ISSN 2515-8260 Volume 07, Issue 06, 2020

Hospital Management and Control System

Ashmita Gupta, Ashutosh Niranajan

School of Medical Sciences & Research,

Sharda University, Greater Noida, Uttar Pradesh

Email Id- Ashmita Gupta, Ashutosh Niranajan

ABSTRACT: Exponential development into ICT and Web technology has had significant effect upon business & infrastructure distribution structures of the current global economy. Electronic -Hospital Management Systems (EHMS) offer benefits of streamlined procedures, efficient compliance & tracking, quality patient service, strict cost containment and expanded efficiency. Healthcare Insurance Portability & Accountability Act (HIPAA) provisions, that have established standard of healthcare sector in management of medical reports as well as protection of patient details. The research focused on identifying success metrics for Hospital Information Systems (HIS), summing up current widely accepted guidelines & procedures such as Health Level Seven (HL7) requirements for shared communications communication, HIS elements, etc. For several customized variants of E-HMS Systems & HIS upon marketplace, a basic module edition of E-HMS was meant to offer simple understanding to analysts and business specialists. Throughout numerous positive research articles discussed in the study, the performance indicators & difficulties presented through positive adoption of E-HMS have been highlighted.

KEYWORDS: Accountability Act, Hospital Information System, Healthcare Insurance Portability, Information & Communication Technology.

INTRODUCTION

Network of Medical records has significant growth for rising patient demands, as well as providing medical professionals and personnel with prompt quality & precision [1]. Several indicators are essential for measuring efficiency of facilities like healthcare sector, and the effective application & usage of Patient management system is a key task. Patient information options were equipped upon industries associated with software & in most situations will have to be modified and in certain cases HIS needs to be created as specialized software dependent upon unique patient specifications (service provision)[2]. Research discusses evaluation & recognition of core E – HMS elements when their requirements & administration differ globally. The main success metrics of E – HMS / HIS are often approached through a bench-marking viewpoint.

Current Management System

Many hospitals face many problems with the Hospital Management System (HMS) as most of them still use manual procedures, while those using the computerized system faced the challenge of adapting to it as well.

Such problems include:

- Heavy software development, implementation and upgrade costs.

ISSN 2515-8260 Volume 07, Issue 06, 2020

- Difficulty switching from manual processes because both the staff and patients are accustomed to manual processes and are therefore unable to deal with the new method quickly.
- There are also some problems posed by the lack of IT compliant medical personnel.
- Large influx of the patients visiting government hospitals makes it extremely difficult to switch to automated processes. They don't have the patience to wait for the registration and data entry, and sometimes struggle to understand automated processes working.

Considering this, there is a need to develop the computerized HMS for these hospitals as it will help to provide for and for customize clinical data, enable ready-made models to be diagnosed more easily, encourage doctors to follow advanced medical prescription patterns, etc.

Hospital Management System (HMS)

Management was described as the method, comprising social and technical functions and practices that occur within organizations in order to achieve predetermined goals through humans and the other resources. Quality in healthcare and patient protection are the universal motto of both primary and secondary care providers. For hospitals a number of models and schemes have been implemented over the years for patient interventions and growth. Strategies of managing medical activities delivers benefits of streamlined operations, strengthened governance & supervision, excellent patient treatment, strict cost containment & increased efficiency. There are diverse modules in process of the HMS.

These include:

- Patient management,
- Appointment scheduling,
- Store management,
- Services management,
- Pharmacy management

Patient information systems are in high demand for coping with rising population demands, as well as helping physicians & Medical care & supporting members for care & accuracy. Various indicators are available to measure the efficiency of facilities such as hospital business, and a key aspect is the effective adoption as well as use of the techniques of IS of Medical care. In the software industry, hospital information systems are available that need to be customized in many other cases, & HIS has to be developed in some situations as a personalized program focused upon specific medical criteria (service provision). Research discusses the evaluation and recognition of core elements[2]–[12].

The current system applies to the system being practiced up to now. Actually all functionalities of hospital are performed manually. This is, if a patient wants to see a doctor, he will be forced to see his doctor before he has called his opportunity. That's making the person really hard. Tickets are sold directly to outpatients and hospital patients. The primary downside is time consuming.

Limitations of existing system:

- Shortage of security of data.

ISSN 2515-8260 Volume 07, Issue 06, 2020

- Time consuming.
- Manual work.
- Consumes huge volume of the paper work.
- The higher officials have no direct involvement.
- To avoid all these limitations, and to make the system operate more efficiently, computerization is necessary.

Objective

- To determine the key performance standard and indicators Hospital Information Systems (HIS) & E - Hospital Management (E –HMS).
- To determine E-Hospital Administration Software Core Components.

Requirement of HIS & E-HMS

Emergency and regular hospital services are required & role of HIS in this is critical. Medical provisions were sensitive to customers & community, as well as quality of HIS & hospital staff provision must be accurate and of the highest standard[7]. Given low-cost pressure from public-sector hospitals, today's hi-tech healthcare facilities are increasingly provided at higher rates through private players over marketing sector. OECD study (2013) recognizes which attempt to reduce prices by administrative methods, like lowering rates for medical care & rationing coverage for patients, had generally been just marginally effective. E-HMS guarantees benefits of smooth processes, improved management & monitoring, excellent medical treatment, tight regulation of expenses & enhanced income[13]. Due to the demands that are legal & industrial sector such as U.S. Healthcare Insurance Portability and Accountability Act (HIPAA) as a global healthcare organization, the urgent need to integrate their businesses is fully realized. Unfortunately, most patient IS remained confidential & therefore only serve single agency within medical sector. That is major barrier for market cooperation[14].

E-HMS is developed for meeting broad Medical care management network as well as procedure for multi-specialty hospitals. This is incorporated end-to-end HMS that offers relevant hospital-wide information to support efficient decision-making in such a seamless flow within medical practices, managing the medical activities & crucial management of finance sector in medical care. Table 1 illustrates many of the main characteristics of this NIC, India e-Hospital solution.

Table 1: E – Hospital Management Solution Distinct Features

ISSN 2515-8260 Volume 07, Issue 06, 2020

S. No	Features
1.	Available on Linux and Windows platform
2.	Audit logging of transactions
3.	Based on HDF(HL7 Development Framework)
4.	Comprehensive Role based Access control and Security
5.	Comprehensive Reporting on various customizable parameters
6.	Data Security and Privacy
7.	ISO / IEC 9126 Certified
8.	Powerful Search facility and tracking of patient history
9.	Touch Screen Kiosk interface
10.	Unicode based Indian Multilingual Support
11.	Vocabulary- ICD-9, LOINC etc.

MODEL OF HOSPITAL INFORMATION SYSTEM

The most important tasks can be summarized as follows about HMS: -

1. *Storing & recording the status of patients*

- While in case of abnormal examination findings & several similar crucial information, visual & auditory warning systems are generated.
- Information Collection & predictive analysis for research-oriented uses.
- Due process ranges & evaluation times to be allocated for patient evaluations.
- The medical record of the patient is electronically stored accurately[15] (e.g. drug allergies) are provided.

1. *Management and Data Flow*

- Enable graphical or digitized hospital database diagnostic images based on the integrated recovery system.
- Registration of human resources and their properties.
- Support for automatic transfer of Interdepartmental & clinical medical info.
- For the online production of internal orders, digital signatures used.
- Communicating by laboratory information system.

2. *Financial Aspects*

- Use and monitoring of medicinal products and ordering process are effective.
- Computerized portrayal of healthcare provider 's needs.
- Effective finance administration.
- Actual and expected treatment costs are listed and reported.
- State assessment of bed utilization & whole medical data output.

ISSN 2515-8260 Volume 07, Issue 06, 2020

E-HMS [16] was developed Which address a broad spectrum of hospital operations and super-specialty patient management procedures. This is an important, end-to - end HMS that delivers appropriate facility-wide knowledge to help effective decision-making within constant process for patient treatment, Medical care management & essential corporate finance.

SUMMARY

This indicates 5 separate styles of hospitals as per WHO's Medical Proof Study quality assessment as follows:

a. Surveys of consumer's experiences
b. Regulatory inspection
c. Statistical indicators
d. Internal assessments.
e. Third-party assessments

In addition, centered over following research scenarios and numerous E Hospital Administration Strategies conversations [6] & HIS, multiple elements of E-Hospital Administration approach were listed below to facilitate potential researchers and industry experts understanding.

1. *HMS/HIS basic model:*

i. *Patient enrollment & consultation preparation software* - An automated patient care program was Compliance feature that gathers patient information that is accurate and appropriate[17]. The program automates the roles of hospital management for a better and more efficient method of patient care.

ii. *Unit Patient Billing and Benefits* - Billing system of patient deals with all aspects of long-term care billing. This system supports cashier and billing operations for various patient groups such as ambulance, clinic & reference. It offers automated uploading of charges alluded to different facilities like bed charges, lab studies conducted, medications given, payments for consultants, food , telephone as well as beverage charges [18]. This framework offers limited payment billing which could be fully combined with finance management Application.

iii. *Services Module*- This offers effective management of all the services at the hospital and secure entry and handling of the charges for each of these services.

iv. *Outpatient Care Program*- Out-patient interface acts as a point of entry to arrange a professional examination & testing appointment with a local doctor / consulting doctor [19]. This module supports doctors through offering an opportunity to acquire medical records of patient instantly to make better and timely consultation decisions.

v. *User Management Module* - The User Manager Module basically deals with security by controlling access to the system details. Every computer that is connected to a user group may monitor only certain displays upon which user group has rights. This also trades in system-related tasks like user management, user manager, user community leader

ISSN 2515-8260 Volume 07, Issue 06, 2020

development & viewing employee database company document maintenance, user group lookup, generating daily statistical summary and user-defined error message.

2. HMS/HIS- Optional Model

i. *Pharmacy Mod*- Pharmacy app is associated with automating the general operation and maintenance phase of a drugstore. The pharmacy machine incorporates bar-coding technology, that transforms it more convenient to supply medical items to the patient.

ii. *Radiology Managing Mod*- This offers provision like Ultra sound, X-ray, scanning and alike. This services can be arranged[20]. The program stores all the specifics of different test results and produces records based on outcomes of examination.

iii. *Electronic Medical Record (EMR)* **–** This was termed as completely collaborated data storage which provides patient records in the hospital for medical and clinical records. Staffs of Health-care sector from different hospital sections with relevant information such as medical exams, diagnoses, history of treatment, test results, etc. The platform offers a medium to reach to critical & accurate medical record of patient leading reliable medical treatment of high quality and low cost.

iv. *Lab Management Mod* - Lab required for a particular examination report and the procedure included in presenting findings to appropriate hospital unit / doctor. L ab section starts with accepting electronic inquiries from clinicians and often supports lab workers in creating inquiries. Lab unit facilitates various researches in the following disciplines: Cytology, Serology, Biochemistry, Microbiology, Hematology, Radiology and Neurology.

v. *Emergency Management*- Emergency module in HMS software enables patients to be registered quickly by capturing Main & precise specifics of identification, including statistical profile, especially considering that this feature is important. Present unit also gathers details about Medico Legal Cases (MLC), and is being utilized for referring public bodies.

vi. *Blood Bank*- This module is quite comprehensive in its nature in the E-HMS which keeps all information about blood donation. The donor and recipient information are preserved.

vii. *MIS Interface* - The interface shown in HMS program was collection of core principles and requirements for all aspects of hospital which were typically checked regularly by higher leadership.

CONCLUSION

The numerous success metrics and criteria of the E – hospital management system & HIS were addressed in corresponding segment & cases. E – HMS / HIS performance indicators appear to differ based on leadership resources, preparation, technological acceptance, user acceptance, etc. HIPAA Privacy Guidelines & HL7 / RIM system are defined in form of key determinants & global regulatory benchmarks for production & deployment of effective patient management

ISSN 2515-8260 Volume 07, Issue 06, 2020

strategies. Specific case studies on wider E – Hospital Management Approach / HIS framework also pave the way for future E–Hospital Management Enhancement research.

REFERENCES

[1] MSH (Management Sciences for Health), *Health Systems in Action.An ehandbook for Leaders and Managers*. 2010.

[2] F. Sultan *et al.*, "Development of an in-house hospital information system in a hospital in Pakistan," *Int. J. Med. Inform.*, 2014.

[3] A. Guérin, P. Mirbod, N. Curatolo, A. Rieutord, and A. Sinclair, "Quality management system," *J. Pharm. Clin.*, 2016.

[4] K. M. Cresswell, A. Worth, and A. Sheikh, "Integration of a nationally procured electronic health record system into user work practices," *BMC Med. Inform. Decis. Mak.*, 2012.

[5] P. W. Handayani, A. N. Hidayanto, A. A. Pinem, I. C. Hapsari, P. I. Sandhyaduhita, and I. Budi, "Acceptance model of a Hospital Information System," *Int. J. Med. Inform.*, 2017.

[6] S. . Asabe and N. . Oye, "Hospital Patient Database Management System," *Int. J. Adv. Comput. Technol.*, 2013.

[7] J. I. Westbrook *et al.*, "Cost-effectiveness analysis of a hospital electronic medication management system," *J. Am. Med. Informatics Assoc.*, 2015.

[8] M. Mimee *et al.*, "An ingestible bacterial-electronic system to monitor gastrointestinal health," *Science (80-.).*, 2018.

[9] D. H. Gadhari, Y. P. Kadam, and P. P. Suman, "Hospital Management System," *Int. J. Res. Eng. Appl. Manag.*, 2016.

[10] D. Queiruga, J. González Benito, and G. Lannelongue, "Evolution of the electronic waste management system in Spain," *J. Clean. Prod.*, 2012.

[11] A. Dubovitskaya, Z. Xu, S. Ryu, M. Schumacher, and F. Wang, "Secure and Trustable Electronic Medical Records Sharing using Blockchain," *AMIA ... Annu. Symp. proceedings. AMIA Symp.*, 2017.

[12] P. Balaraman and K. Kosalram, "E –Hospital Management & Hospital Information Systems – Changing Trends," *Int. J. Inf. Eng. Electron. Bus.*, 2013.

[13] N. Menachemi and T. H. Collum, "Benefits and drawbacks of electronic health record systems," *Risk Manag. Healthc. Policy*, 2011.

[14] S. Y. Hung, W. H. Hung, C. A. Tsai, and S. C. Jiang, "Critical factors of hospital adoption on CRM system: Organizational and information system perspectives," *Decis. Support Syst.*, 2010.

[15] D. D. Ratnaningtyas and K. Surendro, "Information Quality Improvement Model on Hospital Information System Using Six Sigma," *Procedia Technol.*, 2013.

[16] J. V. Carvalho, Á. Rocha, R. van de Wetering, and A. Abreu, "A Maturity model for hospital information systems," *J. Bus. Res.*, 2019.

[17] E. D. Zepeda, G. N. Nyaga, and G. J. Young, "Supply chain risk management and hospital inventory: Effects of system affiliation," *J. Oper. Manag.*, 2016.

[18] S. Sulaiman, A. A. K. Abdul Hamid, and N. A. Najihah Yusri, "Development of a Blood Bank Management System," *Procedia - Soc. Behav. Sci.*, 2015.

[19] C. Ullrich, F. Van Utterbeeck, E. Dejardin, M. Debacker, and E. Dhondt, "Pre-hospital simulation model for medical disaster management," in *Proceedings of the 2013 Winter Simulation Conference - Simulation: Making Decisions in a Complex World, WSC 2013*, 2013, pp. 2432–2443.

[20] J. W. Nance, C. Meenan, and P. G. Nagy, "The Future of the radiology information system," *American Journal of Roentgenology*. 2013.