Necessity for Automation of Patient Care Records for a More Efficient Emergency Medicine System: A Sustainability Dimension

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Abstract

The old days of storing medical information in a file cabinet are long over. Using electronic health record systems allows you to store all this data electronically so you do not lose anything. Electronic health records may include a range of data, including demographics, medical history, medication, immunization status, laboratory test results, radiology images, vital signs. Input is also easier so there are not errors placing important patient records on paper. In this study we have proposed an automated system which would replace the manual system in patient care records. The amount of paper work and the amount of paper used, both can be reduced by using this system. Not only paper but it also minimizes our effort to maintain the data of the patients.

The study is Quantitative and Descriptive in nature. The study was undertaken in one of the emergency medical services, Pune from 20th July 2022 to 20th August 2022. The sampling method used was non-probability purposeful sampling as only record cell staff was included in the study. The study includes nine staff members of Record cell of the organization and other staff of Emergency Medical Services is excluded from the study. The primary data collection method and secondary data collection method is used in the study.

The automated system saves the time consumed in the manual process and hence improving the performance of the organization. This system makes the data more accessible whenever desired. This system would also reduce the human efforts and in turn the cost allocated for the human resources. Eight people work for manual process whereas only one person is required for the automated process in the record cell. More than 2000 pages can be saved which are separated and scanned each day.

Keywords : *Automation, electronic health records, medical records, manual process, patient care records.*

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Introduction

"Electronic Health Records (EHR) facilitate integration of patient health history for planning safe and proper treatment." (Kohli & Tan, 2016). Health information technology (HIT) consists of technological advancements in health care instrumentation, integration, and documentation. It is now beginning to reach a level of consistency, and its benefits are being realized in clinical practice. Comparisons between paper and digital documentation have been conducted in various specialties. There have also been studies comparing manual and automated documentation. (McVeigh et al, 2008). Electronic Health Records (EHR) are becoming an integrated part of modern healthcare. The introduction of EHR in healthcare has been evaluated by many actors and from many perspectives. However, there is hardly any study exploring the opinion of the ultimate users of the system, the patients. (Zurita, L., & Nøhr, C. (2004)

Millions of emergencies end in a loss of life because the needy cannot afford ambulance services. (GoI, 2016). Today, the need for integrated and organized emergency medical services and the provision of quality care and prevention services in the Emergency Medical Services (EMS) system has increased. Typically, in cities, the first contact with emergency patients is provided by the EMS. The EMS provide primary care services to patients in ambulance, further continuation of treatment in provided by the hospital. Wherever the EMS system performance is more accurate and faster, the outcomes of patients' treatment are improved, and mortality and irreversible complications are reduced. (Afzali et al, 2021)

This study was done at a ……. organization which was established in 2014 to provide EMS to emergency and trauma patients. After observing the whole process of documentation at the Medical Record cell of the organization, we noticed that large quantity of papers was being used and at times wasted due to mistakes or errors in documentation. This cost is controllable and utmost essential from the angle of sustainability. Hence, the present study was designed to analyse the benefit of automation of some processes and documentation of patient care record to reduce paper consumption. The study attempts to utilize HIT advancements for improving the traditional modes of documentation and record-keeping within the Emergency Medical Services. Based on the analysis, we have proposed the automated process for patient care records.

Material and Methods

The study was conducted using Descriptive and Quantitative Research Design. The study is undertaken in one of the government organizations which provides emergency medical services, `Pune, Maharashtra. The sampling method used was non-probability purposeful sampling as only record cell staff of EMS was included in the study. All of the nine staff members of record cell of EMS were included in the study and other staff of EMS was excluded from the study.

The primary data collection was used to collect the responses from the questionnaire which was prepared by using the process of a record cell department in the EMS and was filled by the employees of the record cell department. There were nine respondents for this study The need for automation for patient care records was analysed and thus proposed process was formulated.

Results

There are several types of costs associated with manual patient records. Staff hired to assemble, file, retrieve, or use of hard copy is a costly expense. Storage of the paper record necessitates the use of valuable space that could be better utilized. The records also need to be protected from water, fire, or mishandling of the paper to preserve their physical integrity. Reduced performance of an organization results from various inadequacies of the paper record. Accessibility of medical records is of great concern.

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The paper is fragile and does not last permanently. Increased human efforts are required in manual record keeping process. Daily 2,000 papers were scanned and rolled and kept in the boxes if we calculate for a week, it would be 14,000 papers per week (employees of record cell department work for whole week) and if we calculate for a month, it would be 60,000 pages per month

The figure 1, explains the current process of the Patient Care Records (PCR) of the record cell. Each patient care record have 100 pages and daily more than 2000 pages are separated and scanned. The scanned papers are rolled and kept in the boxes for more than five years. Employees of record cell of EMS spend dedicated time of eight hours in the manual process.

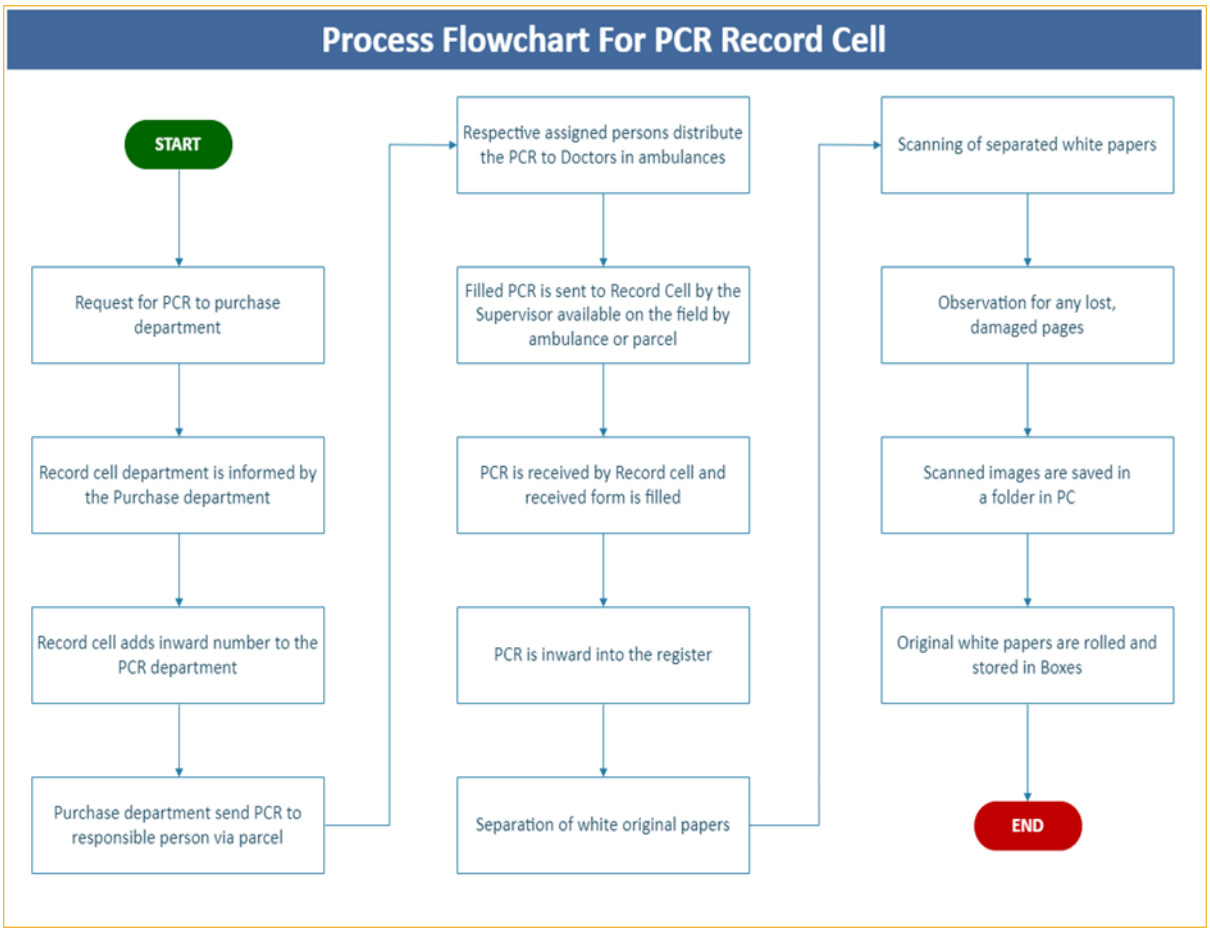

Figure 1: The current process of patient care records in record cell department

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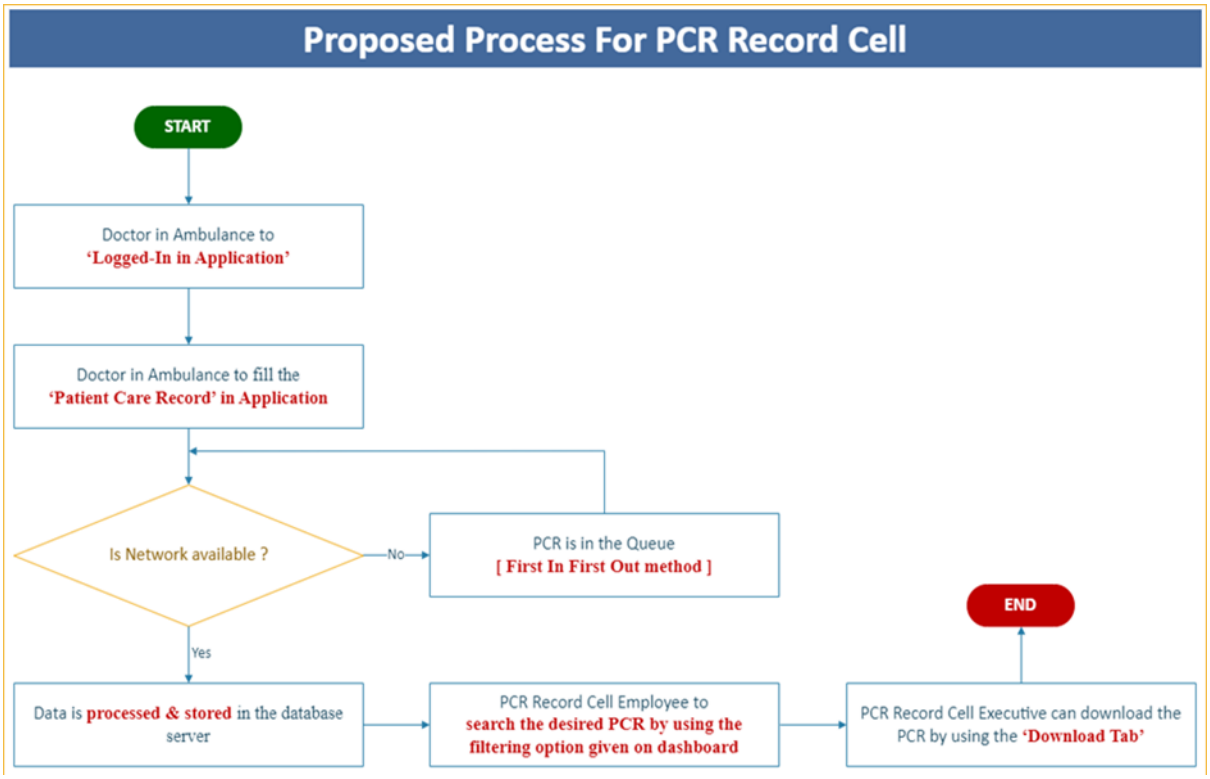

Figure 2: The proposed process for patient care records in record cell department.

As shown in figure 2, in the proposed process once the Doctor in the ambulance fills the Patient Rare Record [PCR] form in the mobile or tablet application, the form is sent directly to the server. If no network is available the form is saved in queue like pipeline as shown in the figure 3(A). The data of the patient will be saved in the queue as Patient1, Patient2, Patient3, Patient4 respectively in pipeline. The dotted lines indicate the waiting pipeline of the Patient Care Record [PCR]. As soon as the network for the mobile or tablet is available, the PCR form is sent to the server from the queue following first in first out order (FIFO) as shown in the figure 3(B). This queue technique can help us when there are mass casualties in a particular area. E.g., Covid-19 pandemic.

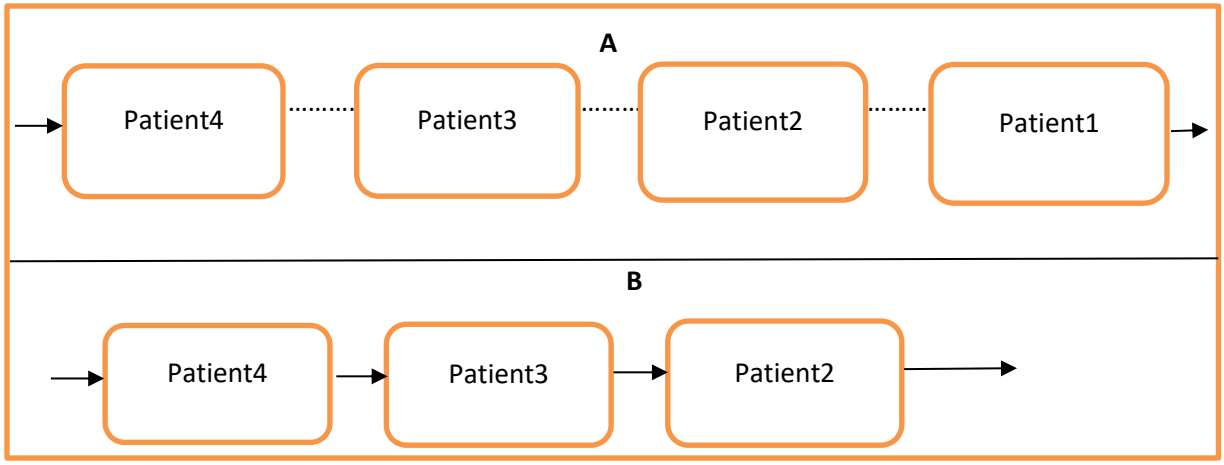

Figure 3: The pipeline process of patient care record.

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According to Government of India, Ministry of Health and Family Welfare, eHealth section,30th December 2016. Preservation of medical records assume significant importance since an electronic health record of a person is an aggregation of all electronic medical records of the person from the very first entry to the most recent one. Hence, all records must compulsorily be preserved and not destroyed during the lifetime of the person, ever. Upon the demise of the patient where there are no court cases pending, the records can be removed from active status and turned to inactive status. In case of such instances data retrieval is the obstacle hence using automation one can just use filter by option and search for the required data. In government organizations where the cost of manual process is high, using this automation technique this high cost can be reduced. Using automation in MLC cases, data transfer becomes easy when required. Human errors are reduced and hence performance of organization is improved. With automation there is improved patient privacy. Storing sensitive patient data in the cloud as many EMRs do puts the data at risk of being hacked without sufficient layers of security. So, such data can be stored on gov. cloud (GoI, 2014). Timely audits for data & network Security & vulnerability check to be carried out to avoid any possible attempts to hack this critical data.

The amount of paper work and the amount of paper used, both can be reduced by using this system. Not only papers but it also minimizes our efforts to maintain the data of the patients. This system also saves the time consumed in the manual process and hence improving the performance of the organization. This system makes the data more accessible whenever desired. Physicians who use electronic health records believe such systems improve the quality of care and are generally satisfied with the systems. (DesRoches et al, 2008).

The results of this study can be used by the officials of the Emergency Medical Centres to plan, apply and solve the problems related to patient care records and improve the performance of the EMS automation system in order to improve the patient care process and reduce the use of papers. This study will benefit the similar emergency medical services who depend on the papers to store the patient care records.

There are some limitations to this study which include, hardware must be replaced and software must be upgraded on a regular basis. In addition, providers must have ongoing training and support for the end-users of an automation system. Another potential drawback of EHRs is the risk of patient privacy violations, which is an increasing concern for patients due to the increasing amount of health information exchanged electronically. There can be increased medical errors due to fault in software system. (Menachemi, N., & Collum, T. H. (2011). There can be financial issues, including adoption and implementation costs, ongoing maintenance costs.

Conclusion

One of the important components of the health system is the Emergency Medical Services (EMS) System and the backbone of which is the Patient Care Record [PCR] which should be handled and stored securely with intense care and thus automation of these patient care records is necessary according to our study.

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