INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

Influence of Information Technology Practices on Provision of Services in Public Institutions in Rwanda

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Abstract:
Information Technology offers opportunities in different aspects of the countries and it is important in the provision of services specifically in public institutions. It is important to emphasize the need for information technology in public institutions order to competently manage and monitor their services.The purpose of this study was to investigate the influence of information technology practices on provision of services in public institutions in Rwanda. The research adopted descriptive survey design and a total of 86 questionnaires were distributed to respondents. The respondents were purposively selected from the levels of Directors, Project Managers and Program Officers who are the main custodians of information in their institutions. Primary and secondary data was collected for the study. Questionnaire was used to collect primary data from the population and secondary data was collected from the Government reports and other related studies. A pilot on the instrument was conducted at Ministry of Public Service and Labour to determine instrument reliability. The collected data was edited, coded and classified; the data was analysed using descriptive statistics and some level of inferential statistics which helped to interpret the correlation of the independent variable to the dependent variable. SPSS version 21 statistical tool was used for data analysis. From multiple regressions, it was inferred that the use of information technology was significant in explaining the provision services at a 1% significance level. The study concluded that information technology has substantively contributed to knowledge management and on provision of adequate services. The study recommends the adoption of project management implementation practices by institutions implementing projects and further research on other project management implementation practices contributing to success of projects.

Keywords: Project, performance, project management, project performance, project success

1. Introduction

Organizations and institutions invest substantial resources into technology initiatives intended to generate advantages associated with improved use of human resources, increased operational efficiencies and creating new capacities within processes and products; however researches indicate there is little knowledge regarding how technology can influence project success. The utilization of right technology can streamline project managers roles and speed task completion time. The true value of technology in project management is the way in which it is utilized it can improve communication, help in risk assessment and control scheduling, but only under assumption that proper tools are used in the right way and at the right time.

Project management implementation practices in developing African countries remain very critical due to the advancement of technology, the increasing complexity of projects and the scarcity of human capital (Crawford et al., 2014). There is need to urgently develop project management implementation practices in developing Africa due to the rapid technological advances, relaxation of trade regulations and a highly competitive marketplace in the globe.

The use of the Internet in the world has increased almost fivefold since the year 2000, and in 2011 almost one third of the world population had been using the Internet. With the evolution of World Wide Web, the concept of buying, selling or exchanging products, services, project control and information over the Internet became one of the most expanding fields in the contemporary business (Pabedinskaitė, 2012). In 2013, 34% of world population has access to the World Wide Web, North America, Australia and Europe are leading with 78%, 67% and 63% respectively (Internet world stats, 2013). The internet use distribution in May 2019 shows that worldwide the internet penetration rate is at 58.8%, 87.7% in Europe, 89.4% in North America, 68.9% in Latin America, 54.2 in Asia and 39.6% in Africa.

Since 2010 in Rwanda, several achievements have been registered by the country in areas related to Information Technology infrastructure, service development, business and investments, cyber security, global partnerships,

among others. Among others, internet penetration in Rwanda is increasing steadily. For instance, internet penetration increased from 7% in 2011 to 39.76% mid 2017.

Some challenges still exist in the sector include low digital literacy rate. In 2017, computer literacy of Rwanda citizens was at 8.4%. And even though broadband internet penetration is growing fast, it is still low in global terms (in May 2017 it was 39.76%).This is attributed to the high cost of internet, weak telecommunication in rural areas, and the small number of digital literate people to utilize the internet.

The National Strategy for Transformation (NST1) adopted in Rwanda in 2017 aimed at strengthening capacity, service delivery and accountability of Public Institutions through information and technology. The Government will ensure digital literacy for all youth (16 to 30 years) by 2024 through implementation of a national digital literacy program with the objective of achieving digital literacy of at least 60% among adults by 2024. This will be supplemented by initiatives to develop local contents and facilitate to access digital devices that will enable them use online services. The percentage of citizens satisfied with services will increase from 67.7% to 90% by 2024 and ensure 100% Government services and projects are delivered online by 2024 from 40% in 2017.

International development projects in Africa face numerous management challenges which contribute enormously to projects stalling or failing at different phases of the project cycle. The problems that face project in Africa may fall into four main traps: one-size fits all technical trap, the lack of project management capacity trap, the accountability for results trap and the cultural trap (Stephen et al,. 2016). In Africa, the environment for projects is marked by resource scarcity and pre-existing rules for moderating the battles or competition for these resources.

The market in Africa is growing fast and comprises of urbanized middle class consumers. The increase of 1.1 billion is expected on African Market by the year 2060. All these coupled with the scramble for Africa's unexploited commodities, are trends that indicate the massive need for better service delivery and infrastructure development in the continent. In order to achieve this, a project oriented mindset needs to be adopted to enable Africa to overcome the huddles to a new phase of development (Stephen et al., 2016).

For any project to deliver as required project performance is a key issue for any project (Idoro, 2015). According to Idoro (2015) this is because there a set of objectives that ought to be met in every project that is undertaken by the organization. According to (Ling, Low, Wang, & Lim, 2013) project performance can be measured from the cost at which the project delivers schedule of performance and the quality of performance metrics.

Langston (2012) defined project performance as the standards at which a project is delivered as it was stipulated in the agreement between the client and the service deliverer. Azlan (2016) argues that project quality is that ability of the service providers to conform to the requirements of the industry in the service delivery. (Yang, 2013) Argued that for the quality of a project that is delivered to the end user is dependent on use of information technology in the procurement and design.

2. Literature Review

The increasing changes in technology and business environment has meant that greater demands are required from traditional management models, which have difficulties in providing adequate answer to stakeholders' expectations. Information and technology (IT) have been recognized over last decade as being an important factor for the realization of the objectives of access, efficiency, effectiveness and transparency (Taylor, 2012).
Different theoretical models and theories have been introduced to explain the phenomenon of timely completion of projects around the globe. Most of these theories discuss and focus on the same goal of increasing the long-term profit but the different theories are founded on different perspective of project completion within the speculated time, (Sharma & Erramili, 2013).

The theory of constraints, introduced by Eliyahu Goldratt, aims to help organizations and institutions to constantly achieve their goals. Project management originates the concept of critical chain project management from this theory. Goldratt adapted the concept to project management with his book Critical Chain. The theory of constraint focuses on goal achievement. It bases on the premise that the rate of goal achievement by a goal oriented system is limited by at least one constraint (Audibert, Mathonnat, & De-Roodenbeke, 2012).

Theory of change articulate expected processes and outcomes that can be reviewed over time. This allows organizations to assess their contribution to change and to review their theory of change (Fulbright et al., 2012). The strengths attributed to theory of change include the ability to allow evaluators and managers to tell a contribution story that is logical to those involved in the project. It also allows conclusions to be drawn on the cause-effect elements of an intervention. However, some of the weaknesses of the theory of change include the fact that it may require a significant amount of data in order to develop the logic (Sharma & Lutchman, 2013).

2.1. Information Technology Practices

Information technology is useful for efficient conversion between data and information but is a poor alternative for converting information to knowledge. Many organizations invest in technology to improve organizational performance and to gain a competitive advantage. The role of technology in project performance depends on how technology systems are designed in organizations (Anantatmula & Kanungo, 2013). Technology can meet the project management needs of documentation, storage and retrieval. A research on the benefits of adopting information technology practices in projects indicated that information technology contributed to a greater extent to improved organizational process flexibility as a strategic benefit whereby, 95% of organizations considered having achieved this through the adoption of IT.

Likewise, 94% of organizations identified improved customer/supplier satisfaction as a strategic benefit. A key motivation for adopting IT was to improve service quality and as a result, perceived improvements in customer/supplier

satisfaction have been acquired (Zika-Viktorsson, Sundstro, & Engwall, 2012). At a tactical level, improved service quality, improved contract administration, and improved response to changes were identified as being experienced by more than 90% of the organizations sampled (Peter and Zahir, 2014). Information technology is profoundly affecting project management capabilities, scope and leadership styles (Thahmain, 2015). Technology provides project management tools for planning and web-based support systems which are essential for communication, conflict resolution, knowledge sharing and integration of complex projects. Technology can help project managers to improve the project processes they use to manage the project complexity, project integration and resource utilization. Information technology projects will continue to fulfil a vital role in the new global economy. Communication is key in the project team.

Information technology facilitates communication and allows timely and efficient passing on of relevant information for action by the project team (Dey, Kinch, & Ogunlana, 2012). This is very critical for project success. Communication efforts often lead to improved collaboration, establishing trust and making better decisions. Information technology facilitates interaction between organizational members, encourages discussion and promotes the flow and collection of knowledge.

3. Methodology

This study adopted a descriptive survey. Descriptive survey research design is a scientific method which involved observing and describing the behavior of a subject without influencing it in any way. It is designed to gain more information about variables within a particular field of study and provide a picture of a situation as it naturally happens. The target population of the study was 108 from which a sample size of 86 respondents was drawn. Stratified random sampling technique was used to select the respondents. Stratified random sampling technique ensures that different groups of a population are adequately represented in the sample. The study used the questionnaire as the instrument to collect primary data. A structured Likert scale type questionnaire was used as a data collection instrument and review of existing literature related to the study topic.

Analysis of data included sorting, cleaning and organization of data from the questionnaires. The study generated both qualitative and quantitative data. The information was then coded and entered into a spreadsheet and analyzed using Statistical Packages for Social Sciences (SPSS) Version 21 and was analyzed using descriptive statistics. The main quantitative techniques used included descriptive statistics such as absolute and relative (percentages) frequencies, measures of central tendency and dispersion (mean and standard deviation respectively).

4. Results and Findings

To assess the influence of information technology on provision of services in public institutions, respondents were asked seven question regarding information technology practices in their institutions. The responses were placed on a five Likert scale; where 1= strongly disagree, 2= disagree, 3= uncertain, 4= agree and 5= strongly agree.

The findings in table below indicate that the respondents agreed that; their projects has enough information technology facilities (mean=4.21), and that the project utilizes IT as the ideal vehicle for the dissemination of informational content (mean=4.29). The respondents also agreed that; the project IT has facilitated knowledge management that has enabled them to identify best practices (mean=3.71). In addition to this, they strongly agreed that the organizations depend on IT to facilitate communication within and without (mean=4.50). Finally, respondents agree that with IT, the projects have managed to integrate various projects (mean=4.04) and that use of IT practices has contributed to the provision of services (mean=4.37).

Statements	Mean	Std. Dev
The project has enough information technology facilities	4.21	0.414
The project utilizes ICT as the ideal vehicle for the dissemination of informational content.	4.29	0.464
I&T has allowed the organization to manage organizational knowledge of past projects	3.71	0.624
Organizational knowledge of past projects facilitated by information technology has led to identification of best project management implementation practices adopted	3.67	0.564
Communication within and without the organization heavily depends on information technology	4.50	0.510
Information technology has enabled the organization to integrate various projects	4.04	0.550
Information technology has to a larger extent contributed to the provision of services	4.37	0.494

Table 1: Information and Technology Practices in Provision of Services

The study applied a Linear Model to determine the predictive power on the influence of project management implementation practices on provision of services. This included regression analysis, the Model, coefficient of determination. In addition, the researcher conducted a multiple regression analysis so as to test relationship among variables (independent) on the influence of project management implementation practices on provision of services. Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the

change in the independent variables or the percentage of variation in the dependent variable (provision of services) that is explained by independent variable (Information and technology practices).

From the Table given below, the R square is given as 0.536 which is an indication that predictor variables (Information and technology practices) explicate 53.6% of provision of services leaving 46.4 percent unexplained.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.732[a]	.536	.503	.130
Predictors: (Constant), (Information and technology practices)				

Table 2: Model Summary

From Table 3 below, the significant value (P=0.000) show that there was a strong significant relationship between the independent variables (Information and technology practices) and dependent variable (provision of services). The P-value of 0.000 which is less than 0.05 denotes that the model of provision of services is significant at the 5 percent significance level.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.575[a]	3	.192	6.388	.000[b]
	Residual	1.379	82	.017		
	Total	1.953	85			
a. Dependent Variable: provision of services						
b. Predictors: (Constant), Information and technology practices						

Table 3: ANOVAª

5. Conclusion

The study revealed that the organizations had information and technology facilities for the projects. The organizations largely utilize ICT in the dissemination of informational content while at the same time depending heavily on ICT facilities for communication within an out of the organization. The study also established that, the organizations are able to track past projects due to utilization of information and technology practices. Tracking of past projects through utilization of Information technology practices has enabled the organizations to identify and apply best practices from previous projects. The findings also indicated that most of the organizations were able to integrate several projects due to application of information and technology practices. The study also conclude that the use of information and technology practices has substantially contributed to the success of provision of services in public institutions in Rwanda

6. Recommendations

From the study findings, we recommend the Organizations and institutions implementing projects to adopt project management implementation practices including information technology practices to ensure successful and sustainable projects. This will help identify, loopholes and deviations from overall projects goals, and correct them early as to ensure successful quality implementation. Selected projects should not only invest in technology, but also training of the project team on usage of the same technology. This will increase skills and their disposal and level of efficiency in increasing project implementation.

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