



STRATEGIC PLANNING FOR IMPLEMENTATION OF ELECTRONIC HEALTH RECORDS IN GOVERNMENT HOSPITALS

Dr. Syed Salman Ahmed^{1,*}, Dr. K.V. Krishna Reddy², Dr. Jonnala Sindhu³,
Dr. Nimma Satyanarayana⁴

¹Junior Resident, Department of Hospital Administration, Nizam's Institute of Medical Sciences

²Associate Professor, Department of Hospital Administration, Nizam's Institute of Medical Sciences

³Senior Resident, Department of Hospital Administration, Nizam's Institute of Medical Sciences

⁴Professor and Head of the Department

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ABSTRACT

Introduction: Electronic health record (EHR) is an indispensable tool for medical and health professionals. They are the product of decades' worth of innovation and constant improvement. EHRs are implemented around the world a while ago. Though India has progressed well in the adoption of IT in other sectors, such as banking, railway reservation, etc, it has not yet utilized the potential of IT in the healthcare sector. The Union Health Ministry has notified the National eHealth Authority (NeHA) which plays a role for setting directions for public and private eHealth initiatives, including electronic health records storage and health information exchange capabilities and other related health information technology efforts & regulation of the same. **Objectives:** The study aims at strategic planning for implementation of Electronic Health Record in the government Hospitals in India. **Methods:** A descriptive analytical study for implementation of electronic health records using SWOT (Strength, Weakness, Opportunities, and Threats) and PESTLE (Political, Economical, Social, Technological, Legal and Ethical) analysis. **Results:** A broad range of administrative, technical, financial and organizational factors should be considered when adopting an EHR system. Communication between different healthcare providers can enable hospitals to properly plan, select, implement and integrate different health IT projects. The hospitals should collaborate with each other to bridge the gap between internal capacity and external resources. **Conclusion:** Timely & quick access to information is the important strength. Lack of hardware and infrastructures are the most important weakness. Having the potential to share information between different sectors and access to a variety of health statistics is the significant opportunity of EHR. The most substantial threats are the physicians' and other clinical staff's resistance in the use of electronic health records. The successful implementation of EHR requires a coordinated effort from the Central Government, State Governments, healthcare providers, medical associations, IT industry.

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INTRODUCTION

Healthcare systems are highly complex, fragmented and use multiple information technology systems. Appropriate use of digital health tools, Electronic Health Records (EHR) in particular as a system level intervention, can improve efficiency and effectiveness of healthcare delivery in the context of health systems strengthening.

*Corresponding author: Dr. Syed Salman Ahmed,
Junior Resident, Department of Hospital Administration, Nizam's Institute of Medical Sciences.

An Electronic Health record (EHR) is the legal patient record that is created in digital format in hospitals and ambulatory environments.¹ Electronic medical records may include demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, vital signs, personal stats like age and weight, and billing information.² It is an indispensable tool for medical and health professionals. They are the product of decades' worth of innovation and constant improvement. Though India has progressed well in the adoption of IT in other sectors, such as banking, railway reservation, etc, it has not yet utilized the potential of IT in the healthcare sector.

The Union Health Ministry has notified the National eHealth Authority (NeHA) which plays a role for setting directions for public and private eHealth initiatives, including electronic health records storage and health information exchange capabilities and other related health information technology efforts & regulation of the same with an aim to introduce a uniform system for creation and maintenance of health records by healthcare providers.³ The idea is that any person in the country can go to any healthcare provider, medical practitioner or pharmacy and access fully integrated health records in electronic format, which is the vision for "efficient" 21st century healthcare delivery. Although the EHR system implementation has started in private and corporate hospitals, it is the government hospitals which are lagging behind and thus there is a need for its adoption. The study aims at focusing on factors for strategic planning for implementation of EHR in government hospitals in India.

Need for electronic health record: For a health record of an individual to be clinically meaningful it needs to be from conception or birth, at the very least. As one progresses through one's life, every record of every clinical encounter represents a health related event in one's life. Each of these records may be insignificant or significant depending on the current problems that the person is suffering from. Thus, it becomes imperative that these records be available, longitudinally arranged as a time series, and be clinically relevant to provide a summary of the various healthcare events in the life of a person. With rise of self-care and homecare devices and systems, nowadays meaningful healthcare data get generated 24x7 and also have long-term clinical relevance. The purpose of collecting medical records, as much as possible, are manifold – better and evidencebased care, increasingly accurate and faster diagnosis that translates into better treatment at lower costs of care, avoid repeating unnecessary investigations, robust analytics including predictive analytics to support personalized care, improved health policy decisions based on better understanding of the underlying issues, etc., all translating into improved personal and public health. Without standards, a lifelong medical record is simply not possible, as different records from different sources spread across ~80+ years, potentially, needs to be brought meaningfully together. To achieve this, a set of pre-defined standards for information capture, storage, retrieval, exchange, and analytics that includes images, clinical codes and data is imperative.

METHODOLOGY

This is a descriptive analytical study for implementation of electronic health records using SWOT (Strength, Weakness, Opportunities, and Threats) and PESTLE (Political, Economical, Social, Technological, Legal and Ethical) analysis, gathered using the available literature, interviewing the key stake holders.

RESULTS

STRENGTHS

-) Improved care that is evidence based, accurate and faster diagnosis that translates into better treatment at

lower cost of care, avoidance of repeating unnecessary investigations, robust analytics including predictive analytics to support personalised and contextualised care, improved health policy decisions based on better understanding of the underlying challenges, all translating into improved personal and public health outcomes.

-) EHR can be used as the main source of training for physicians and providers of public services as well as access to a variety of health statistics.
-) Accurate record of services provided to individuals can be used to carry out tax refunds.
-) Timely and quick access to information with low volume storage of information.
-) Electronic exchange of information and participation in medical care.
-) Increase in the speed of service delivery
-) Prevention of medical errors

WEAKNESSES

Electronic health records relies on the clinicians using the EHR for clinical documentation and decision making, acceptance by the clinicians was perceived as an important challenge.

-) Relative lack of computer literacy amongst healthcare professionals and EHRs lacking user centred design for ease of use.
-) Poor change management practices and communication silos within the healthcare delivery systems.
-) Lack of uniformity in EHR software despite the availability of EHR standards 2016 and an enabling environment created by the Government through the national EHR resource centre at CDAC, Pune.
-) Lack of synergy between healthcare providers resulting in non-interoperability. "Data hugging" by clinical establishments.
-) Lack of Operating System agnostic EHR and mobility extensions as apps.
-) Lack of awareness around privacy and health information security protocols.
-) No mandatory requirement to electronically monitor and report on clinical outcomes to a central nodal agency.

OPPORTUNITIES

-) Sharing of information between healthcare providers and better information management
-) Being used as the main source of training for physicians and providers of public services
-) Access to a variety of health statistics
-) Accurate records of services provided in order to perform individual tax refunds
-) Ensuring the integrity of the entire system
-) Semantic coordination and communication between internal and external parts
-) Applying as legal document about the type of services provided.
-) For accurate registration of services provided, a lot of discipline is imposed on employees, but indeed if salary repayment performed properly, then such a thing may enhance their satisfaction.

-) If the secretary is aware of EHR as a legal document, then the possibility of typographical errors will be reduced.
-) For access to a variety of health statistics, employee's workload will increase, but by fruition of results, employees' satisfaction and willingness will increase

THREATS

-) Lack of strategic planning in the field of electronic health records
-) Problems related to programming and software developed according to the needs
-) Physicians and other clinical staff's resistance in the use of electronic health records
-) Lack of funds for the design, implementation and use of electronic health records
-) Lack of expert human resources
-) Unauthorized access to patient information
-) Limited awareness of healthcare providers about the benefits of electronic health records
-) Absence of a national standard vocabulary for the establishment of electronic health records

PESTLE analysis of implementation of Electronic Health Records

Political factors

-) Political factors are defined as factors that are caused by policy set by local, state or federal governments.
-) Political factors will always have their relevancy in the health care industry. Government, either central or state, has the power to enact legislation. Healthcare system reforms could be initiated by government.
-) The ministry of Health and Family Welfare, Govt. of India has given the standards for implementation of Electronic Health Records in India in 2016.
-) If the government passes a law that requires EMR to be adopted by health care service providers or passes a law that addresses patients' concerns regarding privacy issues, then it would definitely impact EMR adoption. These factors could also influence other factors either directly or indirectly; for example, economic factors are inextricably interconnected with politics.⁴

Economic factors

-) Economic factors are defined broadly as non-political factors that could impact the profitability of an organization. These factors could include various sub-factors such as economic conditions, industry, financial resources and market.
-) Economic conditions can always have an impact on organizations. Inflation rate, recession, and economic growth are some examples of economic indicators that could affect businesses. It is estimated that a one standard deviation increase in inflation variability can lead to a reduction in the investment rate by 1- percent.⁵ Therefore, a high cost and high risk investment such as EMR would suffer under certain economic conditions.
-) Competition among players in the industry would also influence EMR adoption. Although health care providers are often seen as non-profit organizations, the fact is that

in this industry the competition among organizations does exist. Many studies have shown a positive relationship between price and market concentration of nonprofit hospitals.⁶

-) The competition could be in the form of price or quality or facility to attract patients In cases that EMR could be seen as a competitive advantage within the industry, adoption of EMR by one health service provider would definitely spark anxiety among its competitors, which in turn could boost EMR adoption within the industry despite its high initial spending.⁷

Social factors

-) Social factors are defined as intangible factors that relate to how people think, live and work. Since the ultimate goal of any health care provider is to provide the best service to patients, their view of the technology would be significant.
-) Patients' views toward EMR in general could definitely become either a barrier or an incentive for adopting EMR. If patients mistrust EMR due to privacy or security issues adoption of EMR would become difficult.
-) Healthcare service providers will face challenges in adopting EMR if the market is not ready to accept this technology.

Technological factors

-) Technological factors are defined as technical factors related to the EMR system, usability and its operation. Technology is a critical factor in all EMR implementations. If EMR technology continues to be immature, it would be difficult to implement it in an already reluctant (to change) healthcare industry. The most frequently cited reason for discontinued EMR use is software inadequacy.⁸
-) Currently, a medical record of a patient exists scattered across multiple sites, each with proprietary standards which make it almost impossible for them to communicate between each other.⁹ Therefore, without standardization in EMR technology, it would be more difficult for would-be adopters to convince their stakeholders to engage particularly since there is no guarantee that their chosen EMR system won't be obsolete soon.
-) Technological factors also include developing a skilled human resource to implement, operate and maintain EMR within organizations. In this vein, it is concluded that organizations will need at least one full-time EMR technician for day-to-day maintenance of an implemented system.
-) An effective plan for deployment is as important to success as having capable software to use once deployment is complete. In addition, successful EMR implementation requires "creating a project team to manage the process".
-) Finding the unique human resources with appropriate technological, healthcare, project management and change management skills is difficult in a still nascent market. If the human resource market cannot supply these skills or organizations are unable to develop their own expertise through training and development, it will slow down EMR adoption.

Legal factors

-) It's important to recognize that the implementation of electronic health records carries with it significant legal risks.
-) This liability concern was of special concern for small EHR system makers. Some smaller companies may be forced to abandon markets based on the regional liability climate. Larger EHR providers (or government-sponsored providers of EHRs) are better able to withstand legal assaults.
-) While there is no argument that electronic documentation of patient visits and data brings improved patient care, there is increasing concern that such documentation could open physicians to an increased incidence of malpractice suits. Disabling physician alerts, selecting from dropdown menus, and the use of templates can encourage physicians to skip a complete review of past patient history and medications, and thus miss important data.

Ethical factors

There are four major ethical priorities for EHRs: Privacy and confidentiality, security breaches, system implementation, and data inaccuracies.

-) The idea of a centralized electronic health record system was poorly received by the public who are wary that the governments may extend the use of the system beyond its purpose.
-) There is also the risk for privacy breaches that could allow sensitive health care information to fall into the wrong hands.
-) Some countries have enacted laws requiring safeguards to be put in place to protect the security and confidentiality of medical information as it is shared electronically and to give patients some important rights to monitor their medical records and receive notification for loss and unauthorized acquisition of health information. The United States and the EU have imposed mandatory medical data breach notifications.¹⁰

CONCLUSION

Data is an emerging currency equivalent. India has a valuable opportunity for building a futurecentered health system with the sweeping digital database of every Indian's medical record that can be accessed by doctors and hospitals—that is aimed at transforming healthcare in the country. Adoption of EHR requires several technological and non-technological interventions, including standards, regulatory frameworks, infrastructure. The health data is owned by the patient while the actual records are owned by the care providers who act as the custodians of the data. For creation of a true electronic health record of an individual it is imperative that all clinical records created by the various care providers that a person visits during his/her lifetime be stored in a central clinical data repository or at least be shareable through the use of interoperable standards.

Adequate safeguards to ensure data privacy and security must strictly be adhered to at all times. Patients must have the privilege to verify the accuracy of their health data and gain access whenever they wish to do so.

The successful implementation of EHR requires a coordinated effort the Central Government, State Governments, healthcare providers, medical associations, IT industry. With the tech savvy millennials and generation Z taking over the Healthcare workforce, there is a positive attitude in adopting EHR in government hospitals. A national policy around health data as a public good and a framework for government led initiatives for developing AI models for improving the health of the citizens would be important as EHR adoption improves.

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