



## A QUALITATIVE APPROACH OF ICT INVENTORY: AN OVERVIEW OF FEDERAL TEACHING HOSPITAL, IDO, EKITI STATE

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### ABSTRACT

*This study mainly focuses on how inventory (intensive) of relevant ICT facilities is capable of transforming health operations and services into a modern way such that all health facilities attain a global standard of diagnosing and treating all patients. A Federal Teaching Hospital at Ido-Ekiti was used for this study. Qualitative data was collected via In-Depth interview with heads of functioning units in both clinical and non-clinical aspects of the health facility. The results showed that although the management of the health facility is trying their best but some existing units are not yet automated. That is, they still use the manual method of carrying out their specialized duties in those units. These methods are moribund. The implication of this is simply that lots of patients will always languish in pains on their sick bed without attending to them on time. Such patients may suffer referral and may likely give up untimely. Which means, mortality rate is still in the increase in developing nations because of single fact of not using the adequate number and quality types of ICT facilities. The study concluded that the health sectors in developing nations must take the bull by the horn in adopting and using intensive ICT facilities to provide quality health care delivery to their people.*

**Key Words: ICT facility, health care delivery, patients, developing nations and intensive**

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### Introduction

The World Health Organization (2004) perspective of health is not just merely the absence of disease in the human system but the attainment of a state of perfect physical, mental, emotional and social well being. On the other hand, Information and Communication Technologies (ICTs) certainly is described as a range of technologies for gathering, storing, retrieving, processing, analyzing, transmitting and interpreting information. Information/data is seen as a key element to achieving these objectives, as is a workforce trained in the appropriate health information skills (Berland, Elliott and Morales, 2001).

The health sector is a very sensitive sector all round the globe. This is because of its peculiar roles, functions and services it renders to the general public. It is also one of the largest sectors that generate and consume relevant information about the health facility and most importantly, the patients it handles.

Therefore, the urgent need to generate and also have unlimited access to up-to-date and timely information about their patients remains a sine qua non for well timed, proper and adequate diagnosis, treatment and prevention of any kind of diseases. It then goes without saying that every health facility is expected to have relevant modern technological facilities to generate and where necessary receive timely information or data about all patients that use any health facility anywhere anytime. This will help especially in an emerging economic state like Nigeria to improve the life span of its people and to revamp the economy of the country because health is said to be wealth. That is, every health facility regardless of where it is established be it rural or urban needs constant and readily available information that is capable of affecting the well being of all patients, it is important to note that over the last decade, the revolution of ICTs needs to contribute immensely to the continuous learning, sharing and dissemination of health information amongst professionals like the case in the developed nations.

The need for this study cannot be overemphasized in 21<sup>st</sup> century simply because the inventory of relevant ICT facilities in existing and functioning health facilities in Nigeria is very significant. ICT inventory is perceived in terms of quantity and quality. ICT is deployed or adopted in terms of the health service a particular facility is known for or renders in any community. The population of people that visit the facility equally plays a meaningful role. That is, the inventory of ICT facility in any health facility should be able to cater for the number of people that visit the facility for health diagnosis. The demand for health care services in Nigeria ranges from rapid ageing of the population as a result of poverty, the rise in chronic disease and increased consumer expectations; problems with health workforce supply and distribution; inequity of access to services, particularly amongst Indigenous, rural and poor populations; quality and safety concerns; and fragmented and limited ability to share information (Armstrong, James, Gillespie, Leeder, Rubin and Russell, 2007). The extent of our challenges is great and they must be met with less resources (Coiera, 2004).

### **Literature Review**

Healthcare is an information intensive industry and healthcare professionals rely on access to correct and comprehensive information, when and where they need it, to inform the daily decisions they make about a person's care. Information and communications technology is largely absent from the way we generate, capture and share health information as we continue our reliance on handwritten paper records. To say that this reliance on paper is inefficient, wastes money and scarce resources and compromises

patient safety and the quality of care is an understatement (Nichols, Copeland, Craib, Hopkins, & Bruce, 2008). In order to meet these challenges and ensure the sustainability of healthcare, we need to change the way healthcare is funded and delivered. Failure to do so means these challenges go unchecked, needs go unmet, and the health system continues its downward spiral of unsustainability with resultant detrimental flow on effects for workforce participation, productivity and economic growth. The challenges facing healthcare, if not addressed appropriately and soon, will become overwhelming. They call into question nation's ability to deliver efficient, equitable, affordable, portable, universal, highly accessible and safe, high quality healthcare.

In Peru, Egypt and Uganda, effective use of ICTs has prevented avoidable maternal deaths. In South Africa, the use of mobile phones has enabled tuberculosis patients to receive timely reminders to take their medication. In Cambodia, Rwanda, South Africa, and Nicaragua, multimedia communication programs are increasing awareness of how community responses to HIV and AIDS can be strengthened. In Bangladesh and India, global satellite technology is helping to track outbreaks of epidemics and ensure that effective prevention and treatment methods can reach people in time (McNamara, 2007). Investment in information and communication technology (ICT) in the health sector in Uganda and sub-Saharan Africa is limited for a number of reasons. One of these is failure by planners to appreciate that ICTs – computers, telephones, the Internet, radio, etc can improve healthcare delivery. Many policy makers will ask, “Why should we invest in computers and Internet connection when people are dying of malaria, diarrhea and AIDS?”( I-Network Uganda ,2003). Many of this type of related questions are asked by government and stakeholders in several developed countries. We believed that with the information, framework, contributions, evidences and recommendations provided in this paper on the application of ICT in health will help governments and stakeholders of developing countries to invest more in E-health.

The WHO Report for the World Summit on Information Society (WHO, 2005) indicates inequity between burden of disease and spending in developed and developing countries. Health conditions and ICT diffusion in countries provide a basis for outlining opportunities for action in e-Health. Health conditions can be expressed by WHO's mortality strata. United Nations Conference on Trade and Development (UNCTAD) has established an ICT diffusion index as shown in Table 1, ICD development which is based on connectivity, access and policy. These terms are defined as follows:

Connectivity: Physical infrastructure available to a country: per capita internet hosts, PC's, telephone mainlines and mobile phones. Excludes electricity, broadband, and affordability measures. Access: Number of internet users, adult literacy rate, cost of a local call, and GDP per capita Policy: Comprises presence of internet exchanges, competition in the local loop / domestic long distance and competition in the internet service provider market. ICT diffusion index can be calculated from the formula:  $ICT\ diffusion = (Connectivity + Access + Policy) / 3$  ICT diffusion takes on values from 0 to 1 range (e.g. Iceland has the highest ICT diff in Europe = 0.76);

**Table 1. ICT diffusion – Region Max ICT diffusion summary (Rudowski, 2007).**

Region	Max ICT diffusion
South East Asia	0.33 Maldives
Africa	0.36 Mauritius
Americas	0.80 USA
Europe	0.76 Iceland
Eastern Mediterranean	0.58 United Arab Emirates
Western Pacific	0.68 Singapore

Low ICT diffusion value for a given country indicates obstacles in eHealth development. Better telecommunications infrastructure, more reliable and user-friendly access devices are of a high priority in developing countries (Rudowski, 2007).

On the benefits of ICT in healthcare delivery, Mathur (2004) identified the following:

1. In addition to containing costs, advanced information technologies furnish health care providers with the opportunity to improve patient care by streamlining clinical processes and creating a seamless flow of information.
2. Currently, healthcare providers use paper-based records to record a patient's receipt of health care services. Unfortunately, the use of such records leads to the inadequate documentation of the care-giving process, a severe disruption in the flow of patient related information, and a substantial delay in the delivery of health care services. Advanced information technologies - such as computer-based patient records, portable computers, and expert information systems - alter this situation by providing clinicians with real-time access to patient information at the point of care.

3. Within domestic economies of U.S.A., Canada and Japan, Telemedicine services halved traditional costs and increased the productivity of medical professionals. Tele-Expertise has evolved as the basis for branded healthcare chains with an international scope

4. IT enables inexpensive arrangements directly and indirectly through partnerships, branches, representation offices, subsidiaries, affiliates, franchises, licences and alliances through on-line tele-services and data transfers and there are numerous ventures in India, Pakistan, Srilanka, Kenya, and Mexico where transfers of know-how have been so arranged.

5. Within domestic economies of U.S.A., Canada and Japan, Telemedicine services halved traditional costs and increased the productivity of medical professionals.

### **Methodology**

This study took place in Federal Teaching Hospital, Ido-Ekiti, which is a semi-urban area in Ekiti State, Nigeria. The health facility serves its host community and all neighboring communities even the newly established Federal University Oye-Ekiti. The facility is divided into two major parts. That is, the clinical and non-clinical sections. From the existing and functioning units, a total of ten (10) units across clinical and non-clinical were purposively selected for this study. The Head of each unit or anybody delegated by the head were interview for this study. In-Depth interview guide was used to elicit qualitative data for this study. The data was analysed using content analysis and verbatim.

### **Findings**

#### **Inventory of ICT facilities Available in Federal Teaching Hospital Ido-Ekiti**

This section is primary taking stock of the relevant types of ICT facilities available in each of the functioning and existing units or departments in Federal Teaching Hospital Ido-Ekiti. This is because the adoption and use of ICT in all organizations is inevitable due to the technological revolution round the entire globe. On the relevant ICT facilities in the existing units in Federal Teaching Hospital in Ido-Ekiti, the participants have the following to say,

“We have the internal ICT Facilities, in term of our nominal roll, our payroll, all our link together on the system and we have a personnel audit on the system too” (*IDI/Female/Assistant Chief Accountant/2018*).

“We have microscope, internet facilities, staining equipment, incubator, water bat, mobile phone, light microscope, florescent microscope, binocular microscope” (*IDI/Male/ Principal Medical Laboratory scientist/2018*).

“Actually in my unit we have the necessary facilities like the computer, the UPS, the attendant equipment, we also have so many platform that gets our data out across to the necessary and appropriate quarters, we have Facebook, telegram, also we make use of our cell phones, just to make sure our message, our idea, our concept, and the vision and mission of the hospital are well grounded in the mind of the workers, and the public, we are also making sure that the core values are maintained at all times, and when we talk about core values of this center, we are talking about discipline, well behaved, dedicated, committed staffs that are ready to make sure the vision and mission of the hospital is maintained and attained” (*IDI/Male/ Head of Information and Corporate Affairs/2018*).

“We have 15 desktop computers, 4 laptops, networking equipments, bash panel, media converter, optic fibers, switch routers, microtic routers, and wireless radio for access points” (*IDI/Male/Senior System and Program Analyst/2018*).

“We make use of mail, laptops, desktop computers, phones, flash drives, and printer” (*IDI/Female/ assistant Chief executive officer of National Health insurance Scheme/2018*).

“We have a lot in here like the monitor, the EEG (Electroencephalograph) machine itself, the keyboard, the printer” (*IDI/Female/ EEG scientist, Electroencephalography/2018*).

“We use computers, internet connections, internet, analysers, flow cytometers, coagulation analysers and slide strainers” (*IDI/Male/ Head of Hematology and Blood Transfusion/2018*).

“Computers and specific gadgets tailored towards a particular specialty like display unit the passes information to other people. We also have Modern scan machine, Ultra sound machine and Colposcope” (*IDI/Male/Head of Obstetrics and Gynecology/2018*).

From the above responses provided by the participants from different units, it succinctly shows that not all the participants actually have a good and convincing knowledge of the tools or ICT facilities they use in discharging their specialized duties. For instance, examine the response of the second participant (Principal Medical Laboratory scientist, some of the items stated are not ICT facilities such as staining equipment, water bat etc). It is true that they use those facilities perfectly because someone trained them on how to use it but they don't have the knowledge of identifying each of those facilities one after the other. For instance, an Assistant Chief Accountant said, “*We have the internal ICT Facilities, in term of our nominal roll, our payroll, all our link together on the system and we have a personnel audit on the system too*”. He did not mention any ICT facility at all but rather listing software install on their desktop computer that they use for their work.

It was further asked what exactly the relevant ICT facilities in each unit is used for? This is because the specialized work or operations perform in each unit differs. Therefore, the ICT facilities used will depend on the role of each unit. The following responses were advanced from the participants in their respective unit.

“Like the nominal roll, it's to know the number of staff in the institution. Having knowing the number of staff in the institution you now merge it with the number of staff in the nominal roll. On the day that we pay salary on a monthly basis, so we have a check list on the system, that is, you compare the nominal roll with the salary, that is, the payroll. The two must be equal i.e the number of staff in the nominal roll must be equal to the number of staff in the payroll” (*IDI/Female/Assistant Chief Accountant/2018*).

“Like I earlier analyzed, I use them to get our message across to the public, to the members of staffs and patients, the reason why we are here is due to the patients, we also use it to get information down to the patients

relations that is people who bring them down for medical care, to make sure that the way we operate and every other information that we have of them are well analyzed, received and make sure that they have it, so that when they come here, there won't be any problem for them, so that they know the right place to go, and what to do, and how to go about it in a smooth way. And also the tenet of servicom is maintained among the service compliance” (*IDI/Male/ Head of Information and Corporate Affairs/2018*).

“Like the media converter, its converts the network coming from the optic fiber, so that the switch can distribute it to the end users. The switches are the one that that break down the network domain so that people can use the end results too. The routers break down the broadcast” (*IDI/Male/Senior System and Program Analyst/2018*).

“We use them to download files, we receives message through them from our national body in Abuja, and we send official documents through them also” (*IDI/Female/ Assistant Chief executive officer of National Health insurance Scheme/2018*).

“We use them basically for EEG (Electroencephalograph), and also for the easy interpretation of results” (*IDI/Female/ EEG scientist, Electroencephalography/2018*).

“We use them for diagnosis and detecting diseases in the blood system e.g anemia, infections, viruses, and genetic problem, diabetes, cancer and detection plasma drug levels. Flow cytometers counts blood cells and detect biomarkers which indicate certain cancers or organ failures. Coagulation analysers test how long it takes for blood to clot for allowing for monitoring of blood thinning drugs. Slide strainers automatically make stain slide from the blood sample” (*IDI/Male/ Head of Hematology and Blood Transfusion/2018*).



“For the Ultra Sound we use to diagnosing pregnancy and it also help us to get the location of the baby and the well being of the baby, also to know the growth and development of the baby from conception till delivery. Colposcope is use for the diagnosis of cervical cancer” (*IDI/Male/ Head of Obstetrics and Gynecology/2018*).

The above analysis is basically on what ICT facilities adopted in each functioning unit at Federal Teaching Hospital, Ido-Ekiti is used for. This is very important because the specialized role or service carried out by each of the unit is a determinant of the level and types of ICT facilities adopted. At this point, it is not a matter of just adopting any how ICT facility but rather ICT facilities that will do exactly what the unit do manually before and even it will do more works and even better than before. For instance, in the account unit, the software use enables them to do a comparable check of the staff in the hospital through the nominal roll and pay roll. Also, the information and NHIS units handles information or data. They send timely and adequate information or data to their head quarters in Abuja or to their patients or their relatives for a prompt action.

### **Discussion**

The developing nations unlike the developed ones have not been getting the best of the improved modern science and technology (ICT) in all its existing sectors despite the service each sector renders or the product manufactured. Since the society is a social system with variety of parts and each part have its specialized functions or roles. All the parts work together to attain equilibrium. It is very sad to note that why some continents especially Africa is still developing or underdeveloped as the case may be is simply because the specialized functions or tasks of each sector have been left undone. Because the tools that serve as a propeller to drive the said tasks are not in place at all. That is why in developing countries especially Nigeria, premature deaths and diseases of any kind that are supposed to be easily preventable are still in the increase.

Disproportion of timely access to primary health services affects most ethnic groups, societies, communities and social groups. In some nations in developing world, under-financing and corruption even when the money is available in the health sector have led to quantitative and qualitative deficiencies and medical negligence in service delivery and to growing gaps in ICT facilities and

equipments upkeep (see table 2). Others are inefficient allocation of resources by all tiers of government, bad management style, misplacement of priority and lack of coordination among key stakeholders have made duplication of efforts, overlapping responsibilities, and resource wastage.

**Table 2: Nigeria Health Sector Annual Budget between 2013-2018**

2013	2014	2015	2016	2017	2018
₦279 bn	₦262bn	₦	₦221.7bn	₦253.8bn	₦340.456bn

Source: Researcher Work, 2018.

Table 2 is an x-ray of allocation of budget to health sector between 2013-2018. The table unveiled that although there is galloping allocation to health sector in Nigeria. It's really awkward to discover that as far back as 2013 the health sector got as much as ₦279 billion. This allocation is enough to start applying the necessary ICT tools to some health facilities using the Geo-political zones to do this in order to avoid lopsidedness. This is because no Rome was built in a day. But up till now, our politicians and the haves in the country go outside the country for medical check and treatment as the case may be. Looking at the budget, it keeps decreasing from 2013 (₦279bn) to 2016 (₦221.7bn) before it picked up in 2017 (₦253.8bn). The present administration has done beautifully well by increasing the budget to ₦340.456bn in 2018. The ministry ought to leverage on this by providing ICT facilities to our existing health facility to make it compete with health facilities in developed nations.

It is noteworthy, that maternal and child death and children under the age of less than one year is still high. For instance, the health sector is a sector with very sensitive roles in the society. It tasks has a multiplier effects on the society at large. The health sector in 21<sup>st</sup> century should be well equipped with relevant ICT facilities to redesign and restructure treatment and diagnosis processes such that patients do not stay too long in the health facility. Patients treatment are suppose to commences immediately after proper diagnosis with the use of ICT facilities and results comes out almost without more ado less more the patient lose his/her life when it can be saved.

Most countries are at some stages of health sector reform, trying to provide expanded and equitable access to quality services while reducing or at least controlling the rising cost of healthcare. Health reform processes have many facets and there is no single model being adopted by all countries (PAHO, 1998). ICTs facilities have the potential to make a major contribution to improving access and quality of

services while containing costs. Improving health involves improving public health and medical programs designed to provide elective, emergency, and long-term clinical care; educating people; improving nutrition and hygiene; and providing more sanitary living conditions. These in turn ultimately involve massive social and economic changes, as many health challenges go well beyond the health sector. The health sector has always relied on technologies. To WHO (2004), they form the backbone of the services to prevent, diagnose, and treat illness and disease. Also, Daly (2003) in McNamara (2007), opines that ICTs are category of the vast array of technologies that may be of use. Given the right policies, organization, resources, and institutions, ICTs can be powerful tools in the hands of those working to improve health.

It is very important to know that improvement in ICT in the last quarter of the 20th century have led to the ability to more accurately profile individual health risks (Watson, 2003), to better understand such technological developments, however, demand that practitioners, managers, government at all tiers and policymakers in short, all stakes are more responsible in assessing the appropriateness of new technologies (Hofmann, 2002). The methods people use to interact with each other not minding the distance have also changed significantly. Mobile telephony, electronic mail and videoconferencing offer new options for sharing perspectives. In fact, now social media or networking has made life so easy in terms of immediate, effective and efficient social interaction not minding distance. Reliable information and effective communication are crucial elements in public health practices. The use of appropriate technologies can increase the quality and the reach of both information and communication.

Increased information helps people to improve their own health through enlightenment and sensitization on health matters, even if they cannot take some curative steps by themselves, but the fact that they have knowledge about some diseases, the moment they begin to see the symptoms, they will rush to the health facility for appropriate steps for treatment instead of staying at home and be taking self-medication. At the same time, social organizations help people achieve health through health care systems and public health processes. The ability of impoverished communities to access services and engage with and demand a health sector that responds to their priorities and needs is influenced by wider information and communication processes mediated by ICTs (McNamara, 2007).

### **Conclusion**

This study concluded that the inventory of the adopted and used ICT in all existing and functioning health facilities will obviously go a long way to determine the extent of health condition of the people in

developing nations especially Nigeria (FTH, Ido-Ekiti). That is, it will unravel whether ICT facilities used is intensive or not and may be capable of been a catalyst that change, restructure and redesign health operations and services in all health facilities such that it facilitates quality and quick health care delivery to patients. This is because when medical test is conducted on patients immediately and result is timely, treatment will commence without delay and mortality rate will drastically reduced. But in developing nations especially Nigeria, ICT use especially in important sector like health is nothing to write home about. To this end, mortality rate is still in the increase in such nations even in Nigeria.

### **Recommendations**

Having identified barriers to the superior use of ICTs for enhanced access to current and relevant medical information, the following recommendations are suggested:

1. The regular inventory of ICT facilities in all health facilities is very important. This will facilitate the up-dating of ICT facilities for quality and timely health care delivery.
2. All existing health facilities should be equipped with some level of ICT facilities base of the health service they specialized on
3. Minister of health should ensure some amount of money is earmark annually to acquire some needed ICT facilities in some identifies health facilities in the six geo-political zones
4. The Federal government should make sure that the allocation for the Ministry of health annually is in the increase because of the sensitivity of the ministry
5. Hospitals should have an in-house policy that mandates staff to use ICTs in the discharge of their duties. This is because there are bound to be health professionals, particularly the older ones, that will be carefree when it comes to adopting some specific technologies.
6. Hospital regulatory bodies should collaborate with International agencies in the area of funding by giving out grants for the successful implementation of sophisticated ICTs in health institutions in public and private sectors.
7. There should be training and retraining of health professionals on ICT use so that health professionals can be abreast of the latest happenings in the ICT world. Also, it is not enough to

make available state of the art ICT equipment; there must be training on the use of such ICTs to guarantee adequate technical know-how and proper maintenance.

8. Internet access within hospital environments should be given high priority. With Internet access, health workers can collaborate with their colleagues outside the Ilorin metropolis and share experiences that will impact positively on their duties.
9. Electricity is an infrastructural necessity in the use of ICTs; hence Government should give it the priority it deserves. Also, all hospital management should supplement government electricity supply in their various hospital environments with modern power generation technologies like the solar and gas energy plants.

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