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Towards The Adoption Of Healthgrid For Medical Libraries

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Abstract:

This paper justifies the rationale of adopting HEALTHGRID in medical libraries. Electronic health record is currently playing a significant role in making health information and database available. EHR was explained, its benefits, common implementation pitfalls and constraints are examined from literature, its was discovered among other things that concerns regarding data privacy, confidentiality, security and difficulties associated with the integration of record systems with other information resources in the health care setting are its major challenge. It was also discovered from literature that all the related technology like Health information system(HIS), MEDLINE, Open Access (OA) etc are all fragmented, unsecure and limited in functionality and as such a grid which can provide a unified seamless technology is required to pull all the resources/database together in other for a medical library to achieve its aim and objectives. Grid technology is about providing an environment for the gathering and sharing of several medical, health and clinical records health related databanks maintained by unrelated hospitals, health organizations, and drug companies'. It is this functionality that is required in the medical library. HEALTHGRID, being a grid technology, is proposed to serve as an hospital inform agent in meeting the needs of medical libraries.

Keywords: *Electronic health records, Grid technology, HealthGrids, medical library*

1.1 Introduction

The use of Information and Communication Technologies (ICT) is currently widespread and it has permeated every aspect of life endeavours including the healthcare sector. Healthgrid is a paradigm that was introduced for the full utilisation of the Internet to provide secure, effective and efficient healthcare services. Health information systems are frequently refers to as

the interaction between people, process and technology to support operations, management in delivering essential information in order to improve the quality of healthcare services. (Mohd. N. A. & Muhammad, 2015). Haux (2006) describes systems that process data and provides information and knowledge in healthcare environments as health information systems.

Health Informatics is the field that concerns itself with the cognitive, information

processing, and communication tasks of medical practice, education, and research including the information science and technology that supports those tasks. Health informatics tools include computers as well as clinical guidelines, formal medical terminologies, and information and communication systems. In other words, it emphasis is on clinical and biomedical applications with added possibility of integrating clinical components either among themselves or to more administrative-type health information systems (Conrick, 2006). We must therefore see the health care industry as a dynamic institution just as other industries.

2.1 Review of Related Literature

2.1 Historical Background

Historically, the first professional informatics organization was started in 1949 at a time when computer usage was not popular. A man called Gustav Wagner was the founder of the professional organization in Germany from where it started. Health care informatics started out with a variety of different names. Some of these names included medical computing (which is still used today), computer medicine, medical electronic data processing, medical information science, and medical automatic data processing (Allen, Kramer 2011). These different names mostly fizzled out, to be replaced by the term informatics. MEDLINE happen to be one of the oldest medical information sharing databases around. Since 1965 The National Library of Medicine had began to use MEDLINE as a platform to retrieve medical records, information and articles.

Homer R. Warner, one of the founding fathers of medical informatics in the United States, in 1972 founded an entire department devoted to medical informatics at the University of Utah. Medical are found in school of medicine, hospitals, private

industry, and in medical or health associations. A typical medical library must access a wide range of electronic resources, both in print and digital format. The information technology tools like open access (OA) , free searching via Google and PubMed, MEDLINE, ZB MED and HealthGrid are influencers and have a major impact on the operations of medical libraries all over the world. Medical library is establish to assist physicians, care givers, health professionals, students, patients, consumers, medical researchers, and in finding health and scientific information to improve, update, assess, or evaluate health care.

By 1978, the term bioinformatics was used to describe a subset of medical informatics. The thought behind it was to look at biological systems, and compile data on them. Bioinformatics focuses mainly on DNA sequencing for informational purposes, and the technologies developed to aid in that area. Health information technology is the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making (Goldschmidt, 2005). It was reported by German National Library of Medicine Partnerships (in English) that the largest medical library in Europe is the German National Library of Medicine (ZB MED), which also has collections in the fields of nutrition, agriculture, and environmental science. ZB MED operates as the official European supplier of full texts in response to searches conducted in the National Library of Medicine bibliographic databases such as PubMed, and also operates its own search portals. All these technology are all fragmented and a unified seamless technology is required to pull all the resources/database together.

A grid technology can be deploy to make such services available and it would

require much less manpower, less access time ,more securely and relevant knowledge. Indeed, grid technology already allows users today to have access to health information in a secured manner and to stored data on distant grid nodes instead of having one operator in each centre in charge of transmitting information daily to the central repository (Breton, Solomon & McClatchey 2007) . Grid technology can also be deploy to provide guides for the utilization, maintenance, and development of resources in the Medical Library in order to meet the information needs of physicians, nurses and ancillary staff knowing that it can serve as a pull of information services and act as the hospital's informed agent. The impact of HealthGrids expected to reach far beyond e-government, e-commerce ,e-health and by extension e-library. Medical records, information, articles and consumables and other resources can be securely accessed /retrieved in a manner that will showcase medical library services.

1. RELATED TECHNOLOGIES:

Some of the technologies related to HIS are as follows as highlighted by Kim Ball, (2011).

- mHealth: MHealth is mobile health technology, a quickly growing area of Health IT.
- Health Information Technology (Health IT): Health Information Technology (Health IT) refers to the use of a variety of electronic methods for managing information about the health and medical care of individuals and groups of patients.
- A Health Information Exchange (HIE): A Health Information Exchange (HIE) is a local, state or regional system that facilitates the exchange of health information among EHRs and other HIEs. A nationwide HIE is being developed called “NHIN,” which is an abbreviation for “National Health Information Network.”

- Electronic Health Record (EHR): Electronic Health Record (EHR), is an electronic record of an individual's health-related information that conforms to nationally recognized interoperability standards and can be created, managed and referred to by authorized clinicians and staff across more than one health care organization.
- Personal Health Record (PHR) :A Personal Health Record (PHR) contains health information for an individual. With a PHR, access to an individual's health information is controlled by that individual, which is different from an EHR. The PHR is separate from the physician's legal record.
- ePrescribing Systems: ePrescribing Systems electronically transmit a new or renewed prescription to a pharmacy computer system.
- Patient Registry: Patient Registry is a list of patients with a specific condition, such as diabetes, that tracks critical measures appropriate to that condition, allowing the practitioner to pro-actively manage the patient's care. Another use of the term “Registry” is to describe state or regional lists of individuals such as those who have received certain immunizations.

2. ELECTRONIC MEDICAL RECORD (EHR)

Electronic Medical Record (EMR): Electronic Medical Record (EMR) is an electronic record of an individual's health-related information that can be created, gathered, managed and referred to by authorized clinicians and staff within a single health care organization. It is very common for EMR and EHR to be used interchangeably; however, the critical difference to note is the interoperability of an EHR.

3.1 Benefits of Electronic Medical Record (EHR)

I. Digital Format

One benefit to adoption of an EHR is the potential to replace or significantly reduce the use of paper charts. This will improve access to patient information by allowing simultaneous access to clinical records by staff and physicians; as well as fewer delays waiting for or looking for a paper chart. Most EHRs will also allow physicians to access patient records remotely. This may give you access from the hospital, from home or from a mobile device.

II. Competitive Advantage

More and more practices will implement EHRs over the next several years. Patients, physicians and staff members will begin to expect a practice to have an EHR and will begin to prefer practices that are electronic over those that are not.

III. Disaster Recovery

With proper EHR backup procedures, you can store a copy of your data in multiple locations providing safety that you could never obtain from a room full of paper charts.

One of the most interesting aspects of HIS is how to manage the relationship between healthcare providers and patients. Richard and Ronald, (2008) are of opinion that it can foster good relationship with the patient, it will retain them and attract them and make them to become loyal customers, create greater mutual understanding, trust, and satisfaction. Since it foster a good relationship patients are encourage to be involve in decision making as it relate to their health.

3.2 Estimated Benefits On Implementation – Quality, Access, Efficiency

There are estimated benefits for implementing an EHR as identified in literature. Three main types of benefits arising from the investment they are quality, access

and efficiency.

The benefits on quality and access can be direct for citizens, or indirect, by enabling health-care professionals to improve the quality and efficiency of healthcare that they provide. Five factors that are directly traced to these benefits are;

- Informed citizens and care giver : this implies that citizens and care givers will have direct access to data, information and knowledge about their conditions, diagnoses, treatment options and hospitals, which will enable them to take effective decisions about their lifestyles and health.
- Information designed to streamline healthcare processes: healthcare professionals will have access to more complete and focused information thereby making them to be more citizen-focused and effective in the hospital.
- Timeliness of care : This does not necessarily translate into fast treatment but it implies that patients healthcare can be scheduled and treatment are provided at the right time.
- Safety: implies that patients are well informed about potential injuries and harm of patients are minimised. `
- Effectiveness.: Effectiveness provides an improved positive impact to resource ratio. It means information about the possible service options and their outcomes are available. so care giver can make the most appropriate decision.

Benefits on access can have different forms.

- Equity of access is the same quality healthcare and health related services available to all those in need, when they need it and where they need it. A gain on access can be achieved by the provision of a service to more citizens for a given time period. Better information flows, supported by ICT,

can lead to increase in capacity that can provide greater access, also at more locations.

Benefits on efficiency.

- Efficiency benefits are reflected in improved productivity, avoided waste, and optimisation of resource utilisation. Two common signs of increased efficiency are time savings and cost avoidance. (Karl, Stroetmann & Tom 2006).

Generally the Goal of a Successful EHR Implementation is not limited to achieving meaningful use only, but also: Revenue, profitability, productivity, efficiency, data management capabilities, improved quality of care and patient satisfaction.

3.2 Common EHR Implementation Pitfalls

The following pitfalls were identified by American Society of Cataract and Refractive Surgery in their publication on Guide to EHR Selection, Implementation and Incentives as Updated in 2013. They are the fads about EHR.

1. EHR software isn't or can't be customized to meet practice needs
2. Lack of 100% buy - in by doctors or unrealistic expectations
3. Electronic workflows not well - defined in advance
4. Not enough practice time for staff and doctors
5. No plan for continuous investment in software updates, training, system development or equipment upgrades
6. Underestimating initial cost of going electronic
7. Lack of measurable goals
8. Doctor's use of EHR is not made mandatory
9. Lack of thorough investigation and

analysis of software applications, imaging capabilities or equipment interfaces

10. If doctors don't use it, nothing else matters!

A physician focused, specialist - oriented, efficient EHR will be key to a physician's ability to meet the increased reporting demands, satisfy patient needs, and run a financially successful practice.

3.4 Constraints of EHR

E.H. Shortliffe, and J.J. Cimino (2014) in their work identify at least four major issues that have consistently constrained efforts towards the building of an effective EHRs:

- (1) The need for standards in the area of clinical terminology;
- (2) Concerns regarding data privacy, confidentiality, and security;
- (3) Challenges in data entry by physicians; and
- (4) Difficulties associated with the integration of record systems with other information resources in the health care setting. It is in the light of resolving these major issues that a grid technology is proposed.

4 Deploying A Healthgrid

Each hospital will develop its EHR and contribute its records and benefit into a grid which is to serve as a medical library. Grids are expected to save the search time by parallelizing the knowledge in simulation on unrelated EHR in other to make this data/record available. An HealthGrid is about the gathering and sharing of several medical, health and clinical records health related databanks maintained by unrelated hospitals, health organizations, and drug companies (HealthGrid, 2009). An **healthgrid** can be defined as 'an environment in which data of medical interest can be stored and made easily available to different actors in healthcare systems such as physicians, healthcare

centres, patients and citizens'. **Healthgrids** focus equally on the sharing of data (and the associated issues of privacy and ethics) and on distributed health analysis across the biomedical spectrum from public health to patient care and from tissue/organ data to cellular and genomic information. For individualised healthcare, **healthgrids** are envisaged to facilitate access to biomedical information and ultimately knowledge, no matter where the requestor of that information may reside or where the relevant data is stored.

4.1 Benefits of HealthGrid For A Medical Libraries.

The medical library will benefit from healthgrid by making the following available.

- Biological and medical images data from various related or unrelated existing databases can be accessed by matron
- It provides Support and improvement for existing databases pull and push facilities and other health related resources.
- Centralization of Resources
- Improved cataloguing
- Provision of transparent access to knowledge/data from the user point of view, without recourse to its location and provider.
- Currency of the Collection: update databases of various EHR while applications are still running independently.
- Some other benefits are secured data, educative /research searches engine: Computerized searches are permitted through over 450 different databases including Internet access, MEDLARS databases, DIALOG, and OVID databases .Delivery of Materials by SMS or into mail box when requested and Interlibrary Loan: Since it is computer driven Interlibrary loans are done through any of the automated interlibrary loan system e.g DOCLINE.

Conclusion

Health information system will keep playing a significant role in the improvement of the quality, access and efficiency of health care delivery. The adoption of Electronic Health Record will provide the needed platform for improved health care knowledge delivery, Health grid will provide a reliable, secure, responsive, serviceable, and ready for made knowledge that is integrated with other hospital systems all to the benefit of citizens, care giver and government. HealthGrid will provide service for all matron seeking medical information in at fast and secure manner.

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