

# Human Resources, Information Technology, and Performance of Public Health Institutions in Embu County, Kenya

Elias Njagi   Stephen Muathe   Ann Muchemi  
School of Business, Kenyatta University, Kenya

## Abstract

The health sector plays a significant role in the economic development of a country by improving the livelihoods her citizens. Despite the heavy investment in the health sector by the Kenya government, enjoying the right to health has been a mere dream for many Kenyans across counties. The study sought to investigate the effect of human resources and information technology on performance of public health institutions in Embu County, Kenya. The study used explanatory and descriptive research designs and targeted 550 employees and 769 outpatients drawn from the five public hospitals in Embu County. The sample size comprised of 165 employees and 232 outpatients. Data was collected using semi-structured questionnaires and an interview guide. Quantitative data was analyzed using descriptive statistics and inferential statistics, while content analysis was used to analyse qualitative data. The findings of the study demonstrated that there was a positive and statistical significant effect of human resources and information technology on performance of public health institutions. Policy implications of study findings have been discussed.

**Keywords:** strategic human resources, information technology, performance of public health institutions

## 1. Introduction

The major challenge facing both public and private organizations is how to survive in the ever-changing dynamic environments due to competition intensified by globalization. According to Mackie (2008), the long run survival of service organizations is dependent on customer satisfaction which is a critical indicator of performance. Urde (2009) contends that the critical strategic assets that lead to firm performance are human assets and information technology assets.

According to Kenya National Bureau of Statistic (KNBS) and ICF Macro (2010), there are great inequalities in accessing health care by many people across regions in Kenya. Kiambati, Kioo and Towett (2013) observed that Kenya is among the African countries currently experiencing major crisis in the area of human resources for health caused by inadequate distribution of health workers, high labour turnover of medical care workers, inadequate wages and uncondusive working conditions to attract and retain quality workforce in public health institutions.

Pfeffer (1994) argued that the human factor is the foundation of organizational performance since organizational members are the source of competitive advantage. The resource-based view holds that the employee skills are strategic resources for competitive advantage. Huselid (1995) linked strategic human resources with firm performance. Indeed, Pfeffer (1994) had earlier pointed out that since workforce is an important source of competitive advantage, then it is important to build a workforce that has the ability to achieve the competitive success that cannot be readily duplicated by others. A study by Ongori and Shunda (2008) established that continuous skill development by way of training and provision of competitive rewards resulted in employee retention and motivation leading to patient satisfaction and hence improved hospital performance.

Strategic human resources comprise of organizational capital which is mostly seen when an organization acquires trained and well-motivated workforce and puts in place mechanisms to retain them in the organization so as to capture new environmental opportunities leading to sustainable competitive advantage (Urich & Lake, 2009). This is in line with Guest (2009) who argues that strategic human resources help an organization to deal with environmental challenges especially so caused by competition and rapid technological changes.

Studies have shown that an organization can create strategic human resources by embracing best human resource practices such as team building, continuous skill development, career progression, competitive reward schemes, creation of conducive work environment and employee empowerment (Wright & McMahan, 2002; Schuler, 2002; Stone, 2005; Marchington & Grugulis, 2000). The key idea behind Strategic Human Resources is to promote sustained organizational performance.

A study by Meyerson and Dewettinck (2012) found that employee empowerment is a key human resource management practice that contributes significantly to employee productivity. This observation is in line with Smith and Lieht (2008) who found that employees empowerment played a key role in developing strategic human resources leading to quality decisions and consequently improved hospital performance and health outcomes. Effective teamwork, training and better workplace environment have closely been linked with employee productivity because motivated skilled workforce leads to overall organization performance (Hameed, & Amjad, 2009; Guest, 2009).

According to Okeke (2008), the health sector in developing countries is characterized by a shortage of skilled healthcare workers in public health institutions arising from migration of health workforce to developed nations in search of better pay, better working conditions and career progression. This is in agreement with Ibrahim (2014) who found that lack of appropriate regulatory policies on management of human resources regarding conducive work environment has led to migration of health workers and especially doctors in less developed countries to developed nations leading to poor health outcomes. Indeed, empirical evidence confirms that 60% of doctors registered in Sudanese Medical Council are working in overseas countries (Ibrahim, 2014). In Kenya, the performance of public health institution has been deteriorating due to high labor turnover of health care workers across counties (KPMG International, 2013).

According to Brailer (2005), the use of Information technology in healthcare industry is on the increase as the quality of patient care in contemporary times seems to depend so much on timely acquisition and processing of clinical information related to the patient care. Mc Cullough (2008) argued that the primary purpose of IT hospital investment was to support billing and capture revenues, but with time, IT applications began to gain popularity as they were used to support clinical activities such as drug interaction controls, laboratory quality controls, and documentation of patient history in regard to storage and retrieval of information.

Strassman (1991) argued that, although many organizations have embraced information technology to improve performance, studies examining IT performance relationships have not been conclusive. These observations concur with Devaraj and Kohli (2000) who examined information technology payoffs in healthcare industry and found that investment in IT does not lead to organizational performance. Getzen (2007) further established that investment in information technology by health care organizations does not improve performance but only increases the cost leading to alienation of poor people from accessing health care services.

Sun and Shibo (2008) contend that information technology that is capable of supporting value-adding activities in healthcare industry should possess five critical attributes which include understandability, integration potential, compatibility, functionality, and ease of use. Galliers (2007) argues that many organizations are embracing information technology alignment as a key business strategy in order to exploit the environmental opportunities. A WHO (2005) report revealed that a hospital that embraces information technology improves communication between healthcare providers and patients leading to patient satisfaction. However, Verbeke (2012) found that public hospitals in sub-Saharan Africa have continued to perform poorly due to inadequate information technology adoption.

Argyraki and Cheriton (2005) argue that information technology that possesses integration potential through network access increases contact between organizational members leading to improved organizational performance. A report by Institute of Medicine (2002) had earlier observed that in most of the public hospitals in developing countries, order for medications, laboratory tests and other services are done manually and that many hospitals lack the capability to deliver laboratory results in an automated manner.

### **1.1 Organizational Performance**

Organizational performance is a multidimensional phenomenon which is characterised by the ability of an organization to create and deliver acceptable outcomes to various stakeholders (Islam, Khan, Obaidullah & Alan, 2011). This is the major reason behind the survival of an organization in the long-run. However, measuring Organizational performance has been a major challenge due to lack of consensus on measurement indicators among strategic management researchers and practitioners (Santos & Brito, 2012). Coombs, Crook, and Shook (2005) posit that most researchers tend to use financial measures for Organizational performance. However, financial measures only reveal past performance of an organization which may not reflect the present or future state of an organization.

Kaplan and Norton (1996) in their model of balanced scorecard (BSC) suggest that organizational performance should not only be measured by financial indicators but should include non-financial metrics such as customer satisfaction and retention, improvement in business processes and innovativeness, employees' satisfaction and corporate image. Various studies have supported the use of nonfinancial metrics as measures of organizational performance (Ott & Dijk, 2005; Evans, 2007; Spraakman, 2005). Shaw (2003) suggest that efficiency and explicit goals are important measures of performance of healthcare organizations. This is in agreement with Collins and Montgomery (2008) who argues that efficiency and customers satisfaction are important measures of hospital performance.

Shaw (2003) suggest that efficiency (Capacity to deliver high-quality clinical services at low cost) and explicit goals (that reflect the values of various stakeholders such as patients, employees, government and public which in essence is all geared towards delivery of better health) are important measures of performance of healthcare organizations. This is in agreement with Collins and Montgomery (2008) who argues that efficiency and customers satisfaction are important measures of hospital performance.

Studies have shown that there is a significant relationship between employees' satisfaction and client satisfaction in healthcare industry (Ongori and Shunda, 2008). According to Rodak (2013), the common

measurement indicators on studies done in healthcare industry are the average patient length of stay, bed occupancy rate, patient satisfaction, bed turnover and readmission rates. These indicators concur with internationally accepted health indicators such as patient and employee satisfaction for measuring the performance of healthcare institutions (WHO, 2003).

Kenya's health sector plays a significant role in the economic development of the country by improving the livelihoods of Kenyans. The health sector is under the social pillar, one of the three pillars (the other two being economical and political) under which vision 2030 is anchored. In order to realize vision 2030, the government of Kenya has heavily invested in the health sector in order to improve the health of the citizens so that they can gain the ability to realize their social, economic and political goals (RoK 2007). Thus, health care is one of the most fundamental rights of all citizens in the republic. However, enjoying this fundamental right has been a mere dream for many Kenyans because of inequalities of accessing health care across counties (KNBS and ICF, 2010).

Reports by WHO (2010), Transparency International (2011) and World Bank (2014) reveal that critical shortage of human resources continues to undermine the performance of public health institutions. The doctor-patient ratio in Embu county is 1:9091 which is far below the WHO recommended an average of 1:4608.2 (MOH, 2013). Despite these concerns, there has been continuous staff unrest in the county since devolvement of health sector to the counties in 2013 where out of 201 doctors who resigned from public health institutions in 2014, 16 doctors were from Embu County (Matendechero, 2014).

There is a growing concern regarding the performance of Public Health Institutions as evidenced by client dissatisfaction (Tam 2005, IOM, 2006). Empirical evidence shows that public health institutions do not meet their client's expectations forcing them to seek alternative sources of treatment leading to significant personal and financial burden to patients (Berwick & Wittington, 2008; Wanjau, Muiruri & Ayondo, 2012).

Previous studies have focussed on the effect of a single variable on performance, ignoring the fact that, the performance of health sector is a function of a host of factors. For instance, Saif and Saleh (2013) found there was a significant relationship between employee empowerment and hospital performance in Jordanian public hospitals. Muathe, (2010) found ICT adoption led to significant improvements in customers service in SME's of health-related institutions in Nairobi County, Kenya. Thrasher and Revels (2012) examined the role of information technology as a complementary resource in the health care delivery system in the USA. In their study, Rogers Jiang Rogers and Intindola (2015) examined the relationship between hospital strategy, volunteer management practices and patient satisfaction. In view of this, the current study sought to investigate the effect of human resources and information technology on the performance of public health institutions in Embu County, Kenya.

## 2. Literature Review

### 2.1 Theoretical Review

The study was anchored on Resource-Based Theory and supported by two other theories namely; Dynamic Capability theory and Knowledge-Based View.

Resource-based theory proposes that organizations gain competitive advantage by embracing four critical practices which includes: Deploying valuable bundle of resources and capabilities that are inelastic in supply; Creating specific knowledge and skills for human capital; Embracing organizational culture that is difficult to be imitated by competitors; and Developing and implementing strategy that can exploit internal strengths, convert internal weaknesses into strengths and respond to external opportunities (Mata, Fuerst & Barney, 1995; Afionni, 2007).

O'Sullivan (2011) argues that according to resource-based theory, organizations should exploit all sources of competitive advantage in order to develop unique strategies which can yield customer value. Studies have revealed that there are three assumptions of resources based theory that is the basis of competitive advantage and includes: Resources and capabilities possessed by firms differ (resource heterogeneity); Resources and capabilities can be sources of sustainable competitive advantage if they are valuable and heterogeneously distributed across competing firms; and if the skills needed to manage technical and market risks are perfectly immobile (Bordello, Ravarini, Wu & Nigam, 2012).

Dynamic capability theory viewed the firm's ability to integrate, build and reconfigure internal and external competencies to address the rapidly changing environments as the sources of firms' competitive advantage (Teece, Pisano & Shuen, 1990, 1997). Helfat *et al.* (2007) posit that dynamic capability is the capacity of an organization to create, extend or modify its resource base purposefully and that dynamic capability should be built in the organization such that they become organizational routines that are embedded in the organization over time. The basic assumption of dynamic capability theory is that it sheds light on short-term competitive positions that can be used to build longer competitive advantage and consequently to lead to long-run survival of the organization.

The proponents of dynamic capability theory argue that a firm's competitive advantage depends on the ability of the firm to perform five key functions namely: reconfiguring, transforming and recombining assets and

resources in order to form a new resource base; developing mechanism which will make the competitors incapable of replicating firm's processes and systems; Deploying resources into new domains; embracing learning strategies in order to ensure continuous skill development for employees with new skills which will facilitate effective and efficient performance of tasks; and Integrating and coordinating assets and resources emerging out of new resource base (Zollo & Winter, 2002).

The Knowledge-Based View was proposed by Kogut and Zander (1992) who viewed knowledge as the main contributor to the creation and development of dynamic capabilities that can be transformed into valuable products and services. The main focal concern of this theory is asset accumulation, replicability, and inimitability of the Core competencies of the firm. According to the proponents of Knowledge-Based View, integration of specialized knowledge in the firm significantly leads to the development of dynamic capabilities consequently leading to competitive advantage. Further, repeated learning practices help employees to internalize the experiences into the organization leading to the establishment of regular activities that can help organizational members to effectively gather and apply knowledge resources to respond to the changing customer needs (Zollo & Winter, 2002).

## 2.2 Empirical Literature Review

A study by Mark, Lengnick, Cynthia, Hall, Andrade, and Orake (2009) on Strategic Human Resource management established that there is a direct relationship between Strategic Human Resource and firms' performance. The study identified five leveraging strategies for human capital which facilitate attainment of competitive advantage which includes: providing strategic focal points for efforts of individual employees; accumulating, extending and expanding an organizations reservoir of knowledge, experience, and expertise; complementing, blending and balancing resources that enhance employees value; enhancing and augmenting resources by investing in the development of employees skills; and conserving, recycling, co-opting and shielding human resources so that their value is leveraged to achieve economies of scope. The study only examined one resource and yet the performance of an organization is dependent on the combination of resources. In their study Butt, Khan and Rasli (2012) established that conducive work environment had a significant positive relationship with commitment and satisfaction of nurses leading to patients' satisfaction and hence improved hospital performance. The data for the study was collected from public hospitals in Pakistan using a sample of 120 nurses. However, the study only used one cadre of staff as respondents leaving other cadres such as doctors, pharmacists, administrative officers, laboratory technologies among others who could give vital information on employee satisfaction.

In their study, Saif and Saleh (2013) examined employee empowerment in Jordanian public hospitals found that there was a significant relationship between employee empowerment and hospital performance. The study established that employee empowerment practices improved employee morale making them to participate in making quality decisions and hence improving hospital performance. The data was collected from 277 employees from five Jordanian public hospitals. The study ignored critical strategic human resource aspects such as team working, training and competitive reward schemes that can promote retention of highly skilled healthcare workers.

Rogers, Jiang, Rogers, and Intindola (2015) found a positive association between hospital strategy, volunteer management practices, volunteer workforce attributes and patient satisfaction. The data for the study was collected from 107 US hospitals. The study ignored non-volunteer employees and patients of the hospital as respondents who may possess vital information concerning employee and patient satisfaction.

Hanaysha (2016) reported a significant positive relationship between employee empowerment, teamwork and employee training with employee productivity. The study used a sample of 242 employees serving at public universities in northern Malaysia. However, the study ignored the effect of the three human resources management practices studied on overall organizational performance. The study was conducted in northern Malaysia which has a different contextual setting from Kenya and from a different sector. Hence the need to conduct the study in the health sector to confirm the results.

A study by Olatokun and Adeboyejo (2009) investigated the influence of information communication and technology investment on hospital performance. The study found that: Investment in information technology improved hospital performance because it led to faster access to relevant medical information by employees and that there was an easy exchange of information with colleagues leading to increased efficiency. The study further established that insufficient knowledge on the use of ICTs and constant breakdown of ICT equipment were the major challenges limiting the potential benefits of ICT infrastructure. The study used descriptive research design with a sample of 360 reproductive health workers such as doctors, pharmacists, and administrators among others of university college hospital in Nigeria. The study only used respondents from one department and ignored employees from other departments who provide vital information on benefits on IT infrastructure.

Muathe (2010) conducted a study on adoption of ICT by health-related SMEs and found that ICT adoption led to significant improvements in communication between patients and clinicians and between employees in



various departments; information storage and retrieval; business efficiency; customer service; stock control; reduction in administration and operation costs; and reduction in workforce. The study used a cross-sectional and descriptive survey design with a sample size of 172 respondents drawn from 117 health-related SMEs in Nairobi, Kenya.

Angst, Devaraj and Queenan (2011) in their study found there was a significant relationship between information technology integration and performance of cardiology departments in 555 US hospitals. The study used efficiency, the average length of stay and quality as measures of performance. The study focussed only on one department implying that the results may not be generalized in all departments in the 555 US hospitals.

A study by Thrasher and Revels (2012) examined the role of information technology as a complementary resource in healthcare integrated delivery systems in the USA and found that information technology had a significant relationship with hospital performance. The study further revealed that improvement in performance was due to information sharing between departments resulting in better decision making and consequently better customer service leading to customer satisfaction. The study used a sample size of 450 integrated delivery system. However, the study's response rate was 28% since out of 450 questionnaires only 99 completed questionnaires were received. This meant that the findings of the study could not be generalized in the entire health sector in USA due to lack of adequate representation.

In their study Azlan, Yusof and Razali (2012) found that strategic information technology resources led to improvement in information storage and retrieval, business efficiency and daily communication among nurses leading to improved performance of medical centers in Malaysia. The study collected data from nurses as the only respondents and ignored other hospital workers such as doctors, pharmacists and clinical officers whose views were critical in assessing the potential benefits of implementation of ICT adoption.

From the literature reviewed the following hypothesis were developed.

**H<sub>01</sub>** Human resources have no statistically significant effect on the performance of public health institutions in Embu County, Kenya.

**H<sub>02</sub>** Information technology has no statistically significant effect on Performance of public health institutions in Embu County, Kenya.

### 3. Methodology

Explanatory and descriptive research designs were used in the study to achieve optimal results. This was in line with Sekaran and Bougie (2009) who argued that there is no ideal research design but good research design is the one which helps the researcher to obtain optimal results. Maxwell and Miltapalli (2008) contend that explanatory research design is used where the study in question is intended to explain the causal relationships between study variables after analysis of quantitative data objectively collected from the field and empirical testing of hypotheses.

The study targeted 550 employees of different hospital cadres drawn from ten common departments of the five public hospitals in Embu County, Kenya. The hospital cadres included doctors, nurses, clinical officers, pharmacists, laboratory technicians, Hospital administrative officers, health record officers and nutritionists while the ten common departments in the five public hospitals were Outpatient, Pharmacy, Laboratory, Inpatient, Administration, Health records, Maternal Child Health, Comprehensive Care and Counselling, Maternity and Nutrition. In order to strengthen the research findings, the study targeted 769 outpatients based on bed capacity.

The authors used 30% of the population of employees and outpatients as recommended by Mugenda and Mugenda (2003) which resulted in 165 employees and 232 outpatients. Data collection instruments included semi-structured questionnaires to collect primary data and documented sources were used to collect secondary data. This was in line with recommendations of Babbie (2010) who contends that questions are a useful tool for data collection since they are easier to administer and analyze. Qualitative data from outpatients were collected using interview guide. Validity was established by using the results of 21 items from a pilot study. The study ensured that data collection instruments possessed face, content and construct validity by subjecting the questionnaires to double check, seeking expert opinions and operationalization of study variables as recommended by Mugenda and Mugenda (2003) and Saunders *et al.* (2007).

The pilot study enabled the researcher to eliminate any ambiguities in the wording of questions. Cronbach Alpha Coefficients was used to establish the reliability of research instruments in order to determine how the research instruments are related to each other. The authors used a threshold of 0.7 as recommended by Ehlers (2000). The results of the Cronbach Alpha Coefficients showed that the alpha coefficient of strategic human resources and information technology were 0.795 and 0.845 respectively which were above the set threshold of 0.7 alpha coefficient.

### 4. Findings and Discussions

The response rate of the study was 85.6% implying that the findings can be relied upon. The study used descriptive and inferential statistics to analyze quantitative data while content analysis for qualitative data was

used. Descriptive analysis of study variables namely human resources and information technology was done. In the variables studied the respondents were asked to rate the extent to which they agreed to the statements regarding each study variable using a scale of 1-5 where 1 represented Not at All (NAA), 2 represented small extent (VSE), 3 represented moderate extent (SE), 4 represented large extent (LE) and 5 represented Very large extent (VLE).

The aggregate of the respondents' responses on statements regarding human resources was 2.6480 with a standard deviation of 1.0829. The statements were in reference to training, employee empowerment, teamwork, work environment, and compensation. This meant that the respondents agreed to moderate extent on the issues addressed. It implies that the human resources could only attain average performance of public health institutions since the issues addressed in the statements of human resources were only implemented by hospital management moderately as per respondents' responses. The standard deviation of 1.0829 meant that there was no much variation in respondents' views.

The aggregate of respondents' responses in regard to statements on information technology was 2.6845. The statements were in reference to IT integration, IT alignment, Compatibility, Ease of use and Functionality. This meant that the respondents agreed only to moderate extent which is equivalent to average implying that information technology only led to the average performance of public hospitals. This supports the aggregate of respondents views regarding the performance of public health institutions which was 2.6874 with a standard deviation of 1.0470. This implies that performance was rated average by respondents' which is supported by average ratings by respondents in regard to statements on information technology.

The study used multiple linear regression models to test the effect of human resources and information technology on the performance of public health institutions as recommended by Cooper and Schindler (2011). Before proceeding to test the hypotheses, the study carried out diagnostic tests such as normality, linearity, homoscedasticity and multicollinearity to ensure that the basic assumptions of regression model as suggested by Green (2002) are satisfied. The study used a significance level of 0.05.

The model significance was tested by computing F statistics which was found to be 27.004 with a P-value of 0.000 (P-value is less than 0.05). Hence the model was found to be statistically significant for statistical analysis. The coefficient for human resources was 0.233 with a P-value of 0.001 (P-value is less than 0.05) while the coefficient of information technology was 0.180 with a P-value of 0.003 (P-value is less than 0.05).

The first null hypothesis ( $H_{01}$ ) was: Human resources have no statistical significant effect on the performance of Public Health Institutions. The study rejected the null hypothesis ( $H_{01}$ ) because the P-value of the coefficient of strategic human resources was less than the significance value of 0.05. It was therefore concluded that human resources have a positive and statistical significant effect on performance of public health institutions. The findings are consistent with Mark, Legnick, Cynthia, Hall, Andrade, and Orake (2009) who found that there was a direct relationship between human resources and firms' performance.

The findings collaborate with Butt, Khan, and Rasli (2012) who established that conducive work environment had a significant relationship with nurses' commitment leading to better customer service and hence improved hospital performance in public hospitals in Pakistan. A study by Diab (2012) concluded that poor working conditions in Jordanian public hospitals led to high labor turnover of doctors.

This study collaborates with Saif and Saleh (2013) who established that employee empowerment in Jordanian public hospitals improved employee motivation making employees participate in making high-quality decisions and hence improved performance. Additionally, the findings concur with Ongori and Shuda (2008) findings that continuous skill development for healthcare workers through training and competitive reward schemes improved hospital performance.

The study findings are in line with Rogers, Jiang, and Intindola (2015) who found that there was a significant positive relationship between human resources with patients' satisfaction. The study findings further collaborated with Hanaysha (2016) who found that strategic human resources aspects such as employee empowerment, teamwork, and employee training were significantly related to employee productivity leading to overall organizational performance.

The second null hypothesis ( $H_{02}$ ) was: Information technology have no statistical significant effect on performance of Public Health Institutions. The study rejected the null hypothesis ( $H_{02}$ ) because the P-value of the coefficient of information technology was less than the set significance value of 0.05. It was therefore concluded that information technology had a positive and statistical significant effect on the performance of public health institutions. These findings are consistent with Azlan, Yusof, and Razali (2012) who found that information technology improved efficiency and communication between clinicians and patients. In addition, information storage and retrieval was improved leading to improved overall performance of medical centers in Malaysia.

The study is consistent with Muathe (2010) who found that ICT adoption by health-related SME's in Nairobi county led to significant improvement in information storage and retrieval, business efficiency, customer service by improving communication between clinicians and patients and between employees in different

departments consequently leading to improved performance of healthcare institutions studied. The study concurs with Olatokun and Adeboyejo (2009) who established that investment in ICT led to improved hospital performance because of faster access to relevant information by hospital employees, easy exchange of information with colleagues leading to increased efficiency.

The findings collaborated with Thrasher and Revels (2012) who found that there was a significant positive relationship between information technology and performance of healthcare institutions in the USA. The findings further concur with Angst, Devaraj and Queenan (2011) who found that information technology had a positive effect on the performance of cardiology department in US hospitals. The findings of this study however contradicted with Getzen (2007) who found that investment in information technology resources does not lead to improved performance of healthcare organizations but rather increases the cost leading to alienation of poor people from accessing health care services.

## 5. Conclusion and Policy Implication

The study concluded that the public health institutions which invest in human resources in regard to training, team building, improvement of working conditions, competitive compensation and employee empowerment practices would realize higher performance than those which do not. In addition, public hospitals that invest in information technology resources will improve communication between clinicians and patients and between employees in different departments. This will consequently lead to improved performance of such hospitals than those which do not invest in information technology resources. The study further concluded that human resources had greater contribution than information technology resources in performance of public health institutions Embu county.

The findings of this study form the basis of policy formulation as discussed below. The county government should procure adequate, futuristic and visionary human resources for health who will improve the performance of public health institutions. The county government should enhance and enforce policies which will facilitate retention and motivation of human resources for health so that they can put in their best. Such policies include relevant training in order to create human resource base that has the pre-requisite skills, improvement of working conditions, competitive compensation schemes, team building in order to create functional teams and employee empowerment. Effective and efficient implementation of these practices will prevent the occurrence of brain drain in public hospitals. This is in line with the study findings which established that there was a positive statistically significant effect of strategic human resources on the performance of public health institutions.

The county government should procure ICT infrastructure which can improve communication between clinicians and patients and between employees in different departments and also improve storage and retrieval of information for instance regarding patient records. Such ICT infrastructure should possess critical attributes such as IT alignment, IT integration, compatibility, ease of use and functionality. This will consequently improve efficiency of hospital operations leading to improved performance. This is in line with the study findings that established that information technology resources had a positive and statistical significant effect on performance of public health institutions.

## References

- Afiouni, F. (2007). Human Resource Management and Knowledge Management: A Road Map Toward Improving Organizational Performance. *Journal of American Academy of Business*, Cambridge, 2(2), 124-136.
- Angst, C. M., Devaraj, S., Queenan, C. C., & Greenwood, B. (2011). Performance effects related to the sequence of integration of healthcare technologies. *Production and Operations Management*, 20(3), 319-333.
- Argyrazi, K., & Cheriton, D. (2005). Network capabilities: The good, the bad and the ugly. *ACM HotNets-IV*, 139, 140.
- Azlan, M.H.M., Yusof, M.M. & Razali, M.Z.M. (2012). ICT Adoption and Implementation Benefits in Medical Centres: A case study of Pusrawi Hospital, Malaysia. *International Journal of Medicines* 56 (13)1-5.
- Babbie, E. R. (2010). The Practice of Social Research, twelfth edition. *California: Wadsworth-Cengage Learning*.
- Berwick, D. & Wittington, C. (2008). The Question of Improvement. *JAMA* 307 (19), 2093-2094.
- Brailer, D.J. (2005). Economic Perspective on Health Information Technology. *Business Economics*, 40(3), 6-14.
- Butt, H.S., Khan, F. & Rasli, A.B. (2012). Impact of Work and Physical Environment on Hospital Nurses Commitment. *International Journal of Economics* 3(3), 33-43.
- Collins, D. & Montgomery C.A (2008). Competitive Strategy: The Five Competitive Forces that Shape Strategy. *Harvard Business Review July*.
- Coombs, J.G., Crook, T.R. & Shook, C.L, (2005). The Dimension of Organization Performance and Its Implications for Strategic Management Research and Research Methodology in Strategy and Management. *San Diego. Elsevier*, 259-286.

- Cooper, D.R. & Schindler, P.S. (2011). *Business Research Methods, 9<sup>th</sup> Ed Tata McGraw Hill Education Private Limited, New Delhi.*
- Devaraj, S., & Kohli, R. (2000). Information technology payoff in the health-care industry: a longitudinal study. *Journal of Management Information Systems, 16*(4), 41-67.
- Diab, S.M. (2012). Measuring the Dimensions of Medical Services Provided in the Jordanian Government Hospitals from the Perspective of Patients and Staff. *The Asian Journal of Management Science, 75-84.*
- Ehlers, M.B. (2000). Residential Based Business: An alternative Location. *The decision for SME's. Unpublished Doctor of Commerce thesis; University of Pretoria.*
- Evans, S. (2007). Performance Measurement for small business. *Journal of Financial Management, 32*, 45 – 56.
- Galliers, R. (2007). “Strategizing for Agility: Confronting Information Systems Inflexibility in Dynamic Environment,” In *Agile Information Systems*, K.C Desouza(Ed.) New York: Butter Worth- Heinemann, 1-15.
- Getzen, T. (2007). *Health Care Economics: Principles and tools for Health Care Industry. Hoboken NJ: Wiley.*
- Green, W.H. (2002). *Econometric analysis, 5<sup>th</sup> Edition, New York University.*
- Guest, D.E. (2009). Human Resource Management and Performance. A Review and Researcher Agenda, *International Journal of Human Resource Management 8*(3), 263 – 276.
- Hameed, A., & Amjad, S. (2009). Impact of office design on employees’ productivity: a case study of banking organization of Abbottabad, Pakistan, *Journal of public affairs administration and management 3*(1), 1-13.
- Hanaysha J. (2016) Testing the Effects of Employee Empowerment, Teamwork, and Employee Training on Employee Productivity in Higher Education Sector. *International Journal of Learning and Development. 6*(1), 164 – 178.
- Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of management journal, 38*(3), 635-672.
- Ibrahim, N. (2014). The impact of work environment on the *Performance of Health workers in Sudan Centre for Global Health Trinity College Dublin.*
- Institute of Medicine (2002). Key Capabilities of an Electronic Health Record System. Letter Report, Washington, DC: *National Academies Press.*
- Institute of Medicine (2006). Preventing Medication Errors Washington DC. *The National Academies Press.*
- Islam, A., Khan, M.A. Obaidullah, A.Z.M. & Alam, M.S. (2011.) Effect of Entrepreneur and Firm Characteristics on Business Success of Small and Medium Enterprises (SMEs) in Bangladesh. *International Journal of Business and Management, 3*(3), 289-299.
- Kaplan, R.S. & Norton, P. (1996). *The Balance Score Card: Translating Strategy into Action. Harvard Business School Press Boston MA.*
- Kenya National Bureau of Statistics (KNBS) & ICF Macro (2010). Kenya Demographic Health Survey Report 2008-2009: Key findings, *Calverton, Maryland: KNBS and ICF Macro.*
- Kiambati, H., Kiio, C. & Toweett, C. (2013). Understanding the labor market of Human Resources for health in Kenya, Working Paper, November 2013, WHO.
- KPMG International (2013). Devolution of Health Care Services in Kenya Lessons learned from other countries. Retrieved 30-December 2015.
- Mackie, J. (2008). National Policy on Maintenances and Repair of Health Equipment. *Report on Interregional Meeting on Maintenance and Repair of Health Care Equipment, WHO, 6-7.*
- Marchington, M. & Grugulis, L. (2000). Best Practice Human Resource Management. Perfect Opportunity or Dangerous Illusion. *International Journal of Human Resource Management, 11*(6), 1104 – 1124.
- Mark, L., LengNick, H., Cynthia, A., Hall L., Androde, L.S. & Drake, B. (2009). Strategic Human Resource Management: The Evolution of the Field. *Human Resource Management Review, 64 – 85.*
- Maureen, L. (2005). Factors influencing provision of health care service delivery and improving access to Healthcare. *WHO Report, 2005.*
- Maxwell, J.A. & Mittapalli, K. (2008). Explanatory Research. *Encyclopedia of Qualitative Research Methods.*
- Mc Cullough, J. S. (2008). The adoption of hospital information systems. *Health economics, 17*(5), 649-664.
- Meyerson, G., & Dewettinck, B. (2012). Effect of Empowerment on Employees Performance *Advanced Research in Economic and Management Sciences, 2*, 40-46.
- Muathe, S.M.A. (2010). Determinants of adoption of ICT by Health Related Small and Medium Enterprises (SME) within the health sector in Nairobi, Kenya. *Published Ph.D. Thesis Kenyatta University.*
- Mugenda, O. M. & Mugenda, A. G. (2003). Research Methods: Quantitative & Qualitative Approaches. *Nairobi: ACTS.*
- Okeke, J. O. (2008). *Shortage of health professionals: A study of recruitment and retention factors that impact rural hospitals in Lagos state, Nigeria* (Doctoral dissertation, University of Phoenix).
- Olatokun, W.M. & Adebeyejo, O.C. (2009). Information and Communications. Technology Use by Reproductive Health Workers in Nigeria: State Case of the Art, Issues, and Challenges. *An*



- Interdisciplinary Journal on Humans in ICT Environments*, 5(2), 181 – 207.
- Ongori, H., & Shunda, J. P. W. (2008). Managing behind the scenes: employee empowerment. *The International Journal of Applied Economics and Finance*, 2(2), 84-94.
- Onyango, J.W. & Wanyoike, D.M. (2014). Effects of Training on Employee Performance: A Case Study of Health Workers in Siaya County, Kenya. *European Journal of Medical Sciences*, 1(1), 11-15
- Ott, M. & Dijk, H. (2005). Effects on Client Satisfaction in Nursing and Care for the Elderly Homes *Employee Relations Journal*, 27(4).
- Packer, C.A.A. (2002). Using Human Rights to Change Traditions: Traditional Practices Harmful to Women's Reproductive Health in Sub-Saharan Africa: *Utrecht University Institute for Legal Studies*.
- Payne, J. (2005). E-commerce Readiness for SME's in Developing Countries: A Guide for Development Professionals. *Learn-Link-Academy for Educational Development. Washington, USA*.
- Pfeffer, J. (1994). Competitive Advantage through People. Unleashing the Power of the Workforce. *Harvard Business School Press. Boston, M.A.*
- Rodak, S. (2013). *Key Performance Indicators for Hospitals. The Skinny on Health Care.KPIs, White Paper*.
- Rogers, S.E, Jiang, K., Rogers, C.M. & Intindola, M. (2015) Strategic Human Resource Management of Volunteers and Their Link to Hospital Patient Satisfaction in Non- Profit and Voluntary Sector. *Quarterly*, 1-27.
- Saif, N.I. & Saleh, A.S. (2013). Managers Concern Regarding Employee Empowerment in Jordanian Public Hospitals *Interdisciplinary Journal for Contemporary Research in Business*, 5(3), 78 – 86.
- Santos, J.B. & Brito, A.I.A. (2012). Towards Subjective Measurement Model of Firm Performance. *Brazilians Administration Review, Special Issue*.
- Saunders, M., Lewis, P. & Thornhill (2007). *Research Methods for Business Students*, 5<sup>th</sup> Ed, *Great Britain, Prentice Hall*.
- Schuler, R.S. (2002). Linking Competitive Strategies with Human Resource Management Practices. *Academic Management Executive* 1(3).
- Sekaran, U. & Bougie R. (2009). *Research Methods for Business. A skill building Approach* 4<sup>th</sup> Ed, Australia, John Wiley, and Sons, Inc.
- Shaw, C. (2003). How can Hospital performance be measured and monitored? *Health Evidence Network Synthesis, Report on Hospital Performance*, 1-17.
- Smith, M.J. & Lieht, P.R. (2008). *Middle Range Theory for Nursing. New York Publishing Company*.
- Spraakman, G. (2005). The Impact of Enterprise Resource Planning Systems and Management accounting: Some Canadian Findings and Suggestions for Future Research <http://ssrn.com>
- Strassmann, P. A. (1990). *The business value of computers: an executive's guide*. Information Economics Press.
- Sun, B., Shibo, L. & Rong, Z. (2005). Learning and Acting Upon Customer Information – with an Empirical Application to the Service Allocations with Off-Shore Centers. *Marketing Science*, 24(3), 430-443.
- Tam, J.L.M. (2005). Examining the Dynamics of Consumer Expectations in Chinese Technologies. *Journal of Marketing*, 66 (3), 98-111.
- Thrasher E. H. & Revels M.A. The Role of Information Technology as a Complementary Resources in Health Care Integrated Delivery Systems. *Journal Homepage* 90(2) 23-32.
- Transparency International (2011). The Kenya Health Sector Integrity. *Study Report*.
- Urde, M. (2009). Uncovering the corporate brand's core values. *Management decision*, 47(4), 616-638.
- Urich, U., & Lake, G. (2009). Organizational Capability. Competing from Inside Out *Journal of Managerial Issues*, 7(4).
- Verbeke, F. (2012). Evaluation of *Impact of ICT –tools on Health Care Delivery* in Sub Saharan Hospitals. *Vrije Universiteit Brussel and Kigali Health Institute*.
- Wanjau, K. N., Muiruri, B. W. and Ayondo, E. (2012). Factors Affecting Provision of Service Quality in the Public Health Sector: A Case of Kenyatta National Hospital. *International Journal of Humanities and Social Science*, 2(13), 1-13.
- World Bank (2014). Delivering Primary Health services in devolved Health systems in Kenya, Challenges, and Opportunities. *World Bank*.
- World Health Organization (2003). Measuring Hospital Performance to improve the quality of Health Care in Europe; A need of clarifying the concepts and defining main dimensions of Hospital Measurements. *Report on WHO workshop, Barcelona*, 1-20.
- World Health Organization (2005a). Information Communication Technologies for Improving Performance of Health Care Workforce WHO Geneva.
- World Health Organization (2010). The World Health Report 2010: Health Systems Financing *the Path to Universal Coverage. World Health Organization, Geneva*.
- Wright, P.M. & McMahan, G.C. (2002). Theoretical Perspectives for Strategic Human Resource Management. *Journal of Management*, 18(2) 295.