

# Health Information System To Improve Elderly Health

## Study of Health Information System in US to Setup Standard For Developing Countries

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### Abstract

In this paper the state of health information system in US investigated to reach an instance for developing countries. Our main concern was to obtain how HIS and HIT help to increase public and especially elderly health. We do this investigation to setup standard bound to use in developing countries. HIS and HIT transit a mismanaged paper structure of record keeping to an efficient electronic database for record keeping. It will transform the method of management of data to ensure better information results for overall quality improvement. Health information System professionals also play pivotal role information interoperability. Information interoperability helps in easy transfer of data wherever it is needed. Information interoperability is essentially a function of hospitals, but the role played by HIS professionals makes them a good choice for interoperability developers in healthcare.

### Keywords

Health information system, electronic medical record, information technology, healthcare.

## Introduction

The goals put forth in this report are consistent with the current focus in healthcare worldwide. In addressing the healthcare service related issues, effective HIS may have prominent contribution. The HIS helps in analyzing, managing, and collecting the data along with the appropriate methods for use of information [1-3]. It provides a detailed hospital administration system as a database solution. Suggested solution helps medical services with the effective management of operations and practices as the patients can be dealt efficiently in that manner [2-4].

The function of health information system is to identify the issues pertaining to delivery of healthcare service. Furthermore, an effective health information system provides accurate data at the time when it is required [3]. If health care professionals will have required data about different areas, districts and regions, they will be in a better position to compare the coverage of different areas and determine which area has the poorest coverage. In this way, special consideration can be given to those areas which require additional attention [2-3].

The benefits of improved health information systems have exploded as the policymakers have begun to liberalized telecommunication sectors and health care. This trend has begun in different part of the world, in particular, the developing countries [5-7]. We have witnessed improvement in the healthcare service drastically with the help of information management system innovation [6]. The benefits include better health and prosperity of human beings [4]. When it comes to poor infrastructure and poverty conditions, there is less significance of advanced technology in developing nations [5]. Developing nations are not adaptable to technological changes [9]. However, with the increase in low cost innovation designs, the situation has begun to change. Intelligent networks incorporate human intelligence with machine system [3,6]. The advantages of this system are important as they are reducing the cost of illness, and helping in prolonging lives. Moreover, they also function to improve the healthcare standard, and quality of people's life in the developing countries. This study will help in determining how an effective health information system can be useful in improving health services in the developing countries; also help to explain the barriers to its sustainability [5,6,7].

This paper aims to identify the challenges to the effective implementation of HIT in developing countries. This paper will also identify the role of HIS in improving healthcare services by proposing some benefits of it [2].

## Benefits and Cost of Health Information Technology

Although the traditional method of keeping handwritten medical records is maintained in unified format and specification, but the records written by various doctors is difficult to standardize [4]. A medical record comprises of a complete medical history which includes physical examination, hospital records, and specialist examination. Earlier, hospital use to face the hurdle of having duplicate information of same patient which became heavy burden on doctors. It has also benefited doctors as they use to maintain medical records in written form. It was not only time consuming, but also insufficient [3].

Advantage of HIS and information systems of all the other subsystems constitutes a perfect combination. In the past medical order was transcribed in writing, due to which more and more errors occurred [25]. Through the unified management of HIS system, the format easier is to achieve, you can set the example of the contents of both words and medical history essay, to make medical records more complete, standardized, and easy. It will not only reduce the medical records of the time, but also significantly facilitate the reading, consultation and inspection for medical work. There are various benefits that healthcare institute can get through implementation of HIS. Some of them are discussed in details below:

Built-in variables measures are provided by the demonstration in the medical system. These variables include general attributes of patients such as age, sex, name, and other information includes patient's information [4]. Patient's department, number, visiting time, discharge date, admission date, and each and every health related information formulates patient's information [24].

Another advantage of electronic medical record besides improving care for patients is that it can reduce physician cost. Storage cost and unnecessary staff expenses are reduced with EMR storage as they are easily accessible and take up less space than paper versions. Early warnings and preventive measures improve medical quality and reduce the security risks. It keeps on reminding doctors how to provide standard services, and effectively improve the quality of care [5].

Evaluation of medical records in a timely manner is based on the timeliness of the healthcare quality, which is one of the key elements after evaluating the quality of medical records. The use of an EMR for reviewing patient's information and portal images drastically improves compliance with timeliness. It provides benefits of timely information so that doctors can save their time and spends it more on patient's care [6]. More timely review of information helps in the treatment care of higher quality.

Written medical records mostly provide delayed messages and at times they are not even accurate. Time delay became the quality control measure which has been difficult to solve, until Electronic medical records arrived. First, the integrity of medical records is defined by the content integrity of HIS system in the medical records through the file structure [1].

Medical personnel can have remote access to medical records in few minutes even in seconds. The greatest advantage of hospital information system is transmission. In an emergency room, information can be retrieved in a timely manner through HIS and showed in front of the physicians. Not only doctors, patients can also get access to their medical information recorded in HIS [22]. They can review their medical records, check-up dates, prescribed medicines etc through this portal. Accurate understanding of the patients had previously received treatment and the accuracy of the information. It helps in avoiding the result of unclear cause in patients with a history of memory errors and omissions described in. it also shorten the doctors diagnosing time by winning valuable time for saving lives [16].

Database information sharing is not allowed to everyone due to ethical concerns related to it. However, the concerned person can get access to his patient's information when required. Doctors can now routinely use a lot of closed medical records, and information HIS

shares with them. HIS can act as a network system, remote access, consultation and database information sharing [15].

After the adoption of HIS, you can overcome these deficiencies. IC Diagnosis and treatment of patients in each hospital results through the hospital computer network of patient who carries cards to transmit [23]. The sharing of medical records will bring great convenience and authorized external users to query the data centre through the Internet on medical record information [17]. It documents unified and flexible information that reduces medical errors and enhance the sense of quality health care.

The other side of the story explains the disadvantages of implementing technology in healthcare institutes. Electronic medical records are becoming essential factor of healthcare delivery system increasingly. However, variability in adoption of electronic records has been observed in different regions. Availability of supports and resource seems to be related to the idea of variability [1]. To be successful, the resources to bear the cost of software and hardware should be provided by the system of primary care. It will take time to complete the transition to a paperless system from a paper system. To maximize the use of this system, training has to take place in hospitals. The change begins from the authority of an organization so acceptance of EMR system by support of leaders can do wonders. In hospitals, doctors are the champion [7].

Another obstacle regarding the adoption of electronic record is the concern that the access to patient's recorded information will become universal. With this, the responsibility of stakeholders also increases to ensure that the information recorded is not misused. Family physicians need to make sure that health information privacy laws apply to both patients and stakeholders [18].

Health information system is said to be a lifetime record consisting of extensive information on development of health patient. It acquired information from dentists to visits, psychiatric data to clinic applications, and all the information related to hospitalization. In the development of system compatibility between competing medical institutes, it is worth noting that, the real state of affairs has no interest [8].

Since we know that the implementation of MIS is very expensive, healthcare providers are concerned about return on investment. In this course, the advantages of health care information system are kept in mind. However, it is obvious that safety of patients cannot be evaluated in terms of financial indicators [21]. Another major obstacle lies in the perception and implementation of information systems is the lack of direct benefit to doctors. With extensive use of hospital information system, the clinicians require skills to enter patient's information into electronic form. Due to this reason, many doctors find use of paper records much convenient. In short term it might benefit being the economical way of managing the data, but in long term it will led you behind others [9].

For example, a doctor's appointment, made by a computer, can take almost two times longer than the design of handwriting or dictation. The dynamics of innovation in the development of intuitive, user-friendly interface indicates that this problem is gradually disappearing [19].

Lack of awareness in this area is the main cause of additional difficulties in the perception of HIS. Under the appearance of various terms, such record represents a separate vision of the problem. Ten years ago, when technology was not much advanced, it was

fashionable for western countries to show a computerized patient map. Today, almost every health service provider work with the units within their own organizations which are called electronic health record [20].

The terminologies like electronic health passports, and computerized patient record started to circulate in the healthcare community. While the electronic health record is the world-accepted unit of electronic health information systems, these terminologies started adding confusions. EMR, EHT, EIS were the common terminologies used to address electronic health information system. Hence, medical staff was unable to identify the difference between these terms. They were not aware of what needs to be included in each term as copies of patient records, medical history, and other information was to be communicated through MIS [10].

The main generator of medical errors is by far the pen. Handwritten version of the data is often illegible as in recipes, as well as in the documentation. The most important advantage of the EHR is not, that they require a computer data entry, and that they streamline the process. Successful EHR system improves workflow, increase their efficiency, thereby providing improved management of patient care [13].

### **Material and Methods**

Two types of surveys were taken to have knowledge of hospital side and consumer side as far as HIT is concerned. A supplement mail survey was conducted on use of EMR system, and it was in person survey. Sample of 50 health care opinion leaders were chosen to analyze effectiveness of choosing HIT to achieve transparency. Data of 35 hospitals was taken to examine the use of health care technology in different medical departments.

For consumer survey, adults of aged 18-64 were selected and asked few questions through questionnaire circulated in hospitals as well as online. It was done to find out the extent of internet used by adults in order to find healthcare information.

The traditional medical record storage caused trouble in data sharing. This was because hospital patient's record was kept in the hospital and not provided to another hospital. If a patient went for re-examination in any other hospital, it caused waste of valuable medical resources but also to increased patient waiting time and a lot of the necessary pain [14].

According to medical record documentation requirements, list the contents of each paragraph of conventional medical file, can also specify the mandatory content such as hospital medical records of complaints, and the general physical examination. Doctor must enter the case of these elements in order to save the records, so as to achieve the purpose of ensuring the integrity. The system having built-in-variable in reference to medical records automatically replaces the old information with current patient's information. In this way, system makes sure that doctors are facilitated with the updates information which can ease the health care process.

The direct benefits of inter-system-compatible of patient data will become obvious when used within the boundaries of one hospital to provide health care services, the restricted grade action for the development of such systems in the world, mostly lies within the same organization. The degree of accessibility and intuitive systems is growing rapidly. More and

more medical practitioners understand that such indirect benefits of electronic records, as the alarm-system and control the appointment of drugs may be more than offset the time spent learning to use them. Mobile health systems provide the ability to input digital information directly at the bedside during rounds, which is a direct, tangible benefit.

**Results and Discussion**

Table 1 shows the data taken from 35 hospitals to evaluate the usage of HIS in healthcare settings. It shows that manual usage is eliminating with the use of automatic systems. The development of medical services and global health has initiated fast IT market development. A single information system has been used in more and more clinics in different countries. There are various technologies included in healthcare information technology. Electronic health records (EHR) were initially developed as a file cabinet for patient’s information found electronically [11]. This data was taken from various sources and it eventually integrated voice, text, handwritten notes, image, etc. Now a day they are viewed generally as part of patient tracking system and automated order-entry. It also provides real time access to patient information and along with that a detailed record of their care.

Feature	Pharmacy		Laboratory		Radiology		Medical Record		Wards
	N	Percent	N	Percent	N	Percent	N	Percent	N
<b>Manual</b>	15	42.85714	10	28.57143	23	65.71429	35	100	35
<b>Automatic</b>	30	85.71429	28	80	32	91.42857	28	80	29
<b>Barcodes</b>	10	28.57143	0	0	0	0	0	0	0
<b>Scanning</b>	5	14.28571	8	22.85714	2	5.714286	2	5.714286	1
<b>Word Processing</b>	0	0	0	0	34	97.14286	3	8.571429	6

Table 1: Equipments of HIT used in US hospitals

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Picture Archiving and Communication System (PACS) integrates and captures radiological and diagnostic images from number of devices. These devices include X-Ray, computed tomography scan, and MRI. With PACS, computer stores and disseminates the images to a clinical data repository, medical record, and other point of care [12].

CPOE is a fulfilment and medication ordering system in its basic form. The advanced form of CPOE may also include radiology studies, lab orders, discharges, procedures,

referrals, and transfers. Clinical Decision Support System provides nurses and physicians with updated treatment and diagnosis recommendations. The CDSS covers various technologies ranging from drug prescription warning to simple alerts to full clinical protocols and pathways [14]. It can also be used as part of HER and CPOE. This system is used widely for providing assistance in clinical decision making as to how to proceed with patient’s treatment.

Bar coding is similar to bar-code scanner in healthcare environment. To electronically capture information encoded, an optical scanner is used. In healthcare organizations, patients are provided with a bracelet which detects the bar code and finds the matching drugs for the patient [11]. Applications like lab, medical devices, and radiology can be pursued in its implementation. Radiology Information Systems (RIS) keeps a track on patient within the boundaries of hospital. It tracks through wireless communication system with which all medication departments and labs are linked. It is neither widely available nor mature, but used as a good alternative to bar coding.

Increment in number of patients managing their own healthcare online has been observed. Through communication with healthcare provider and joining chat rooms patients get updated about their health status. The success of HIS can be calculated with the use of this facility by the consumers.

HIT is the application of information processed through computer software and hardware for the use of healthcare information. Research on HIT taken place in 2009 has shown that 61% of adults uses online forums to search for medical and health information, whereas, 74% use the internet for every purpose. Moreover, 49% adults access a website that provides them specific medical problem or condition information [11].

Older adults are less likely to use online portals as compared to adults between the ages of 18 to 49. The National Health Interview Survey (NHIS) initiated the household survey to collect data on the use of HIS. The estimates of HIT use among women and men aged 18-64 was provided by Health E-Stat using NHIS data [11].

	<b>N</b>	<b>Percent</b>
<b>Very Important</b>	34	68
<b>Important</b>	10	20
<b>Somewhat Important</b>	5	10
<b>Not Important</b>	1	2

Table 2: Adoption of health information technology to achieve system of transparency

Table 2 displays the result for importance of HIT as a mean of transparency. 68% believes it to be very important for the system, while 2% thinks HIT does not hold any importance for transparency. To eliminate barriers like cost of HIT, financial assistance should be provided. Figure B shows what health opinion leaders support financial incentives for HIT. Maximum opinion leaders are in the favour of options like HIT specific pay for performance program, reward programs, subsidized loans, and Grants. Only 9% of them suggested that non-providers should bear the cost themselves.

## Conclusion

Healthcare is one of the basic rights of every citizen. As we said this investigation was done to obtain how HIS and HIT help to increase public and especially elderly to reach standard bound for developing countries. The excellent aspect is that the government is giving proper attention on the healthcare sector. Although, HIS professionals are playing a very active role in this transformation they should use a proactive approach in improving their participation in the healthcare system. This is good for their professional development. It is important that whichever technology is selected, it must be capable of adapting to the dynamic and continuous changing in the healthcare data. However, it must be realized that the technology does not have to make huge changes in the source code which results in a long delay by the vendor in its implementation. It is essential that it provides the technical basis for semantic interoperability and sustainability.

The statistics related to survey conducted at U.S centres for disease control and prevention regarding functioning of EMR in physician practices. The survey resulted that on national level it is least implemented with the figure of 10%. Massachusetts and partners healthcare physician possess 40% and 100% functioning EMR, respectively. This trend shows the demand of EMR increasing day by day.

Its significance is not only due to the fact that there are increasing number of specialized providers, and growing number of mobile patients. It is due to the fact that it allows the systems to be migrated or moved without the loss of significant amount of patient data. It is important that the technology is designed and developed to incorporate independent features so that if there is a need to replace any of them, it can be done without bringing harm to the sustainability of the entire infrastructure. Programs such as Linux and JBoss contribute enormously in the sustainability of the health information systems.

In health care industry, clinical data automation will occur at dissimilar rates. Automation will be led by hospitals, managed care organizations, integrated health networks and bigger health care delivery systems. With the larger institutions practicing automating first, this trend will be slower in the ambulatory setting. Physicians are interested in EMR systems, though, the slow penetration into the ambulatory practice, in part due to anticipated improvements in software and technology.

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