HEALTH INFORMATION SYSTEMS The Role of Information Systems in Healthcare Delivery

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ABSTRACT- Complex data input, processing, storage and retrieval takes place in health care delivery environments. In some healthcare delivery centres, manual systems are still used leading to a compromised healthcare delivery system. This research discusses the pivotal role of information systems in sustainable healthcare delivery for socio-economic development. Information systems are now an indispensable component in the provision satisfactory service to the general public. We also conclusively provide recommendations for the improvement of the current status quo of the health information systems

I.   INTRODUCTION

The technological and human capital development in health services in our generation has been indeed quite amazing. The amazing development has been subject to the increased disease and consequently the number of patients. Healthcare providers at the other end take advantage of Information Communication Technology (ICT) to handle the ever increasing volumes of data about: patients, health professional, and the administrative information. This information is a very important resources in health care delivery just like in any other business. The information is used usually for decision making at all levels of management: operational, tactical and strategic level. [1]Emphasises that the health care industry is one of the most information intensive and technologically advanced in our society.Communication between healthcare professionals and patients is an integral component of the therapeutic process and a major determinant of patients'satisfaction[2].Healthcare Information systems aid information dissemination.

Information systems play a significant role in helping to improve health and healthcare outputs and decision-making at the point of care, as well as in the planning of healthcare delivery. It is very clear that heightened focus and advancement in healthcare technologies could dramatically contribute to the improvement of healthcare service delivery.[3]LuiaeLj. *et al.* 2006 and [4]NEC 2011).

Accordingto [1] health care organizations hospitals, pharmacies and medical aid societies need data to effectively perform the tasks associated with the patient revenue cycle, tasks such as scheduling, precertification and insurance eligibility determination, billing, and payment verification.

A healthcare quality information system (HQIS) may be defined as a data system that capable of capturing data on medical programs and practices, and providing reports on healthcare and possible outcomes for the patients treated. Thus a HQIS offers the opportunity to address deficiencies in any healthcare evaluation situation. The ultimately goal of this system is to improve the quality of healthcare delivery[5].

The various types of health information systems are justified by the different data and informational needs of the different administrative levels in any organisational setup.

II.   HEALTH INFORMATION SYSTEMS AND THEIR CONTRIBUTIONS TO SUSTAINABLE HEALTHCARE SERVICE DELIVERY

There are basically three types of people who involved in healthcare delivery: Medical professionals, Administrative staff and the patientsas identified by [6]and it is from the three categories that the different types of healthcare information systems are driven from.The different types of healthcare information systems types contribute to healthcare delivery in different capacities. According to [7], there are essentially two types of information used in clinical informatics: Patient specific and knowledge based. In this paper, the researchers decided to classify the healthcare information systems according to usage. The researchers explore each class of information systems and then elaborate its contribution to the improvement of healthcare delivery.

The existing body of literature indicates that the most common clinical applications in healthcare include Electronic patient record systems, laboratory information systems, knowledge-based systems, pharmacy and electronic prescription systems, bioinformatics and radiology information systems [3], [8], [1],[9],[10]. All these applications affect the ways by which health care providers deliver care to or communicate with patients, and they all confront the almost equally same barriers impeding their widespread adoption and practical use.

[11]points out that health information systems purposefully contribute to high-quality, efficient patient care, however [10] further highlighted that there are several factors that influence the quality of healthcare delivery like health worker motivation, quality of training received, efficiency of healthcare facilities andeffectiveness of monitoring of immunisation activities.In this regard we can conclusively say of healthcare delivery does not solely depend on information systemsand therefore information communication technology is a support activity in healthcare delivery.

Themajor concern of business executive alignment applying information technology in an appropriate and timely way and in harmony with business strategies, goals and needs[12]. The information systems pyramid is the common way of classifying information systems therefore the ICT applications highlighted by the researchers above fall into the three general types of information systems: operational, tactical and strategic information systems. For the purpose of this research, it is important to note that clinical and administrative health information systems will regarded as the core of an integrated hospital clinical information system. Hospital information systems are just an instance of health information systems, in which a hospital is the healthcare environment as well as healthcare institution.

The core application using patient specific information is the electronic medical records (EMR). The paper based medical record has its tradition and virtues however the researcher identified the weaknesses and strengths of manual systems including incompleteness, difficult to access, insecure from unauthorized users and data redundancy [7].

According to the World Health Organisation [8], electronic patient information systems have the potential to improve health by giving healthprofessionals improved information about their patients. They can also improve the quality of healthcare and help control costs through improved efficiency.

The literature reviewed by the researcher shows that the benefits of the electronic medical records are vast including the reduction of operational errors, improvement in critical clinical decision making through the use of decision support systems during patient encounters, and universal access to interactive healthcare information in real time mode [13]
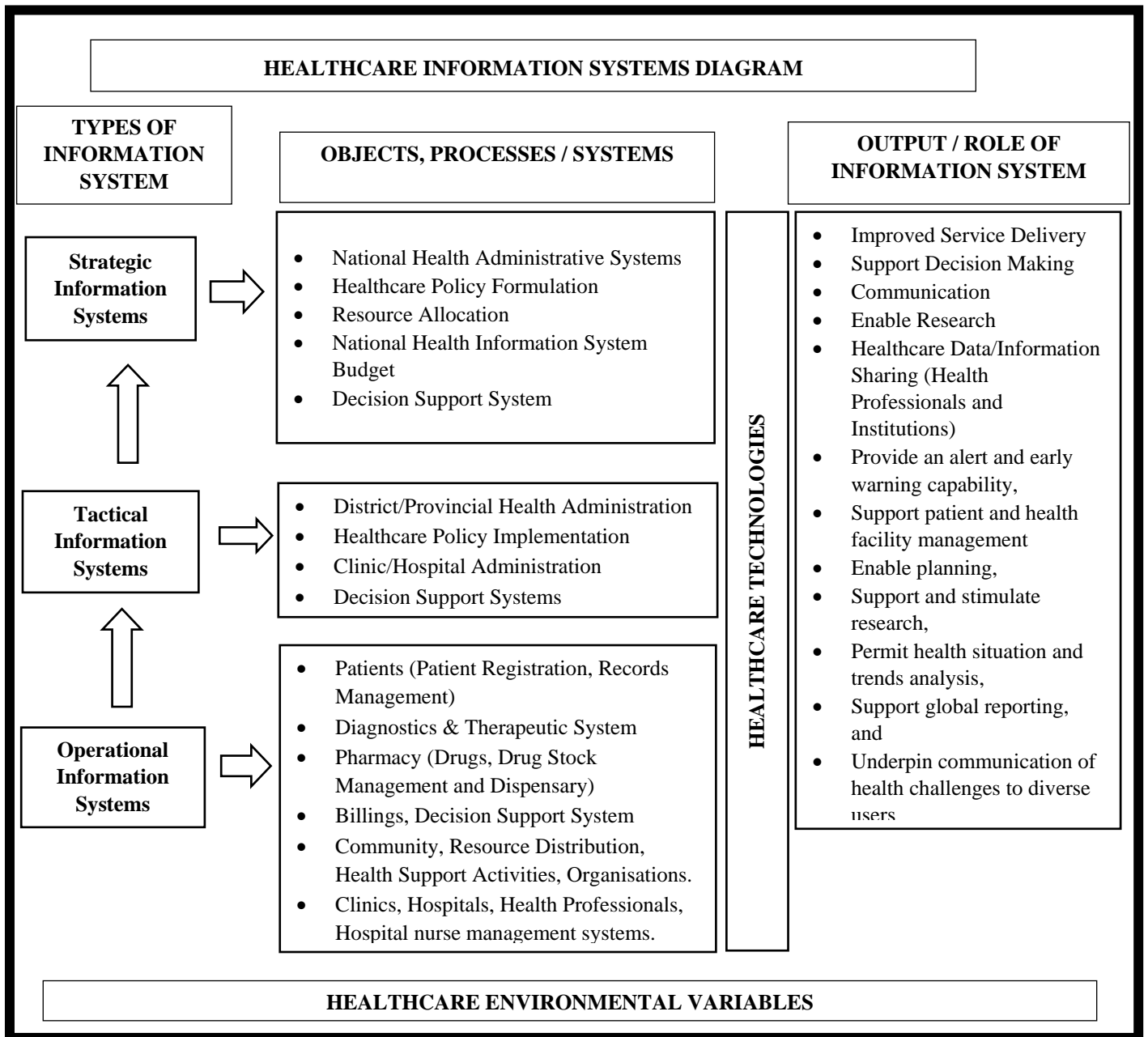
From a tactical and strategic perspective, health care providers may implement such systems in order to improve the overall quality of healthcare and consequently stay competitive. Since these healthcare information systems are used and applied at different levels, it means they are also viewed and understood from different angles. From a policy and policy maker perspective, the electronic medical record provides good opportunities for integrating patient information thereby improving the efficiency and quality of care without the limitations of the range of patient population[14]

Whilst electronic health record systems promises a number of considerable benefits to the systems users and service benefiaries, it is important to note that undesirable consequences from the implementation mayemerge. Such undesirable poor electronic health record system design and improper use may result inelectronic health record related errors that consequently jeopardize the integrity of all the information, thereby endangering patient safety and decrease the quality of care. These undesirable consequences also may increase serious fraud and abuse and therefore serious legal implications on the healthcare provider and the patients. [15]

As highlighted at the beginning of this research, health delivery process is data and information intensive, therefore computer systems are used to carry out some of the voluminousclinical data processing. This complexity has facilitated the introduction of robotics in healthcare. Robotics in healthcare are being used to perform complex tasks and operation like surgery. The advantage of such systems include shorter recovery times and more reliable outcomes in some healthcare delivery procedures [16].

According to Intuitive Surgical, Inc[17], it is beneficial to invest in robotics. Robotics offer the promise of sustainable and highly affordable healthcare services provision without compromising quality of care. Considering the valuable contribution of robotics in terms of health, societal and economic benefits is the technology to consider especially in environments where healthcare professionals are scarce.

Health Telematics systems are another type of information system. Telematics is theelectronic transfer of complex data from one place to another. Usually the data is video or multimedia. Therefore tele conferencing (having conferences by video link) is a type of telematics. The Department of Health in Leeds has several such suites to allow people to hold meetings between Leeds and London.A common method nowadays is to use Web based technology

HEALTHCARE INFORMATION SYSTEMS DIAGRAM

TYPES OF INFORMATION SYSTEM	OBJECTS, PROCESSES / SYSTEMS		OUTPUT / ROLE OF INFORMATION SYSTEM
Strategic Information Systems	• National Health Administrative Systems • Healthcare Policy Formulation • Resource Allocation • National Health Information System Budget • Decision Support System	**HEALTHCARE TECHNOLOGIES**	• Improved Service Delivery • Support Decision Making • Communication • Enable Research • Healthcare Data/Information Sharing (Health Professionals and Institutions) • Provide an alert and early warning capability, • Support patient and health facility management • Enable planning, • Support and stimulate research, • Permit health situation and trends analysis, • Support global reporting, and • Underpin communication of health challenges to diverse users
Tactical Information Systems	• District/Provincial Health Administration • Healthcare Policy Implementation • Clinic/Hospital Administration • Decision Support Systems		
Operational Information Systems	• Patients (Patient Registration, Records Management) • Diagnostics & Therapeutic System • Pharmacy (Drugs, Drug Stock Management and Dispensary) • Billings, Decision Support System • Community, Resource Distribution, Health Support Activities, Organisations. • Clinics, Hospitals, Health Professionals, Hospital nurse management systems.		

HEALTHCARE ENVIRONMENTAL VARIABLES

Administrative health care systems are used at administrative level, they are a collection of clinical information systems for administration purposes. They extract information from clinical systems and use it to manage daily activities, such as staff attendance register, scheduling appointments and billing patients for the services rendered.Decision support systems use given variables to that maybe extracted from other systems to make a decision basing on identified trends, analyze costs, or solve problem areas in operations.

III. HEALTH INFORMATION SYSTEMS AND THEIR SOCIO-ECONOMIC CONTRIBUTION

This research also explores the socio-economic contribution of healthcare information systems.

Health is one of the highest demanded services and strides have been made in transforming the total health care delivery system into a system that is highly patient-centered and value-based.[1] emphasises that this value – based healthcare information system value may be may be in varied forms including improved patient services, improved security of patient health records, improved quality of care, more highly satisfied patients, or happier staff, or something more personally appealing to the medical practitioners such as improved quality of documentation, less stress, and more leisure time.

Healthcare is a component of the economy and has a great influence on the quality of our lives and our general functionality within the society. Healthcare deliver inaccuracies have serious consequences that can affect the patient's ability to carry out their own social and productive endeavors [18] The status of the national economy has an effect on the health status of the citizens of that economy. If the economy is stable and the technological environment is progressive, the patients and healthcare specialist will be able to use ICT gadgets to transact as well as receiving health related alerts.

Successful information systems must be implemented after a thorough consideration of available socially, technically and economically sustainable alternatives and options. Information systems are acquired without exploring all options, without evaluating costs and benefits, and without gaining sufficient input from majoruser groups and as a result the outcome can be quite disastrous [1].

Of equally importance in this research is the issue of information systems sustainability, [1]it recommends the development of strategies for ensuring the financial sustainability of the ICT applications and related analysis of capabilities should funding end.Considering sustainability in addition to leadership, governance, management, stakeholder involvement, policy support, organizational and technical strategies, technical support and coordination, financial support and management, and evaluationguarantees success of the healthcare system [19].

IV. CONCLUSION

From the context of this study, healthcare information systems play a significant role in the improvement of servicedelivery. ICT and healthcare information systems in particular if implemented strategically they contribute to socio-economicdevelopment. It is important for the information systems to the used at all administrative levels.The benefits of including health care systems and procedures in the national information communication technologies policy is actually a measure of national economic development.ICT investments in healthcare delivery to complements the staff competence and aid improvements in health service delivery and patient satisfaction.Healthcare information systems and personal data about patients and health professionals are inseparable, therefore high levels of confidentiality must be maintained so that personal data is not accessed by unauthourised users. However, there must be a balance between security and the functionality of the system.

V. REFERENCES

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