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Adoption of Computerised Health Information System Focusing on Kenya's Health Facilities

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Abstract
Although the benefits of information technology are clear adapting new information systems to health care has proven difficult globally and rates of use have been limited. With the challenge of inadequate health workers and low quality of service delivery, Information Communication Technology is essential to ensure availability of Information to multiple users and multiple settings. It is also important for Integration of variable types of data media, data legibility, reduced medical errors, complete and quality data. It also enable structured data entry, accurate calculation of processes, provision of tools for decision support and data based analysis. Although Kenya as a developing country has invested in Information Communication Technology with the aim of improving patient care, all indications have shown slow adoption of technology in healthcare industry. Therefore it is important to focus on means of hastening adoption of HIS in order to enhance service delivery in the health sector and hence effective service delivery for Kenyan people.
Keywords: Adoption, Health Information Systems, ICT Infrastructure.

1. Introduction

With increasing need for efficiency in Health Information Management, Use of Information Communication Technology is essential in overcoming the challenges of inadequate health workers and low quality of service delivery which are key in efforts towards achieving the Health Millennium Development Goals (Kloss, 2013).

Given the fragmented nature of health care, the large volume of transactions in the system, the need to integrate new scientific evidence into practice, and other complex information management activities, the limitations of paper-based information management are intuitively apparent. Information Management is therefore fundamental to health care delivery (Chassin and Galvin, 1998). Effort to strengthen the HMIS in developing countries goes back to only over a decade ago (Simba, 2004). As a result of these efforts enormous amount of data has been generated in many of these countries to the extent that in some of the countries data has become a source of problem. This is because often managers are overwhelmed with lots of data that they cannot analyse effectively and use it for decision-making. Therefore, the collection, compilation and analyses of data become an end rather than the means of improving health care services (Opit, 1987). In addition, data produced continue to be untimely and of doubtful quality thus ending up being inadequately used for decision-making (Finau, 1994).

While the benefits of health information technology are clear in theory, adapting new information systems to health care has proven difficult globally and rates of use have been limited (Valdes, Kibbe, Tolleson, Kunik and Petersen, 2004). This could be attributed to the fact that Most information technology applications have centered on administrative and financial transactions rather than on delivering clinical care (Audet, Doty , Peugh, Shamasdin, Zapert and Schoenbaum, 2004).

While more and more patients seek healthcare services and prioritize quality in their lives through enhanced healthcare treatments and services great demand is created on the health care industry's information-handling abilities and infrastructure (Bodenheim, 1999). It is therefore crucial to ensure there is reliable information and effective communication in public health practices.

According to Lagesen and Vivian (2007), adoption of ICT provide timely information that is proven to save lives, improve the quality and efficiency of the health delivery system and contain the cost of healthcare. Therefore use of appropriate technologies can increase the quality and the reach of both information and communication (Zakaria, Yusof and Zakaria, 2009).

With the potential of Health care benefiting from Information and Communications Technology, it is taking so long to move towards the adoption while research has shown that ICT adoption in healthcare can save billions of dollars (RAND, 2013).

If the utility of data is not appreciated, programme strategies and monitoring indicators as a basis for information systems are not efficiently defined, data are inadequately and inefficiently integrated into the managerial process then HMIS will not develop to improve quality of service and decision making (Ashley, De Brine, Lehr and Wilde, 2007).

Kenya like other developing countries also struggles with high levels of poverty and this has had its effect on the adoption and access to ICT while ICT adoption is meant to focus on enhancing health service provision for Kenyans by ensuring faster service delivery for all (Graham and Mann, 2013; Person, 2004). It therefore is important to embrace the potential offered by intensive ICT adoption in the health sector for quality

and timely service delivery in heath care provision.

2.1 Importance of ICT

The use of ICT in healthcare represents one of the most important challenges, where the Information technology shifts the exclusive focus on medicine from curing to prevention of diseases as well as enhancement of the health status and care (Smith and Álvarez, 2008). According to Eysenbach (2003), development of information assist consumers acquire more responsibilities for their health care and participate actively in the decision making.

Besides reducing paper cost and human energy, ICT enables medical expertise to become available regardless of the location of the patient, which increases patient democracy and quality of care (Maas and Eriksson, 2006). Other benefits of using ICT in HIS include: simultaneous availability of Information to multiple users and multiple settings, Integration of variable types of data media, data legibility, Reduced medical errors, complete and quality data, structured data entry, accurate calculation of processes, provision of tools for decision support and allows analysis if backed by database (Chamorro, 2001).

2.2 Adoption of Technology

According to Rogers and Shoemaker (1971), adoption is defined as the acceptance and continued use of a product, service or idea. In HIS, adoption of ICT incorporates the implementation of various ICT solutions which facilitate efficient, enhanced and high quality healthcare operations (Wickramasinghe and Schaffer, 2010.)

Potential adopter passes through certain stages before decision is made on whether to adopt or reject an innovation. These stages of decision process start with awareness which is having knowledge of existence of a new innovation. Persuasion follows which involves anticipating and predicting the future use satisfaction and risk of adoption where the potential adopter develops a positive or negative attitude towards the innovation. This plays a very important role in modifying the final decision making. The Decision stage occurs when an individual engages in activities that lead to adoption or rejection of an innovation (Rogers, 2003).

In the Kenyan health system, healthcare providers are obviously at different stages of ICT adoption. It is therefore important to ensure that efforts are made to stimulate adoption in every stage of the adoption process.

2.3 Slow Adoption

The adoption of information technology has been relatively slow in the health care industry compared to many other industries. In the banking industry for example, ICT has made the automation of many routines possible and thus reducing the need for work force that was tied up in these routines. Consequently, the productivity of labour has increased permanently. However, health care industry is lagging behind despite all the heralded benefits of ICT adoption (Shortliffe, 2005).

Some of the reasons why this is the case is incompatibility of different ICT components, lack of demonstrated cost effectiveness and issues of privacy, confidentiality and security.

2.3.1 Incompatibility of Different ICT Components

New information and communication technology has to be interoperable with other electronic means of data storage and communication. Interoperability is broadly defined as the ability of two or more systems or their components to exchange information and to use the information that has been exchanged. In healthcare context Interoperability is the ability of health care information and technology systems to work together within and across organizational boundaries in order to advance the effective delivery of health care for individuals and communities (Fonseca, Ribeiro and Granja, 2009).

Safe and effective healthcare relies heavily on the ability to exchange data from one software to another and from one person to another as well as on the ability to understand that information so that it can be used. Care givers may be unwilling to share health-related information. However, even when healthcare providers are in agreement to share information, individual entities may have their customized or vendor-driven software that is incompatible and not interoperable with other systems (Iroju, Soriyan, Gambo, and Olaleke, 2013). One way of overcoming this problem can be common technical standards since the value of a network depends on the number of existing users (Christensen and Remler, 2007; Katz and Shapiro, 1994).

2.3.2 Lack of Demonstrated Cost-Effectiveness

Research by Whitten, Mair, Haycox, May, Williams, and Hellmich. (2002) on telemedicine depicted that one cannot draw any conclusions of the cost effectiveness from the existing literature and therefore it is difficult to draw generalisable conclusions.

With many separate small-scale studies having already been conducted, comprehensive studies have not been conducted yet on cost-effectiveness of ICT in healthcare which would be a source of motivation on its adoption. The decisions to adopt new technology are often irreversible, which means that it is hard to go back to the old methods if the new technology proves to be poor. This means that it is rational for the health care providers to be careful with their investing decisions especially where there is no considerable evidence of the benefits (Yip, Phaal, and Probert, 2014).

2.3.3 Issues of Privacy, Confidentiality and Security

The issues of privacy, confidentiality and security have to be considered when adopting new ICT technology to store and exchange information. According to Rindfleisch (1997), Medical records contain a lot of information about patients such as height, weight and blood pressure to mention some. Sometimes they contain very sensitive information that should not be available to outsiders. Access to information about topics like fertility and abortions, sexual behaviours and psychiatric care must be controlled because disclosure can harm the owner. It can cause prejudice and embarrassment, complicate getting and holding a job and affect individual's insurability.

Many countries are moving towards national, international or even global e-health environments. Such a development requires advanced security and privacy services. The use of the Internet to transmit sensitive medical data, however, leaves the door open to the threats of information misuse either accidentally or maliciously. Health-care industries are therefore extremely cautious in handling and delivering electronic patient records using computer networks due to the high vulnerabilities of such information. To this extent, security and privacy issues have become two of the biggest concerns in developing e-health infrastructures and have thus spurred research activity to develop secure systems (Blobel, 2007).

Therefore the above issues of privacy and confidentiality remain a big challenge toward adoption of ICT in HIS by health care providers who need assurance of security upon adoption of ICT.

3. Conclusion

With increasing need for efficiency in Health Information Management, Use of Information Communication Technology is essential in the efforts towards achieving the Sustainable development Goal number 3 of Good Health and Well-Being. There has been slow adoption of ICT in healthcare due to challenges which if could lead to experiencing of many benefits of ICT adoption.

In Kenya, Adoption of ICT will reduce paperwork in health sector as well as enhancing availability of Information to multiple users in different settings. It will also bring about the possibility of integrating different types of data, data legibility and reduce medical errors due to increased efficiency by ICT enabled system.

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