

# DATA ANALYSIS OF EMR, IN DISTRIBUTED DATABASE WITH RESPECT TO TODAY'S E-HEALTH APPS

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## Abstract:

Comparative effectiveness research has been an ongoing effort to identify best-practices for health care. A doctor's EHR in the office is supposed to be able to connect with outside sources of patient data, other clinicians using the same or different EMRs. Of most urgency, though, is the desire to connect a clinician with the local hospital. And, of all of the integrations, this one is the most difficult. This paper focuses on the use of data from an electronic medical record (EMR) within a health care organization. It discusses how health provider extracts data from multiple sources in a near real-time fashion. Here also we discuss how national patient identity number can be used for healthcare transaction, how health data can be made protected by using the HIPPA concepts, how we can maintain the security of the patient data.

**Keywords:** EMR; HIPPA.

## 1. Introduction

One of the perceived advantages of electronic medical records is that physicians will have a wealth of information that can help them and gain greater insight about patients [1]. So, modern hospitals will have one system for Medical Records (which often involves transcriptionists). Besides connecting community docs together, HIEs (Health Information Exchange) were placed where different large institutions could connect hospitals and academic centers could exchange information with each other. More importantly, these HIEs were places where community doctors could connect with their local hospital(s), as well as with clinical laboratories. The other approach to clinical data sharing between clinicians is web-based Chart Share – still an emerging technology. EHR data, particularly with the expansion of web-based offerings in the market, are also hosting very large stores of data (though it is different – it is behind the walls of HIPAA privacy protection). However,

a similar effect on the economy can be seen. One of the challenges in connecting the dots in health care – linking together all the fragments of health data about a given patient that is scattered widely across many different settings of care – is trying to match patient identities. So how do we link it all together? When a patient is referred from one doctor to another for consultation. Health information technology makes it possible for health care providers to better manage patient care through secure use and sharing of health information. Health IT includes the use of electronic health records (EHRs) instead of paper medical records to maintain people's health information. These solutions are used by healthcare organizations to improve their full continuum of care through improved communications and collaboration.

## 2. The legend of hospital EHR integration

Before we discuss about the legend of hospital EHR and its integration we must know that, what the hospital EHR really is? It is nothing but a Group, which is installed in the system those who are different, each may have sold as standalone best suited to that Department [2]. So, the hospital will have a modern system for medical records, another one for the pharmacy, which is different to home lab, one for their Radiology imaging systems, and one for billing. So, for different departments there are different EHR's, here our aim is to integrate these different EHR and maintain their interoperability, So that the present system can be reusable for us.

### 2.1. Managing the Transition from Paper to EHRs

The transition from a paper-based medical record to an electronic medical record (EMR) must be addressed and managed on many different and complex levels: administratively, financially, culturally, technologically, and institutionally. The

EHR consists of many components that work together to create the foundation of the legal medical record.

Managing the transition from paper-based records to EHRs is a complex process intensified by the multitude of systems, functionality, and rapid technology advances. No single standard approach exists for solving the transitional process concerns, and each healthcare organization must determine the steps and policies that are needed as they evolve into using a fully functioning EHR. Many healthcare organizations have some degree of hybridization that coincides with the implementation plan. There are many decisions to consider when determining steps and guidelines for managing the transition process from paper to hybrid records and hybrid to electronic records. To ensure accurate and timely business records, healthcare organizations need to define the legal health record and ensure that the quality and integrity of the health record remains intact during the transition process [3].

### 3. Data and System Security

The traditional paper-based medical record is considered by many to be old and outmoded for a variety of reasons, such as its relative ease to misplace or inadvertently destroy, the need to fax or mail it to another location and the time required to do that, as well as its tendency to be personal and customized to a particular physician, thus making it difficult to encode. While the EMR model satisfies most of these woes, it is not without its own issues. In some EMR models, the EMR itself is web-accessible; meaning records or even whole databases may be susceptible to virus corruption or software breaches. With an internet-transferrable medical record, it is possible for a malicious party to sell or alter thousands of people's health information - something nigh impossible to do with traditional records. In this fashion, the revenge of a disgruntled employee or nosiness of a third-party marketing firm can have much farther reaching effects. However, since the health and monetary savings of EMRs far outweigh the potential dangers, their implementation is necessary [4].

### 4. Objective

With the existence of n-number of technologies to formulate the EMR and varied methods for calculating the patient epidemic index the need for

formulating a systematic semantic approach for resonance of EMR has to be derived in context with clinical ontologies. To bridge this gap the system has been suggested and the result will be carried out to formulate the methods and simulate the results.

### 5. Need for the proposed system

There are many models and methods in the MIS field that can be applied to healthcare information systems. These include Nolan's stages of growth, Rockart's CSF's, Porter and Millar's value chain concept, the Capability Maturity Model of the SEI and numerous others. The application of many of these classic models will help us to understand better the complexities of healthcare information system and organizations that use them. Expertise and lessons learnt in client server computing, artificial intelligence and expert systems, and decision support systems can be applied to analogous situations in healthcare. This would help in the smoother transition to sophisticated information technology. Studying the impact of information technology on the patient/provider relationship, the effect of IT on learning in healthcare organizations, developing cost effective models for implementing telemedicine and applied medical informatics projects.

The basic problem faced by many medical records vendor is of data extraction. This made the classic idea of research needs as to extract data in uniform ways and to store it on multi platforms in a distributed database environment is a great challenge.

#### 5.1. Electronic medical record: what your record can tell you

Data analysis will help your practice achieve meaningful use, qualify as part of an accountable organization, and identify at-risk patients or inefficient business practices.

One of the perceived advantages of electronic medical records is that physicians will have a wealth of information that can help them gain greater insight about patients.

The process of gathering and examining this information is called data analytics. For practices that are applying for federal bonuses for meaningful use of technology, or planning to work with accountable organizations, analytics will be critical for proving that a practice is doing well enough to earn a bonus.

### 5.2. Extraction of Electronic medical record data

To manage the public interests in health services, local and national health authorities need updated and precise information on use of medical resources, medication, epidemics, etc. Today, this information is at the best incomplete and outdated. For medical doctors and health personnel in general, access to updated and complete patient records is vital for an optimal patient diagnosing and treatment. Today, vital patient data at the GPs (General Practitioners) offices is unavailable for hospital doctors and medical specialists, or to medical emergency units.

In India we have one EMR for home-based caring services, two EMR system providers for GPs and three EMRs for hospitals. No standard data format exists, which means that all EMRs have their own data formats. This calls for a system that can manage different data formats.

As a result of lack of standards and systems for secure integration of patient data, statistical data have been registered manually.

For some of the EMR systems, statistical modules exist. However, they do not support electronic interpretation and grouping, and they are not widely distributed. In addition, the implementation of regional and national computer networks for health institutions enables integration of EMR data.

## 6. System Architecture

The system architecture will be based on user model based agent system technology. The basic idea behind user model based software agents is to construct the agent from a task specification and a user model. Such an integration of adaptive user interface and software agent technology represents the core module of a user model based software agent. In this way, a software agent can be constructed by transferring only the task specification and the user model to remote hosts. This approach requires that the body part, which includes most of the agent code, is present on the remote hosts.

The agent-based system architecture will be evaluated with other models and approaches, including middleware and distributed databases.

## 7. Security of the System

A major problem with EMR data integration is privacy and security. Distributed systems that

handle confidential information give rise to a new set of challenges. In particular, authentication and authorization are more difficult than in other settings. E.g., while medical doctors must be given access to the entire patient's medical data, other groups as nursing assistants are not granted the same access rights.

This calls for a careful study of the relationship between authentication and authorization. Furthermore, confidentiality is closely linked to authentication. In a system for EMR data integration, no medical data should be transferred before the receiver is authenticated and a secure channel has been established.

## 8. Conclusion

The application of information technology to medical records offers the promise of new knowledge that can be obtained only by integrating and analyzing data extracted from hundreds if not thousands of patient records, including clinical information, medical images, environmental profiles, and genetic analyses, combined with new findings from molecular and genomics research. As institutions struggle with the adoption and implementation of EMR systems, it is crucial that they consider the needs and seek the advice of the research community.

Importantly, improvements made in EMR systems in response to research needs will ultimately serve clinical care needs as well. For example, in trying to achieve consistency and standardization, medical record systems will not only become more useful for research but will also contribute to improved quality of patient care. Simultaneously providing physicians with smart clinical decision support tools. With the proposed system the search & indexing of EMR on any platform will be made with an ease & the software medical service providers will be hugely benefited.

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