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**FACTORS INFLUENCING PERFORMANCE OF INFORMATION AND COMMUNICATION TECHNOLOGY PROJECTS IN
SMALL AND MEDIUM ENTERPRISES IN KENYA: CASE OF NOVEL TECHNOLOGIES EAST AFRICA LTD**

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FACTORS INFLUENCING PERFORMANCE OF INFORMATION AND COMMUNICATION TECHNOLOGY PROJECTS IN SMALL AND MEDIUM ENTERPRISES IN KENYA: CASE OF NOVEL TECHNOLOGIES EAST AFRICA LTD

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Abstract

The purpose of this paper was to explore factors that influence performance of ICT projects in SMEs in Kenya. Significantly the study sought to establish how management Skills, Information and Communication Technology, Employee motivation and government policies influence performance of ICT Projects in SMEs in Kenya. The study adopted a descriptive survey design, where all the employees of this company were requested to respond. The findings of the study revealed that government policies greatly influence performance of ICT projects in SMEs in Kenya followed by Information and Communication Technology, then employee motivation and finally management skills. The study therefore concluded that management Skills, Information and Communication Technology; Employee motivation and government policies positively influence performance of ICT projects in SMEs in Kenya. This study has added new knowledge to the existing literature, hence filling the gap. The study recommend a similar study to be carried in any sister company and validate the findings with this so as to arrive at a consensus.

Keywords: *Management skills, Information Technology, employees' motivation government policies and performance*

Introduction

The term "Information and communication technologies "(ICTs) is defined as a different set of technological tools and resources used to communicate and create, disseminate, store, and manage information (Barbara, Baofeng & Xiande, 2010). ICTs encompass a range of rapidly evolving technologies and they include telecommunication technologies (telephony, cable, satellite, TV and radio, computer-mediated conferencing, video conferencing) as well as digital technologies (computers, information networks, World Wide Web, intranets and extranets) and software applications (Chisenga, 2006).

Information Communication and Technology (ICT) plays an important role for any organization (Creswell, 2013). The use of ICT that ranges from large complex systems to personal computers, this has been a key feature in the success of medium and even small organizations (Doukidis et al, 2008). Recent research also found positive signs that SMEs can take advantage of electronic commerce (e-commerce), as a type of ICT, in helping their business to expand (Chirchir, 2014). This is further supported in revelation by Porter (2001) who argues that ICT can provide powerful strategic and tactical tools for organizations, which, if properly applied and used, could bring great advantages in promoting and strengthening their competitiveness.

Global Perspective of Performance of ICT Projects

Many researchers around the world have studied the criteria for terming an ICT project a success and came up with numerous findings. For example, Creswell (2013) in their study found that determining whether an ICT-project is a success or a failure is far more complex. First, the total failure of a project which means it has never kicked off or in which a new system developed but immediately

dies or ceases to exist. A good example is India's Indira Gandhi Conservation Monitoring Centre which was expected to be the country's information provider based on a set of main environmental information systems. Not even after spending more than a year of planning, analysis and design work, these information systems never became operational, and the whole initiative collapsed shortly afterwards (Creswell, 2014). The second possible outcome is partial failure where key goals are not achieved or in which there are significant undesirable results.

Notable experience is Tax Computerization Project in Thailand's Revenue Department where seven areas of taxation were set out in order to be computerized. At the end of the project, only two areas had partly met the goal, and five others were not operational (Greener, 2008). According to Standish Group research (2014) shows a staggering 31.1% of projects were cancelled before they ever get completed. Further results indicate 52.7% of projects exceeded the original budget estimates by 189%. The lost opportunity costs were not measurable, but were estimated to be in trillions of dollars. Based on this research, The Standish Group estimates that American SMEs and government agencies spend \$81 billion for cancelled software projects. These same organizations pay an additional \$59 billion for software projects that are completed, but exceeding their original time estimates.

Local Perspective of Performance of ICT Projects

There are also a wide range of ICT Initiatives and projects ongoing in Kenya including the schools laptop programme; an initiative of the Jubilee Government (Mue, 2013), digital inclusion projects (Hallberg, Kulecho, Kulecho & Okoth, 2011), development of Konza technology city (IST-Africa

Consortium, 2014) and digital migration, a project to migrate from the current analogue broadcast to digital platform. The national fiber optic infrastructure is being rolled out and is currently work in progress (ICT Authority, 2014). The government of Kenya is also working on automation of Government services through e-Government to provide Government shared services such as the citizen portal and the national single window (Kenya Trade Network Agency, 2014). Other than the government, private developers have also embarked on projects to lay out fiber-optic networks terrestrially across the country that has seen the number of business and houses who can access fiber optic internet links rise. All these initiatives and projects by the government and private sector are aimed at returns on investment, be it financial or in terms of meeting requirements of the intended beneficiaries (Greener, 2008).

Performance of ICT Projects

Ling *et al.* (2009) there are many factors that contribute to the success of the project and it can be grouped into five categories; Action project management, project-related factors, project procedures, human-related factors and the external environment (Chan & Scott, 2004). According to Greener (2008), ICT evaluation can be defined as establishing by quantitative, and/or qualitative methods the value of the ICT to the organization Performance cannot be judged as good or bad without the successful implementation of the project. Many researchers around the world have studied the criteria for terming an ICT project a success and came up with findings about the same. For example, Kemunto (2014), in their study found that determining whether an ICT-project is a success or a failure is far more complex. First, the total failure of a project which means it has never kicked off or in which a new system developed but

immediately dies or ceases to exist. Such an outcome can be defined relatively objectively.

Statement of the Problem

The problem of managing Information and Communication Technology projects in small and medium enterprises (SMEs) has been an issue in Kenya. Nor'ashikin (2013) argues that a lot of concentration on organizations, people, procurement, technology, quality, philosophy, governance, value, performance management, knowledge management and project management office. Despite the foregoing, there is need to do a study on this area, since most of the project fail before they accomplish their objectives (Stoica & Brouse, 2013). Similarly, Morris (2010) noted that managing ICT projects in SMEs is wanting especially in regards to their performance, and the inability of these ICT projects to give their customer a satisfactory service on timely basis. Studies available have focused on other areas like performance and knowledge management on projects but not on policies and ICT. Studies available from developed countries such as US, Europe, Australia and other parts of the world and even from outside Africa have also identified failure of ICT projects. However, most of these studies concentrated on public sectors (Magutu, 2010). Muller (2005) had observed that a previous empirical findings shows that managing performance of ICT projects in SMEs measures have lacked precision and consistency. Gretszy, (2010) established that many studies have only focused on knowledge and performance management at the expense of managing performance of ICT projects in SMEs towards high profit. It is insufficient to merely analyze a company's performance by knowledge, especially under today's changing volatile Information Technology (Magutu, 2010).

Additionally, Fredrick, Victor and Beth (2015) carried a similar study on factors that influencing performance of ICT projects in Kenya. In their study they covered only the area of government policies, Innovation and Human resource management practices and systems adopted. Specifically, they never covered the factors influencing performance of information and communication technology projects in small and medium enterprises in Kenya. The study was warranted by the existing knowledge gap in the key area of performance of ICT projects in SMEs, which it sought to fill in the long run.

The specific objectives of this study were:

- To determine how management skills influence performance of ICT projects on SMEs in Kenya.
- To establish the effect of Information and Communication Technology on performance of ICT projects in SMEs in Kenya.
- To examine how employees' motivation affect performance of ICT projects in SMEs in Kenya.
- To establish the how government policies affects performance of ICT projects in SMEs in Kenya.

Management Skills

According to PMI (2008), project management is the application of knowledge, skills, tools and techniques for implementing activities to meet project requirements. ICT Project management is a strategy to manage ICT projects efficiently and effectively to achieve the success of ICT projects (Demir & Kocabas, 2010). Understanding of management skills is fundamental to the efficient use of resources and contributes to increased productivity in SMEs (Jo & Barry, 2008).

Projects that perform poorly signal a credibility gap as to the need for and competence of management in project mode. Provided that projects in SMEs are led by knowledgeable and competent project

managers, good project management techniques and tools alone are of little value to an organization (Mallik, 2015).

Top management support has been cited as the most crucial success factor in ICT project execution. According to Zhang top management support in project implementation has two main aspects; providing leadership and providing the required resources. Additionally, the roles of top management in project implementation involve developing an understanding of the abilities and limitations, establishing reasonable objectives for project, exhibiting commitment, and communicating the organization strategy to all employees (Mallik, 2015).

Information and Communication Technology

ICT allows access to global market by the Small and medium enterprises even with small initial investment. Therefore, IT provides abundant opportunity to spearhead the progress of small and medium business as a tool for development in countries where investment capital is scarce. This in turn enables sustainable development and boosts local economy, making IT a major tool for SMEs to enhance their competitiveness (WBG, 2002). Additionally, the most common and central ICT usage is communication (Magutu, 2010). Communications using ICT technology can involve one or several IT-supported media, such as text, voice, graphics, radio, pictures, and animation. Using different media increases the effectiveness of a message, expedites learning, and enhances problem solving.

Examples of ICT applications which fulfill this role are: Internal and external networks (such as *TCP/IP*, LAN or other networks); Electronic Mail; Web-Based Call Centers; Multimedia call centers; Electronic boardroom; Call centers; Electronic Chat Rooms; Voice communication; Weblogging

(Blogging); Electronic meeting systems; Interactive whiteboards - allows different users to simultaneously write on the whiteboard; Screen sharing software - allows different users to work on one document which is separately visible for every user and Electronic teleconferencing (video teleconferencing, web teleconferencing) (Muriuki, 2014).

Employees' Motivation

Motivation involves study of why people behave in certain ways, (Mullins, 2010). The basic underlying principle is 'why do people do what they do?' Generally, motivation can be described as the direction and persistence of action. It is concerned with why people choose a particular course of action in preference to others, and why they continue with a chosen action often over a long period and in the face of problems and difficulties. Understanding human motivation requires the consideration of innate psychological needs, namely competence (being effective in dealing with the environment), autonomy (a sense of volition, and the experience of the possibility of choice), and relatedness - the desire to feel connected to others (Muriuki, 2014). He argues that to be motivated means to be moved to do something. They further debate that a person who feels no drive or inspiration to act is thus characterized as unmotivated, while someone who is energized or activated toward an end is considered motivated.

Self-Determination Theory (SDT), Muriuki (2014) distinguish between different types of motivation based on the different reasons or objectives that give rise to an action. The most basic distinction is between intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome. According to Herzberg (1959), two kinds

of factors affect motivation in different ways. These are hygiene factors which are factors whose absence motivates, but whose presence has no perceived effect. They involve things that when you take them away, people become dissatisfied and act to get them back

Government Policies

Sewe (2010) had to determine the factors affecting ICT performance and expansion in Kenya concentrated on policies and strategies put in place, economic factors and Industry factors on Performance of ICT projects. With regards to economic factors Sewe (2010) identified tax incentives, incentives for investment in the ICT sector and access to current information on ICT to be affecting the expansion and growth of ICT. Other factors identified include; regulatory requirements by the government which were found to constrain investment in ICT, license fees and license requirements and political risks. Sewe (2010) argued that the enactment of the government regulatory policy in Kenya facilitated the liberalization and privatization of the telecommunication industry in Kenya adding that proper government policy creates an enabling environment to the development and growth of the ICT industry.

The report by United Nations Commission on Science and Technology for Development (UNCSTD) recognizes the difficulties that most African nations face, and warns of further isolation if priority is not given to ICT strategies (Mutunga, 2011). The report further debates that "ICTs do not offer a solution for social and economic dislocation, and this may lead policy makers to give lower priority to the need to create effective national ICT strategies. Moreover, industry and government bodies have a role to play in promoting and supporting small business networking and ICT. Given the fact that ICT

industry is global, there is a need to understand government role in contributing to the success of ICT projects.

By the same token, the IDRC (2005:2) contends that severe lack of infrastructure in Kenya seriously limits opportunities for using ICTs for economic and social development. Definitely, these are areas of concern for any ICT project to be successful. Currently, the government of Kenya (GOK) through the Ministry of Information, Communications and Technology has set up a working group to spearhead the review of the ICT Sector Policy and legislative framework with a view to aligning it with the Constitution. The Working Group on the Development of Policies and Legislation to implement Article 34 of the Constitution has representation from relevant government agencies and other ICT industry stakeholders, chaired by Prof. Patricia Kameri-Mbote, the Dean, School of Law, University of Nairobi (CAK, 2013).

Performance of Projects

At the end of the project, only two areas had been partly met the goal, and five others were not operational (Nagery, 2012). Moreover, organizations use project management to enable them effectively manage projects better, the interest has fallen on project managers, who play an important role in making projects successful. Additionally, Neuman (2011) identifies the need to have a software project manager as number one common good management practice. Moreover, Nagery (2012) state that project managers have great influence on the success of IT projects. Nkatha (2013) concur with this view and state that successful project management systems and competent project managers form the foundation for successful projects. The third and final category is where one may see the success of a project in which most stakeholder groups achieve their major

goals and do not experience substantial undesirable outcomes. For example, a South African tyre manufacturing enterprise introduced a relatively simple workflow tracking system using bar codes on the tyres. Opinions from different interested parties' perspectives showed that all three significant groups – managers, supervisors and workers – perceived the system to have brought satisfaction to their work (Nagery 2012).

Research Methodology

Research Design

This study adopted a mixed research design approach of exploratory, descriptive and quantitative designs. The design refers to a set of methods and procedures that describe variables and involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data. The design enabled the study to combine both qualitative and quantitative research approaches. Qualitative approaches enables collection of data form of words rather than numbers. It provides verbal descriptions rather than numerical (Kothari, 2011). Mugenda and Mugenda (2008), states that qualitative methods can be used to gain more in depth information that may be difficult to convey quantitatively. Quantitative approach strives for precision by focusing on items that can be counted into predetermined categories and subjected to statistical analysis (Creswell, 2013).The use of these two approaches reinforces each other (Mugenda & Mugenda, 2008). The research used this approach because the data collected used the main questionnaire was quantitative and will be analyzed using statistics. Qualitative on the other hand involve interpretation of phenomena without depending on numerical measurement or statistical methods.

Sample and Sampling Technique

A census study was carried out to all 100 respondents who are the employees at Novel Technologies East Africa Limited. This study was interested in all employees who are working in novel technologies east Africa ltd) in Kenya. This is a physical representation of the target population and comprised all the units that are potential members of the sample (Kothari, 2011).

Instruments

The structured questionnaires were administered to all the respondents in this study and research assistants who have knowledge and experience were used to drop-and-pick questionnaires. The study used both open ended and closed ended questionnaires. All instruments were pre-tested to the respondents and where necessary, adjustments were made before the actual data collection.

Reliability

Reliability is the degree to which the research instrument yields consistent results or data after repeated trials (Mugenda & Mugenda, 2008). Reliability of the questionnaire was tested through a pilot survey by collecting data from subjects not included in the sample which was carried out two weeks before the data collection. A coefficient of reliability was determined in order to reduce errors which might compromise the reliability of the collected data.

Validity

Validity is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study (Mugenda & Mugenda, 2008). This study therefore carried out a content related validity test (content and format of the instrument) in order to assess the clarity of the instruments items so that those items found inadequate in measuring variables could be

modified to improve the quality of the research instrument as well as increase its validity.

Reliability Test

The study performed a pilot test on a group of 11 respondents from the target to test the reliability of the research instruments. Cronbach's Alpha was used to test the internal consistency of the questionnaires. The alpha value ranges between 0 and 1 with reliability increasing with the increase in value. Mugenda & Mugenda, (2008) indicates that coefficient of 0.6-0.7 indicates acceptable reliability, and 0.8 or higher indicates good reliability.

Employees Encouragement in the Organization to pursue ICT courses

Most of the respondents stated that the organization encourages them to pursue ICT courses in various ways. Majority of the respondents 35.2% (31) of the respondents indicated that sponsorship was the common method of encouragement, 27.3% (24) stated loans as encouragement, 26.1% (23) stated that they were encouraged to pursue ICT related courses by given time-off while the rest 11.4% (10) stated promotions as encouragement. This is in line with the findings of Thornberry (1987), who observed that ICT sector is a fast-paced industry and therefore it requires continuous, regular re-training of those who work in it.

Use of ICT in Monitoring the Projects

From the results, majority of the respondents 52.3% (46) stated that a project monitoring in the organization is done weekly, 31.8% (16) stated that projects monitoring is done on daily basis, 11.4% (10) on monthly basis while the remaining 4.5% (4) of the respondents were not aware of how the organization monitors its projects. These findings are in line with Barczak and Sultan (2006), who

observed that ICT tools are used more frequently in project monitoring rather than more sophisticated and more complex tools. This is in line with the findings of Bardhan *et al.* (2007) who observed that ICT application in project management can be used as a basic communication technology which is appropriate in managing modern projects.

In addition, the researcher conducted a linear multiple regression analysis so as to test the relationship among variables (independent) on factors that influence the performance of ICT projects in SMEs in Kenya. Statistical package for social sciences (SPSS) was used to code, compute and analyze the measurements of the multiple regressions for the study.

Regression Analysis

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877 ^a	.855	.852	.42895

Predictors: (Constant), Government Policies, Employee Motivation, Managerial Skills, Information and Communication Technology

Dependent Variable: Performance of ICT Projects in SMEs in Kenya

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by change in the independent variables or the percentage of variation in the dependent variable (ICT projects performance in SMEs in Kenya) that is explained by all the four independent variables (managerial skills, ICT, employee motivation and government policies). The findings show that the four independent variables that were studied explain only 85.5% of factors that influence

the performance of ICT projects in SMEs in Kenya as represented by R^2 . This therefore means that other variables not covered under this research study contribute 14.5% of ICT projects performance in SMEs in Kenya. Therefore, further research should be conducted to investigate the other factors (14.5%) that influence ICT projects performance in SMEs in Kenya.

ANOVA Test

Table 2: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.626	1	80.407	0.315	.000 ^b
1 Residual	6.272	87	.184		
Total	10.898	88			

a. Dependent Variable: Performance of Projects

b. Predictors: (Constant), Government Policies, Employee Motivation, Managerial Skills, Information Technology

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$, Where; Y= performance β_0 =constant (coefficient of intercept), X_1 =; management skills, X_2 = information technology, X_3 =; employee motivation, X_4 = government policy, ϵ =error term; $\beta_1 \dots \beta_4$ =regression coefficient of four variables.

Table 3: Coefficients of Determination of Overall Performance of all Variables

Model		Unstandardized		Standardized	t	Sig.	95.0% Confidence	
		Coefficients					Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant - Performance)	-1.365	.329		-4.153	.000	-2.019	-.711
	Managerial Skills	.106	.034	.154	3.156	.002	.039	.173
	Information and Communication Technology	.175	.028	.453	6.149	.000	.119	.232
	Employee Motivation	.366	.038	.186	4.399	.000	.091	.241
	Government Policies	.402	.043	.247	4.643	.000	.115	.288

a. Dependent Variable: Performance of Projects

The researcher conducted a multiple regression analysis so as to determine the relationship between dependent and the four independent variables. The SPSS generated data in table 4.8 above helps in formulating the equation:

Y is the dependent variable (performance of ICT projects in SMEs in Kenya), X_1 is managerial skills, X_2 is Information and Communication Technology, X_3 is employee motivation, X_4 is government policies. According to the regression equation established, keeping all factors under study (managerial skills, ICT, employees' motivation and government policies) constant at zero the expected project performance is -1.365. The data findings analyzed also show that keeping all other independent variables at zero, a unit increase in managerial skills will lead to a 0.106 increase in the project's performance, while a unit increase in ICT will lead to 0.175 increase in project performance, a unit increase in employees motivation will lead to a 0.166 increase in project performance whereas a

single unit increase in government policies will lead to a change of 0.202 in project performance.

The findings from absolute t-values above the highest are 6.149 indicating that ICT contribute the most or rather is the most significant to projects performance. Therefore, this means that at 5% significance level and 95% level of confidence, managerial skills had a 3.156 level of significance, ICT, employees' motivation and government policies had 6.149,4.399,4.643 level of significance respectively. This further concludes that government policies are the most significant factor.

Summary

After conducting the research, the results of the study reveals that managerial skills have positive influence on ICT projects performance in SMEs in Kenya. This was evidenced by a coefficient of 0.106 and a significant value of 0.002. These findings were agreement with the results by the respondents that there is need to improve managerial skills in the organization where 54.5% of the respondents

agreed while 45.5% of the respondents disagreed. Similarly, employees who had worked for a period of 5-8 years rated the quality of projects at Novel Technologies above average with a frequency of 32, 9-12 years of experience had rated above average with a frequency of 28 and 6 for the lot with 13-15 years of service. Those with 1-4 years of working had rated the quality of projects in their organizations below average with a frequency of 22. This clearly shows that those who had worked longer had more experience in organizations ICT Projects compared to those who had an experience of below 4 years. According to the findings of this study, employee motivation had a coefficient of value of 0.175 and .000 level of significant. This clearly shows that use of ICT in managing projects contributes to 17.5% of the project success. The result further agrees with the majority (52.3%) of the respondents who stated that the organization monitors their projects through use of Information and Communication Technology.

Employee motivation had a great positive influence on the performance of ICT projects in SMEs in Kenya. According to the findings of the study as shown by the coefficients of determination, employee motivation scored 0.166 and a P value of 0.000. The study further revealed that majority of the staff (53.4%) at Novel Technologies felt that the employee motivation in the organization was

average, 31.8% rated the employee motivation in the organization above average followed by 13.6% who felt that employee motivation in the organization is below average while the remaining 1.1% of the staff felt that motivation in the organization is good.

Government policies had an influence on the performance of ICT projects in SMEs in Kenya as shown by a coefficient of 0.202 and a significant value of 0.000. These finding therefore means that government policies alone contribute to over 20% of the performance of ICT projects in SMEs in Kenya. From the results, the county government plays a major role on matters requiring licenses as shown by 47.7% of the respondents compared to 34.1% of the respondents who agreed that national government was the major source of licenses. The study further revealed that holding managerial skills, employee motivation, Information and Communication Technology and Government Policies constant, the performance of ICT projects would be severely affected shown by a coefficient of -1.365 and 0.000 significant value. From the findings, the respondents were asked to rate the quality of the projects at Novel Technologies. The majority 43% rated the quality of the projects in the organization above average, 28% agreed the quality of projects is good, 22% average while the rest 7% felt that the quality of the projects in the organization is below average.

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