ROLE OF INFORMATION, COMMUNICATION AND TECHOLOGY IN SUPPORTING PROJECT PERFORMANCE IN TANZANIA; A CASE STUDY OF ARUSHA CITY COUNCIL

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Abstract: The study was based on examining the role of ICT in supporting project performance as a matter of fact in today's technology-enabled work environment, ICT assumes greater importance in the context of project management and its performance due to greater challenges where technology tools are routinely used for collaboration, communication, and deployment of project management practices. The objectives of the study was to assess the availability of ICT hardware, identify ICT software, examine the availability of internet applications, identify data management system and examine the project managers ICT's knowledge and skills for the selected projects in supporting project performance.The study adopted a case study of Arusha City Council as its projects managements relates to other councils or municipals in Tanzania, and the study employed both descriptive and explanatory research design where stratified simple random sample33 respondents from a population of 107 Arusha City councils staff grouped into senior management level, project managers and project team members. Primary data was collected from the field by questionnaires, focus group and observation while Secondary data was collected from libraries, articles, journals and internet sources. Quantitative and qualitative data analysis methods was used to analyze the collected data whereby content analysis and Pearson product - moment correlative coefficient was employed with the aid of Statistical Package for the Social Sciences (SPSS). The study concluded that apart from challenges noted which are lack of trainings on the use of ICT in project implementation, lack of good policy, plan and strategy on the use of ICT on the implementation of the projects and lack of awareness on the use of ICT nevertheless the regression analysis showed that there was positive correlation coefficient between the role of ICT in supporting project performance by correlation factor of 0.624, the relationship which was found to be statistically significant as the significant value was 0.014 which is less than 0.05 hence at Arusha City Council, show that among other factors, ICT is of more important to be employed in the implementation of projects as it enhance project performance by provision of projects with quality and customer satisfaction, projects delivery on time and cost efficiency projects.

Keywords: Hardware, Software, Data Management System, Internet Application, Project Manager's ICT Knowledge and Skills, Project Performance.

1. INTRODUCTION

We are unquestionably dependent on computers and communication devices and services that connect them. Today, technology has made communication faster and easier but also less manageable. To help control communication, official communication policies and procedures are necessary to ensure accurate and effective transmission of information. Many firms have computer information systems and executive who oversee all aspects of information technology (Luisser,

2008). Globalization and free market are forces that shaped our present economy by causing far greater challenges than ever to meet customer needs. The resultant competition is compelling organizations to develop products and services faster, cheaper, and better in order to maintain competitive advantage in the market place. To attain and sustain good performance, organizations focus on how they practice project management and integrate Information Communication and Technology (ICT) in the case of dealing with complexity while improving project performance. It resulted to many organizations investing in Information Communication and Technology (ICT) in order to improve organizational performance (Marchand, *et al* 2000 and Sutherland and Canwell, 2007).

The application of Information, Communication and Technology (ICT) have been continued to be adopted with many sectors in worldwide for facilitating and simplifying different tasks and services. (Yang, *et al* 2007), states that project managers should promote the use of ICT as it facilitate communication and knowledge sharing. The use and application of ICT in providing services is largely used in developed nations, while in most of developing nations the use and application of ICT in project management is still low. The findings indicates that, most of developing countries particularly in African countries have failed to apply and use effectively ICT equipments due to some hindering factors which include weak infrastructure, inadequate technical skills, unreliable power supply, insufficient and unaffordable telecommunications system and services, lack of ICT personnel for repair and maintenance (Sahay and Walshn, 1995).

(Hagan and Wylie, 2006), states that businesses also use ICT to measure performance in terms of financial performance, meeting goal, objectives, output targets, meeting targets for staff and individual**. (**Gichoya, 2005),illustrates examples from Heeks, (2002), of how participative Information System techniques were a failure in the case of Mexico's General Hospital and an end-user development initiative for health Information System in South Africa. The implementations failed because of the large gap between design assumptions and requirements and actuality of organizations into which ICT was introduced. As among the factors which contribute to the performance of the projects, therefore, this research will focus on examining the role of Information, Communication and Technology in supporting project performance.

2. PURPOSE

The purpose of the study was to examine the role of Information, Communication and Technology (ICT) on supporting project performance, using Arusha City Council as a case for the study. Specifically the study sought to assess the hardware, software, data management system, internet application, project manager's ICT Knowledge and skills on project performance.

3. RESEARCH METHODOLOGY

This study employed descriptive and explanatory research designs. Descriptive research design is thought of a means to an end rather than to an end in itself meaning that if the study utilizes description, it is likely to be precursor to explanation. (Saunders, *et al* 2007), argue that in businesses and social sciences, it is usually common that research begins with description of variable characteristics before explanation of the causal relationship between variables. Both quantitative and qualitative methods were employed in the whole process of data analysis and interpretation. The sample population covered in the study was 33 employees from different departments within Arusha City Council.

The study relied on primary data sources and secondary data. Primary data was collected using questionnaires, focus group discussion and observation. Secondary data was collected from libraries, articles and journals and internet sources. The integration of these methods enabled the researcher to have adequate qualitative and quantitative data for triangulation and analysis process (Best and Kahn. 2006).

The researcher used both the quantitative and qualitative data analysis methods. Content analysis were used to analyze the open ended qualitative questions and Pearson product - moment correlative coefficient were used to measure the relationship strength.(Christen , 2007), argue that the Pearson Product Moment Correlation Coefficient is the most commonly used stratified measure of degree of relationship between two variables. The five research questions of the study were tested by Bivariate Pearson Product Moment correlation coefficient test between each independent variable and dependent variable. The analysis was done by the aid of Statistical Package for the Social Sciences (SPSS).

4. RESULTS AND DISCUSSION

Role of ICT in supporting project performance

The purpose of the study was to examine the role of Information, Communication and Technology (ICT) in supporting project performance in Tanzania particularly at Arusha City Council in Arusha Region. The study focused on the five main issues namely the availability of ICT hardware for the selected implemented projects, identification of ICT software used for the implementation of the projects, examining the availability of internet applications, identification of data management system and examining the project managers ICT's knowledge and skills.

Question one: What ICT hardware available for the selected projects in supporting project performance?

The research question was addressed to find out the availability of hardware input devices and output devices. The study found that ACC had a total of 121 desktop computers in its various departments. The desktops observed for the units were 9 for the engineers', 8 for project, 21 for ICT, 5 for the planning and 6 for the economists. The study found 5 laptops for engineers unit, 7 laptops for the project unit, 3 laptops for the ICT unit, 3 laptops for the planning unit and 4 laptops for the economists unit. Also, the usage of CCTV camera were observed at the agricultural products weigh bridges at Ngarenaro for the purpose of monitoring the revenues and EFD and POS machines were also observed used for collection of revenues. Other hardware observed in the study is expressed in the table 1 below.

Table 1: Hardware

	Engineer's unit	Project unit	ICT unit	Planning unit	Economists unit	Total
Desktop	9	8	21	5	6	49
Laptops	5	7	3	3	4	22
Projectors	1	1	-	1	1	4
Photocopier	1	1	1	1	-	4
Scanner	-	1	1	-	-	2
Digital camera	1	3	1	1	1	7
Mobile phones	8	11	5	3	6	33
Flash/Sticks	8	11	5	3	6	33
External hard drives	2	4	6	2	2	16
Telephones	1	1	1	1	1	5

The 33 respondents agreed that presence of the ICT hardware had influenced project performance in terms of implemented projects to be of high quality, cost effective and timely delivery projects. For example, for the financial year ending on June 2018, ACC has implemented successfully from the own source of fund 3 projects for the finance and business sector, 19 projects for economic sector, 11 projects for primary education, 13 projects for secondary education, 1 project for health sector and 2 roads projects wealth Tanzania Shillings - Tshs 3,054,886,741.53.

Question two: What are the ICT software used for the implementation of projects in supporting project performance?

The study found that ICT software such as Local Government Revenue Collection software is used by the ACC and necessary for the collection of revenues from the customers, EPICA software is useful in the control of expenditure such as project expenditure, LAWSON software is essential in employees registration information and Basic Education Management Information software is used in the maintenance of information of registration of students at ACC, Hospital Management Information Software - HOMIS is used for the collection of revenues in the government hospitals, , TANEPS which is useful in procurements, tenders and adverts and Treasure Single Account – TSA which is essential in the inter-banking system. The observed software such as PLAN REP is useful in the project planning for all project implemented at ACC, Biometric Software which is used in the monitoring the attendance of project team members undertaking council projects, Autocard software which is essential in projects' drawings, Arch card, Master series, Point of Scale -POS, VISIO, FFARS, LGMD. The 33 respondents said that the availability of ICT software are of vital importance in influencing project performance in the view of quality, cost efficiency and timely delivery of projects as shown in table 2.

Table 2: Project Planning Software

Name	Application
Plan Rep Software	Project planning
Autocard software	Project drawings
Arch card Software	Project drawings
Master series software	Project planning
TANEPS software	Useful in procurement, tenders and adverts
EPICA software	Control project expenditure
Local Government Revenue collection software	Collection of revenue
LAWSON software	Control project employees registration information
Treasure Single Account – TSA software	Control inter-banking system
Biometric software	Monitoring the attendance of project team members

Doyle, 2010, also argue that state software supplies the step –by- step instructions that tells the computer what to do, provide a user interface that makes it easy for the user to load programs, search for files, copy files, . Hide the complexity of the hardware from the user, Deal with any errors that occur while the computer is working on tasks, Provide the interface between the application packages being run and the hardware, Handle the storage of data by keeping track of all the files and directories /folders on the disk drives, Maximize the use of computer memory by operating systems deciding where in the memory the program instructions are placed.

Question three: What is the internet application used in supporting project performance?

This study sought to establish the availability of internet application and software used in influencing project performance at Arusha City Council. From the findings, it was observed that ACC had Local Area Network - LAN, VISIO, internet, WIFI, intranet. The availability of the internet application had enabled project managers to implement projects with high quality, cost efficiency and productivity efficiency. Also, the application of internet had facilitated the flow of information, communication and technology. This had lead to improve the quality of projects implemented, lowered cost of implementation of projects and improved the productivity of the projects. In the study of Scott, 2001, also state that internet application can be a means of facilitating communication and exchange of information and/or facilitating knowledge sharing between various departments and functions in the organization. ICT can act as an enhancer of collaboration and a networking tool amongst employees, customers and partners because it removes the barriers to real-time communication and effective information sharing.

Question four: What is the data management systems used in supporting project performance?

The study sought to find out data management system used in supporting project performance at ACC. The study found that project managers at ACC use desktop computers, external hard drives, laptops, flash drives , sharing files system, hard copy as data management system to manage data and information of projects. The study observed that data management systems were achieved by the use of desktops, laptops, external hard drives, flash/sticks, sharing files drives and hardcopy.

Table 3: Availability of data management systems

Name	Application
Desktops	Storage of data/information (internal hard drives)
laptops	Storage of data, information
External hard drives	Storage of information
Flash/Sticks	Storage of data/ information
Sharing files drives	Storage of information
Hardcopies	Storage of information

The study revealed that from the respondents asked, 48.5% a total of 16 respondents said that the use Data management system has made the decision making process faster for project managers in a great extent and 51.5% a total of 17 respondents said that the use of data management system has made the decision making process faster in a good extent as shown in table 4 below.

Table 4: Useful of data management systems

	Frequency	Percent	Cumulative Percent
Great extent	16	48.5	48.5
Good Extent	17	51.5	100
Total	33	100	

In the study of Date, *et al*, 2006 and Kasvi 2003 state that retrial of data from the data management system is far faster than a human can, It provide accurate , up-to-date information available on demand at any time as it manage organizational knowledge of the past projects thus enabling successful project completion.

Question five: What is the level of knowledge and skills of ICTs do project managers posses in supporting project performance?

A project manager needs to be conversant with ICT to be able to achieve high performance in project management. ICT project managers with the skill of ICT can plan, coordinate and manage a range of activities such as developing timelines setting budget and assigning tasks within projects. They need to familiar with various forms of ICT software and hardware in undertaking project management in order to achieve a high project performance.(Sharon 2015).In this study, a total of 33 participants from the departments of ICT, Planning, Economist, Engineering and Project management were interviewed to ascertain the knowledge on the ICT skills and responded that they had the skill and knowledge in ICT and project management in general. They acquired the skills during their studies as the level of their education ranged from the diploma level to bachelor degree.

The study found that from the respondents asked, 48.5% a total of 16 respondents said that that the project managers' ICT skill and knowledge has influenced project performance at ACC with great extent, 45.5% a total of 15 respondents said that the project managers' ICT skill and knowledge has influenced the project performance at ACC with good extent and 6.1% a total of 2 respondents said that the project managers' skill and knowledge on ICT and project management has influenced the project performance at ACC. This findings is consistent with the study done by Kirsch, 2000 and Joseph, *et al* 2008 who argue that successful project management requires both hard and soft skills. Hard skills comprise technological skills, domain expertise, experience including overall ICT experience as well as project management experience, and project management skills such as planning, monitoring, risk management and scheduling. Both the Project Manager's hard skills and soft skills have a significant favorable impact on project performance including cost performance and client satisfaction.

Table 5: Usefulness of Project managers' ICT knowledge and skills in supporting project performance

	Frequency	Percent	Valid Percent	Cumulative Percent
Great Extent	16	48.5	48.5	48.5
Good Extent	15	45.5	45.5	93.9
Moderate Extent	2	6.1	6.1	100.0
Total	33	100.0	100.0	

Correlation between ICT and Project Performance

The regression analysis was performed to determine the correlation between ICT and project performance.

Table 6: Correlation between ICT and project performance

		Project performance
ICT	Pearson Correlation	.624
	Sig. (2-tailed)	.014
	N	95

From the findings in the table above, the study found that there was positive correlation coefficient between ICT and project performance as shown by correlation factor of 0.624, this relationship was found to be statistically significant as the significant value was 0.014 which is less than 0.05 hence at ACC, show that ICT is of more important to be utilized in the implementation of projects as it enhance project performance by provision of projects with high quality and customer satisfaction, projects delivery on time and cost efficiency projects.

Challenges hindering ICT usage at ACC

The study found that the 33 respondents from different departments interviewed, 45.5% of the total of 15 respondents admitted that since the acquired the knowledge on the use of ICT at school, college or university, they have never attended on the in job trainings or from the outside ACC to acquire new skills and knowledge on the use of ICT to promote project performance at ACC and 54.5% a total of 18 respondents also said that there is a lack of training on the in jobs trainings or trainings from the outside ACC to acquire new skills and knowledge on the ICT skill and knowledge to promote project performance at ACC.

Table 7: Lack of training

	Frequency	Percent	Valid Percent	Cumulative Percent
Great Extent	15	45.5	45.5	45.5
Good Extent	18	54.5	54.5	100.0
Total	33	100.0	100.0	

The study found there is no good policy, plan and strategy for the use of ICT in the implementation of the projects at ACC. From the 33 respondents asked, 45,5% a total of 15 respondents said that there is a lack of good policy, plan and strategy on the use of ICT on the implementation of the projects in order to influence project performance with great extent, 39.4% of the 13 respondents said that there is a lack of good policy, plan and strategy on the use of ICT on the implementation of the projects in order to influence project performance with good extent and 15.2% a total of 5 respondents said that there is a lack of good policy, plan and strategy on the use of ICT on the implementation of the projects in order to influence project performance with moderate extent.

Table 8: Lack of good policy, plan and strategy on the use of ICT

	Frequency	Percent	Valid Percent	Cumulative Percent
Great Extent	15	45.5	45.5	45.5
Good Extent	13	39.4	39.4	84.8
Moderate Extent	5	15.1	15.1	100.0
Total	33	100.0	100.0	

The study also found that some of the projects failed to implemented with high performance due to the fact that there were a lack of awareness on the use of ICT. From the 33 respondents asked, 30.3% respondents a total of 10 respondents said that lack of awareness on the use of ICT to project managers had hindered the projects implemented a good performance with great extent,45.5% of the total of 15 respondents said that lack of awareness on the use of ICT to project managers had hindered the projects implemented a good performance with good extent and 24.2% of the total 8 respondents said that lack of awareness on the use of ICT to project managers had hindered the projects implemented a good performance with moderate extent.

Table 9: Lack of awareness on the use of ICT

	Frequency	Percent	Valid Percent	Cumulative Percent
Great Extent	10	30.3	30.3	30.3
Good Extent	15	45.5	45.5	75.8
Moderate Extent	8	24.2	24.2	100.0
Total	33	100.0	100.0	

5.   CONCLUSIONS AND RECOMENDATIONS

Based on the findings, the study concluded that among other factors, ICT has a paramount role in supporting project performance. ICT has facilitated the quality of goods and services delivery to customers, better communication with its beneficiaries and partners in service delivery, customer satisfaction to the projects implemented by the ACC. The study also found that the use of ICT has helped the projects' managers to meet timely delivery of the projects by meeting the target schedule of projects to be implemented on time and increasing customer satisfaction and has improved the planning

and execution activities of projects hence improving project performance in reaching its customers. The study also found that the use of ICT has influenced cost efficiency in reduction on the operational cost and transport cost. For example, ACC had saved a total of Tshs. 233,270,309.77 for the projects implemented for the financial year ending June 2018.

The study concluded that apart from challenges noted which are lack of trainings on the use of ICT in project implementation at ACC, lack of good policy, plan and strategy on the use of ICT on the implementation of the projects and lack of awareness on the use of ICT nevertheless the regression analysis which was performed to determine the correlation between ICT and project performance, it was found that there was positive correlation coefficient between ICT and project performance as shown by correlation factor of 0.624, this relationship was found to be statistically significant as the significant value was 0.014 which is less than 0.05 hence at ACC, show that among other factors, ICT is of more important to be utilized in the implementation of projects as it enhance project performance by provision of projects with high quality and customer satisfaction, projects delivery on time and cost efficiency projects.

Among other factors necessary in project management, ICT is among of those factor which support project performance. According to this study, there is a need of the availability of hardware, software, internet application, data management system and the projects managers' skills and knowledge to achieve project performance when project managers decided to use ICT. On the challenges noted in the study which are lack of staff training on ICT, lack of organizational policy, plan and strategy on the use of ICT on projects implementation and lack of ICT awareness are the paramount factors which hinder the high project performance and may lead to project failure at ACC. Based on the findings of the study, the following recommendation were made:

First ACC should enhance the trainings on the ICT's skills and knowledge to the staffs and projects team members to learn modern ways on how to manage projects so that can earn high project performance. This trainings might be the internal trainings or trainings from the outside the ACC essential to learn specific skills to enable them deliver their jobs descriptions especially when implementing projects. Training will enable project managers to transform data into information and polish their knowledge on the use of ICT in supporting project performance. Secondly, ACC should facilitate and increase awareness on the role of ICT in supporting project performance to the staffs, project team members and other stakeholders by introduction on regular conducting workshops, seminars, meetings. It is paramount important to understand the technical knowhow on dealing with ICT especially in the process of project implementation.

Lastly, ACC has to focus to formulate a clear and a well organized policy, plan and strategy on how best the use of ICT can support project performance. It will act as a guidelines to staff, project team members and in general an organization on how ICT can be best utilized in order to support project performance.

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