.

On the other hand, risk management entails measures that are put in place to be able to mitigate risks that may affect or interfere with the normal operations of the information systems such as; fire proof, burglar doors, theft among others. To enhance the performance of information system the institution should acquire relevant enterprise application. Enterprise application is software that an organization acquires to enhance its operations and if the two terms are combined, (enterprise application) it usually implies that only large institutions and as opposed to small ones. Faircloth (2011) stated that an enterprise application is any application that is built with a multi-tier architecture, and designed to support a bigger number of users within the corporate enterprise. Regarding integration and deployment enterprise applications, any effective information system should be an open information system that integrates with other information systems used in the organization or with other information systems externally to create interaction among systems, as long as the security and control measures are put in place. Technical proficiencies and technical skills deals with the expertise or the knowhow needed to perform specific task on the information system.

Methodology

Correlation research design that seeks to find relationships between independent and dependent variables after an action or event has already occurred was used in the study to determine the state of information systems at AIU. The target population of the study was 1034 and they included various users of management information systems at AIU, that is all faculty, administrative staff and students who use computes in their course of duty.

The study employed stratified random sample on the target population. According to Henn, Weinstein, and Foard (2009) stratified random sampling, ensures that key groups within the population are adequately represented in the sample.

Using the CV, the sample size

$$n = \frac{NC^2}{C^2 + (N-1)e^2}$$

Where n = Sample size, N = Population size, CV = Coefficient of Variation (which is ≤ 30%), e = margin of error (which is fixed between 2-5%). The study sample size was calculated at 25% coefficient of variation and 2% margin error of 2%.

If N=1034, e =2% and C =25%, then

$$n = \frac{1034\,(0.25^2)}{(0.252) + (1034 - 1)(0.02)^2}$$

$$n = 136$$

The above formula was used in order to minimize the margin of error where the sample size therefore was 136 respondents.

Reliability test was carried out to determine the confidence that the findings if the study would reproduce the same results using the same population and methodology. As explained by Uzoagulu (2008), reliability means consistency of measuring whatever it purports to measure. The study used the Cronbach's α to measures the internal consistency, of how closely related variable in this study were to each other. (Ayo & Victor, 2017) provides the following rules of thumb: "_ >.9 – Excellent, _ >.8 – Good, _ >.7 – Acceptable, _ >.6 – Questionable, _ >.5– Poor and _ <.5–Unacceptable" and above indicates reliable result. Therefore, the study according to table 3.3 gave .814 that is 81.4% depicting good results.

Table 1 *Reliability Test*

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.814	.849	25

Responses were analysed by assigning numerical values to Likert type scales, as the respondents were filling the online tool and submitting it. The study used chi-square analysis techniques to test hypotheses. The study used regression analysis to establish relationship between the independent variables and the dependent variable by use of the following regression model:

$$\boldsymbol{Y = \beta 0 + \beta 1\, X1 + \cdots \varepsilon}$$

Where;

Y = Strategic information systems implementation (Dependent Variable)

X1 = Independent Variables (Information system managerial and technical skills)

β0 = Co-efficient of the model

β1 = Beta Co-efficient of Determination

Ɛ = Stochastic Error Term

Findings

Statistical Inferences

Regression analysis. Regression analysis is a set of statistical processes for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables or 'predictors'. The results obtained from regression analysis are as depicted in Table 2.

Regression Coefficient of IS Managerial and Technical Skills and SIS Implementation

The regression coefficient relates the individual independent variable and the dependent variable.

Table 2 *IS Managerial and Technical Skills and SIS Implementation*

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	.803	.329		2.442	.016
	Managerial& Technical Skills	.459	.079	.452	5.801	.000

a. Dependent Variable: SIS implementation

Therefore:

$$If\ Y = \beta 0 + \beta 1\, X1 + \cdots \epsilon$$

$$SIS = 0.803 + 0.459\, x\, 1$$

The regression coefficient for the predictor is the difference in response per unit difference in the predictor. The regression coefficient is the change in response per unit change in the predictor. Here, strength differs by 0.459 units for every unit difference in Strategic information systems. The distinction between cross-sectional and longitudinal data is still important. The Sig. (P-value) =0.000, and since it is less than α=0.05, it shows that IS Managerial and technical skills has a significant influence on the strategic information systems implementation.

Coefficient of determination. Table 3 showed that R2 (R squared) which is the Coefficient of determination to the dependent variable (SIS) implementation is influenced by the corresponding independent variables IS Managerial and Technical skills. An R of 0.963 indicated a strong relationship between the

variables in question and further, an adjusted R2 of 0.928 (92.8%) is a strong indicator that the independent variables in the model affect the strategic information systems implementation. The interpretation of this result depicted predictors identified for this study as influencers of strategic information system implementation. The remaining percentage of 7.5% meant that there are other factors that affect strategic information system implementation that were not captured.

Table 3 *Coefficient of Determination*

Model	R	R Square	Adjusted R Square	Std. Errr of of the Estimate
1	.963[a]	.928	,925	.39685

a. Predictors: (Constant), Managerial and Technical Skills

Table 4 *Hypothesis: IS Managerial and Technical Skills and SIS Implementation*

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	40.396[a]	15	.000
Likelihood Ratio	39.936	15	.000
Linear-by-Linear Association	4.576	1	.032
N of Valid Cases	536		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.25.

Chi-Square Tests

The chi-square test results indicated a significant P value of .000 which led to the drop of the null hypothesis and the adoption of the alternative hypothesis. As the rule of the thumb is if P= 0.000< 0.05, thus reject H0 accept H1. The hypothesis test result indicated that there is significant relationship between information system managerial, technical skills and strategic information system at AIU.

The Effect of IS, Managerial and Technical Skills on SIS at AIU

The regression results further indicated that IS, managerial and technical skills were positive with a P- value of (0.000) which showed a statistically significant relationship with strategic information system implementation. This results concur with Cleophas and Zwinderman (2012) who recommend that the p-value should be smaller than 0.15 at most. The following indicators were measured; information systems core knowledge, technical proficiencies, business expertise, and personal attributes.

Conclusion

From the findings, it is concluded that the information technology staffs have adequate information system's core knowledge, managerial and technical proficiencies skills. They also have a clear understanding of what is expected of them as they are able to use their personal attributes to enhance their service delivery.

Recommendation

The study recommended continuous improvement on the information system, managerial and technical skills of staff for successful implementation of strategic information system, especially both enterprise resource planning and knowledge management system in order for AIU to achieve a competitive advantage over its competitors.

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