Roles & Responsibilities of Management Information System in Hospital Information System (HIS)

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ABSTRACT

A management information system (MIS) provides information that organizations need to manage themselves efficiently and effectively. Hospital Information System (HIS) is vital to decision making and plays a crucial role in the success of the organization. Computerization of the medical records and documentation has resulted in efficient data management and information dissemination for the users. Hospital took to develop a management information system. It is widely accepted that the use of information and communication technology (ICT) in the healthcare sector offers great potential for improving the quality of services provided, the efficiency and effectiveness of personnel, and also reducing organizational expenses. The use of an efficient information system effectively promotes the managing performance. This paper seeks to examine how MIS support hospital information system (HIS).

Keywords: Medical Equipment; Medical Equipment Management; Hospital Information System; Management Information System; HMIS.

1.0 Introduction

A management information system (MIS) provides information that organizations need to manage themselves efficiently and effectively. Management information systems are typically computer systems used for managing three primary components: technology, people (individuals, groups, or organizations), and data (information for decision making)[1] .Hospital information systems (HIS) are increasingly becoming an emerging tool in health care arena to efficient delivery of high quality health services.

Hospital Information system is one of the most common computer systems have been designed to support health care services. These systems are large computerized data bases were intended primarily for communication and store health and administrative information. HIS has a different component and includes broad scope and level of systems from departmental (a system limited a specific clinical or financial domain) to knowledge based systems that provide diagnostic support and intervention for patient care activities.

It is believed that HIS implementation is an organizational process community. User community in health care arena consists of many different user groups (physicians, nurses, administrators, managers, researchers, etc.). Neglect of any of these parties imply to missing related expertise, skills, knowledge, requirements and expectations. Expectation and requirement arise from what users see and hear about the system and interpret the ways the system will work for them. Studies indicated that addressing user expectation is a distinct element to ensure the successful adoption of the HIS.

Lucas was one of the first researchers to debate the information system failure. He posed three classes of variables: user attitudes and perceptions, the use of systems and user performance to describe his model of IS failure. Gradually this theory was developed and a failure category in term of "use failure"/ interaction failure/ user failure has been emerged; use failure arise because end-users neglect as a significant stakeholder group in a HIS project. Therefore, user need analysis and customizing HIS software with regard to user expectations provide the integral part of HIS adoption.[2]

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One of the most important issues is health services. Hospitals provide a medical assistance to people. The best introduction for Hospital Information Systems has been made in 2011 International Conference on Social Science and Humanity, which is; "Hospital Information Systems can be defined as massive, integrated systems that support the comprehensive information requirements of hospitals, including patient, clinical, ancillary and financial management. Hospitals are extremely complex institutions with large departments and units coordinate care for patients. Hospitals are becoming more reliant on the ability of hospital information system (HIS) to assist in the diagnosis, management and education for better and improved services and practices. In health organization such as hospitals, implementation of HIS inevitable due to many mediating and dominating factors such as organization, people and technology."[3] It was observed that decentralized filing system is being followed in the Medical Records Department of the tertiary care hospital i.e. the department is divided into two units – Out Patient (OP) and In-Patient (IP) MRD. The other information available to the hospital management include

1. OP and IP Statistics
2. Death cases
3. Left against Medical Advise (LAMA) cases
4. Long standing cases
5. Cash and Collection reporting

2.0 Benefits of His

- Easy access to doctor's data to generate varied records, including classification based on demographic, gender, age, and so on. It is especially beneficial at ambulatory (out-patient) point, hence enhancing continuity of care. As well as, Internet-based access improves the ability to remotely access such data.
- It helps as a decision support system for the hospital authorities for developing comprehensive health care policies.
- Efficient and accurate administration of finance, diet of patient, engineering, and distribution of medical aid. It helps to view a broad picture of hospital growth
- Improved monitoring of drug usage, and study of effectiveness. This leads to the reduction of adverse drug interactions while promoting more appropriate pharmaceutical utilization.

- Enhances information integrity, reduces transcription errors, and reduces duplication of information entries. (4)

3.0 Services

The various services provided through HMIS are as follows:

A. Patient care services
- Registration
- Wards
- Pharmacy
- Billing
- Patient Education
- Information Kiosk
- Nursing Care

B. Clinical services
- Clinical/EMR (Gynecology, Ophthalmic, Orthopedic, ENT, Gastro Medicine, General Medicine, Nephrology, Pediatric, Surgery, Urology, Skin etc…)
- Laboratory (Pathology, Microbiology, Bio Chemistry, Radiology)
- Blood Bank
- Imaging

C. Hospital administration
- Hospital Admin
- Human Resource
- Payroll
- Financial Accounting
- Stores/Inventory
- Purchase
- Complaints & Redresses
- Transportation
- MIS Reports
- EIS Reports

D. Ancillary services
- National Programs
- Linen Management
- Equipment Maintenance
- Resource Scheduling
- Special Camp & Training
- Bio Medical Waste

E. Necessity/needs
- Difficulty in integration of patient records and hospital activities affected quality of health care services adversely.

- Difficulty in getting Real time information regarding the outbreak of epidemics.
- Need for an integrated tool for timely monitoring of services.
- Lack of timely information resulting in inefficient utilization of resource.
- Adoption of Quality standards for processes such as NABH, NABL & ICD 10 for diseases, Death causes etc.
- Necessity for effective tool for health policy making.[5]

4.0 Technology Architecture

HMIS has been developed on .NET technology with SQL Server 2005 as backend. The Technology architecture for HMIS project is as follows:

- Tier 1 (Presentation Logic): Includes simple controls and user input validation
- Tier 2 (Application Server): Includes business processes logic and the data access
- Tier 3 (Data Server): Provides business Data

Fig 1:
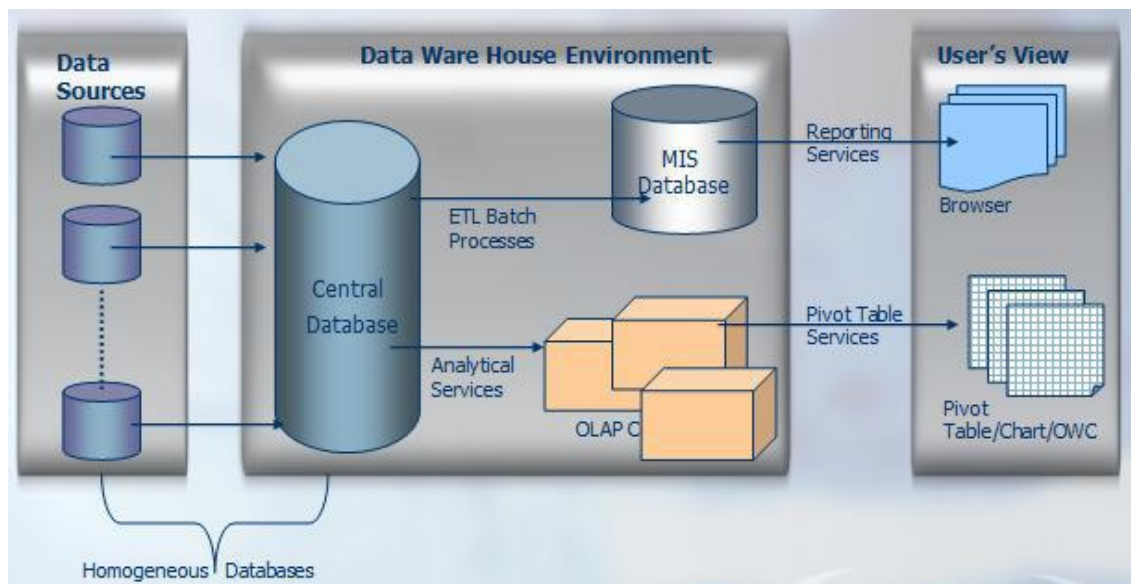
List of activities handled online
- Doctors
- OP Record
- Investigations
- Prescription
- ANC Record
- Assessment
- Prescription
- Nurses Activities
- Ward management
- transfer/discharge of patients
- Diet for patients
- Linen and laundry management
- Drug Indents/issues online
- Biomedical waste management
- Inpatient details (doctors instructions/handover, takeover, etc.)
- Injection details [6]

5.0 Issues/Challenges

A. Maintenance of manual records
- No Outpatient records for patients maintained in hospitals
- Time consuming data entry
- Duplication of data entry
- Huge effort in data consolidation and reports preparation
- Reports related
- Periodic reports sent as hard copy
- Challenge for data analysis/comparison

B. Delays in receipt of data
- Lack of standard names and codes followed
- No real time data available to monitor the performance of the hospital
- Drug inventory/equipment inventory

- Maintenance and tracking of warranty/AMC-more cumbersome
- Current Manpower status
- Evidence based program management lack of adequate data [7]

6.0 Challenges In Implementation

- Infrastructure –connectivity/power
- Training the hospital staff
- Lack of computer knowledge

7.0 Conclusion

The present scenario in India is that most of the Medical Records Department are partially computerized. Evaluation of HIS must be conducted with regard to some multidimensional aspects: including user requirements, cost containment, goal achievement, etc.

At the bottom line, since planning for system evaluation should be started parallel with the system design effort, following steps is recommended to ensure HIS success in health care organizations. Hospital information application efficiently improved the operation management of medical devices immediately and continuously.

We easily manage medical equipment in different department, different location in hospital.

HIS helps CED department to manage complaint system in a proper manner so they quickly done solution for a particular complaint.

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