Management information systems capabilities and organizational performance of supermarkets in Nairobi City County, Kenya

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Abstract

The trend of performance of supermarkets in Kenya has deteriorated over the recent years which have seen supermarkets such as Uchumi and Nakumatt collapsing. The study main goal was to establish the relationship between management information systems capabilities and organizational performance of supermarkets in Nairobi City County, Kenya. Specific objectives guiding this study included; establishing the relationship between system infrastructure, system flexibility, system security, system automation and performance of supermarkets in Nairobi County, Kenya. Theoretical theories used in this study include; technology acceptance theory, contingency theory and lastly diffusion innovation theory. Descriptive research design was of great use to this research since it described the characteristics of the identified variables. The study focused on 174 registered supermarkets in Nairobi County. This study used simple random sampling method to construct a sample size of 121.Semi –structured questionnaires were self administered via drop and pick method to the respective ICT managers and other any other managers of various departments within the supermarkets. The importance of this study was to provide more knowledge and skills to respective supermarkets managers in curbing issues that arises due to misuse and neglect of ICT infrastructure and performance of supermarkets in Nairobi County. The major finding was that the use of ICT in supermarkets had a positive and measurable influence on performance of supermarkets in terms of market share. The study was also of importance to the scholars as it acted as a source of information in carrying out research projects. To the government, it offers a platform in creating rules and procedures to be adhered to supermarkets in Kenya.

Keywords: Hardware, Internet, Management information system, MIS Capabilities, Performance, Software, Supermarket

1. Introduction

Jobe, (2009), management information system (MIS) is the use of computers to process information for effective decision making in the management of an organization. The MIS comprised of automation of information system which aided in counting (tallying) ,accounting techniques and record keeping of which are by far the oldest including the ledger which tracked researchers business (Chene &Hodess, 2009).MIS assisted the company in positioning itself by allocating funds where needed hence improving economic and financial performance of a firm, ability to undertake control and monitoring of expenditure , lastly it increased the ability to access information on financial and operational performance which assisted in future market positioning (Jobe, 2009).Organizational performance of supermarkets globally portrays similarities such as shares trading on financial markets, growth rate predictions and online marketing of their products for wider market coverage. Dutch based supermarkets are dominated by powerful companies which are few in number and compete fiercely in regards to product quality. Andre de Waal (2016) study on "Analysing supermarket performance with the high performance organisation framework" concludes that evaluation of strengths of the internal organisation and improving product quality was a key aspect of improving organisational performance. Mungai K. (2016) study on guiding practices and supermarkets performance in Nairobi county findings were that process benchmarking leads to improved performance of supermarkets in Nairobi County.

The use of management information system in Kenya was advocated as the most appropriate strategy in attenuating the occurring effects of public swindling that have negatively affected both the public and private sectors since independence (Kihara, 2009). Kenyan supermarkets must be tailored to achieve a dominant fit in organization. It must have the ability to suit a unique organizational situation arising out of the operations. It must also position itself with the lifestyle, the norms and value system that characterizes effectiveness in decision making processes by users in the supermarkets. However, Miheso (2013) noted that integrated information management systems are part and parcel of successful operation of the Supermarkets in its existence and need to be assessed in their wider managerial operations, environmental and organizational context. Management information systems are seen to be effective if the electronic information is correct and serves widely the intended objectives of the system users' successfully. However, the study established gaps in methodology, theory and objectives guiding previous studies, the current study aimed at filling this gap by applying descriptive research design as their research method, at the same time, the study also sought to investigate shortage of hardwares, negligence and delay of software upgrades, poor internet connectivity in relation to system infrastructure. System flexibility faced a challenge of user acceptance, lack of upgrades to emerging applications versions and uncoordinated, unverified data processing. System security fell short on data verification whereby incorrect data was fed into the system by end users, data authentication measurements were not adhered to and data easily exposed supermarkets secrecy and data protection measurements were easily taken for granted leading to systems failures. Major issues were noted on system automation in regards to its operability criteria, communications topology setup for the systems to transfer data and lastly computation of day to day activities within the supermarkets.

2.0 LITERATURE REVIEW

2.1 Theoretical review

Theoretical review included study of the theories that were relevant to the study field, management information system capabilities and performance. The following theories guided this study; technology acceptance theory which suggested that new technology indirectly affected individual's attitude in the supermarkets towards adoption and acceptance of technology by influencing how easy it was to use it and its perceived usefulness to the supermarkets. Contingency theory emphasized the importance of both the leaders' characteristics and how favorable the environment was in which the leader operates. Innovation- diffusion theory was applied to scrutinize the adoption of various management information systems in supermarkets in Nairobi City County.

2.2 Empirical review
2.2.1   Information System infrastructure and organizational performance concept

Jayaram, Shawnee, Droge (2000) thesis on information system infrastructure effects and process improvements on supply chain time performance includes of an empirical study carried out on 57 top tier automotive industries to examine the direct and complimentary effects of information system infrastructure (ISI) and process management on periodic performance. The findings are that the three dimensions of ISI namely; information technology, design manufacturing technology and manufacturing technology directly influences at least one dimension of time based performance. The study also supports the idea of concurrent operation of information system infrastructure and process improvement to enhance cycle time performance in supply chain. However the study never talks of how internet connectivity measures contribute to process improvement and time management.

Choi and Tulu (2017), study on user experience and effective system interface in a health application. The study uses mixed methods consisting of a controlled experiment and a follow up survey to test our hypothesis. The studies findings are that system interface in this case touch technique and target direction has a significant impact on the task completion time as well as application user interfaces perceived usability and likability. The study main focus is on the end user performance and not organizational performance in general hence this study sought to answer or expose the influence of management information system capabilities and performance of supermarkets in Nairobi County, Kenya.

2.2.2 Information Systems' flexibility and organizational Performance

J. Gebauer (2005), studies on information system flexibility and performance of business processes. The study implemented the optimization model to relate business process characteristics with two basic types of information system flexibility namely; flexibility to use the IS and flexibility to change the IS. The findings were that area of concentration should have been on flexibility of information system management to offer support to high uncertain. The study however failed to acknowledge other MIS capabilities. The study only focused on the changes made and failed to touch on user perceptions and data processing abilities. This study goal is to establish the influence of system flexibility in regards to user acceptance, version upgrades and data processing affects the overall performance of supermarkets in Nairobi, Kenya.

C. Wanjiru (2017) performed a case study on youth polytechnic development projects in Embu county and management information systems attributes on project performance. . Data collected

was analyzed by use of descriptive statistics; frequency tables mean. Cronbach's alpha test was used in assessing reliability of research instrument. The study concluded that software use to generate quality information needed by project manager helped them perform their tasks professionally thus increasing project success. The study also concluded software quality had a great role in system acceptance by users however the study is only limited to the software aspect of IS whereas this research paper aims at investigating the overall effect of MIS capabilities and performance of supermarkets in Nairobi City County, Kenya.

2.2.3 Information Systems' Security and organizational Performance

Information security has been on the frontline in maintaining companies' integrity and secrecy. Information is a valuable asset of any firm planning to succeed in its operations. In today age, the company that has the right, correct, up to date information in the right time is most likely to beat its competitors.

Kong, Jung, Lee and Yeon (2015) carried out a research of the Korean Securities Industry on information security and organizational performance. Study population was retrieved from the Korean financial investment association and comprised of group employees of sixteen domestic branch security officers. This study finding were that activities in relation with information technology service infrastructures, investments, information security and sharing were confirmed as motivational factors and not as hygiene factors as per Hertzberg's two-factor theory. The study did not relate management information security and performance

Mwita (2015) investigated the factors affecting information systems security effectiveness in university of Nairobi. The target population was all administrative staff of University of Nairobi. The study concluded that the IS security model effectiveness was significant at the five percent significance, this indicated that a well formulated and communicated ICT security policy, top management support of IS security related matters, training and awareness creation and organizational culture strongly influenced the effectiveness of IS security. The current study focused on relating management information systems security and performance.

2.2.4 System automation and organizational Performance

The advancement of technology had led to its many outlets in the market. It was easily purchased, developed and replaced. Systems automation in firms had largely increased its node of operation where by most of the activities were machine based hence requiring minimal supervision. However, the effects of systems automation were primarily limited to aviation domain and studies produced conflicting feedback on the impact of automation on team performance, coordination and communication (Wright, 2002).

Parasuraman et al (2000) proposed an automation model that consisted of information processing, analysis, and decision selection and action implementation. The objective were to assess automation effects as applied in the several stages of information processing on performance and team coordination in complex decision making process.Almazan (2017) study on the influence of IS on organizational results: case study 133 companies Tamaulipas Mexico findings were that companies that were keen on improving the quality of information and accompanying systems had a productive impact on overall performance of the organization

Abugabah (2011) looked at both theoretical model and critical review on the influence of information systems automation on user performance. The study findings were that a proposed model that links user characteristics, system and information quality and task technology were fit to enable an information system to be easily operated hence improving user performance.

Bacha (2012) study on how information systems impacts performance key and guiding activities of a firm which included a sample size of one hundred firms findings were information systems had a relative influence on the performance of key activities or operations within a firm especially on the totality and value creation of the key activities

2.3 Conceptual framework

The independent variables in this study included; user interface, reporting and analysis, security and information systems automation, whereas the dependent variable is performance.

Independent Variable   **Dependent Variable**
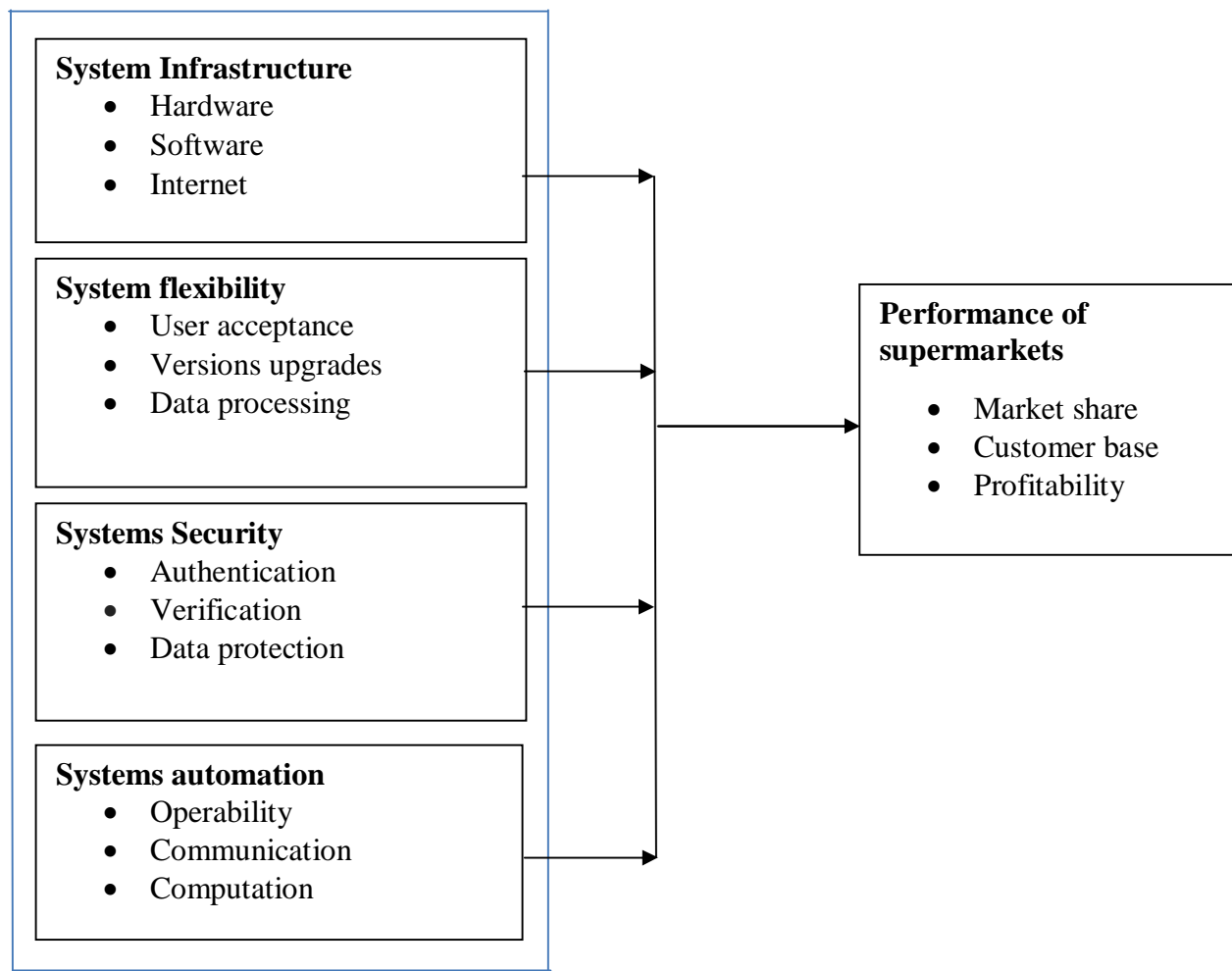
MIS Capabilities

Figure2.1: Conceptual Framework. **Source: Author (2019)**

3.0 Research methodology
3.1 Research design and target population
 The study utilized descriptive research design since it gives a description on the differing traits. Area under study being Nairobi City County had a total of 174 registered supermarkets according to a survey by Consumers Federation of Kenya (Cofek, 2016) stated that, there are 174 registered supermarkets in Nairobi. The study focused on all 174 registered supermarkets in Nairobi County.

3.2Sampling Procedures
Simple random sampling method was utilized in this study since it was probabilistic. Elements in the population had an equal chance of being selected at each draw hence the feature of randomness. The composition of samples did not necessarily determine whether or not it was a random sample (Kothari 2008)
The below formula was useful in determining the sample size of the study Thompson (2012);

$$n= \frac{Np(1-p)}{((N-1) B^2)/4 + p(1-p)}$$

Where: B=0.05: Error of estimation magnitude.
N=174: population size.
p=0.5: anticipated population.
n= 121 sample size

The study used sample size of121 ICT managers from supermarkets in Nairobi County. In cases where supermarkets outsourced ICT managers, managers from various departments were approached to assist in questionnaires distribution.

3.3 Data collection and pilot testing
 Questionnaires were used for data collection. Respective managers were provided some which were later to be collected. The whole process was made efficient and effective where by registry of every questionnaire was necessitated. Pilot testing was conducted after recipient of filled in questionnaire in order to spot errors that would inhabit proper data analysis The reliability was measured by a test re-test method. Respondents were provided with the respective tools and re-administering of the same tools after seven days.

3.4 Validity
If the pilot test was found to be effective, the researcher was to carry out validity of the study .Validity on the other hand indicated whether the tools measured what they were designed to measure (Brotherton, 2008). Content validity was used to measure the tools identified. Cooper and Schindler (2006) concluded that content validity as a measure represented a particular domain of indicators of an individual subject.

3.5 Reliability
Reliability was greatly achieved when several concurrent items were measured at once using uniform testing procedures. The researcher measured reliability based on the pilot group of 121 supermarkets randomly picked from our target population. Internal consistency applied Cronbach's Alpha to measure instruments reliability. Alpha values range from 0 to 1 with a coefficient value of 0.6 being reliable (Mugenda, 2008).

3.6 Data Analysis

Collected data was inspected for completeness and consistency. It was later coded and tabulated. The research provided both qualitative and quantitative data which was analyzed using descriptive statistics (measure of central tendency, regression and measures of variations) by use of frequency tables and charts. The regression equation estimation was employed to analyze the independent variable affected the dependent variable. The regression equation will be ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$):

Where Y = Performance

X_I = System infrastructure

X_2 = System flexibility

X_3 = Systems security

$X_{4\ =}$ Systems automation

ε = Error Term

B1-β4represents change in Y by each independent variable.

MIS Capabilities regression equation will be ($Y= X_1+X_1M^\varepsilon+\varepsilon$): where M= MIS capabilities

The above processes were vital in ensuring that data collected was organized in a systematic manner that facilitated analysis (Mugenda & Mugenda, 2003). The ANOVA test, most preferably the one- way ANOVA was conducted to determine the existence of significant variations between the variables.

4.0 Research findings and discussion

The findings of this study revealed that all the study variables (system infrastructure, system flexibility, systems security and systems automation) had a significant influence on Performance of supermarkets in Nairobi. Regression test showed that a unit change in system infrastructure while holding the other factors constant would enhance the performance of supermarkets in Nairobi County by a factor 0.539 which is significant at 0.004. descriptive results further showed that data management in the supermarket has been simplified (M= 4.38), the user interface creates efficiency of activities in the supermarket (M= 4.18) and that data management in the supermarket has been simplified (M= 4.17), these findings concurs with the study findings by Taylor (2013) that support of changes in response and the agility of an organization and arising of the administration and business are necessary requirements when it comes to creating a strong foundation of a well-designed information system that is also coherent

Further, the study revealed that MIS assists the manager in organizing the supermarket and make meaningful decisions (M= 3.95) the hardware in use are of good quality (M= 3.92) and that Internet connectivity assist department integration hence information sharing (M= 3.71) these findings goes hand in hand with the study findings by Urhuogo, Addo, and Williams, (2014), when performance is well driven and information gaps well filled, then there is better flow of information through MIS. Throughout the levels, supply of appropriate information is provided which helps in removing hindrances of giving inappropriate information. On the influence of information system flexibility on organizational performance of supermarkets in Nairobi City County, this study revealed that a unit change in system flexibility while holding other factors constant would enhance the performance of supermarkets in Nairobi County by a factor of 0.622, results also showed that the accuracy of the data used determines how effective information will be of benefit to the supermarket (M=4.33), data gathering and sources within the supermarket are reliable (M=4.15) and that the programs in use are up to date (M= 4.12). These findings concurs with the study findings by Anthony (2010) planning that is strategic and possible decision

making is made efficient to the management, which also enhances efficient flow of information at all management levels which is also easy, fast and secure enabled by MIS through overall operational flow.

Further the study revealed that the supermarket system creates output reliable data sorting from the sales and stocks (M= 3.97) the supermarket system meets supermarkets goal and objectives (M= 3.81) and that the MIS in the supermarket is responsible for data processing (M= 3.77). These findings go hand in hand with the study findings by Wejnert, 2011) that efficiency is enabled through management and control of all organizational activities that are established by MIS.

On role of MIS in promoting information security, this study uncovered that implementation of MIS ensured that Sales and records systems in the supermarket are not easily modified (M= 4.36 the supermarket system ensures recent data records are not attacked by virus (M= 4.10 SD) and that information systems presents data as per immediate need hence eradicates chances data inaccuracies (M= 4.00). These findings concurs with the study findings by Kong, Jung, Lee and Yeon (2015) information system are important in ensuring information security, confidentiality, availability and integrity are maintained.

Further the study revealed that data mirrors supermarkets current operations / yields (M= 3.90), supermarket management does not exposure data (M= 3.85) and that users authentication measures are put in place for recognition (M=3.77). These findings go hand in hand with the study findings by Urhuogo, Addo, and Williams, (2014), who contends that in order to be ensure data reliability security measures needs to follow current standards.

Results presented showed that MIS presented grate automation capabilities which promoted process efficiency and ultimately better performance,   test regression statistics showed that a unit change in systems automation would enhance the performance of supermarkets in Nairobi County by a factor of 0.505, Descriptive results showed that supermarket MIS enables easy tracing of missing data (M=4.41), computation of useful information for the supermarket has been easy (M= 4.22) and that in the supermarket missing data is automatically traced (M=4.05). These findings concurs with the study findings by Parasuraman et al (2010) that highly automated organizations would tend to have better performance than those with low level of automation.

Further the study revealed that MIS creates easy communication in the supermarket sales (M= 3.99) The system acknowledges other computers within the network (M= 3.91) System operations highlight gaps in the data in the supermarket (M=3.89) These findings goes hand in hand with the study findings by Abugabah (2011) competitors are defeated through a strong competitive advantage from their competitors which most companies have implemented, costs have also been reduced, speed and reliability increase and reliability implementation, development and support through enhancing process automation.

Assessment on organizational performance in last 5 years showed that the turnover ratio determines the performance of the supermarket had significantly increased (M= 4.27) , profitability is one of the many ways used to measure performance (M= 4.20) and that promotion marketing is crucial in awakening supermarkets performance (M= 4.11), these findings concurs with the study findings by who Mwita (2015) contend that effective and efficient information is at the management's fingertips whenever needed through MIS. Management information system provides businesses with competitive advantage that is also enhanced by information technology.

5.0 Summary conclusion and recommendation

The study established that management information systems capabilities have an influence on organizational performance of supermarkets in Nairobi City County, Kenya. The study findings revealed that all the study variables (system infrastructure, system flexibility, systems security and systems automation) had a strong positive influence on supermarkets performance in Nairobi County.

Drawing from the study findings, the research concluded that system infrastructure has a strong positive correlation on supermarkets performance in Nairobi City County, Kenya. Further the research revealed that management information system assists the manager in organizing the supermarket and make meaningful decisions

An assessment on the influence of information system flexibility on organizational performance of supermarkets in Nairobi City County study concluded that Kenya, from the findings system flexibility has a strong positive relationship on performance of supermarkets in Nairobi County. This implies that the supermarkets in Nairobi county need to adopt system flexibility mechanisms to achieve their target market goals.

On information security, the study concluded that data mirrors supermarkets current operations yield supermarket management does not exposure data and that user's authentication measures are put in place for recognition. The study further concluded that information security has a strong positive influence on performance of supermarkets in Nairobi County.

On information systems automation, the study concluded that great automation capabilities promoted process efficiency and ultimately better performance of supermarkets in Nairobi County, hence positively influencing performance of supermarkets. The study further concluded that systems automation would enhance the performance of supermarkets in Nairobi County hence improved customer base and market share.

The supermarket management should increase and adopt system automation mechanisms to largely increased its mode of operation where by most of the activities were machine based hence requiring minimal supervision.

The supermarket management should have strong IT infrastructure via future-oriented POC analysis. Using this procedure and monitoring the degree of MIS flexibility and alignment in the long term would reduce risks and could transform the corporate MIS into a useful tool to address environmental changes

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