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Does Adoption of Information Technology Improve Firm Performance? A Survey of Firms Listed in the Nairobi Securities Exchange

Carolyne Wanjiku Wambu
Daystar University ,P.O BOX 44400 – 00100,NAIROBI, KENYA
cmbmlina@gmail.com

Dancan Njagi Irungu
Lecturer, School of Business and Economics ,Daystar University , P.O BOX 44400-00100 NAIROBI, KENYA
dirungu@daystar.ac.ke

Abstract
Information technology has become a major driver for firm performance in the 21st century. Many firms however, have lagged behind in the adoption of IT which a major drawback given the nature of global competition. The objective of the study is to determine the effects of the adoption of Information Technology on organisational performance which is a survey of firms listed in the Nairobi Securities Exchange. Cross sectional research design was used in the study. The study targeted the chief information technology officers, information technology managers, information system managers and managers involved in policy making decisions on computing systems in all the companies listed in the Nairobi securities exchange. Both open ended and closed questionnaires instrument was used to gather the data. The study found out that competitive advantage, cutting costs, customer service and convenience, enhancing security, and financial management are the attributes that are associated with adoption of information technology and this improves the performance of the firms listed in the NSE. The study concludes that IT adoption has an effect on performance of firms listed at NSE, in addition environmental, strategic and managerial factors have an effect of IT adoption on the performance of organisations. The study recommends that firms should invest in IT capabilities and IT resources in order to spur performance.
Keywords: Information technology, Security exchange.

Introduction

Information technology (IT) has been widely recognised as important to a firm's survival and growth (Lucey, 2005). It is a fundamental and an integral part in supporting, sustaining, and growing a business. The Knowledge of this has made many corporations make huge investments in IT. Gartner (2010), reports that despite the current economic slowdown, worldwide IT spending reached $3.4 trillion in 2010, a 4.6 per cent increase from 2009. Advanced IT helps firms to deal with market complexity and to gain competitive advantage (Crichton & Edgar, 1995). Law and Jogaratnam (2005), for example, showed IT to be an essential component of the strategic planning process for boosting hotel business performance and improving customer service. Advanced IT can distinguish market offerings, help firms to meet customer expectations, deliver service standards and performance and mobilize employees and business partners within the organization.

Background

Society's widespread use of Information Technology (IT) requires firms to consider the adoption and use of these technologies as a necessary condition of maintaining competitiveness in the market. Their current development has created an economic space identified by new terms in the literature, such as e-economy, digital economy, information economy, or new economy (Mustafa, & Gashi, 2006). The revolution in information technologies began in the United States in the 1970s (Vijayasarathy & Robey, 1997). The first academic papers, which appeared during this period, stress the importance of information systems (Galbraith, 1993) applied to management. In the 1980s, academic studies of IT developed theoretical work and case studies (Porter & Millar, 1985). It is only in the last two decades that considerable technological advances have promoted the acceptance and adoption of IT in society. Their development has created significant changes in firms, in their organizational structures and relationships with other firms, and in their processes. These changes have helped to improve the firms' economic performance (Bharadwaj, 2000) and relational performance (Vijayasarathy & Robey, 1997).

Different authors have developed definitions of the concept of IT. Porter and Millar (1985), understood that "Information technology must be conceived of broadly to encompass the information that businesses create and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information. Then, computers, data recognition equipment, communications technologies, factory automation, and other hardware and services are involved."

Sriram and Stump (2004), argued that investment in IT brings improvement in productivity and benefits for firms. On the other hand, this investment facilitates integration of the supply chain, improves interfirm relationships, and thus improves performance. According to D'Avanzo, Von Lewinski, and Van Wassenhove (2003), "supply chain planning," "linkages with customers," and "linkages with suppliers" offer the best opportunities for operational improvement. All these abilities are transformed by IT.

IT use has brought significant changes in products, processes, structures, and infrastructures. These changes have affected firm performance (Porter & Millar 1985). IT alters profitability because it generates competitive advantage, primarily in costs and marketing. While investment in IT decreases the firm's costs of obtaining economies of scale (Zhao, Dröge, & Stank, 2001), it also reduces inventory costs (Power & Sohal, 2002) and transaction costs (Steinfield, Kraut, & Plummer, 1995). On the other hand, IT use offers advantages in marketing, as firms (industrial and distribution) can know their customers better, interact with them and respond more rapidly to changes in the market. Firms can thus develop new products to meet the needs detected (Stein and Sweat 1998; Yu, Yan, & Cheng 2001).

In contrast, some studies demonstrate the absence of a positive direct relationship between the specific use of IT and firm performance, a finding currently termed the IT paradox (Devaraj & Kohli, 2003; Devaraj et al., 2007; Campos & Yagüe, 2007; Sriram & Stump, 2004). Studies such as those by Brynjolfsson (1993) offer explanations for the apparent lack of a positive direct relationship between IT use and firm performance. Among other issues, they stress the methodological problems involved in estimating the different concepts, inappropriate selection of the study sample, problems of overinvestment due to agency costs and delayed performance as a result of "adjustment costs" or learning curves.

The Nairobi Stock Exchange (NSE)

The Nairobi Securities Exchange (NSE) is the principal stock exchange of Kenya. It began in 1954 to oversee stock exchange in Kenya. The NSE is Africa's fourth largest stock exchange in terms of trading volumes, and fifth in terms of market capitalization as a percentage of GDP (Mwarari & Ngugi, 2013). The Exchange works in cooperation with the Uganda Securities Exchange and the Dar es Salaam Stock Exchange, including the cross listing of various equities.

Companies listed in the various Stock Exchange(s) in the world tend to be the industry leaders in various aspects one of them being technology and technology adoption. This tends to influence other companies and institutions. As such the companies listed in the Nairobi Securities Exchange (NSE) would have an influence on the adaption of Cloud computing in Kenya. Most of the small and medium (SME) sized companies will be looking at the big corporations listed on the NSE to see how they react to the new technology wave of cloud computing and IT adoption.

Cloud computing is being integrated into companies operations worldwide and Kenyan businesses are looking for ways to benefit from this technology. In 2008, CIO Magazine surveyed 173 Information Technology and business leaders to get first-hand feedback on what enterprises really think about cloud computing, and how, when and why they plan to deploy it in their enterprises. The survey unveiled some of the factors that influence a company to adopt new technologies. This study seeks to determine the effects of the adoption of Information Technology on organisational performance with a survey of firms listed on the Nairobi Securities Exchange.

Research Objectives

To determine the effect of IT adoption on the performance of firms listed at NSE

LITERATURE REVIEW

IT management capabilities are critical for the survival of the firms in the 21st century. It refers to the ability of an organisation's IT and management staff to administer IT resources and transform them for the creation of business value for the organisation (Peppard, 2007). IT management capability refers to the management of all heterogeneous IT components within the firm. IT management capability is noticeable in the areas of planning, investment decision making, coordination and control (Bhatt & Grover, 2005; Kim et al., 2011). Management staff within a firm must observe the transitions and changes in external markets to identify opportunities and threats. Changes in the external environment may necessitate manipulation of existing business strategies to sustain competitive advantage. In order to support these renewed strategies, IT management must take appropriate actions to ensure the alignment of IT resources with business strategies. The importance of this alignment has been highlighted in the literature. IT resources and business strategies are interwoven; Feeny and Willcocks (1998), assert that IT resources influence business strategies, and that business strategies have an influence on IT resources. Ravichandran and Lertwongsatien (2005) identify that when a firm's IT resources are controlled by a higher level of management, they receive better support. This, in turn, influences the effectiveness of changes in the business processes, products and services of the firm. Melville (2004) noted that successful implementation of business process innovations requires the deployment of the right IT in the right

business process.

IT personnel expertise is defined as the fundamental skills that IT staff possesses in an organisation (Lee et al., 1995). It is critical that a firm's IT staff hold a combination of skills (e.g. awareness and management of IT), knowledge of IT elements (e.g. knowledge about operating systems, databases, networks security and programming), and knowledge of technology management for the efficient management of a firm's IT resources. However, IT personnel expertise becomes an intangible asset for firms when IT personnel understand how the firm's business strategies are combined with IT skills (Feeny & Willcocks, 1998; Rockart et al., 1996; Ross et al., 1996). As IT becomes an integral part of business operations, IT personnel who hold business knowledge are able to formulate effective IT solutions and leverage their technical skills to align the firm's strategies to changing environments. Therefore, firms with competent IT personnel have a higher chance of meeting the demands of changing environments by aligning IT strategies with business strategies, developing reliable and cost effective systems, and anticipating IT needs for business services better than their competition (Rockart et al., 1996; Bhatt & Grover, 2005; Kim et al., 2011).

IT infrastructures in organisations are composed of all IT assets such as software (e.g. CRM, SCM, HR payroll), hardware (e.g. computers, servers, network and communication devices) and data to support the information systems. Duncan (1995), identified the strategic potential of IT resources as sharable and reusable possessions of a firm. Flexibility in the IT infrastructure tends to evolve independently, integrating with new technologies and supporting the continuous changes in the alignment of IT resources to business strategies. This flexibility enables the IT resources that provide the foundation for a firm's existing business processes to support future applications also (Duncan, 1995). IT infrastructure flexibility enables organisations to develop, diffuse and maintain various information systems efficiently in the context of changing business environments, market needs and strategies (e.g. partnerships, mergers, strategic alliance) (Weill et al., 2002). For a firm to have the ability to reengineer its business processes, it must rely on the flexibility of its resources and their applications. Greater IT infrastructure flexibility enables firms to accommodate required changes and maximise the advantages provided by their existing resources more effectively than their competition. Studies indicate that flexible IT infrastructure can facilitate the achievement of integration and modularity among and within information systems (Byrd & Turner, 2001).

RESEARCH METHODOLOGY

The study adopted cross sectional research design. The population of the research study were the 61 companies listed on the Nairobi Securities Exchange as at 1st January, 2014 (NSE, 2014). The target population for this study were the chief information technology officers, information technology managers, information system managers and managers involved in policy making decisions on computing systems from the 61 firms listed on the Nairobi Securities Exchange. A sample of 72 was used for the study. Questionnaires were used to gather primary data while documentary analysis was done to gather secondary data. Six questionnaires were pretested in two firms that to ensure reliability and the validity of the instrument. Statistical Package for Social Sciences (SPSS) version 21 was used to analyse the data.

STUDY FINDINGS

Response rate

Out of the 72 respondents that were targeted, 51 filled in and returned the questionnaires making a response rate of 70.8% which was considered satisfactory.

Length of Time the Respondent Has Worked in the Organization

The study sought to determine the length of time the respondent has worked in the organisation. The results are shown in Table 4.1

Table 4.1 Length of Time the Respondent Has Worked in the Organisation

	Frequency	Percent
Less than 1 year	11	21.6
1 to 3 years	21	41.2
4 to 20 years	12	23.5
More than 20 years	7	13.7
Total	51	100.0

The findings indicate that most of the respondents 21(41.2%) had worked in the organisation for 1 to 3 years, 12(23.5%) for 4 to 20 years, 11(21.6%) for less than 1 year and 7(13.7%) for more than 20 years. This indicates that most of the respondents had worked in the firms for more than 1 year and had enough experience and knowledge to answer the study's questions.

IT adoption and Competitive advantage

The study sought to determine the effect of the competitive advantage on business performance in the firms. The researcher used a Likert scale with Strongly Agree (1),Agree (2), Neutral (3), Disagree (4) and Strongly Disagree (5) were the levels of agreement. The findings indicate that 75% of the respondents strongly agreed that the Organization has improved it profit margin due to information systems, 49% of the respondents strongly agreed that information systems have helped in retaining loyal customers, 41% of the respondents were neutral that More investors are ready to partner with the Organization due to information systems while 75% of the respondents agreed that The Organization has improved it total revenue due to information systems and 45% of the respondents agreed that There is a growth in the market share due to information systems.

This indicates that the firms have improved it profit margin, total revenue, information systems have helped in retaining loyal customers, there is a growth in the market share due to information systems and more investors are ready to partner with the Organization due to information systems. This is in agreement with research by Bharadwaj (2000), which found that firms with superior IT capability (IT leaders) demonstrated better business performance than their counterparts by contending that the IT leader firms can leverage IT related resources to create a unique IT capability, which can be a source of competitive advantage that generates superior business performance. Porter (2001), also agrees that companies can improve their business performance by leveraging their IT capability to increase revenues, reduce costs, or both.

IT adoption and cost management

The study sought to determine the effect of adopting IT on cutting costs. The findings indicate that 63% the respondents strongly agreed that information systems have led to switching to a less expensive employee health insurance program while they were 45% of the respondents were neutral that there have been cases of laying off employees due to information systems and that Information systems have helped in lowering monthly bills, 43% of the respondents were neutral that information systems have led to change hours of service and 31% of the respondents were neutral information systems have offered more assistance in and restructuring debt.

This indicates that information systems have led to switching to a less expensive employee health insurance program in the firms listed on the NSE while there is no noticeable effect of information systems on that cases of laying off employees, lowering of monthly bills, information systems have led to change hours of service and information systems have offered more assistance in and restructuring debt. This is in agreement with Fahy and Hooley (2002) who indicate that superior IT capability is potentially an important source for reducing marketing cost by increasing switching costs and customer loyalty. Even if IT becomes more available and homogeneous, firms with superior IT can impose switching costs on customers and thus induce their loyalty.

IT adoption and customer satisfaction

The findings indicate that 55% of the respondents strongly agreed that Information systems have led to customer satisfaction. 63% of the respondents strongly agreed that Information systems have led to integrated systems in the firm, 71% of the respondents agreed that Information systems have led to positive feedback of customers, 65% of the respondents agreed Information systems have led to reduced number of Complaints while 27% of the respondents were neutral that attending time per customer is lowered and accurate due to Information systems and 13% of the respondents were neutral that Information systems have led to the creation of multiple Contact Options for our clients.

This indicates that Information systems have led to customer self-service whenever Possible, Information systems have led to integrated systems in the firm, Information systems have led to positive feedback of customers and attending time per customer is lowered and accurate due to Information systems while there is not noticeable effect that Information systems have led to the creation of multiple Contact Options for our clients and Information systems have led to reduced number of Complaints from clients. This is in agreement with Delone and Mclean (2003), and Shih (2004), who indicated that the processing quality of an IS, which is measured in terms of ease of use, functionality, availability, flexibility, reliability and response time is enhanced thus leading to better customer service and better organizational performance.

DISCUSSIONS

On the effect of the competitive advantage on business performance in the firms the study found out that the respondents strongly agreed that the organization has improved in profit margin due to information systems while they agreed that the organization has improved its total revenue due to information systems, information systems have helped in retaining loyal customers, there is a growth in the market share due to information systems and more investors are ready to partner with the organization due to information systems. Rockart and Scott-Morton (1984) posit that traditional information systems are crucial for firm's competitive position. They used a format of Leavitt's (1965) organizational representation to show that these systems through their effect on staff, structure of the organization, and process of management can affect competitive result. The studies of

Parsons (1983b), and Ives and Learmonth (1984) suggest that information technology have created opportunities for firms to compete. They suggested four aspects of opportunities for IT competing and supportive oriented strategy and performance of a firm namely operational and functional efficiency improvement; usage of inter-organizational relatedness; IT product initiative; and acquiring bargaining benefit overriding one's customers and suppliers influence.

The study also found out that on the effect of the cutting costs on business performance in the firms, the respondents agreed that information systems have led to switching to a less expensive employee health insurance program while they were neutral that there have been cases of laying off employees due to information systems. Information systems have helped in lowering monthly bills, led to change hours of service and have offered more assistance in and restructuring debt.

On the effect of customer service and convenience on business performance in the firms, the study found out that the respondents agreed that information systems have led to customer self-service whenever possible, led to integrated systems in the firm, led to positive feedback of customers and attending time per customer is lowered and accurate due to information systems while they were neutral that information systems have led to the creation of multiple contact options for their clients and led to reduced number of complaints from clients. Furey (1991) points at customer service delivery enhancement via convenience provision, information provision for management use and extra services offerings as factors for information technology practices. Thus, many competing roles of IT in service embraces entry limitation, enhancing production, and generating revenue (Fitzsimmons & Fitzsimmons, 1997). Heskett et al., (1997) added that the emergence of the application of information technology is a crucial feature to customer satisfaction via various channels of delivery.

CONCLUSION

The study concludes that most of the organisations used cloud computing and IT Systems, invested in IT systems and used IT resources to a great extent. On the effect of the competitive advantage on business performance in the firms the study concludes that the organizations have improved their profit margins and their total revenue due to information systems, information systems have helped them in retaining loyal customers, there is a growth in the market share due to information systems and more investors are ready to partner with the organizations due to information systems.

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