

Paper ID_ I016274

Paper Title_ Use and outcome of Electronic Health Record for health insurance_ an experience of Symbiosis Centre of Health Care

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Abstract

Effective use of Electronic Health Records (EHRs) applications by Symbiosis Centre of Health Care (SCHC) for 23,782 students and employees) has resulted in efficient data management & information dissemination without errors & delay during hospitalization. The EHR [1] was evaluated by healthcare & paramedical staff for Use & Outcome. The Use is studied for ease of use, security, flexibility, reliability, efficiency, service response, technical support, ability to make changes and overall satisfaction. Outcome was evaluated in terms of reduced human errors, workload of doctors, time saved in data management, automated reports generation & independent data submission. The experience of using the system for 6 months had a composite score for logistic use and outcome were 63.6 % and 60.4 % respectively. It assists in reducing turnaround time (TAT), decision making, medical audit, faster processing of insurance claims, improved time saving, reduced errors & effective data flow that eased health insurance system.

Keywords

Electronic Health Record, Health care, Health Insurance

1. Introduction

Now it's a time for health care professionals to change their mindset from conventional record keeping system to ICT [2] enabled Electronic Health Record system. Over the last few decades, biomedical sciences have made great improvements in the modes of investigations, interventions including surgical procedures. This has improved the vital need to have authentic and accurate medical records. Scope of electronic record system extended beyond just 'medical records' and it now includes health related aspects like preventive and promotive medicine, data storage of a family in addition to several other tools for health care effective & efficient delivery systems. Various tools range from complex decision support systems to reminders for patients. Electronic Health Records (EHR) has furthered efficiency of health care delivery through effective management of resources. Organization of high volume of data also facilitates quality and speed of the healthcare services.

The study conducted on the perspectives of **health insurance** information technology experts on the role of **health insurers** in encouraging **electronic health records** (EHRs) & study defines meaningful use as implementing EHRs to enhance healthcare quality, safety and affordability. [3]The use of EHR systems is increasing even at grassroots. Despite several challenges, today the public health system in India is equipped with computers and internet connectivity [4]. Though adaptation of Information and Communication Technology (ICT) in society seems to be fast, the EHR are not fully harnessed to its optimum capacity. For example, even in 2009, less than 10% hospitals of even United States had basic electronic record system [5]. Apart from the technical advancements, use of electronic systems depends on several factors. Human-computer interaction studies reveal several aspects of computer usage. Health care professionals always want to focus on clinical work and sometimes feel that EHR is a burden. Lengthy and complicated graphic user interface, hardware issues, functionality and usability determine the effective usage and impact of the system [6]. The research article reported on the support of insurance companies on the common set of standards for creating and managing electronic personal health records. [7] Studies on usage of EHR systems conclude that despite comprehensive functionalities, poor usability is the reason for limiting impact of ICT applications [8]. Logistic evaluation of uses is an important step in implementation of an electronic system. Like pharmacovigilance, usage evaluation of EHR systems is continuous process for its utility. This study reports use and outcome of electronic health record for health

insurance system implemented in Symbiosis Centre of Health Care (SCHC).

2. Electronic Health Record for Health insurance system for Symbiosis at SCHC.

Symbiosis Society [9] and Symbiosis International University [10] has 35 academic institutions spread across 20 campuses in 4 states of India. Symbiosis Centre for Health Care looks after the health care needs of the entire Symbiosis family, with its 10 clinical units. Apart from therapeutic services, SCHC [11] is involved in health education, preventive and promotive health programs, immunization, outreach programs and most importantly, health insurance.

SCHC developed Electronic health Record system to be used for Healthcare services for Clinical Department to maintain the health reports for annual health checkup, OPD as well as health insurance system for staff and students of Symbiosis. Health Record was maintained in Hard copy and Excel sheet since 1997. Since 2011-12 the health card and health insurance data is automated in Document, Records, & Collaboration Management systems by Paper Tracer. We have given link to staff and students to access the software and enter their personal health details. The entry is allowed in the software if the Institute has sent data required for health insurance Company through the software for staff and student. If not then Staff and students are getting pop up to contact college Administration. This system ensures if any name is missed by the concerned Institute. Security and confidentiality of data is ensured by way of taking Undertaking /Declaration by the User. The staff and Students have been given the limited access to view and enter personal details ONLY.

Uniqueness of the institute policy is to provide 'insurance from KG to PG' for 23782 students and staff who also avail the facility. This is very important in the view of changing trends of current health care system, where the patient has to pay advance deposit which is not available with student at zero hour. The objective of health insurance policy by National Insurance company (NIC) [12] for Symbiosis staff and student is to ensure that treatment is neither delayed, nor denied & least of all, deferred for financial reasons. This unique cashless insurance service enables every student to access health care facility during literally walk-in & walk-out of the hospital. The health insurance plan is envisioned to meet need for social security, on time medical treatment and monetary assistance during hospitalization during academic career of students.

SCHC can be viewed basically as an information-processing agency for submission of data to insurance

company to avail health insurance benefit for staff and students. The campus health care units also process insurance data apart from its therapeutic activities. Conventional process of insurance data management and claim settlement were clumsy hence the institute adopted US based HIPPA [13] compliant EHR system for health insurance data. Medical Officer need to access data 24x7 as and when student or staff is hospitalized as it is possible due to ONLY due to easy access of data at Electronic Health Record System.

EHR System is fully operational since May 2011. We are using a Business Process Management Software system that allows use of SQL Modules to deploy powerful custom SQL databases, make them collaborative with internal as well as external users, personalize with our Symbiosis Logo and allow using the software within a matter of minute.

It has number of specialized features allowing the easy document, data, and information transfer from other databases and sources into its system. With the invention of Paper Tracer's "SQL Modules", databases can be set up in a matter of minutes. User-friendly, completely secure **storage environment** for all data and document information.

Most of the present EMR is to take up responsibilities to function more effectively and efficiently in health insurance data management for group of staff and student population. This idea supports the need for an Information System making the EHRs the main source of health information concerned to data management for health insurance.

The Data which comes through document manager is downloaded at insurance company end and converted into the sequential file as per Symbiosis data capture format. The initial data is captured into National Insurance company system through data capture option. Thereafter insurance company is actually feeding name, date of birth and sum insured into the system and passing endorsements. The Data stored in Excel Format and renewal of policy has been done.

Distance always poses a crucial challenge for submission of data to insurance company at an educational institute with 43 constituents scattered all over India. The incomplete document submission to health Centre as well as to insurance company was the major problem in systems management which in turn resulted in the rejection of request letter (RL) by insurance company for cashless benefit or reimbursement. As staff and students paid premium to institute, responsibility to pay bill for hospitalization of staff or student due to non-submission

and incomplete submission of data to Insurance Company is the responsibility of University.

There are very few customized databases available for health insurance at University that combine detailed information to connect all staff and students demographically placed all over India through on campus health Centre to insurance company. SCHC designed a database that combines detailed information to connect all staff and students demographically placed all over India through on campus health Centre to insurance company. Collection of information on time & submission of information with standardized format to insurance company was the challenge. This was achieved by studying existing applications for identification of proper system that caters the need of SCHC. We identified an online service provider and customized the software [14]. We introduced online medical insurance system at all the health units considering following three categories of user groups:-

- a) Clinical systems that facilitate or provide input into the health care process
- b) Infrastructure that supports both the administrative and clinical applications.
- c) Administrative and financial systems which facilitate billing and other administrative tasks

Addressing the diverse needs with voluminous data entry was tedious task. After the training, the data was entered by respective institutes of students and staff availing insurance facility. We trained doctors and managers of clinical units to use the online system. Study of use of the system was planned to identify lacunae if any. The flow of data in depicted in Fig 1.

3. Objectives, Methods & Observations

Objective of the study was to evaluate use and outcome of existing health insurance data management system

Link of an online questionnaire was sent to the stake holders at health care Centre's and institute during the academic year 2011-12. The medical staff and managers of health care units were asked to mark each variable on the Likert scale of 1 to 5. Use and outcome variables were converted into following components.

3.1 Usability

Usability was determined by ease of use, security, flexibility, reliability, efficiency, service response, technical support, ability to make changes and overall satisfaction. There were 9 components in total with 45 as maximum possible score for each user.

3.2 Outcome

Impact of the system was evaluated as outcome score. That included reduction in human errors, workload of doctors, number of phone calls, incidences of incomplete detail submissions. Improvement in terms of mistake free data submission, time saved in data management for insurance was also considered to measure outcome. The outcome had 6 variables, each with maximum 5 score making 30 as maximum possible score.

We calculated composite scores for usability and outcome. The formulae were as follows:

- A. Usability score = $[(\text{total usability points} / 45 * \text{no of participants}) * 100]$
- B. Outcome score = $[(\text{total outcome points} / 30 * \text{no of participants}) * 100]$

The cumulative scores were calculated as 'percentage' for both the variables.

Clinicians and managers (n=16) entered their experiences in the structured online forms. Mean duration for system use was one year. Usability and outcome scores were 63.61 % and 60.41 percent respectively. Usability was perceived higher in data security and system response (67 % for both) aspects. Outcome of the system was reported mostly in automation and reduced phone calls (83.3 % in both). Users felt that the time for claim settlement was reduced by more than 50 %. Details of various components of usability and outcomes are presented in Fig 2 and 3.

4. Discussion

The usability of various clinical and Para clinical systems is evaluated to facilitate its use and overcome lacunae [15] [16]. Ideally, meticulous evaluation of online systems is necessary for process standardization. The effective systems ultimately upgrade administrative processes and ease the patient. The challenges of electronic systems are in its practical use, adaptation by users than its technical developmental aspects.

Electronic Health Information based systems provide applications to share personal information, selection of policy & premium as required by insurance company. Health insurance facility is delivered when information is provided in specified format on time to insurance company. As all constituent institutes of Symbiosis become more dispersed across geographic boundaries, access to health information was compromised. It was a challenge as insurance companies & third party administrators (TPA) need timely access to information before issuing Authorization Letter (AL) during hospitalization of staff & student to offer cashless benefits.

If an Institute does not manage staff & student data, it cannot analyze responses over a given time, making it difficult to track the services and support whether services are improving, worsening, or remaining stagnant. Designing a database and response management, to monitor overall satisfaction of all stake holders of health insurance is the key to success for Information & Communication Technology (ICT) in health care. ICT has the potential to improve the efficiency, safety & quality of health care by providing new ways for health care providers to easy access and use health information. Expanded efforts of the team at health Centre's for standardized records, formats, nomenclature and communication protocols to enhance interoperability with educational institutes, on campus health Centre's, insurance company and TPAs is a key for successful administration of insurance benefits.

However, ICT in health care is challenging due to the variations in definitions, the volume of applications, and a rapid pace of change in technology. SCHC also experienced challenges, change in hardware and software, training new staff members, maintaining Standard Operating Procedures (SOPs) for work flow. We still feel scope for improvement in various areas. For example, one forth users still do not feel that work load is reduced with the existing system (Fig 3), which is a limitation of electronic insurance system. We need to take messages from the data for even better use of electronic health system and track the technological advancements and their effective applications to address healthcare needs. Effective usage of the funds depends on interoperability and quality of the electronic systems [17] [18].

The power to process information rapidly makes the data bank useful for planning and research. The impact of information technology for information submission for health insurance will have larger gains if explored. Fortunately today, technology solutions are increasingly breaking down the distance barrier, making healthcare more accessible to everyone. We have experienced positive change in the processes and ultimately in patient satisfaction. Apart from these quantitative estimations, several feedbacks on the system were encouraging. Medical, paramedical and management staff adopted the system. They felt that the system had changed work flow and efficiency to a great extent. Table I summarizes such feedbacks on this change. It was observed that automated data management is being followed in the health insurance by on campus health care unit at each educational institute resulting in faster claim processing of hospitalized members of Symbiosis family. As consumer is always right

what more than a patient's smile any healthcare system should expect?

5. Conclusion

This study dealt with an information system, which is employed in educational settings to improve efficiency and quality for data management in health insurance. Automated health insurance system lead to ease of use; better security, flexibility and reliability resulting in overall efficiency and user satisfaction. The institute gained in terms of reduction in human errors and workload of doctors. Other resources including number of phone calls

and time were saved. The system cut down incidences of data errors and zeroed incomplete data submissions. Finally health care by consumers was substantially improved.

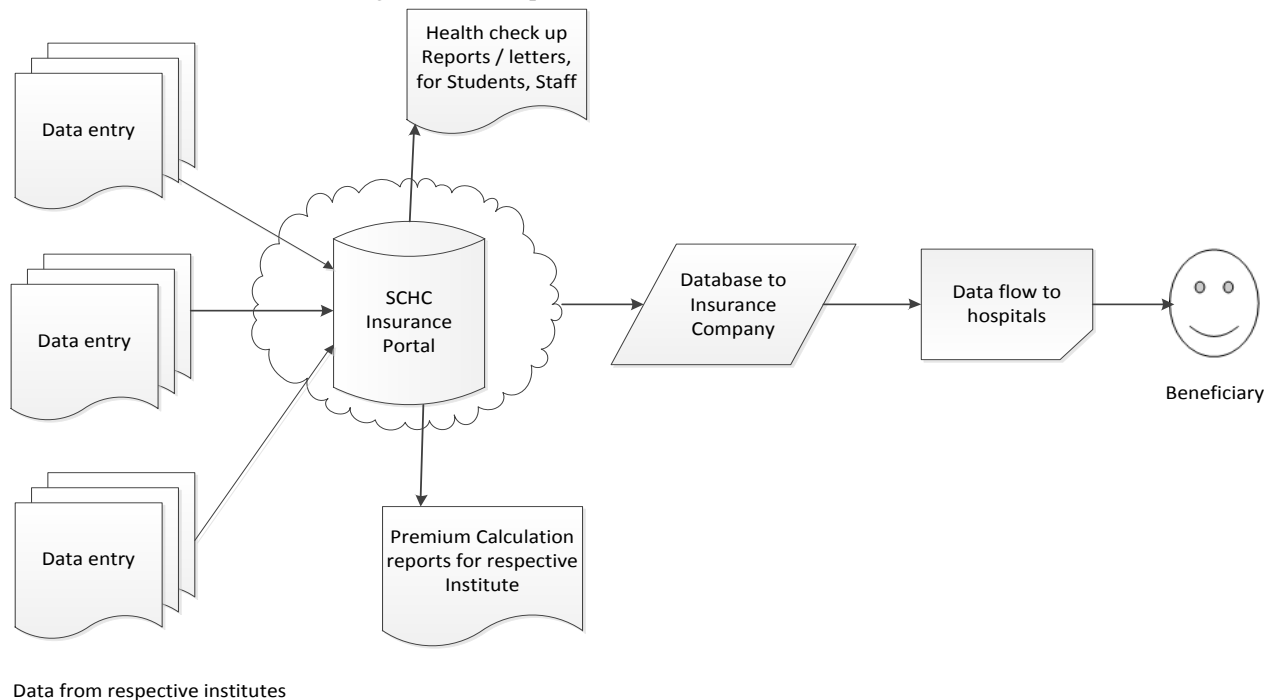


Figure 1: Schematic presentation of SCHC Health Insurance System

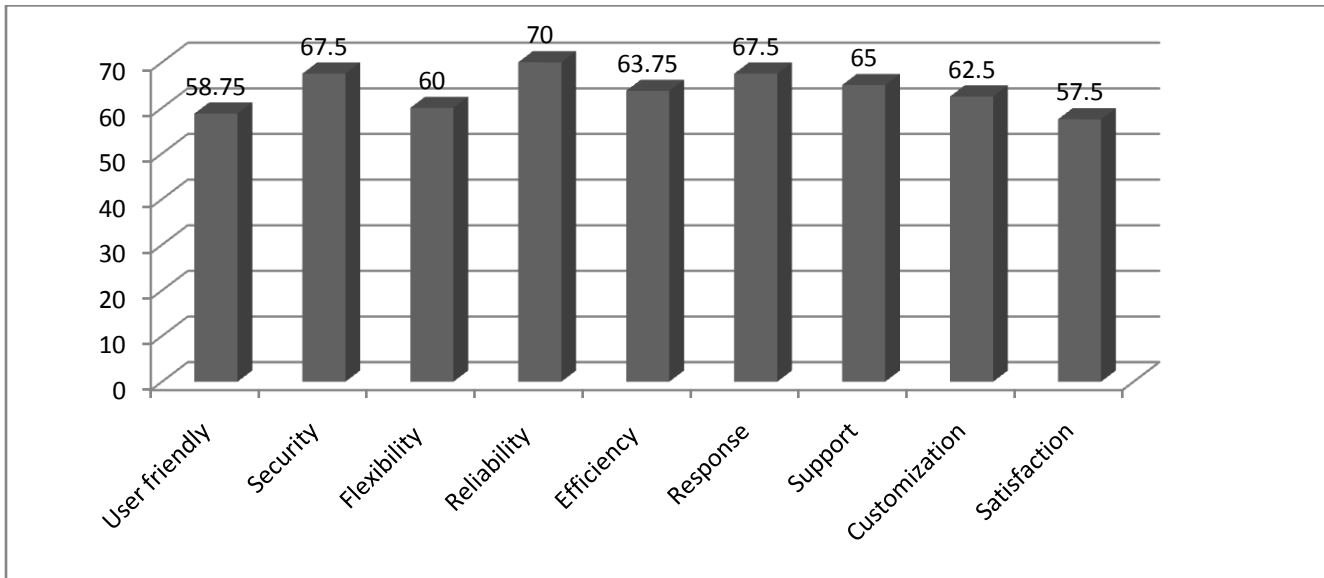


Figure 2: Usability of Health Insurance System

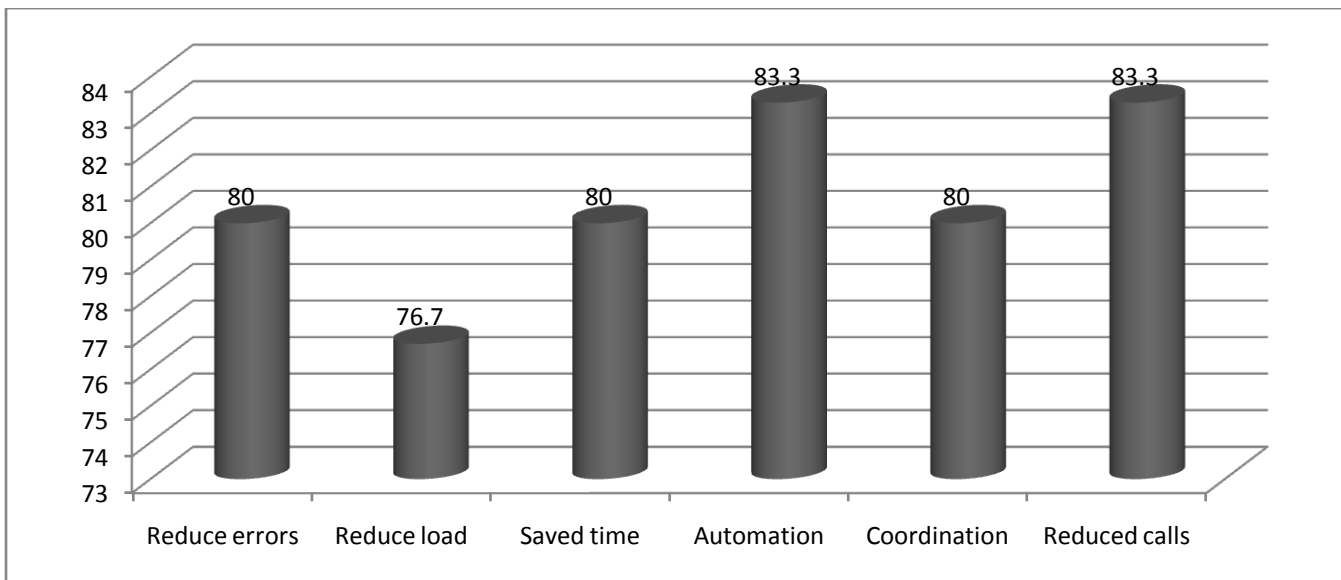


Figure 3: Outcome of Health Insurance System

Table I: Benefits offered by EHR over conventional insurance system

Criteria	Conventional system	Electronic Health Insurance System
Data entry	Hard copy as per format given by insurance company was forwarded by Institute to SCHC	Automation software for insurance data submission
Information sharing	Medical officer used to forward the information manually to insurance company.	Reports and data is mailed daily to insurance company, insurance cell SCHC and accounts dept.
Data handling by insurance company	Insurance company used to enter data in excel sheet and therefore was prone	All fields required for insurance are mandatory in software so that complete information is only

	to manual mistakes	submitted to insurance company.
Data maintenance	Large data difficult to maintain	Easy and time saving
Premium calculation	Manual and error prone	Automated and accurate
Common problems faced	Misplacement of documents, incomplete and late submissions, data in different formats	No misplacement /loss of important information, complete and timely submissions, data in standardized format
Human resources required	Huge	Minimum
Mean duration (days) for claim processing	More than 48 hours after hospitalization	Within 24 hrs. after hospitalization
Claim settlement	Information search difficult resulting in problems in claim settlement	Information search easy and efficient claim settlement
Scalable	Not easily	Very easily with few clicks
Expenses	Overall high	Overall medium to low

Acknowledgement

The research is supported by Symbiosis Centre of Health Care, Pune, Maharashtra, India.

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