

INFLUENCE OF DIGITIZATION OF HEALTH RECORDS ON STRATEGIC ORIENTATION OF HEALTHCARE INSTITUTION PROVIDERS

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Abstract: The research study sought to establish the influence of digitization of health records on strategic orientation of healthcare institutions in Kenya. The research study findings was deemed to be of benefit to the government agencies, doctors and healthcare professionals, academicians and researchers. The target population for the study was drawn from clinics within Nairobi County, and a sample of five clinics were selected with a population of 129 healthcare professionals drawn from the five clinics from the clinics databases and was selected using purposive and convenient sampling design pilot testing was done using 13 respondents , Questionnaires were used to collect data and was analyzed using SPSS 19 and presented through graphs ,charts tables and frequencies.

Keywords: Digitization, Strategic Orientation, Health Records, Health Care Institutions.

1. BACKGROUND OF THE STUDY

Continuous technological developments in healthcare industry have saved countless lives and improved the quality of life for many people. Technology has changed experiences for patients and their families and has also created a huge impact on medical processes and the practices of healthcare professionals notes (Priya, 2018). The innovation of electronic health records (EHRs) in replacing paper records has been a major development for many allied healthcare professionals ,medical assistants, medical records and health information technicians (MRHITs), medical billing and coding professionals, and registered nurses are just some of the allied healthcare roles impacted by this implementation.

Kumar (2017), notes that nurses and technicians are now responsible for inputting patient data such as vital signs, weight, and test results into a central, digitized system. On the administration side of things, medical billers and coders use EHRs for scheduling appointments, updating patient records with diagnostic codes, and submitting medical claims. Enhanced patient care EHRs provide invaluable data to clinical researchers, which advances medical knowledge and the development of new treatments for common health problems, additionally a central and standardized system throughout the entire healthcare industry can quickly enhance business strategy of the institution. It gives insights into how widespread an outbreak is, enabling preventative measures to be put in place much more quickly.

Lara (2017) ease of workflow medical billers and coders are perhaps most impacted by EHRs, as the number of medical codes recently jumped from 13,600 to 69,000 in Kenya in the last two years. Despite this huge jump, the introduction of EHRs has made life for medical billers and coders much easier. Entering data into a computerized system is much less time-consuming than paper-based methods. It also reduces the risk of errors in patient data and financial details notes (Eissa, 2017). Accessing patient records digitally can be done in an instant and viewed via portable devices, increasing efficiency and productivity hence lower healthcare costs .According to a study from the University of Michigan, the shift from paper to electronic health records reduces the cost of outpatient care by 3% these researchers estimated this as \$5.14 in savings per patient each month (Panda, 2016).

Kayawat (2015) noted that big data is a huge dilemma of the digital age, it refers to the enormous amounts of data collected from a variety of sources that are then processed and used for analytics as an industry dealing with the public, and healthcare naturally collects and stores huge amounts of data. When analyzed by data experts, this information has multiple benefits, such as, reducing healthcare costs, predicting epidemics, avoiding preventable deaths, improving quality of life, reducing healthcare wastage, improving efficiency and quality of care, developing new drugs and treatments. Lara (2017) argues that with the shift to EHRs and the fact that even one research study can amount to 100 terabytes of data, healthcare facilities need to have expandable, cost-effective, and safe storage solutions. Cloud computing is one of the most innovative products in healthcare technology today. The cloud uses hardware and software to deliver services via the internet. In this case, healthcare professionals and patients are able to access certain files and data, and use applications from any internet-enabled device. Manish (2018) notes that better and safer data storage, cloud computer technology allows for masses of information to be stored at a low cost, without the limitations or expense of additional hardware or servers. With an increased reliance on EHR systems, Cloud storage protects against the loss of sensitive data with strong backup and recovery services. Improved access to big data, the cloud is an invaluable tool for medical research, as well as for sharing medical information. In a survey of 105 healthcare industry IT professionals, 59% said they were using or planning to use the cloud for data analysis, and more than 75% for health information exchange. This new ability to share big data easily has helped lead to the development of life-saving drugs (Dhanta 2018).

Mobile health applications give professionals, administrators, and patients greater flexibility, they are an inexpensive way for facilities to provide more high quality services, and at the same time are cheaper for patients to access. Some generate better health awareness, while others assist communication between patient and healthcare providers. The areas that mobile health applications can assist with (Saurabh 2015) noted include, chronic care management, medication management, medical reference, diagnostics, personal health records, women's health, fitness and weight-loss and mental health while having a central point for all data information may be extremely useful, over-dependence on the cloud introduces the risk of important information being unavailable in emergencies. However, the main concern arising from Cloud computing technology and increased mobile use is security and data protection (Agrawal, 2017).

Mobile technology solutions are creating endless opportunities for both patients and medical experts. These solutions are effective in emergency care, patient care and hospital management. Easy tracking of patient information improves response time, thus ensuring quicker care. Patient self-monitoring and wellness, access patient records from anywhere, at any time, 77% healthcare providers say mobility worked, using the mobility, physicians can access to Electronic Medical Records (EMRs), monitor patients outside the hospital, communicate with patients and prescribe medicine. Big data revolution is underway in the healthcare industry. Besides reducing healthcare cost, it has many other benefits such as predicting epidemics and avoiding preventable deaths, reducing healthcare wastage and improving the quality of efficiency of healthcare (Mishra, 2018).

2. STATEMENT OF THE PROBLEM

According to a report by Markets and Markets (2017), the healthcare IT market in North America is expected to reach \$104 billion by 2020 with a CAGR of 13.5 percent. The trends show that the adoption of healthcare IT solutions is growing rapidly by the healthcare providers. The advancement of the technology has made it easy to record healthcare data such as vital signs and reports. According to Agrawal (2017), healthcare IT solutions are in much demand as some technologies are gaining ground in the medicals. New healthcare technologies and IT solutions have improved the medical practices and made healthcare even more effective and more reliable than before, doctors are connected with patients through various mediums such as website, mobile applications, social media and much more. The practice of telemedicine has been used widely to provide treatment to remote patients. Dhanta (2018) noted that digital portal acts as an online resource which enables the care team to access the information to treat the patients by knowing the case history and medication. The implementation of the modern technologies would bring many more changes in the healthcare making easy access to treatments and life much easier.

Sakalle (2015) stated that modern technologies such as mobility, cloud and big data have transformed the information & technology in healthcare. Many companies and startups have been focusing on the innovations to contribute in the healthcare industry and building health IT solutions in Kenya. In 2016, which is considered as the biggest year of

healthcare technology innovations, there were many innovations including medical devices, software and gadgets. According Khumar (2017) future innovations and health care solutions in the fields of technology infrastructure, payment models, care models and disease management applications will be witnessed including healthcare industry advanced enabling communication across different channels and technologies such as smartphone, tablets, cloud computing, social media and data analytics. Experts in the healthcare believe that by 2018, more than 70 percent of healthcare organizations would invest in consumer-facing mobile apps, wearable health gadgets, remote health monitoring tools and virtual care notes Manish (2018), by 2020, health data will travel through the cloud, the mobility solutions to touch \$83 million from \$65 in 2015. Mobility has been gaining ground in the healthcare industry. The data growth generates opportunities to develop new drugs. IT solutions in the medical sector is on the rise and it has the advantages like cost efficiency, access to information and security. Spending on cloud could touch to \$9.5 billion by 2020. It will improve analysis and information tracking and enable on-demand access to computing and large storage facilities notes (Kapoor, 2018).

The above studies brings out the relevance of technology in medical and healthcare provisions across the world and specifically in Kenya where healthcare professionals and providers are now turning into technology based healthcare provisions this study is imperatively important in establishing the impact technology has in shaping strategic directions of healthcare providers in Kenya.

3. LITERATURE REVIEW

Rameez (2017) noted that Digital technology is the easiest and most efficient way to keep, maintain, record and retrieve patient's information. The positive impact of technology in healthcare is clear. Hospitals that make a digital transition experience all of these benefits of healthcare technology, trends and innovation. Mishra (2018) noted that making the move promises a higher caliber of care across the board. Embracing digital healthcare services facilitates: Cutting-edge digital platforms Improved operational efficiency Integrated approach to patient care automated administrative and clinical processes easier collaboration higher enhanced capacity for innovation better patient outcomes reduced costs brings effective strategies for implementing and integrating new digital solutions seamlessly into your operations (Saini, 2014).

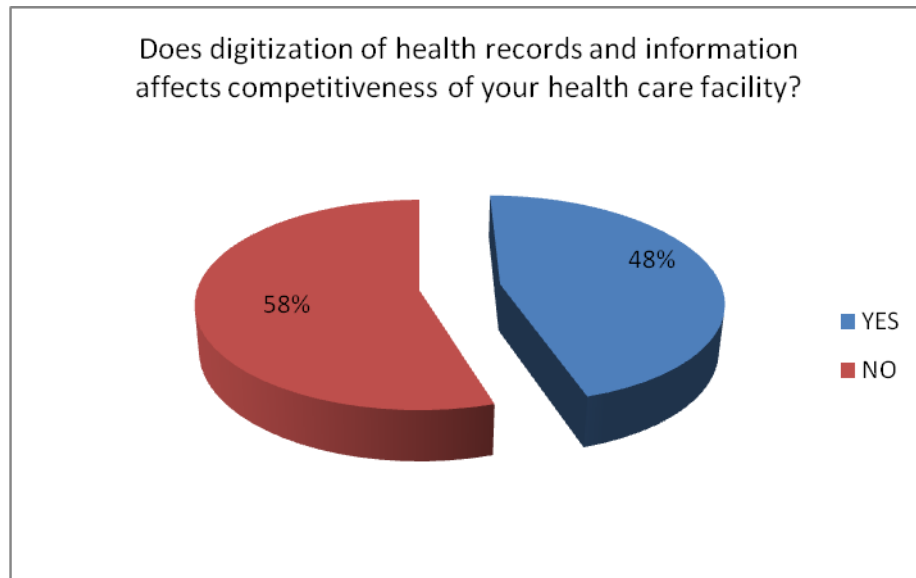
Meena (2017) stated that by automating appointment booking systems, healthcare providers are able to save money and free up administrative time by using alerts for patient appointment reminders. Updates on medical emergencies health issues become more manageable it is known that annoying problem where patients forget about their appointments? Sending reminders about upcoming appointments directly to your patients' phone ensures that they're aware of the time, date and location of their consultation gathering feedback from patients on the standards of healthcare received is a great way to improve your services. 2-way allows you to collect this information quickly and easily one could send out a short survey or use an easy to remember short code which patients can use to send you their feedback (Babu 2000).

According Kumar (2016) owning a smartphone, it's no surprise that mobile application has become one of the most preferred communication methods among businesses for interacting with their customers. A mix of industries has begun to incorporate text messaging as a way to simplify communications and improve the customer experience. In particular, the banking and healthcare industries have outpaced all others in their ability to use SMS to improve customer service efforts, accuracy of communications, internal operations, treatment quality and patient care (Raja 2017). Healthcare providers are leveraging on technology to make the patient experience more convenient and personal. A national consumer survey found that more than of the respondents preferred receiving notifications such as appointment reminders and prescription updates via text message, rather than from email. Consumers are frustrated with email because of the constant bombardment of irrelevant junk mail they receive from businesses daily. They view text messaging more favorably because it is quick and most importantly, tailored to their individual needs and preferences.

4. METHODOLOGY

The target population for the study was drawn from clinics within Nairobi County, and a sample of five clinics were selected with a population of 129 healthcare professionals drawn from the five clinics from the clinics databases and was selected using purposive and convenient sampling design pilot testing was done using 13 respondents, Questionnaires were used to collect data and was analyzed using SPSS 19 and presented through graphs, charts tables and frequencies.

5. FINDINGS



The researcher sought discretely whether digitization of health records and information affect competitiveness of your health care facility and resultantly 58% majority said NO indicating that competitiveness of health care facility has not affected by digitization of health records. However, 48% of the respondents reiterated by indicating YES insinuating that digitization of health records and information has great effect on competitiveness of your health care facility.

Table 1: Statements relating to digitization of health records and information

Statement	n	1	2	3	4	5				
Digital access to personal details information of patient is key indicator of effectiveness	(29)	24%	(35)	29%	(5)	4%	(31)	26%	(21)	17%
Digital access of patients past medical history prevents misdiagnosis of patients illness hence reduce losses and complaints	(34)	28%	(33)	27%	(4)	3%	(23)	19%	(27)	23%
Digital access of Medication data enables a firm gain faster and accurate delivery of medication to its Patients and hence gains strategic advantage	(34)	28%	(27)	23%	(3)	2%	(33)	27%	(24)	20%

The research sought opinion of respondent on the statement that digital access to personal details information of patient is a key indicator of effectiveness, 53% of the respondents disagreed with the statement saying; digital access to personal details information is not a key indicator of effectiveness. 4% of the respondents were neither in agreement nor disagreement. 43% of the respondents were in total agreement with the statement, alluding that digital access to a patient personal details is a key indicator of effectiveness.

On the statement that digital access of patients past medical history prevents misdiagnosis of patients' illness hence reduce losses and complaints, 55% of the respondents disagreed with the statement, stating that digital access to the patient past medical history does not necessarily prevent misdiagnosis of patients' illness. On the other hand 42% of the respondents agreed with the statement, indicating that digital access to past patients' medical history truly prevents misdiagnosis of patients' illness. 3% remained neutral to the statement. Digital access of Medication data enables a firm gain faster and accurate delivery of medication to its Patients and hence gains strategic advantage. Those who responded summing up to 51% disagreed, alluding that strategic advantage can be gained even if there is no digital access to information. However, 47% of the respondents agreed stating that, its true strategic advantage can be gained by a firm through having the digital access to medication data that enables faster and accurate delivery of medication. 2% were thus neutral.

The study also sought to establish the significance, direction and strength of the linear relationship between strategic orientation of healthcare institution providers, which is the dependent variable, and digitization of health records which is the independent variables. This was achieved through performing a Pearson's correlation analysis. Pearson's correlation values range from -1 to 1. -1 indicates a perfect negative relationship, 0 indicates that there is no relationship between the variables while +1 indicates a perfect positive relationship. Again an absolute Pearson's correlation value of 0.5 indicates a strong linear relationship between the variables while a value below 0.5 indicates a weak linear relationship. The sign of the Pearson's correlation coefficient value indicates the direction of the relationship. Finally, the resultant p-value less than 0.05 at 95% confidence level indicates that the linear relationship between variables of interest is statistically significant. Therefore, a correlation analysis was performed in this study and the findings were presented in Table 2.

Table 2: correlation Correlations

	digitization of health records	ofmobile applications	electronic procurement medical supplies	strategic orientations of healthcare institution providers Performance
digitization of health records	1	.250	.621**	-.512*
	Pearson Correlation			
	Sig. (2-tailed)	.332	.008	.036
	N	121	121	121

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

According to the table there was a strong positive significance relationship between digitization of health records and mobile applications, $r = 0.621$; $p = 0.008$.

A simple linear regression model was performed with strategic orientations of healthcare institution providers as the dependent variable and digitization of health records as the independent variable. This is aimed to establish a linear relationship between them. The results were tabulated in tables 4.7, 4.8, 4.9. Table 4.7 was on the model summary and presented the coefficient of determination which determined goodness of fit of the model.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.512 ^a	.262	.213	.45657

a. Predictors: (Constant), digitization of health records

According to the findings in table 3 digitization of health records was found to explain 21.3% of the variation that occurred in strategic orientations of healthcare institution providers. This was indicated by coefficient of determination value of 0.213 (Adjusted R Square).

Table 4 showed the analysis of variance which aimed at determining the significance of the overall model.

Table 4: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.109	1	1.109	5.318	.036 ^b
	Residual	3.127	120	.208		
	Total	4.235	121			

a. Dependent Variable: strategic orientations of healthcare institution providers

b. Predictors: (Constant), digitization of health records

The results indicate that the model with digitization of health records as the independent variable significantly predicted strategic orientations of healthcare institution providers, $F = 5.318$; $p = 0.036$.

Table 5: Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	8.771	1.977		4.438	.000
	digitization of health records	-1.242	.539	-.512	-2.306	.036

a. Dependent Variable: strategic orientation of healthcare institution providers

The results in the table 5 revealed that digitization of health records significantly predicted strategic orientation of healthcare institution providers. This was indicated by a significant p-value ($p= 0.036$ less than 0.05).

6. CONCLUSION AND RECOMMENDATION

Even though competitiveness of health care facility has not been affected by digitization of health records, the firm should maintain the health digital record incorporating with other health services. Digital access to personal details information should be improved to be secure enough for both the doctor and the patient access, thus effectiveness. Digital access to the patient past medical history does not necessarily prevent misdiagnosis of patients' illness, however the firm should invest more on the digital access to the patient's past medical history for it's bound to improve firms' performance.

In conclusion competitiveness of health care facility has not been affected by digitization of health records. Digital access to personal details information is not a key indicator of effectiveness in health care sector. Access to the patient past medical history does not necessarily prevent misdiagnosis of patients' illness indicating that illness perhaps change and diagnosis can't be the same. Strategic advantage can be gained even if there is no digital access to information.

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