

The role of Information and Communication Technology in Healthcare Management for Efficient Healthcare Delivery in Nigeria

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Abstract - Information and communication technologies (ICT) are being widely used in healthcare management systems. The records of patients in Nigerian hospitals have over time been run down due to large numbers of patients; this led to poor record keeping since it's a paper based system. This paper is designed to develop a centralized database for storing health related information for all Nigerians. Operational data from communications, blood banks, and patient's medical information systems were linked together using data mining techniques so as to demonstrate data integration and information sharing among medical practitioners. This paper will be of immense benefit to government, hospital administrators and the masses.

Keywords - Information and communication technology (ICT), healthcare management systems, database, data mining.

I. INTRODUCTION

Health systems management or health care systems management describes the leadership and general management of hospitals, hospital networks, and/or health care systems. In international use, the term refers to management at all levels. Health systems management ensures that specific outcomes are attained, that departments within a health facility are running smoothly, that the right people are in the right jobs, that people know what is expected of them, that resources are used efficiently and that all departments are working towards a common goal. (http://en.wikipedia.org/wiki/Health_administration). Research industry and development efforts within the healthcare industry and rapid advancement in Information and communication technology (ICT) over the last two decades have brought about significant advances in the quality of medical services to the patients (Burney et al. (2010).

Health care (or healthcare) is the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in human beings. Health care is delivered by practitioners in allied health, dentistry, midwifery (obstetrics),

medicine, nursing, optometry, pharmacy, psychology and other health professions. It refers to the work done in providing primary care, secondary care, and tertiary care, as well as in public health. Access to health care varies across countries, groups, and individuals, largely influenced by social and economic conditions as well as the health policies in place. Countries and jurisdictions have different policies and plans in relation to the personal and population-based health care goals within their societies. Health care systems are organizations established to meet the health needs of target populations. Their exact configuration varies between national and sub national entities. In some countries and jurisdictions, health care planning is distributed among market participants, whereas in others, planning occurs more centrally among governments or other coordinating bodies. In all cases, according to the World Health Organization (WHO), a well-functioning health care system requires a robust financing mechanism; a well-trained and adequately-paid workforce; reliable information on which to base decisions and policies; and well maintained health facilities and logistics to deliver quality medicines and technologies. (<http://www.who.int>). Retrieved 2013-11-24.

II. Information and Communication Technology

Information and communications technologies (ICTs) can play a critical role in improving health care for individuals and communities. By providing new and more efficient ways of accessing, communicating, and storing information, ICTs can help bridge the information divides that have emerged in the health sector in developing countries—between health professionals and the communities they serve and between the producers of health research and the practitioners who need it. Through the development of databases and other applications, ICTs also provide the capacity to improve health system efficiencies and prevent medical errors.

(<http://www.healthconnectintl.org/ictforh.html>)
Accessed October 12, 2014.

According to Anyakoha (1991), information technology is "the use of manmade tools for the collection, generation, communication, recording, re-management and exploitation of information. It includes those applications and commodities, by which information is transferred, recorded, edited, stored, manipulated or disseminated". Hawkrige (1983) describes information technology as a revolution which has penetrated almost all fields of human activity, thus transforming economic and social life. UNDP (2001) asserts that even if sustainable economic growth facilitates the creation and diffusion of useful innovations, technology is not only the result of growth but can be used to support growth and development. ICTs are credited with the ability to transform, and deep and significant changes are expected from their widespread use in Africa. From this stand point Africans can take maximum advantage of the new technologies even if major challenges remain. These challenges include adapting ICTs to local conditions and uses in developing countries, and allowing each country understand those innovations and adjust them to their own development needs.

III. Benefits of ICT

ICTs are expected to produce a number of benefits:

- increase quality of care and efficiency
- reduce operating costs of clinical services
- reduce administrative costs
- enable entirely new modes of care
- increase patient security and data protection (<http://www.msss.gouv.qc.ca/ministere/observatoire/index.php>) Accessed October 14, 2014

IV. System Operation's Style

First the administrative control panel will register and have user name and password which will now enable him or her to login and view the medical records of each patient and all hospital records. When a patient comes to the hospital, the patient will be given form to fill and an identification number will be generated for the patient immediately, the identification number can be used by any registered hospital in Nigeria to view the medical history of that patient. Data mining techniques will be used to extract the medical history of a patient in a particular hospital.

Table 1 shows the sample of a patient's registration form

First Name	Chidimma
Middle Name	Lilian
Surname	Okpalla
Designation	Assistant Lecturer
Occupation	Civil Servant
State of posting	Anambra
Date of Birth	1985-04-12
Sex	Female
Marital Status	Married
Age	30
Blood group	A+
National Id No	84289
Telephone Number	08036359729
Residential Address	Ihiala
Grade level	9
Step	2
Employer	Federal University of Technology, Owerri
Healthcare Provider	Life Specialist hospital
Genotype	AA
Medical History (Allergy)	Chloroquine

Table 2 shows a sample of hospital Registration form

User Name	Chioma
Hospital Name	Life
Address	Nnewi
State	Anambra
Password	Password
Date Registered	October 14, 2014
Time	14:20 PM

Table 3 show the sample of Patient's medical report

First Name	Surname	Address	ID	Diagnosis	Vital Sign	Treatment
Jude	Okpalla	Ihiala	84367	Malaria	Normal	Fansider tablets
Ikenna	Okechukwu	Onitsha	83468	Typhoid	Normal	Amoxil tablets
Kelechi	Okechukwu	Onitsha	83569	Malaria	Normal	Artesunate tablets

From the above table, Jude Okpalla was diagnosed of malaria and was given fansider tablets for his treatment, Ikenna Okechukwu was diagnosed of Typhoid and was given amoxil tablets while Kelechi Okechukwu was diagnosed of Malaria and was given Artesunate tablets for treatment.

V. Conclusion

Information and Communication Technology can offer real opportunities to improve the quality of community life. A healthy information society is concerned with getting reliable and timely information to its members. Making people aware of the benefits derivable from the use of ICTs will help to make the society a healthy one. This paper will be able to alleviate the problems of unnecessary duplication of data especially for inpatients and outpatients, inconsistency of data; hence making it easy to trace the flow of patient past medication data.

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