EFFECTS OF INFORMATION COMMUNICATIONS TECHNOLOGY BASED INNOVATIONS ON OPERATIONAL PERFORMANCE. A CASE OF NAIROBI CITY WATER AND SEWERAGE COMPANY LIMITED

Kimorop, B., Ngeno, P. K., & Rotich, G.

The Strategic JOURNAL of Business & Change MANAGEMENT
ISSN: 2312-9492 www.strategicjournals.com

Vol. 5, Iss. 1, pp 946 - 959, March 19, 2018. www.strategicjournals.com, ©strategic Journals

EFFECTS OF INFORMATION COMMUNICATIONS TECHNOLOGY BASED INNOVATIONS ON OPERATIONAL PERFORMANCE. A CASE OF NAIROBI CITY WATER AND SEWERAGE COMPANY LIMITED

Kimorop, B., [*1] Ngeno, P. K., [2] & Rotich, G. [3]

[*1]Jomo Kenyatta University of Agriculture and Technology [JKUAT], Nairobi, Kenya
[2]Jomo Kenyatta University of Agriculture and Technology [JKUAT], Nairobi, Kenya
[3]PhD., Jomo Kenyatta University of Agriculture and Technology [JKUAT], Nairobi, Kenya

Accepted: March 14, 2018

ABSTRACT

The main aim of the study was to assess the effects of information communications technology based innovations on operational performance of water utility company. A case of Nairobi City Water and Sewerage Company limited. The study was guided by the following research objectives; To analyze the effect customer based Innovations on operational performance, To assess how Market based Innovations influences on operational performance, To explore the effect of Process based Innovations on operational performance and at Nairobi City Water and Sewerage Company limited and To establish how Product based Innovations influences operational performance at Nairobi City Water and Sewerage Company limited. The study applied descriptive research design. The study was carried out at the Nairobi city water and Sewage Company. The study targeted Staff and customers of Nairobi city water and Sewage Company since they possess the information required by the study. The study focused on the population target of 450 staff and 550 customers from Nairobi headquarters that are using innovation services in the company. The study used a sample for the study 300 respondents. The study used stratified random sampling technique. Data collection was done through questionnaire. Microsoft excels packaged and SPSS 21 was used to analyze and present the research findings which were in form of tables of frequencies and percentage. The study used regression analysis which is a statistical tool for the investigation of relationships between the variables. The R-square value was 0.743 which show that information communications technology based innovations explains 74.3% of factors affecting performance 25.7% are explained by factors that are not captured in the study.

Key Words: *Customer Based Innovations, Market Based Innovations, Process Based Innovations, Product Based Innovations, Operational Performance*

INTRODUCTION

Investment in ICT has increased globally in the recent past (Hage & Dewar, 2007). Many organizations have adopted the use of information and communication technology (ICT) in order to improve the products and services they offer to their customers(Koellinger,2015). ICT has changed the way organizations operates in totality, from the way data is captured, processed and even output of the results on the activities of the company (Legris & Collerette 2016).

Some of these organizations have reaped great benefits from ICT, some have not been able to establish whether indeed the investment in ICT was worthwhile while others have suffered noticeable losses arising from the investment in ICT. The findings by Spiezia (2011) support that ICTs act as an enabler of innovation, in particular for product and marketing innovation. Innovative firms grow faster in terms of employment and profitability. Solow (2013) states that approximately 70% increase in company production can be attributed to technological change. The lack of good quantitative measures for the output and value created by IT has made difficult to justifying investments.

This has also been seen in academics have had similar problems assessing the contributions of this critical new technology has on operational performance and has been seen as a negative signal of for its value (Legris & Collerette 2006).

The effects of ICT on corporate performance are subject to debate because not all studies have demonstrated clear payoffs from ICT investments (Kohli & Devaraj, 2013). Chan study found out that ICT had a minimal impact on companies' processes and output while Kohli & Devaraj study was able to determine that ICT was viewed as a hindrance by employees in their work. Atzeni & Carboni (2014) investigated the impact of ICT on total factor productivity (TFP) and its contribution to output growth; they concluded that the impact was positive.

Gable and Raman (2010) investigated on the effects of ICT on business operations and concluded that ICT is a major pillar in driving organizations day to day operations. Company has invested heavily in ICT since its inception, no study has been undertaken to find out the extent to which the technology has been adopted and its influence on performance . This study sought to establish the extent of the usage of ICT based innovations on operational performances in the company. The study sought to find out how ICT based innovations have contributed to the efficiency and effectiveness in Nairobi City Water and Sewerage Company limited. Therefore it is important to do this study so as to be able to understand how these ICT based innovations have been able to affect the operational performance of Nairobi City Water and Sewerage Company limited.

Study Objectives

The main aim of the study was to assess the effects of information communications technology based innovations on operational performance. A case of Nairobi City Water and Sewerage Company limited. The specific objectives were:-

- To analyze the effect of customer based ICT innovations on operational performance of at Nairobi City Water and Sewerage Company limited.
- To assess how market based ICT innovations on operational performance at Nairobi City Water and Sewerage Company limited.
- To explore the effect of process based ICT innovations on operational performance at Nairobi City Water and Sewerage Company limited.

- To establish how product based ICT innovations influences operational performance at Nairobi City Water and Sewerage Company limited.

Empirical Review

The study reviewed empirical studies done by other scholars on the area of ICT innovations

Customer based Innovations

Hong and Miyazaki (2013) study on technological and non-technological innovations in B2B mobile services in Korea. This study examines the characteristics of business-to-business (B2B) mobile services in Korea in order to identify technological and non-technological innovations. A statistical analysis of 242 services was done to characterize B2B mobile services in Korea.

From a characteristics-based approach, 'new' service characteristics after 2009–2010 are linked with radical innovation while service characteristics prior to 2009–2010 (but have been 'improved') are linked with incremental innovation. A combination of 'improved' and 'new 'service characteristics are linked with semi-radical innovation. Subsequently, incremental, radical and semi-radical innovations were distinguished. From the perspective of non-technological innovation, combinative and customized innovations were identified to focus on the direct competences of service providers and users.

Market based Innovations

Requena, Sellens, and Zarco, (2007) study on ICT use in marketing as innovation success factor: Enhancing cooperation in new product development processes. This paper sought to explore the role that Information and Communication Technologies (ICT) plays in the processes of product innovation and marketing as an element that strengthens the cooperation and communication among agents within the innovation project, reducing the obstacles to innovation and enhancing the development of differentiated products as well.

The study had a sample of 2,038 companies from all sectors of economic activity in Catalonia. The findings showed that, intensive ICT use in marketing makes the company more innovative, as it perceives that its usage breaks down barriers to innovation and speeds up processes that in turn become more efficient.

Secondly, increasing ICT use in marketing encourages company predisposition to collaborate with and integrate particular agents within the business environment in the development of the innovation process, improving the degree of adaptation of the new product to market demands.

Process based Innovations

Henten (2012) study on process innovations from the ICT-based service encounter. The purpose of this paper is to develop a framework for analyzing the dynamics of process innovations emanating from ICT-based service encounters.

Many process innovations are based on the direct encounter between employees and customers, and the paper aims to extend the analysis of such encounters to ICT-based encounters. The paper discusses and merges different approaches in the existing literature and examines different modes of ICT-based customer/employee interaction to construct a framework that will help understand how process innovations are developed on the basis of a service encounter, which is ICT-based.

The implementation of ICT in services contributes greatly to the process innovation of services, but in order to better understand process innovations in ICT-based employee/customer interaction, a ''service approach'' is one of the important ways to move forward.

Product based Innovations

Khin, Ahmad, Ramayah, (2010) study on Product innovation among ICT technopreneurs in Malaysia. The purpose of this study is to discuss a brief review of the literature in product innovation, innovation strategies and resources. The study further presented qualitative findings related to product innovation as well as their strategies and resources among ICT (information and communication technology) technopreneurs in the software sector of Malaysia. The study was a qualitative study which focused on empirical study. Semi-structured interviews were conducted with five ICT technopreneurs in Malaysia.

The findings generate insights into the kind of market that ICT technopreneurs are in, the problems they are facing, their practices and opinions towards product innovation, and their strategies as well as the resources required. The findings imply that resource constraints, market factors such as market need, and strategic orientation towards customer and market needs may play a part in product innovation practices among ICT technopreneurs. Practitioners should pay attention to these factors to achieve innovative advantage.

Research Methodology

The study applied descriptive research design. The information collected was both qualitative and quantitative in nature. The study was carried out at the Nairobi city water and Sewage Company. The study targeted Staff and customers of Nairobi city water and Sewage Company since they possess the information required by the study. The study was focused on the population form the Nairobi headquarters that have used the innovation services in the company was 1000 of individuals. The study used simple random sampling and convenient sampling to get the sample size from the accessible population had an equal and mutually inclusive chance of being picked for the research responses. It was used to assist in providing in accurate information about the inclusive groups in the table below and also provided efficient capturing variations in the population to prove the hypothesis right or wrong or data analysis and interpretation.

Research Findings

Descriptive Analysis

Adoption of Innovation

The table 1 below showed results of the most evident innovation in the company. From the findings displayed in the table 1 majority155 (63%) agreed that customer based innovation whilst a 91(37%) minority disagreed. Another majority of respondents 162(66%) agreed with process based innovation being evident whilst a minority 84(34%) disagreed, 153(62%) indicated that there was market based innovation in the company whilst a minority 92(38%) Disagreed, lastly 166(67%) indicated that there was product innovation and a minority 80(33%) indicated that there wasn't.

Table 1: Innovation Most Evident

Innovation Most Evident	Yes	No
Customer based innovation	155(63%)	91(37%)
Process based innovation	162(66%)	84(34%)
Market based innovation	153(62%)	92(38%)
Product based innovation	166(67%)	80(33%)

Factors Influencing Adoption of Innovation

The table 2 below shows results on the various factors influencing adoption of innovation. The respondents were free to choose more than one factor. The result showed that 89% indicated size of the firm, 77% indicted Years of operation, 83% indicted type of products, 81% education level of employees,87% indicated training, 80% indicated customer loyalty, 63% indicated type of market served, 60% indicated competition and 89% indicated the economy.

Table 2: Factors Influencing Adoption of Innovation

Factor	Frequency	Percentage (%)
Size of the firm	219	89
Years of operation	188	77
Type of products	205	83
Education level of employees	199	81
Training	214	87
Customer loyalty	196	80
Type of market served	155	63
Competition	149	60
The economy	216	89

Products Based Innovations and Operational Performance

The study sought to determine to what extent did product based innovation affect the operation performance. From the results shown in figure 3 below shows that 93(38%) indicated to a large extent 28% indicated to a very large extent, 17% indicated to a moderate extent, 11% to a small extent and 6% to no extent.

The study went further to and put some statement on how product based innovation affect the operation performance. The results are displayed in the table 3 below shows that the mean for the first statement there was focused on new markets was 4.0 and the standard deviation was 1.16, the mean for the second statement was 3.81 and the standard deviation 0.93. The mean for the third statement was 2.16 and the standard deviation 0.74. The mean for fourth statement was 4.17 and the standard deviation 0.73. The mean for fifth statement was 4.13 and the standard deviation 0.74. The mean for sixth statement was 4.13 and the standard deviation 1.1. Lastly the last statement mean 3.98 and the standard deviation 1.22.

Table 3: Statements on Products Based Innovations and Operational Performance

Statements	Mean	Std Dev
There is focus on new markets	4.0	1.16
The markets accepts the innovation	3.81	0.93
There is need for more product based innovation	2.16	0.74
Innovation meets market needs	4.17	0.73
Customers are able to give input on innovation	4.13	1.1
More market segmentation is required	3.98	1.22

The study went further to the type of product innovation evident from the company. From the findings 52% indicated new, 45% indicated modified and finally 3% indicated duplicated.

Market Innovations and Operational Performance

The study sought to determine to what extent market innovation affected the operation performance. From the results 97(39%) indicated to a large extent 27% indicated to a very large extent, 23% indicated to a moderate extent, 7% to a small extent and 4% to no extent.

The study went further to and put some statement on how market innovation affected the operation performance. The results were displayed in the table 4 below which showed that the mean for the first statement there was improved Product/Service quality was 4.05 and the standard deviation was 1.1, the mean for the second statement was 3.89 and the standard deviation 0.87. The mean for the third statement was 2.14 and the standard deviation 0.72. The mean for fourth statement was 4.2 and the standard deviation 1.05. The mean for fifth statement was 4.05 and the standard deviation 1.05.

Table 4: Statements on Market Innovations and Operational Performance

Statements	Mean	Std Dev
There is improved Product/Service quality	4.05	1.1
There is ease in use of product	3.89	0.87
The products meet the best quality standards	2.14	0.7
The products are well designed	4.19	0.72
The products improve satisfaction	4.2	1.05
There is training for use of new products	4.05	1.09

The study went further to type of market innovation evident from the company. Majority agreed that the most evident market innovation was modified at 52%, while 33% indicated that it was new and a small number indicated it was market innovation was duplicated 15%.

Process Based Innovations and Operational Performance

The study sought to determine to what extent did process based innovation affect the operation performance. From the results 98(66%) indicated to a large extent 40% indicated to a very large extent, 27% indicated to a moderate extent, 2% to a small extent and 1% to no extent.

The study went further to and put some statement on how process based innovation affect the operation performance. The results are displayed in the table 5 below shows that the mean for the first statement is 3.84 and the standard deviation is 0.92, the mean for the second statement is 2.19 and the standard deviation 0.75. The mean for the third statement is 4.12 and the standard deviation 0.83. The mean for fourth statement is 4.08 and the standard deviation 1.15. The mean for fifth statement is 4.0 and the standard deviation 1.21. The mean for sixth statement is 5 and the standard deviation 0.91.

Table 5: Statements on Process Based Innovations and Operational Performance

Statements	Mean	Std Dev
Saves time	3.84	0.92

Improves business efficiency	2.19	0.75
Adds value to the company	4.12	0.83
Improves customer retention	4.08	1.15
Improved service delivery	4.0	1.21
Improves on cost saving	4.26	0.91

The study went further to type of process based innovation evident from the company. A majority agreed that the most evident market innovation was new at 52%, while 36% indicated that it was modified and a small number indicated it was market innovation was duplicated 12%.

Customer Based Innovations and Operational Performance

The study sought to determine to what extent did customer based innovation affect the operation performance. 89(36%) indicated to a large extent 26% indicated to a very large extent, 27% indicated to a moderate extent,6% to a small extent and 5% to no extent.

The study went further to and put some statement on how customer based innovation affect the operation performance. The results are displayed in the table 6 below shows that the mean for the first statement is 3.93 and the standard deviation is 1.21, the mean for the second statement is 3.85 and the standard deviation 0.89. The mean for the third statement is 2.19 and the standard deviation 0.78. The mean for fourth statement is 2.19 and the standard deviation 0.78. The mean for fifth statement is 4.14 and the standard deviation 0.78. The mean for sixth statement is 3.93 and the standard deviation 1.26.

Table 6: Statements on Process Based Innovations and Operational Performance

Statements	Mean	Std dev
Improved service delivery	3.93	1.21
Provides wide range of products and services	3.85	0.89
Improves efficiency and effectiveness	2.19	0.78
Reduced customer response times	4.14	0.78
Has helped in easy identification of problems in systems	4.1	1.14
Improved customer satisfaction	3.93	1.26

The study went further to type of process based innovation evident from the company. A majority agreed that the most evident market innovation is duplicated at 53%, while 32% indicated that it was modified and a small number indicated it was market innovation was new was 15%.

Operational Performance

The study sought to determine to what extent innovation affected the operation performance. 107(43%) indicated to a very large extent 40% indicated to a large extent, 14% indicated to a moderate extent, 2% to a small extent and 1% to no extent.

The study went further to and put some statement on how customer based innovation affect the operation performance. The results were displayed in the table 7 below shows that the mean for the first statement is 4.34 and the standard deviation is 0.77, the mean for the second statement is 3.85 and the standard deviation 0.9. The mean for the third statement is 2.12 and the standard deviation 0.71. The mean for fourth statement is 4.15 and the

standard deviation 0.8. The mean for fifth statement is 4.14 and the standard deviation 1.1.

Table 7: Statements on Operational Performance

Statements	Mean	Std dev
There is operational Cost savings	4.34	0.77
There is an increase in employee's productivity	3.85	0.9
There is employee's motivation	2.12	0.71
There is an increasing income revenue	4.15	0.8
There is a higher variety of services	4.14	1.1

Correlations of the Study Variables

The study did a correlation analysis to find out the relationship of the independent variables to dependent variable performance. The findings on study variables as indicated in the table 8 that there is a positive and significant linear relationship between all the variables with product based innovation showing a strong, positive and significant correlation with performance at operational 0.848 followed by market innovation which shows a strong, positive and significant correlation with operational performance at 0.778. Process based innovation has also a strong positive correlation to operational performance at 0.832 also customer based innovation has a positive correlation with operational performance at 0.683.

Table 8: Study Correlational Analysis

Correlations

		Performance	Products Based Innovations	Market Innovations	Process Based Innovations	Customer Based Innovations
Pearson Correlation	Performance	1.000				
	Products Based Innovations	.848	1.000			
	Market Innovations	.778	.866	1.000		
	Process Based Innovations	.832	.919	.848	1.000	
	Customer Based Innovations	.683	.718	.656	.769	1.000

Regression analysis

A multiple regression was also conducted to predict the effects of the independent variable and dependent performance. The R-square value as shown in the table 9 was 0.743 which show that information communications technology based innovations explains 74.3% of factors affecting performance 25.7% are explained by factors that are not captured in the study. The results are presented in the table below. The p- value is less than 0.05 at 0.000 which means that the model is statistically significant.

Table 9: Model of effect of information communications technology based innovations on performance

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.862[a]	.743	.739	.48561	.743	174.501	5	241	.000	1.076

a. Predictors: (Constant), Customer Based Innovations , Market Innovations , Products Based Innovations , Process Based Innovations

b. Dependent Variable: performance

Analysis of Variance (ANOVA) was used by the researcher to determine the linear relationship among the variables under investigation. Using this method, the sum of squares, degrees of freedom (DF), mean square, value of F (calculated) and its significance level was obtained. From the findings displayed in the table 10 below shows that the p-value is less than 0.05 at 0.000 which means that it was statistically significant. The f calculated was F (245, 4) =175.501.

Table 10: Study ANOVAa

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	164.603	4	41.151	174.501	.000[b]
	Residual	56.832	241	.236		
	Total	221.435	245			

a. Dependent Variable: performance

b. Predictors: (Constant), Customer Based Innovations , Market Innovations , Products Based Innovations , Process Based Innovations

The study conducted a multiple regression analysis so as to determine the relationship between the factors affecting the Information communication technology based innovation and performance. The table 11 below shows the results.

Table 11: Coefficients of information communications technology based innovations on performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.036	.152		-.234	.815
	Products Based Innovations	.533	.103	.471	5.155	.000
	Market Innovations	.117	.072	.110	1.630	.104
	Process Based Innovations	.253	.100	.235	2.525	.012
	Customer Based Innovations	.082	.046	.091	1.785	.076

The regression equation ($Y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \alpha$) was:

$Y = -0.036 + 0.544X_1 + 0.117X_2 + 0.253X_3 + 0.082X_4 + 0$

From the finding in the table above shows that product based innovations had an influence on operational performance. For every unit increase in product based innovations, there was a corresponding increase by 0.544 in operational performance. The p-value was positive and significant between products based innovations and operational performance it was less than 0.05 level of significance at 0.000.

The findings also show that for every unit increase in market innovations there was a corresponding increase by 0.117 in operational performance. The p-value was positive and not significant between market innovations and operational performance it was more than 0.05 level of significance at 0.104.

The findings also showed that for every unit increase in process based innovations there was a corresponding increase by 0.253 in operational performance. The p-value was positive and not significant between process based and operational performance it was less than 0.05 level of significance at 0.012.

The findings also revealed that for every unit increase in customer based innovations there was a corresponding increase by 0.253 in operational performance. The p-value was positive and not significant between customers based innovation and operational performance it was more than 0.05 level of significance at 0.076.

CONCLUSIONS AND RECOMMENDATIONS

The regression analysis provided a deeper insight in to the relationship between the independent variables and the dependent variable. The R-square value was 0.743 which show that information communications technology based innovations explained 74.3% of factors affecting performance 25.7% were explained by factors that are not captured in the study. The model was also found to be statistically significant.

The first objective was to find out how customer based innovation had an effect on operational performance. The study sought to determine to what extent did customer based innovation affect the operation performance 89(36%) indicated to a large extent which was a majority. The respondents went further to agree with the statement on customer based innovation showing that customer based innovation did have an impact on operational performance. The correlation analysis showed that customer based innovation has a positive correlation with operational performance at 0.683. From the coefficient of determination it was seen that for every unit increase in customer based innovations there was a corresponding increase by 0.253 in operational performance. The p-value was positive and not significant between customers based innovation and operational performance it was more than 0.05 level of significance at 0.076.

For the second objective on market based innovation and how it affected operational performance, the study showed that market innovation affected the operation performance to a large extent with a majority of the 97(39%) respondent. The respondents further agreed with the statements on market innovation where the study sought different opinions. The correlation analysis showed that market innovation which shows a strong, positive and significant correlation with operational performance at 0.778. The findings also show that for every unit increase in market innovations there was a corresponding increase by 0.117 in operational performance. The p-value was positive and not significant between market innovations and operational performance it was more than 0.05 level of significance at 0.104.

The third objective on process innovation and operational performance revealed that process

innovation did affect operational performance to a large extent where 98(66%) of the respondent indicated to a large extent. The respondents also agreed with all the statements on process innovation where the study sought different opinions. The correlation results revealed that process based innovation has also a strong positive correlation to operational performance at 0.832. The findings also showed that for every unit increase in process based innovations there was a corresponding increase by 0.253 in operational performance. The p-value was positive and not significant between process based and operational performance it was less than 0.05 level of significance at 0.012.

The fourth objective on product based innovation and operation performance. The majority of respondents the agreed that product based innovation affects the operation performance to a large extent. The respondents further agreed with the statements on product based innovation where the study sought different opinions. The correlation results revealed that there is a positive and significant linear relationship between all the variables with product based innovation showing a strong, positive and significant correlation with performance at operational 0.848. Product based innovations had an influence on operational performance where for every unit increase in product based innovations, there was a corresponding increase by 0.544 in operational performance. The p-value was positive and significant between products based innovations and operational performance it was less than 0.05 level of significance at 0.000.

Conclusion

Customer based innovation were seen to have a significant influence on the operational performance of Nairobi City Water and Sewerage Company limited as shown by the findings of the study. Therefore the study concluded that customer based innovation were evident and are important for performance in the company. Most of these innovations were found to be duplicated and useful to the customer of the company.

Market based innovation were found to be evident according to the findings gotten by the study. The findings showed that customers did have use of the innovation and they impacted customer satisfaction. Therefore the study concluded that process based innovation were evident and are important for performance in the company.

Process based innovations were revealed to be evident in Nairobi City Water and Sewerage Company limited. This means that the process based innovations are useful to the customer and so they are impactful on operational performance. Therefore the study concluded that process based innovation were evident and are important for performance in the company.

Product based innovation were seen to be evident from the findings gotten in the study .The findings showing that product based innovation did have a significant influence on the operational performance of Nairobi City Water and Sewerage Company limited. They were seen to be very important and the company needed them since the customer use them on a daily basis.

Recommendations

The company should continue to improve on the customer based innovation in the company to ensure that there is improved service delivery and customer satisfaction.

On Process based innovations the company needs to improve process to help ensure that there is improved business efficiency and cost saving. This significantly impacted operational performance.

On Market based innovation there is need to also improve the market based innovations. This will help in improving product quality and understanding customer needs in the company.

On Product based innovation there is need to improve further so as to be able to have innovations that meet the needs of the customer and be able to cater to more segments of the market.

Areas of Further Research

The objective of the study was to determine the effects of information communications technology based innovations on operational performance. A case of Nairobi City Water and Sewerage Company limited. The regression analysis R-square value was 0.743 which show that information communications technology based innovations explained 74.3% of factors affecting performance 25.7% are explained by factors that were not captured in the study. The study suggests further research in other areas within the organization using other variables. The study further suggests studying other companies and industries to find out effects of information communications technology based innovations on operational performance.

REFERENCES

Andersen, B., Howells, J., Hull, R., Miles, I. and Robert, J. (2011). Knowledge and Innovation in the New Service Economy, Cheltenham: Edward Elgar.

Armstrong, P., Harchaoui, T. M., Jackson, C. and Tarkhani, F. (2012) "A Comparison of Canada US Economic Growth in the Information Age, 1981 2000: The Important of Investment in Information and Communication Technologies", Economic Research Paper Series No. 70, February, Zurich.

Armstrong, M. P. (2011). The Four-Way Intersection of Geospatial Information and Information Technology: A White Paper Prepared for the Workshop on the Intersection of Geospatial Information and Information Technology. Iowa: The University of Iowa.

Baldwin, J. and Sabourin, D. (2001). "Impact of the Adoption of Advanced Information and Communication Technologies on Firm Performance in the Canadian Manufacturing Sector", Statistics Canada, Micro Economic Analysis Division, Ottawa, October

Bosilj-Vuksic, V. and M. Spremic (2005). ERP System Implementation and Business Process Change: Case Study of a Pharmaceutical Company. Journal of Computing and Information Technology, 13, 11–24.

Council of Economic Advisors. (2001) "Annual Report of the Council of Economic Advisers", The Economic Report of the President.

Gardner, B. (2007). Ensuring Successful Information Technology Utilisation in Developing Countries. Garborone: Botswana (Pty) Limited, Botswana.

Gago D. &Rubalcaba, L. (2007). Innovation And ICT Service Firms: Towards a multidimensional approach for impact assessment. Journal of Evolutionary Economics, 25-44.

Gable, G.G. and Raman, K.S., (2010). Government Initiatives for IT Adoption in Small Businesses: Experiences of the Singapore Small Enterprises Computerization Programme. International Information Systems 1, (1).

Gholami R, (2006). Essays on Information and Communication Technology: Investment, Usage and Economic Impacts PHD thesis.

Hammond C, J. (2008). Growing Up in Technological Worlds. How Modern Technologies Shape the Everyday Lives of Young People. Bulletin of Science, Technology and Society.

Hubona, G.S., Truex, D.P., Wang, J. and Straub, D.W. (2006). Cultural and globalization issues impacting the organizational use of information technology, Armonk:

Jalava, J. and Pohjola, M. (2001) "Economic Growth in the New Economy", WIDER Discussion Paper 2001/5. Helsinki: UNU/WIDER.Sharpe.

Jorgenson, D. and Stiroh, K. (2000) "Raising the Speed Limit: US Economic Growth in the Information Age",OECD Working Papers, No. 261.

Kim, S. J. (2002) The Digital Economy and the Role of Government: Information Technology and Economic Performance in Korea, Program on Information Resources Policy, Harvard University, January.

Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Delhi: Wiley

Payne, A. (2003). Handbook of ICT: Achieving Excellence in Customer Management, Butterworth- Heinemann, and Oxford.

Sawyar M. L. (2005), Information technology and firm performance: linking with environmental, strategic and managerial contexts, Information and Management (35) 4351.

Shelly G.B & Cashman, M.E. (2004). 'Discovering Computers: A gateway to information Web Enhanced', Thomson Course Technology Boston, U'K. 39: 74-78.

Schneider, V. and Barsoux, J. (2007). State of the industry report. Training and Development Solow RM. Technical Change and Agreeable Production function. The Review of Economics and Statistics 1957: 39, 312-320

Maliranta, M. and Rouvinen, P. (2004) "ICT and Business Productivity: Finnish MicroLevel Evidence" in The Economic Impact of ICTMeasurement, Evidence, and Implications, pp. 213 240,Paris: OECD.

Metcalfe, J. S. and Miles, I. (2000) Innovation System in the Service Economy. Measurement and Case Study Analysis, Boston: Kluwer.

Miles, I. (2005) "Innovation in services", in Fagerberg, J., Mowery, D.C. and Nelson, R.R. (Eds.), The Oxford Handbook of Innovation, Oxford: Oxford University Press.

Manyika, J. and C. Roxburgh (2011). The great transformer: The impact of the Internet on economic growth and prosperity. McKinsey Global Institute (http://www.mckinsey.com. Accessed October 2016).

Mgaya, R.J. (2009). Adoption and diffusion of group support systems in Tanzania, Delft University of Technology.

Mugenda, O.M and Mugenda, A.G (2003). Research Methods, Quantitative & Qualitative Approaches, Acts Press, Nairobi

Ngechu, M. (2004). Understanding the research process and methods. An introduction to research methods. Acts Press, Nairobi.

Nickerson, R.S. (2007). Why interactive computer systems are sometimes not used by people who might benefit from them, International Journal of Man-Machine Studies, Vol. 15.

Oliner, S. and Sichel, D. (2001) "The Resurgence of Growth in the Late 1990s: is Information Technology the Story?", Journal of Economic Perspectives, Vol.14, No.4, pp. 3 22.

Orodho, P. (2003). The practice of social research (10th Ed). Thomson Belmont CA

Quinn, J. B. (2011). Managing Innovation: Controlled Chaos, Harvard Business Review, vol. 63, no. 3.

Qureshi, S. (2008). Fostering civil associations in Africa through GOVERNET: an administrative reform network. Journal of Information Technology for Development, 8(2).

Reynolds, W., Savage, W. and Williams, A. (2007). Your Own Business: A Practical Guide to Success, ITP.

Van der Wiel, H. (2001a) "Does ICT Boost Dutch Productivity Growth?", CPB Document No. 016, CPB Netherlands Bureau of Economic Policy Analysis, December.

Van der Wiel, H. (2001b) "Innovation and Productivity in services", CPB report 2001/1. CPB Netherlands Bureau of Economic Policy Analysis.