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ROLE OF COMPUTER BASED INFORMATION SYSTEM ON ORGANISATIONAL PERFORMANCE: A CASE OF KENYA AIRWAYS COMPANY

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ABSTRACT

Information and communication technology (ICT) increases productivity and operational efficiency, reduces costs, impacts on intangible assets such as quality improvement in design processes and inventory management. Organizations have embraced computer based information systems (CBIS) in their managerial functions of planning, coordinating, directing, controlling and decision making to improve on their organizational performance. However, several organizations have posted mixed results in their performance following the adoption of CBIS. Globally, the importance of CBIS in organizations can be best demonstrated by the amount of investment organizations put in on these technologies with worldwide spending reaching US$ 3.8 trillion in 2014 in hardware, software, IT services and telecommunications. In Kenya, the importance of CBIS has been experienced in several sectors including Safaricom's M-Pesa money transfer platform which has been ranked as one of the best in the world. The purpose of this study was to investigate the role of computer based information system on organizational performance in the aviation industry in Kenya. This study adopted a descriptive research design. The study population was Kenya Airways employees stationed at the company headquarters in Nairobi County. The study used a census approach to research and the target population was one hundred and forty four (144) employees of Kenya Airways Company. The main instrument of primary data collection was a self-administered, semi structured questionnaire. Secondary data was obtained from published sources such. A pilot study was undertaken and thereafter instruments were administered to selected sample of the population. The instrument was tested for validity and reliability. Qualitative and quantitative techniques were used in the analysis of data with the assistance of Statistical Package for Social Sciences (SPSS) version 22. The outcomes of the study were presented using charts, tables. The recommendations made would be of benefit to the aviation industry, the Government of Kenya, academic researchers, banking sector. Kenya Airways Company will use the outcome of the study in a variety of ways to improve on their performance.

Key Words: *Efficiency, Integration, E-Commerce Strategy, Communications, Organizational Performance*

Background of the Study

In recent years, information systems technology has become crucial and is playing a critical role in contemporary society and dramatically changing economy and how business is done. The impact of information and communication technology (ICT) on performance of organizations has been studied mainly using cost reduction and productivity measures (Liang, You and Liu, 2010; Das, Yaylacicegi, and Menon, 2011). ICT increases productivity and operational efficiency in specific business processes by reducing costs and by impacting on intangible assets such as quality improvement in design processes or life-cycle enhancement in inventory management systems (Wachira Muturi, Sirma, 2014). ICT also enhances coordination of activities by improving internal and external communication, as well as information systems (Latham, 2011).

When businesses are rapidly moving towards international integration, the roles of computer-based information systems (CBIS) become very vital both in integrating the activities within an organization as well as supporting communication and coordination across organizational boundaries. CBIS have made it possible for an organization to get best out of its resources and to achieve its goals, so that the organization can live up to the expectations in this era of competition (Gupta, 2013). Undoubtedly, business is conducted in a global environment and simply cannot do without CBIS. The use of information systems is changing the way business and organisations of all types and sizes work and is greatly assisting managers reduce ambiguity in decision making (Lucey, 2005).

The importance of CBIS in organizations can be best demonstrated by the amount of investment organizations put in on these technologies. Worldwide spending had been projected to reach $ 3.8 trillion in 2014 in hardware, software, information technology services and telecommunications (Gartner, 2014). Gartner further states that organizations invest increasingly in information systems (IS) for various reasons such as achieving more efficiency and improving performance and quality. Chaffey and Wood (2005) further emphasized on this issue and stated that although organisations have different information systems because they have varying information needs, they all strive for competitive advantage through continuous improvement; re-evaluation of the effectiveness and efficiency of their business information system.

Information systems have become a major function area of business administration for playing a vital role in the e-business and e-commerce operations, enterprise collaboration and management, and strategic success of the business (Hevner, March, Park & Ram, 2004). However, information system implementation creates both positive and negative effects for an organisation that use it. Most of the literature has underpinned the design and use of a modern IS which is mainly based on technology (Lucey, 2005; Davies, 2009). The technology, which influences organisations in many ways begins to have effects on an organisation in which IS is introduced and implemented. The designed IT-based information systems can affect the business processes of an organisation (Lucey, 2005). Consequently, managers of the organisation have to understand these effects in order to design and run systems that provide only benefits for the organisation, and to avoid the risks that occur from IS tools (Davies, 2009).

Traditionally, CBIS were used to support operational functions, like processing accounting transactions, with the emphasis being based on achieving information systems efficiency and effectiveness.

Nowadays, CBIS are the means by which organisations and people, using information technologies, gather, process, store, use and disseminate information (Gupta, 2013), with firms using information systems as a strategic weapon to gain competitive advantage. Again, nowadays, CBIS are not restricted within the organizational boundaries but have spread beyond these boundaries in a bid to engulf both upstream and downstream activities, such as integration with suppliers and customers.

The benefits of CBIS have been distinguished in two categories of hard and soft benefits (Dharni, 2010). Hard benefits are usually related to cost reduction, such as the reduction in data entry staff made possible by the introduction of an electronic ordering system or to revenue generation, such as the increased throughput as a result of a new production control system. Soft benefits comprise of intangible, indirect and strategic benefits. Intangible benefits can be attributed to a particular application but they cannot be easily expressed in quantitative terms. Indirect benefits are primarily easy to measure but cannot be wholly attributable to the proposed investment and can only be realized as a result of further investments, enabled by the new systems. The implementation of a Local Area Network (LAN) across an organization provides the infrastructure on which valuable shared application can later be implemented. Strategic benefits refer to positive impacts that are realized in the long run and usually come as a result of the synergistic interaction among a number of contributing factors.

Global Perspectives on Computer Based Information System

Usage and penetration of computer based information systems worldwide has continued to grow phenomenally. India is one of the fastest-growing computer based information system markets in the world. India is considered as a pioneer in software development and Business Processing Outsourcing (BPO) estimated at $ 87.6 billion by the year 2011-2012 generating direct employment to 2.8 million and indirect employment to about 8.9 million, software exports accounted for $ 69 billion (MSPI, 2014).

Finland emerged the top on the list of the 144 economies ranked on Networked Ranking Index on Information and Communication Technologies. The ranking was based on internet access, adult literacy to mobile subscriptions, and availability of venture capital, patent applications and e-government services which gauge the social impact of digitization. 90 percent of Finnish households had Internet access compared to 70 percent in the United States and 85 percent in the United Kingdom. As per the rankings, Singapore came 2nd, Sweden 3rd, United Kingdom 7th Russia 55th, China 58th, Brazil 60th, India 69th and South Africa 70th (World Economic Forum, 2013).

Kenyan Perspectives on Computer Based Information System

Kenya is committed to the development of computer based information system as spelt out in the Vision 2030 document on education and training under the social pillar by equipping secondary schools with content delivery systems. The National Treasury allocated Kshs 53.2 billion for a period of three years for the purchase of 1.35 million laptops for class one pupils, development of digital content, training teachers and rolling out computer laboratory for class 4 to 8 in all schools in Kenya (GoK, 2014).

The Ministry of Finance developed an electronic based transaction system (e-government), a computer based information system platform interface between the public sector and

stakeholders. The services offered include tracking the status of Identity Cards once applied for, business licensing, submission of tax returns, registration of public service jobs online among other services (GoK, 2014).

The manufacturing sector in Kenya employs computer based information system in the design and manufacture of products and one such organization is the Numerical Machine Complex. The corporation is an ISO 9001: 2008 certified engineering firm that manufactures vehicle spares and metal based engineering products. It is equipped with computer controlled machines and Computer Aided Design/Manufacturing software (CAD/CAM) (GoK, 2014).

The service sector adopted computer based information system in financial sector such as the mobile money transfer (virtual banking) dubbed M-Pesa. This computer based information system platform offered by Safaricom Company enables its subscribers to conduct financial transactions through mobile phones. It was launched on 27 March 2007 to cater mainly for the unbanked population and has since grown to a customer base of 19,671,000 by June 2014 and handled Kshs 94.8 billion of real-time payments per month (Safaricom, 2014).

Profile of Kenya Airways Limited

Kenya Airways was established in February 1977 following the breakup of the East African Community and subsequent disbandment of the jointly owned East African Airways. The company was privatized in 1996 with the aim of increasing level of performance, efficiency, productivity and profitability and improving on the quality of service and effective service delivery.

Kenya Airways is one of the companies undertaking air transport in Kenya, regionally and internationally. The current ownership structure is as follows; Kenya Government 29.80%, KLM 26.73% and General public 43.47 % (New shareholding after rights issue in 2012). The company has been in air transport since 1977 and boasts of a fleet of 47 aircrafts after acquiring 20 Embraer aircrafts from Brazil and 2 Dreamliners from Seattle USA (Msafiri, 2014).

The airline placed an order of 9 Boeing 787 Dreamliners from Boeing aircraft manufacturers with the first delivery made on April 5, 2014 (Kenya Airways Company's Strategic plan 2008 -2013).

The company serves domestic, regional and international customers and this has necessitated the need for constant communication, connectivity and high knowledge of their customers. In order to carry out these functions efficiently, the company adopted the use of computer based information system in the late 1990s. The adoption of this technology has transformed the company's organization structure and the management of the seven divisions in the company.

The company is headed by the CEO and seven Directors in charge of Human Resource, Marketing, Information Technology, Flight Operations (Chief Pilot), Finance, Technical and Ground Operations (Kenya Airways, 2014). A survey commissioned by the company to assess the impact of Computer Based Technologies on performance of the company produced mixed results (Kenya Civil Aviation Journal, 2010).

Statement of the Problem

The aviation sector in Kenya contributes Kshs 24.8 Billion (equivalent to 1.1 % of the Kenyan gross domestic product (GDP)), through airlines, airports and ground services, supply chain and spending by employees in the sector (OE, 2011). But the performance of Kenya Airways, however, has been

mixed in that the company made profits in 2010 and 2011 amounting to Kshs 2.035 Billion and Kshs 3.538 Billion respectively and made losses in 2012, 2013 and 2014 of Kshs 1.660 Billion, Kshs 7.864 Billion and Kshs 25.7 Billion respectively (KQ, 2015).

Despite best practices in the aviation industry by some players, Kenya Airways mixed performance would cost the government Kshs 3 Billion yearly loss in direct taxes and Kshs 1.1 Billion loss in taxes on imported aircrafts spare parts. Additionally, Kenyans would continue losing high paying jobs due to retrenchment by the company with the net effect being a reduction of taxes collected by the government (KQ, 2015).

The government projects a revenue collection amounting to Kshs 1.250 Trillion for the year 2015/16 with the largest component of revenue generated from income tax, followed by value added tax (VAT) and Excise tax (PBO, 2015). With the Kenya Airways Company being one of the biggest contributors of these taxes, continued losses would affect the government's projected revenue income.

Several studies have been done on the role of CBIS and organizational performance in the airline industry in Kenya. Irungu (2012) did a study on the influence of ICT on the performance of aviation industry in Kenya, Abudho, Njanja and Ochieng (2013) did a study on key success factors in airlines with the objective of examining the challenges facing the airline industry in Kenya, Stanley (2013) did a study on the effect of Relationship Marketing on Customer Satisfaction in the Airline Industry in Kenya and Mokaya, Kanyagia and Wagoki (2012) did a study on market positioning and organizational performance in airlines industry in Kenya.

This shows that limited attention has been paid to the role of CBIS on organisational performance especially in relation to aviation industry in Kenya. This study therefore seeks to fill the research gaps by investigating on the role of CIBIS on organizational performance in airline industry in Kenya.

General Objective

To establish the role of computer based information system on organizational performance in Kenya Airways.

Specific Objectives

The study was guided by the following objectives:

- To establish to what extent efficiency affects organizational performance of Kenya Airways.
- To determine to what extent integration affects organizational performance of Kenya Airways.
- To evaluate the effect of e-commerce strategy on organizational performance of Kenya Airways.
- To examine the effect of communication on organizational performance of Kenya Airways.

LITERATURE REVIEW

Introduction

This chapter explored the concept of CBIS, theoretical review, conceptual framework and review of variables.

Concept of Computer Based Information Systems (CBIS)

Alter (2008) states that an information system is a work system whose processes and activities are devoted to processing information, i.e. capturing, transmitting, and storing, retrieving, manipulating, and displaying information. Yeo (2002) on the other hand states that information system denotes any wide combination of computer hardware,

communication technology and software designed to handle information related to one or more business processes.

Computer based information systems have the ability of obtaining, storing, processing, retrieving, and displaying the right information for the right decision essentially enabling a manager to make the right decisions fast (Murdick, Ross & Clagget, 2007). The perceived benefits of CBIS include increase in operational efficiencies, sharing of databases, reduction of operational cost, communication between transacting parties, collaborative inter-organizational relationship (integration of functions) and enhance supply chain capabilities (e-commerce) (Ochieng'a, 2009). Measuring the success of CBIS takes special importance in many organizations since the costs and risks of these large technology investments rival their potential payoffs (Markus, Axline, Petrie & Tanis, 2003).

Computer based information system indirectly influences organizational performance by improving organizational capabilities (internal and external capabilities) (Liang, You & Liu, 2010). However, Dawson (2007) is of the view that purchase of computer based information system by individual departments in an organization leads to challenges in the internal communications in the organization negating the benefits of CBIS. He further stated that high profile sales strategies of CBIS software and hardware products may pressurize organizations to purchase sophisticated systems beyond their needs.

Nowduri (2011) argues that lack of expertise in institutionalization, programming, monitoring and evaluation of computer based information system and a well-defined decision making system in majority of organizations resulted in achieving very little in the improvement of decision-making process.

Theoretical Literature

A theory may be viewed as a system of constructs and variables in which constructs are related to each other by propositions and the variables are related to each other by hypotheses (Wacker, 1998). This section covered the theories that are relevant in explaining the role of computer based information system on organizational performance of firms in the aviation industry.

Technology Impact Model

In technology impact model, information systems are seen as substitute for labour, in much the same way as automation in the shop floor. The central argument is that technology can perform the work of managers more efficiently than a human being. Technology is used to improve some mechanistic notion of 'efficiency' for example the speed or volume of transactions processed (Kimble & McLaughlin, 1995). Kimble & McLaughlin further stated that the particular requirements of specific systems frequently had the effect of enforcing a rigorous and more formalized discipline upon managers. The study found out that this effect was particularly obvious at middle and junior level of management. This theory is important to this study since it focuses on efficiency and reduction on agency costs as a result of the adoption of computer based information technology in an organization.

General Systems Theory

General Systems Theory is a logico-mathematical field whose task is the formulation and derivation of those general principles that are applicable to systems in general. In this way, exact formulation of terms wholeness, sum, differentiation, progressive mechanization, centralization, hierarchical order, finality and equifinality etc. become terms which occur in all sciences dealing with 'systems' (Bertalanffy,1972). Bertalanffy contends that there

are general aspects, correspondences, and isomorphisms common to 'systems', this is the domain of general systems theory. Systems theoretical approach include general systems theory, cybernetics, theory of automata, control theory, information theory, set, graph, and network theory, relational mathematics, game and decision theory, computerization and simulation.

This theory is important to this study since it focuses on integration within an organization and external integration in an industry. Internal and external integration are fundamental to superior performance. Business uncertainty and risks can potentially be more managed by adopting an electronic integration solution (Lajili & Mahoney, 2005)

Theory of cyber Transformation

Cyber transformation theory was developed at the Centre for E-Business Research at the University of Texas and unveiled by formally by a sequence of articles and presentation by Dutta and Segev in 2001. The theory of cyber transformation encompasses two dimensions; a technological capability dimension based on interactivity and connectivity and a strategic business dimension constructed around the factors of products, prices, promotion and placement (recognizable as the four Ps of traditional market model) and customer relations (Dutta & Segev, 2001).

Dutta and Segev further argued that the theory of cyber transformation and companion marketplace model belong to the E-strategy school of thinking about online trading. There is a significant positive association between cyber transformation and each of the three e-commerce metrics i.e.B2C revenues, customers acquired and online sales leads (Brogan, 2003).

This theory is important to the study since it explains the e-commerce in organisations. B2B e markets enhance the various benefits that are generally attributed to e commerce. They reduce transaction costs, as they bring a large number of buyers and sellers into one trading community. They also facilitate efficient processing transaction by facilitating online auctions and online processing of invoices, purchase orders and payments (OECD, 2001).

Berlo's Communications Model

Berlo (1960) constructed "a model of the ingredients of communication", Berlo identified controlling factors for the four elements of communications: Source, Message, Channel and Receiver.

Berlo's concept of communication was that it is a process in which a "source" has a purpose communicated to a receiver by means of a message. The purpose is expressed in the form of a message and sent through a channel (medium) the "decoder" translates the source's purpose into a code that the receiver can comprehend. Berlo's model is a linear communications model where communications takes place properly if the receiver is on the same level with the speaker.

This model is important in this study since it explains the concept of communications. In an organization communication is important for coordination and information to the staff. According to Abugre (2011) good and effective communication from the leadership in formal sector can affect employees' work behaviors' in a positive manner and consequently affect organizational work output more compared to employee performance appraisal, employee training and development, employee welfare system etc. Among the respondents surveyed 86.4% agreed that organizational communications is very important and comes first of all other organizational processes.

Conceptual Framework

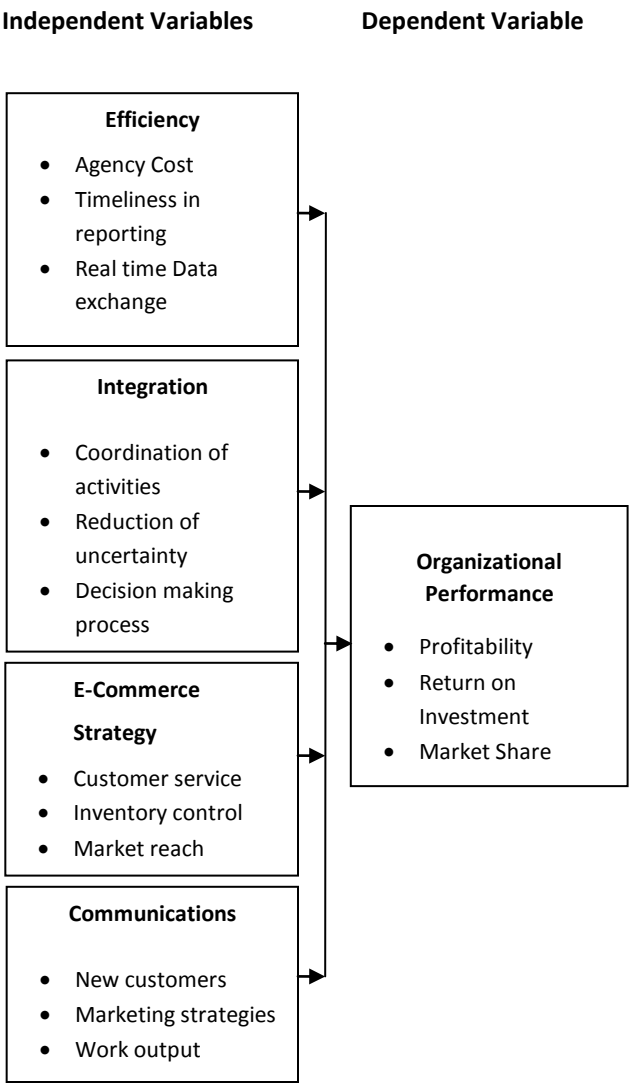

Figure 1: Conceptual Framework

Review of Variables

Efficiency

Efficiency and effectiveness are two central terms used in assessing and measuring organizational performance, as well as inter-organizational arrangements such as strategic alliances, joint ventures, sourcing as well as outsourcing agreements (Mouzas, 2006). According to Pinprayong and Siengthai (2012), business efficiency reveals the performance of input to output ratio while organizational efficiency reflects the improvement of internal processes of the organization, they concluded that organizational performance is influenced by effectiveness and efficiency. As business grows in size and scope, agency costs or coordination costs rise because owners must expend more and more effort in supervising and managing employees.

Application of computer based information system in an organization reduces the cost of acquiring and analysing information, permits organizations to reduce; agency costs, the number of middle level managers and clerical staff and increases revenues (Laudon, 2003)

Application of Computer based information system in aircraft maintenance in airlines in China, achieved real-time data exchange between air and ground crews to provide decision support for rapid fault diagnosis and digital maintenance. The platform improved efficiency and the quality of maintenance of aircrafts which accounted for approximately between 20% and 30% of the operating costs in airline industry (Zhang, Zhao, Tan, Yu & Hua, 2011).

The introduction of computer based information system in the Nigerian health-care system improved efficiency and timeliness in reporting and analyzing process of key medical data from the regions across the country by achieving a reporting rate of between 90 and 95%. The system was cost effective and made analysis and presentation of data in tables and charts easier compared to the former manual system (Ezenwa & Brooks, 2014). This led to the first hypothesis the study sought to test:

$H_{01:}$ There is no positive relationship between efficiency and organizational performance of Kenya Airways

Integration

Lajili and Mahoney (2005) argue that the use of computer based information system required internal and external integration which are fundamental to superior performance. Business uncertainty and risk can potentially be more managed by adopting an electronic integration solution. They were of the view that investment in a strong e-infrastructure by industries with high business risk could reduce vertical coordination, communication and bureaucratic costs. Computer based information system enhances internal and external organizational integration because it increases the integration and flow of information between employees, allowing them to improve coordination of activities. Further, internal integration reduces uncertainty by improving communications between departments which improves decision-making process (Teixeira, Koufteros & Peng, 2012).

Firms achieve internal integration by effectively coordinating processes on an enterprise wide basis (Muguro, 2014). E-procurement platform has integrated the government of Kenya's Ministries and Department's procurement processes where vendors can access information on tenders floated and transact business with government Ministries (Gok, 2014).

Computer based information system (Check-In & Boarding platform) in airline industry integrates Check-In, Check-Out and Security Control departments in the airport by employing bar coded passengers' boarding pass. By scanning the boarding pass, passengers' boarding information is quickly captured and automatically uploaded into the airports computer based information system facilitating quick check-in process for passengers and enhancing security and control at the airport (Datalogic, 2014). This led to the second hypothesis the study sought to test:

$H_{02:}$ There is no positive relationship between integration and organizational performance of Kenya Airways.

E-Commerce Strategy

Tontochi and Manshady (2012) argued that e-commerce takes place directly between a business, its partners or its customers through a combination of computing and communication technologies taking into account sales, marketing, communications, service and workflow.

Most businesses used e-commerce because it provided the opportunity for increased profits (through increased sales or lower costs) and thus enhanced the sustainability of the firm. E-commerce benefitted an organization in product design, supply and inventory management, production, marketing, sales and distribution, and customer service (Barkley & Markley, 2007).

However, Ghezzi, Mangiaracina, and Perego (2012) outlined challenges on the adoption of e-commerce as a cost reduction strategy; the first being the value density (the inclination of customers to pay delivery fee and the merchant to provide return of a product service from customer which makes products expensive), the greater the product range results in complexity in procurement network and hence higher procurement costs and finally the shorter the product life cycle of a product gave rise to obsolescence risk as was the case with consumer electronics. The benefits of the adoption of computer based information system (e-commerce) included improved customer service, better inventory control, lower marketing and distribution costs, reduced cycle time, increased market reach, and reduced operation costs (Velmurugan & Narayanasamy, 2008).

Mansell (2003) argued that international market conditions were influenced more by existing market

structures and commercial practices than by introduction of new computer based information systems. He further contended that e-commerce required sophisticated computer based information systems, costly data input procedures and the need to provide and monitor sensitive information in electronic form therefore weak capabilities in this area and limited financial resources could post negative results. This led to the third hypothesis the study sought to test:

$H_{03:}$ There is no positive relationship between e-commerce strategy and organizational performance of Kenya Airways

Communications

Banihashemi (2012) viewed communication as essentially a perceptual process where the sender must encode intended meaning to create messages and the receiver then decodes the messages to obtain perceived meaning. He further argued that effective communication depends on the sender and the receiver sharing an understanding of the rules used to encode meaning into messages.

Kibe (2014) contends that strategic communication is an intentional process of providing ideas in a clear, concise and persuasive way. She further argued that a manager must make an intentional effort in to muster communication skills and used them strategically, that is consistent with the organization's values, mission and strategy.

Application of computer based information system in telecommunication firms in Kenya improved organizational performance by establishing easy communications through social media platform to customers and staff, the platform helped business firms attract new customers and enhanced customer loyalty. Further the platform helped the senior management in designing marketing strategies that addressed customers' needs through feedback collected from the customers (Nyambu, 2013)

Rajhans (2012) found out that effective organizational communications practices contributed to employees' motivation and increased their performance and loyalty to the organization which led to low staff turnover ratios in Vanaz Engineers Company. The two way communications policy practiced by the company helped in conveying the company's policies and vision, future plans among many others lower down while senior management received feedback from the staff on issues related to the improvement of the company's performance. This led to the fourth hypothesis the study sought to test:

$H_{04:}$ There is no positive relationship between communication and organizational performance of Kenya Airways

Organizational Performance

According to Richard, Devinney, Yip, & Garry, (2009), organizational performance encompasses three specific areas of the firm's outcomes: financial performance (profits, return on investment, and return on assets); market performance (sales, market share, etc.); shareholders return (total shareholder return, economic value added, etc.).

Ifandoundas and Chapman (2006) are of the view that competition has brought pressure on organizations to improve on organizational performance (efficiency and productivity) through technological innovation. Computer based information system and organizational structure are the drivers of the firm's performance since they encourage decision-making, assumption of authority and responsibility and this facilitates organizational learning leading to higher levels of profitability and efficiency (Farhanghi, Abbaspour & Ghassemi, 2012).

Govrea, Ilies, and Stegerean (2011) contend that organizational performance is influenced by organizations: strategy, leadership, quality, innovation and development, computer based information based system, performance measurement, employees, corporate governance and external environment.

Empirical Literature

Gagnon and Dragon (2001) examined the impact of technology on organizational performance. They found out from the respondents that the technology had befitted them by offering rapid access to a large quantity of information of better quality and the elimination of repetitive tasks. However, the decimal results realized were attributed to lack of integrating the information system into the culture and functioning of the organization and therefore the system was underutilized hence little benefits were realized. The study suggested that the users and managers must commit to taking charge of the organization's information system and specify the objectives and orientations of the system's management process. Further they will have to maintain control over needs assessment, design, implementation, operation and evaluation of the information system. Development of user technical knowledge was found to be important together with integrating the information systems with departments.

Sirma, Obegi and Ngacho (2014) conducted a research on the factors influencing the implementation of computer based information system in public universities in Kenya. The study found identified six factors which included university's top management support, end-user training, understanding and approval by top management, availability of qualified and competent ICT staff were important factors for the successful implementation of information system. Further the researchers observed that poor information system (IS) consultants effectiveness and poor project management effectiveness could lead to low quality IS implementation efforts which in turn contributes to user's resistance to change and their unacceptance of the information system.

Muriuki (2010) did a study on information technology and performance of supply chain management: a case study of international energy technik Ltd. The study revealed that IT had improved the process of transactions across the various functions and also it was integrated in such a way that information flows along the various functions; procurement, planning, logistics and warehouse. The study found out that IT had reduced the cost of operations and lead time for orders and improved on customer services. The study suggested that more focus in the application of IT should be directed to planning and sales functions to in order to give a clear picture of the requirements of the customers for the company to save by reducing large inventory holdings.

Moturi (2013) investigated the implementation of ICT-Base strategy by East African Potland Cement Company Limited. The study found out that the results were mixed. The positive results noted were success in the training of staff, experts and consultant implementing the strategy were well versed with technologies involved, however the negative results were poor communications of the ICT strategy lead to little involvement of the company's staff in the implantation process.

Nyandiere, Kamuzora, Lukandu, and Omwenga (2012) did a research to investigate the implementation of enterprise systems for management in the Kenyan universities. The study found out that 87 % of the universities surveyed undertook strategic planning in ICT covering such

areas as infrastructure, technology platform, financing, service delivery and ICT skills training for users. However the study revealed that funding for ICT projects was low in the universities and also over 60% of the universities used ICT in admissions, library, finance and accounting and examinations management leaving out other important departments. The study suggested that application of ICT in all the departments including human resource and marketing be beneficial, additionally each university should develop a framework for the implementation of ICT projects.

Moriones, Billon and Lopez (2013) investigated the perceived performance effects of ICT in manufacturing SMEs in Spain. The study found that ICT had a significant impact on the improvement of external and internal communications. Further the study found that the managers' perception of positive impact of ICT in the organization was related to the adoption of new work practices following the adoption of ICT. The researchers concluded that the firms with larger coordination needs would benefit more from ICT adoption as would be the case of firms dealing with more frequent and complex information flows usually associated with a large number of and variety of agents involved.

The study suggested that, for organizations to take full benefits of ICT investments, firms should make effort to adopt organizational practices aimed at increasing teamwork and worker participation in decision making.

RESEARCH DESIGN AND METHODOLOGY

Research Design

This study adopted a descriptive research design to establish the relationship between the independent variables of computer based information system (Efficiency, Integration, E-Commerce, and Communications) and organizational performance (Bhattacherjee, 2012).

Study Population

The study population was the one hundred and forty four (144) employees of Kenya Airways stationed at the company headquarters at Embakasi in Nairobi County.

Sample Size and Sampling Techniques

This study adopted a stratified sampling technique. Stratified sampling involves dividing the population into homogenous groups, each containing subjects with similar characteristics (Kothari, 2004). The study census was the one hundred and forty four (144) employees of Kenya Airways Company picked randomly at the company headquarters in Nairobi County comprising of top and middle level management staff and lower level management.

Research Instruments

The study utilized self-administered semi-structured questionnaires to collect primary data. Closed ended questions were used in the questionnaires because they are easy to administer, analyze, and are economical in terms of time and money (Stanley, 2013).

Data collection procedure

The study used questionnaire to collect data. Questionnaires were distributed to the respondents who were requested to fill in on their own free will and on their own terms guided by the questions.

Data Processing and Analysis

The study used both primary and secondary data. Data obtained was recorded, coded, tabled, classified and reconciled before being considered for analysis.

Analysis of primary data was done through statistical methods using descriptive and inferential statistical methods of analysis (Rugg &Petre, 2007). Simple and cumulative frequency distribution method of data analysis will also be used (Mugenda and Mugenda 2004). Statistical analysis of data was supplemented with the application of computer packages in the forms of Statistical Package for Social Sciences (SPSS) 22.0 windows for analysis and the outcome of the analysis was presented using charts, tables and graphs with the values provided in percentages, averages and percentage averages (Greener, 2008)

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

This chapter provided a summary of data analysis, finding of the study and the discussion of the findings of the study.

Response rate

Out of 144 questionnaires distributed to the respondents, 122 were received. This represented a response rate of 84.7%. According to Mugenda and Mugenda (2003) a response rate exceeding 50% is adequate.

Firm Demographics

The analysis of the demographic characteristics was based on the information given by the respondents in the questionnaire. The respondents gender, age, years of experience with computer based information system, competence as a computer user, level of education, position in the organization and the department were all captured.

Majority (51.7%) of the respondents surveyed were male while a few (48.3%) were female. This reflects almost a gender balance. Majority (62%) of the respondents surveyed were young between the ages of 18-25 and 26-35 years, 17.2% were between ages 36 to 45, while a few (10.6%) were above 45 years of age. This is an indication that majority of the respondents are youth. This group is energetic, eager to learn and is tech savvy, a requirement in the high technology aviation industry.

Majority (41.7%) of the respondents had up to 7 years of experience with computer based information system, 38.3% had 8 to 12 years of experience while a few (18.8%) had over 12 years of experience. Majority (47.5%) of the respondents surveyed were very competent users of computers.

Majority (37%) of the respondents surveyed were in the operational level. Majority (27.9%) of the respondents surveyed were from the human resource department, 12.2% from finance, 10.7% from marketing while a few (7.4%) from the operations department. One would have expected to find majority of in the operations department but due to the nature of their work, this cadre of employees is normally in the field, for instance pilots and cabin crew.

Analysis of Efficiency

The result had an indication that the staff from various departments at Kenya Airways accessed information beneficial to their work and interacted through CBIS.

Further the study sought to find out whether computer based information system's operating hours are convenient to all its users. Majority (76.2%) of the respondents agreed, 2.5% were neutral while a few (21.3%) disagreed. Majority (77.9%) of the respondents agreed that CBIS system is easy to learn, 4.1% were neutral while a few 18.1% disagreed.

Majority (77.9%) of the respondents agreed that CBIS is capable of identifying and categorizing groups of customers, 3.3% were neutral while a few (18.9%) disagreed.

Analysis of Integration

Measurement of Coordination Factor at Kenya Airways

Majority (81.2%) of the respondents agreed that CBIS ensures good coordination among organization's functional areas, 3.3% were neutral while a few (15.6%) disagreed. Majority (78.6%) of the respondents agreed that CBIS is able to integrate all functions in the organization

Measurement of Uncertainty reduction Factor at Kenya Airways

Majority (81.1%) of the respondents agreed that CBIS services are dependable, 1.6 % were neutral while a few (17.2%) disagreed, 82% of the respondents agreed that CBIS produces error free records, 3.3% were neutral while a few (14.7%). This is an indication of the system's reliability.

Measurement of Decision Making Factor at Kenya Airways

Majority (81.9%) of the respondents agreed that CBIS improves the quality of decision making in the organization, 0.8% were neutral while a few (17.3%) disagreed. Majority (80.3%) of the respondents agreed that CBIS increases the speed of decision making in the organization, 3.3% were neutral while a few (16.4%) disagreed. Nzomo (2013) in his study on impact of accounting information system on organization effectiveness of automobile companies in Kenya found out that ICT improved decision making by providing accurate and timely reports which aided in making informed decisions.

Analysis of E-commerce Strategy

Measurement of Customer Service Factor at Kenya Airways

Majority (85.3%) of the respondents agreed that CBIS offers better customer service, 1.6% were neutral while a few (13.1%) disagreed. Majority (81.1%) of the respondents agreed that CBIS makes Product/Service information available to customers, 0.9% were neutral while a few (18%) disagreed. E-Customer Relationship Management helps companies improve the effectiveness in interaction with customers while at the same time making the interaction intimate through individualization. The technology allows companies to foster close relationships with customers, analyze customer information and provide a coherent view of the customer which improves profitability (Bahrami, Ghorbani & Arabzad, 2012).

Measurement of Inventory Control Factor at Kenya Airways

Majority (79.5%) of the respondents agreed that CBIS enhances inventory stock control, 1.7% were neutral while a few (18.9%) disagreed. Krishnaveni and Meenakumari (2010) in their study on usage of ICT for information in higher education institutions found out that usage of ICT improved inventory control, allocation of resources, fiscal management, communications, personnel services, records and employee productivity among many others.

Majority (81.2%) of the respondents agreed that CBIS reduced order cycle time, 1.6% were neutral while a few (17.2%) disagreed. These results are supported by Fasaghari, Roudsari and Chaharsooghi (2008) in their study on assessing the impact of information technology on supply chain management in Iran. The researchers found out that 90% of the respondents surveyed agreed that IT impacted on supply chain management positively as it facilitates inter-organisational communication and intern reduced cycle times.

Measurement of Market Reach Factor at Kenya Airways

Majority (78.7%) of the respondents agreed that CBIS enables response to market demands, 1.8% were neutral while a few (19.7%) disagreed. Wachira, Muturi, and Sirma (2014) in their study on an evaluation of perceived effect of ICT's on the performance of SACCO's in Kenya: Nairobi County supports this argument. They found out that application of ICT helped SACCOs cultivate new markets and gain competitive edge.

Majority (75.4%) of the respondents agreed that CBIS enhances sales forecast accuracy, 2.5% were neutral while a few (23.1%) disagreed. Majority (81.1%) of the respondents agreed that CBIS provides good market intelligence, 3.3% were neutral while a few (15.6%) disagreed.

Analysis of Communications

Measurement of Use of CBIS to Acquire New Customers Factor at Kenya Airways

Majority (83.6%) of the respondents agreed that CBIS is easily accessible to new customers, 2.5% were neutral while a few (13.9%) of the respondents were in disagreement. Ashari, Heidari and Pavaresh (2014) support these results in their study on improving small and medium-sized tourist enterprises performances through strategic use of information communications technology: ICT challenges and opportunities. They found out that ICT enables quick identification of customer needs and reaching potential customers with comprehensive, personalized and up-to-date products and services that satisfy their needs.

Measurement of Marketing Strategy Factor at Kenya Airways

Majority of (76.2%) of the respondents agreed that CBIS improves market share, 1.7% were neutral while a few (22.1%) disagreed. These findings are in agreement with Bethapudi (2013) findings in his study on the role of ICT in tourism industry in Hyderabad found out that ICT improved business potentiality and that social media was an effective tool in promoting online marketing for enterprise.

Majority (81.2%) of the respondents agreed that CBIS improves brand recognition, 1.6 % were neutral while a few (17.2%) of the respondents disagreed.

Measurement of Work output at Kenya Airways

Majority (81.1%) of the respondents agreed that CBIS presents timely and accurate information, 1.6% were neutral while a few (17.2%) disagreed. Ghogare and Monga (2015) in their study on "E-Agriculture" introduction and configuration of its application support this study results. They found out that application of ICT in agriculture improved farm management by providing timely and accurate information and knowledge to farmers that enabled them to make critical decisions such as what to plant, when to plant and other environmental factors in their areas.

Majority (76.9%) of the respondents agreed that CBIS gives precise and complete information, 1.7% were neutral while a few (20.5%) disagreed.

Correlation Analysis

Table 1 is a Pearson correlation matrix illustrating the relationship between the independent variables (communications, integration, efficiency and e commerce) and organizational performance at Kenya Airways. The study found out that there was a relationship between the variables and the performance of Kenya Airways.

The highest correlation was between integration (r=0.867) and organizational performance of Kenya Airways while the least correlation was between communication (r=0.800) and organizational performance of Kenya airways. A correlation of +1 means there is a perfect positive linear relationship between variables (Young, 2009).

Table 1: Correlational Analysis Table

		C	E	I	E C
Organizational Performance	Pearson Correlation	0.800	0.858	0.867	0.863
	Sig.(2-Tailed)	0.158	0.000	0.000	0.000
	N	122	122	122	122

Regression Analysis

Table 2 shows the regression analysis of the model. When efficiency was regressed against organizational performance, R^2 obtained was 0.736. The value 0.736 implies that the factor efficiency explains 73.6% of the variability of organizational performance with the other factors R^2 value was 0.764, 0.752 and 0.640 for Integration, E Commerce and Communications respectively. This shows Integration explains 76.4% of the variability of organizational performance and E Commerce explains 75.2% of the variability of organizational performance while Communications explains 64% of the variability of organizational performance. That shows that Integration had the highest variability while communications had the lowest.

Table 2: Regression Analysis Table

Variable	R	R square	Adj R square	Std Error
E	0.858	0.736	0.740	0.0975
I	0.874	0.764	0.760	0.0996
E C	0.867	0.752	0.750	0.0935
C	0.800	0.640	0.640	0.0800

Hypothesis Testing of the Study Variables

Table 2 shows the overall significance test of the factors. Significance test results for the relationship between efficiency, integration, e commerce, and communications and organizational performance of Kenya Airways were tested using SPSS version 22 at 80% confidence level. The results obtained indicated that only integration and e commerce were statistically significant. Popular α-levels are 10% (0.1), 5% (0.05), 0.5% (0.05) and 0.01% (0.001) (Fisher 1926).

The first objective of this study was to assess the effect of efficiency on organizational performance of Kenya Airways.

The hypothesis to test for this specific objective was:

H_{01}: There is no relationship between efficiency and organizational performance of Kenya Airways.

When the factor efficiency was regressed against dependent variable (organizational performance) the results indicated that t=0.2840, p=0.264 at 80% confidence level. This indicates that the factor efficiency is not statistically significant at 80% confidence level. Therefore the null hypothesis was accepted. These results are consistent with the findings of Dharni (2010) in his study on CBIS in the manufacturing sector: a study of procurement, implementation, use and evaluation. He found out that efficiency associated with the adoption of IS did not have significant influence on firm performance (results obtained were t=2.91, p= 0.054).

The second objective of this study was to evaluate the effect of integration on organizational performance of Kenya Airways.

The hypothesis to test for this specific objective was:

H_{02}: There is no relationship between integration and organizational performance of Kenya Airways.

When the factor integration was regressed against dependent variable (organizational performance) the results indicated that t=19.088, p=0.000 at 80% confidence level. This indicates that the factor integration is statistically significant at 80% confidence level. Therefore the null hypothesis was rejected.

The findings of this study are supported by Farhanghi et al (2013) in their study on the effect of information technology on organizational structure and firm performance: an analysis of consulting engineers firms in Iran. They found out that IT had significant influence on organizational structure of a firm (t=8.810, p<0.075) and also IT had significant influence of firm performance (t=3.680, p<0.126). They suggested that IT enable organizations to address demands for increased information processing and allows managers to design organization structures that are flexible.

The third objective of this study was to determine the effect of e commerce on organizational performance of Kenya Airways.

The hypothesis to test for this specific objective was:

H_{03}: There is no positive relationship between e commerce and organizational performance of Kenya Airways.

When e commerce factor was regressed against organizational performance the results indicated that t=2.474, p=0.015, at 80% significance level. This indicates that the factor e commerce is statistically significant at 80% confidence level. Therefore the null hypothesis was rejected.

These findings are similar to the finding of the study by Karim, Owomoyela and Oyebamiji (2014) in their study on electronic commerce and business operations: empirical investigation of business in Nigeria. They found out that adoption of e commerce by supermarkets in Nigeria had a significant impact on the service operations with (t=8.118, p<0.05). They suggested that e commerce had improved service operations, reduced cost of operations and availed more choices to customers than they could easily locate otherwise.

The fourth objective of this study was to determine the effect of communications on organizational performance of Kenya Airways.

The hypothesis to test for this specific objective was:

H_{04}: There is no positive relationship between communications and organizational performance of Kenya Airways.

When the factor communications was regressed against the independent variable (organizational performance), the results indicated that t=1.422, p=0.158 at 80% confidence level. This indicates that the factor communications is not statistically significant at 80% confidence level. Therefore the null hypothesis was accepted.

The findings of Muda, Rafiki and Harahap (2014) in their study on factors influencing employee performance: a study of Islamic banks in Indonesia indicate that communication had a partial effect on the employees' performance of the two Islamic banks in Indonesia with (t=4.287, p<0.000). They concluded that the factors of job stress, motivation and communication do simultaneously affect the employees' performance at the two Islamic banks.

Overall Regression Model

The overall regression model was established by extending the hypothesized relationship among the variables represented in the regression equation. In the hypothesized relationships, organizational performance was set as dependent variable while independent variables were; efficiency, integration, e commerce and communications. All the variables were tested at of 80 % confidence level (2-tailed test).

The overall regression model was denoted as:

$$Y=\beta_o + \beta_1X_1 +\beta_2X_2 + \beta_3X_3+ \beta_4X_4 + \varepsilon$$

Where Y is the dependent variable (Organizational Performance), β_0 is the regression constant, β_1, β_2, β_3 and β4 are coefficients of independent variables, X_1 is the Efficiency, X_2 Integration X_3 E-Commerce Strategy and X_4 Communications and ε the error term.

Substituting in the β values from table 4.18 in the overall regression model, the result was:

$$Y = 0.271 + 0.777X_1 +1.129X_2 + 0.543X_3 +0.639X_4 + \varepsilon$$

Table 3: Overall Regression Equation Table

	Unstandardized Coefficients		**Standardized Coefficients**	**T**	**Sig (p value)**
	B	standard error	Beta		
Model Constant	0.271				
E	0.777	0.059	0.800	0.2840	0.264
I	1.129	0.206	0.867	19.088	0.000
E C	0.543	0.220	0.392	2.4740	0.015
C	0.639	0.221	0.140	1.4220	0.158

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The summary of the study is presented in this chapter as guided by the specific objectives. This is followed by conclusion and recommendations. The chapter finally gives directions on areas of further research.

Summary of Findings

The general objective of the study was to investigate the role of computer based information system on organizational performance in the airline industry in Kenya. The study relied on theoretical and empirical studies on the role of computer based information system on organizational performance, a conceptual model of the relationship between the independent variables and the dependent variable was developed. The hypothesized relationships were then tested.

The extent to which efficiency affects organizational performance of Kenya Airways.

Efficiency had a relationship with organizational performance at Kenya Airways Company. However efficiency did not have a statistically significant influence on the organizational performance of Kenya Airways. Consequently the null hypothesis was accepted. All three factors of efficiency; reduction in agency costs, timeliness in reporting and real time data exchange were found to have contributed significantly to efficiency influencing performance of Kenya Airways.

These results are consistent with the findings of Almilia and Surabaya (2009) in their study on determining factors of internet financial reporting in Indonesia. The study revealed that the use of Electronic reporting reduced agency costs by reducing information asymmetry and monitoring costs, improved on timeliness in reporting compared to paper-based corporate reporting and also improved on readability, usability and understandability of the information.

The extent to which integration affects organizational performance of Kenya Airways.

Integration had a positive relationship with organizational performance of Kenya Airways Company. The null hypothesis that there is no relationship between integration and organization performance at Kenya Airways was rejected. Integration also had a statistically significant influence on organizational performance of Kenya Airways. Three factors namely coordination of activities, reduction of uncertainty and decision making process contributed to integration influencing organizational performance at Kenya Airways Company.

These findings are consistent with the research findings by Bazhenova, Taratukhin and Becker (2012) in their study on impact on information and communication technologies on business process management on small and medium enterprises in the emerging countries. The researchers found that due to the integration of business processes implemented by Enterprise Resource Planning (ERP), it became possible to eliminate boundaries between functional departments thus increasing the access to information and its seamless movement between the departments. This had a positive effect on organizational performance.

The extent to which e-commerce strategy affects organizational performance of Kenya Airways.

E-commerce strategy had a relationship with organizational performance of Kenya Airways Company. However e commerce did not have a statistically significant influence on the organizational performance of Kenya Airways. Consequently the null hypothesis was accepted. All the three factors of e-commerce strategy namely customer service, inventory control and market reach contributed significantly to e-commerce strategy influencing organizational performance of Kenya Airways Company.

Jahanshashi et al (2012) in their study on Analyzing the Effects of Electronic Commerce on Organizational Performance: Evidence from Small and Medium Enterprises. The researchers found out

that e-commerce application was important to small and medium enterprises because it improved marketing systems, payment systems and ultimately increased efficiency of the workers and the profits of the organization (firm performance). This had an impact on organizational performance.

The extent to which communications affects organizational performance of Kenya Airways.

Communications had a relationship with the organizational performance of Kenya Airways. However, communications did not have a statistically significant influence on the organizational performance of Kenya Airways. Consequently the null hypothesis was accepted. All the three factors of communications namely acquire new customers, marketing strategies and work output contributed significantly to the effect of communications on organizational performance of Kenya Airways. Dawson (2007) argued that purchase of computer based information system by individual departments in an organization or purchase of complicated CBIS systems led to challenges in the internal communications in the organization negating the benefits of CBIS. This had an effect on the overall organizational performance.

Conclusions

Emanating from the analyses, the study found out CBIS positively influenced organizational performance of Kenya Airways. Only two factors statistically influenced organizational performance (integration and e commerce strategy). The factor integration was found to have had the highest statistically significant influence on organization performance of Kenya airways.

The study results are consistent with Teixeira, Koufteros and Peng, 2012 in their study on Organizational Structure, Integration, and Manufacturing Performance: A Conceptual Model and Propositions. They found out that computer based information system enhanced internal and external organizational integration. CBIS increased the integration and flow of information between employees, allowing them to improve the coordination of activities. They further argued that, internal integration reduced uncertainty by improving communications between departments which improved decision-making process. This had a positive influence on organizational performance.

The results of the study indicate that e-commerce strategy had statistically significant influence on organizational performance of Kenya Airways. These findings of the study are consistent with the finding of Barkley & Markley (2007) in their study on E-Commerce as a Business Strategy: Lessons Learned from Case Studies of Rural and Small Town Businesses. They found out that most businesses used e-commerce because it provided the opportunity for increased profits (through increased sales or lower costs) and improved the sustainability of the firms. They suggested that e-commerce benefitted an organization in product design, supply and inventory management, production, marketing, sales and distribution, and customer service. Thus e commerce has a positive influence on organizational performance

Recommendations

Four factors were considered in the study. Out the four, integration should be accorded the highest priority at Kenya Airways since according to the study it had the highest statistical significance. This factor would lead to KQ achieve competitive advantage over the competitors. The second priority should be given to e commerce strategy because from the results it had the second highest statistical significance. Kenya is regional hub for finance and trade in the East African region with a population of over 129 million. Kenya can take the

advantage and opportunities offered by e commerce in order to remain as the regional hub. Kenya Airways should accord e commerce high priority to take advantage of Kenya's trade advantage in the region.

Thirdly, the company should consider continuous evaluation of their CBIS systems with a view to upgrade or acquire new CBIS systems in the market that would address the company requirements. This will enhance effectiveness in business operation processes and hence gain competitive advantage in the industry. Finally the company needs to consider the interoperability capabilities of the CBIS systems they acquire with the systems in the industry so that they can be able to exchange information for mutual benefit.

Areas of Further Research

The study of computer based information system concentrated on only four sub-variables. It was not possible to study all factors that determine success of computer based information system. Undeniably, other factors came into play and provide perceptive results to the issue of computer based information system influencing organizational performance of Kenya Airways.

Secondly, the study relied on cross-sectional data survey where respondents were asked to assess the viewpoints on the item in the instrument. But some success factors of computer based information system are known to be strategic and dynamic in nature. Therefore, a longitudinal study would be more preferable as it could provide a better perspective of the role of computer based information system on organizational performance of Kenya Airways.

Lastly, the findings presented in this study are based on evidence gathered from Kenya Airways Company. Future research should be extended to other airlines operating in Kenya.

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