



## Paperless Hospitals

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**ABSTRACT:** This paper focuses on emphasis in areas of human data storage, particularly in hospitals. It deals with enumerating the various types of advantages and disadvantages that pertain to areas of consideration under the paperless procedure. Also, it analyzes the pre requisites that are inevitable for application and implementation of paperless data acquisition and transfer as is used, and can be implemented in future in hospitals. Dealing with Electronic Patient Record System (EPR), it focuses on summarizing all aspects related to paperless data transactions, and points out the benefits of using smart systems and cards to monitor and record patient details throughout the life span of a person, by robustly dealing with healthcare details and providing a platform to analyse single handedly the overall health record.

**Keywords:** Electronic Medical Record Systems (EMRs), Health Care.

### I. INTRODUCTION

The term that is used to deal and manage medical information about individuals is 'medical informatics'. In the world today out of everything we want, the base is to have good health and thus there is a need that arises to propose technologically sound systems that can cater to need of probable patients. Medical facilities aim to achieve the target of safeguarding the lives of individual with the help of equipments that are safe for operations. With the growing world, the way to handle patients is also taking a turn and leading to upcoming 'Paperless Hospitals'. The basic feature and objective on which these operate is the aim to minimize the usage of hard copies. The era of softbots is the talk of the times! All medical records and reports can be put to soft copies in an electronic format. The IT field is developing and expanding very fast across the globe. All the data is stored on the server and databanks. These data can be easily accessed with the help of internet and proper operating system. Paperless hospital also aims to store the data on the server and can be accessed easily whenever required. The objective of this paper is to discuss about the currently present paperless hospitals across the globe, there modes of operations, advantages and disadvantages of paperless hospital and future scope of this system. This paper discusses about the EMR i.e. Electronic Medical Record of the patient. Paper based medical record systems are very fast replaced by the EMRs due to its many advantages. It also improves the management and the use of information for providing better health care delivery.

The amount of hard copies and managing those hard copies is reduced with the help of EMRs or EPRs. It makes the system easy to access and provides better platform to understand the condition of the patient. This system is widely being used in the hospitals of many countries. Mostly these systems are developed by the universities across the world and are implemented in the hospitals upto the 90% completely paperless.

### II. CURRENTLY OPERATING PAPERLESS HOSPITALS

There are many hospitals all across the globe that are practically implementing this process. These includes:

- Barts Health Group of Hospitals in London.
- Covenant University Health Centre (CUCH) in Southern Nigeria, implemented from 2009.
- Mediterranean Institute for Transplantation and Advanced Specialized Therapies (ISMETT), Itlay.
- Hospitals of Norway.
- Hospital of IIT Roorkee (India) had also implemented this technique.

There are many more hospitals in India as well as the world, that are shifting towards the EMR (Electronic Medical Record) system.

### III. DETAILS OF OPERATION

As the patient enters the hospital, the patient ID is given to the patient at the admission. The details of the patient like Name, Age, Sex, Address, Contact Number, Email ID is uploaded on the server of the Hospital. The department is assigned to the patient

according to his illness by the administrative department. Then department assigns the doctor to the patient, patient can also choose the particular doctor to whom he wants to visit. Now the doctor examines the patient and prescribes the medicines on the server with the help of data input systems, it can be laptops, digital writing pads or Tablets. The medicines can be collected by the patient at the pharmacy with the help of patient ID and billing can be done. If the doctor asks the patient for the medical test, then the patient can go through the tests in Laboratory of the hospital and the results are uploaded on the server which can be accessed by the authorised doctor or the patient itself. All the departments of the hospital are interconnected with each other and is properly secured.



**Fig. 1.** Interconnection of the Departments.

The software that is used for the above discussed technology can be Java Based, or any web based application protocol database system that can run on the central server. The main objective is that it should provide proper data storing mechanism and the user interface to post or retrieve data.

The software used for Paperless Hospital is more or less similar to the banking services.

Security of the EMRs are the another big challenges of the system. Security of the system is basically designed on the following basis:

- **Confidentiality:** It determines that who may access which data and who may modify or delete data.
- **Authorization:** It determines how and where access rights are managed.
- **Authentication:** It determines the authentication of the user and the server.
- **Accountability:** It determines how the accesses are logged.

- **Integrity:** It determines how the information is being protected from getting changed during transmission.

The proper training should be provided to the operator, to operate on the system. This is done to provide accurate, fast and better facility to the patient. This also helps in reducing the human error.

#### IV. ADVANTAGES OF PAPERLESS HOSPITALS

- It provides an ease to the access of the medical record information.
- As every data is on server, so it reduces the administrative time to manage and file the medical records.
- Time required for the data entry is reduced.
- Human errors are reduced.
- Errors due to misinterpretations of illegible handwriting is eliminated.
- Quality of the information accessed by the clinicians is improved.
- If the patient is allergic to any drug, then at the time of medication an alert or flag will be triggered.
- The data or Electronic Medical Record is secured and can be accessed by the authorized person only.

#### V. DISADVANTAGES OF PAPERLESS HOSPITALS

- This process cannot be implemented in the area with irregular electric supply.
- Low level of internet access also affects the process, as the data is stored online in the server.
- Absence of essential computer skills in the staff also hampers the process.
- The setup cost of the infrastructure is high.
- The technology used and the database in different hospitals are different, it is difficult to link the two hospitals.

#### VI. FUTURE WORK

In future this technology can be developed more. The different hospitals can be linked with the single server only. The EMRs or EPRs of the patient can be accessed from any hospital. The smart cards like debit or credit card can be provided to the patients that can be used to access the EMRs easily. All the medications and treatments of the patient is stored on the server with the help of these smart cards. The record of the patient can also be used for the research purposes for the students in the medical field.

If the person had an accident and is admitted in the hospital, if the injured person is having the smart card than the family members of the injured person can be contacted easily because the smart card is carrying all the details of the person. And at the time of operation, the full details (like blood group, allergic to which drug) of the patient are easily accessed with the help of smart card. It will be like a boon to the medical field.

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