ANALYTICS FOR HOSPITAL HEALTH CARE DATA

Team ID: PNT2022TMID43179

INTRODUCTION

Human Body is a very complex and sophisticated structure and comprises of millions of functions. All these complicated functions have been understood by man him, part-by-part their research and experiments. As science and technology progressed, medicine became an integral part of the research. Gradually, medical science became an entirely new branch of science. As of today, the Health Sector comprises of Medical institutions i.e. Hospitals, HOSPITALs etc. research and development institutions and medical colleges. Thus the Health sector aims at providing the best medical facilities to the common man. Still being a developing nation India has seen a tremendous growth of the Health sector in the field of research as well as in the field of development of numerous large and small scale Hospital institutions still lacking in inter-structure facilities. Government of India has still aimed at providing medical facilities by establishing hospital. The basic working of various hospitals in India is still on paper as compared to hospitals in European countries where computers have been put in to assist the hospital personals their work. The concept of automation of the administration and management of hospital is now being implemented in India also, with large hospitals like APPOLO and AIIMS in Delhi, ESCORTS in Chennai, having automated their existing system.

LITERATURE REVIEW

- "A hospital resource and patient management system based on real-time data capture and intelligent decision making" Author(s): Musa, A. Lancashire Bus. Sch., Univ. of Central Lancashire, Preston, UK Yusuf, Y, Meckel.M. Systems and Informatics (ICSAI), 2012 International Conference.
  This paper highlights the shortcomings of existing hospital information systems and proposes a location, identification and communication system that is able to overcome some of the inadequacies of existing systems and significantly improve the efficiency and throughput of the various units of the hospital setup. The system is based on RFID and wireless sensor network-based location and information management framework and the necessary technology platform that would allow hospital assets, personnel and patients to be tracked in real-time for the purpose of optimizing operations in all aspects of the daily activities of hospitals. The system is also intended to provide a continuous visual simulation and analysis platform to streamline operations, increase process efficiency and service levels.

ADVANTAGES: This paper highlights such limitations of existing systems and proposes a RFID(Radio Frequency ID) and wireless sensor based , location and information management framework that facilitates real time tracking of hospital

assets, personnel and patients as they move through pre-set procedures as part of daily activities of the hospitals.

DISADVANTAGES: One of the major challenges existing hospital management systems face is around operational efficiency and wait times between different processes, departments and persons.

- "Study on information system of health care services management in hospital" Author(s): Daiping Hu, Antai Sch. of Manage., Shanghai Jiaotong Univ., China Weiguo Xu ; Huizhang Shen ; Mengyu Li. Services Systems and Services Management, 2005. Proceedings of ICSSSM '05. 2005 International Conference.
  As the rapid advancement and wide application of computer hardware, software and network, hospital information systems (HISs) have entered almost all hospitals in China and are becoming more important and covering more parts in daily hospital operations. Most functions in a HIS provide the users an easier and faster way in doing their medical tasks with graphic user interface. But the HIS is a management information system focusing on daily operations within hospital to improve efficiency of work by using online clinical data acquisition and processing. So, to some extent, a HIS improve quality of health care services, but it cannot measure and evaluate the quality of health care services. At present, hospitals in China are in a competitive environment. In order to attract more patients, high customers' satisfaction is most important for a hospital in the competition. Hospital services management system (HSMS), which is an information system of health care services management in hospital can improve quality of service and lead to cost reduction, high customers' satisfaction and great attractability to other hospitals' customers. In this paper, we study the HSMS. The main work as follows: review services management and HIS, analyze the contents of health care services management and the functions of a HSMS, design the framework of a HSMS, study the implementation technology of a HSMS, discuss the how to integrate a HSMS into a HIS.

  ADVANTAGES: This paper reviews the HIS (Hospital Information Systems) which are widely used in many hospitals in China mainly to provide easier and faster way for daily medical tasks /activities with a GUI And provides for overcoming some of the limitations of HIS.

DISADVANTAGES: HIS aims at improving quality of health care services but do not have way of evaluating /measuring those. So this paper proposes HSMS (Hospital Services Management System) which aims at improving quality of services, identifying cost reduction areas , analyses and evaluate /rate heath care services . The ability to evaluate the services facilitates hospital achieve higher Customer satisfaction scores and get a competitive edge against those hospitals which score less or use HIS and do not have ways of promoting the quality of their services.

- "Specification of a Reference Model for the Domain Layer of a Hospital Information System"Author(s): Gudrun Hübner-Blodera , Elske Ammenwertha , Birgit Brigl b , Alfred Winter b a Institute for Health Information Systems,UMIT – University for Health Sciences, Medical Informatics and Technology, Hall in Tyrol, Austria b Institute for Medical Informatics, Statistics and Epidemiology, University of Leipzig, Germany, ENMI, 2005.
  Objectives: One of the tasks of information management is systematic planning of a Hospital Information System (HIS). However, the description and the analysis of the current state of a HIS typically create high costs and are not well supported. The aim of this paper is therefore to report about the specification of a reference model for the domain layer of a Hospital Information System. Methods: We developed a reference model for the domain layer of a Hospital Information System based on the requirements index for information processing in hospitals for describing the enterprise functions, and based on the object types from the Health Level 7 Reference Information Model (HL7-RIM) for describing the entity types. Result: The developed reference model is a comprehensive hierarchic model of the enterprise functions of hospital information systems. The central enterprise function "patient treatment" for example is described with 35 enterprise functions and 38 entity types on a three-level hierarchy. Discussion: Reference models provide a kind of modelling patterns that can easily be used and adapted to a respective Information System. The availability of reference models should therefore provide a highly valuable contribution to keep the costs for modelling Hospital Information Systems low. We will start to evaluate the reference model by using it in the description of the information systems of a University Clinic of the Tiroler Landeskrankenanstalten GmbH (TILAK), Austria. If this pre-test is positive, it is planned to extend the use of the reference model to the overall Hospital Information System of the TILAK.

  ADVANTAGES: This paper aims at creating a reference data model that will serve as a generic starting point for any new HIS development projects so costs involved in

studying and analyzing current state and coming up with gaps analysis and additional requirements can be significantly reduced. The model is Hierarchical in nature that is it is dived into 3 levels of sub models and units so a choice for full or partial implementation can be offered based on the requirements.

DISADVANTAGES: Many enterprise projects get scrapped due to high costs involved in initial planning requirement gathering and design phase. The costs in this phase become unmanageable due to lot of unknown factors. Like lack of Subject area expertise, lack of knowledge on different Hospital enterprise functions 1) Patient admission 2)Patient Treatment planning 3)Order Entry 4)execution of diagnostic and treatment procedures 5)administrative documentation 6)billing 7) Clinical documentation 8) discharge and 9) referral to specialised medical institutions, lack of

knowledge /experience on the entities types involved (example: patient, Clinical finding) , their roles and responsibilities and the relationships /associations between different enterprise function and /or entity types.

- "Developing Effective Hospital Management Information Systems: A Technology Ecosystem Perspective". DATE OF SUBMISSION: 5 October 2014 PREPARED BY: Dr Christopher Bain MBBS, Master Info. Tech Student No: 10054499 The environment in which hospital managers operate is characterised by high demandpressures, strong public service expectations, and an ever diminishing income stream (inrelative terms) with which to provide services. Even in private hospital care, many ofthese pressures still apply, as well as a pressure to maintain profit margins. The agendacontext here is a complex one, particularly when one considers the role of hospitals inthis context. Hospitals have multiple competing priorities when viewed from amanagement perspective. This is despite the fact that the core mission of the hospital isto provide timely, safe care within available human and financial resources, to patientswho present for care. This care can be across multiple care settings inside the hospitalincluding the inpatient space, the operating theatres, the intensive care unit, and theemergency department; and in outreach settings. Hospitals however, have beendescribed as a series of cottage industries each loosely coupled with a commonobjective of supplying care to patients.

  ADVANTAGES: This paper more so contributes to Planning, Design and development aspects of any Hospital management system by highlighting ESFs that should be considered. The external and internal factors the author mentions are: The public at large, Law and policy makers, Funders, International Journal for Research in

Engineering Application & Management (IJREAM) ISSN : 2494-9150 Vol-01, Issue 11, FEB 2016. INJRV01I11006 www.ijream.org © 2016, IJREAM All Rights Reserved. 3 Medical suppliers the biggest of which are pharmaceutical companies, the scientific community, the software development community. Internal influencer authors can obviously also be at play in terms of what services are provided by the hospital and how they are provided. These can include: the skills and experience of staff, internal business strategies such as competition and subsidization, Soft factors such as morale and culture, Equipment availability.

DISADVANTAGES: The author of this paper focuses more on needs of hospital manager and the ecosystem in which he/she operates. The internal and external Environment shaping factors ESFs that bear an impact or association on daily hospital activities and decision making process that the hospital manager has to go through in each situations. Some of the challenges that this ecosystem needs to work on are high demand pressure, greater customer satisfaction level and low profit margins.

- The surveys are classified into five organizational dimensions: Strategy, Structure, Decision Making, Technology, and People. We found a predominance of the technology dimension in 25 studies, based on the organizational dimensions. The research is essentially related to information systems, supply and quality. Although there are different models of hospital maturity, it was found that the models developed for hospital organizations are mostly related to their technical / operational areas, but in a fragmented way. The present study contributes to a comprehensive literature review of hospital maturity and models.

ADVANTAGES: The present paper aims to analyze previous researches related to maturity models for management of hospitals, using the analytical model of organizational dimensions proposed Morton adapted to hospitals. As highlighted by Frega et al. this research is justified due to the lack of maturity models able to meet the specificities of healthcare organizations, in a general point of view. The authors present in their research an exhibition with the most relevant articles found, revealing that 80% of publications regarding maturity models include the field of information systems, and only 5% covered the hospital management sector. The current document is structured as follows: the second section presents the methodological procedures, the third presents the results of the literature research on the theme of maturity models and hospital management, and finally, the final considerations.

DISADVANTAGES: To characterize these potential inaccuracies, O'Neill developed a mechanism to characterize the extent of the capacity of the hospital information technology, on an individual basis and on an enlarged basis, using a method of inquiry based on the gradual approach of a given problem in the hospital sector in Ireland. For

the author, the use of appropriate evaluation tools is highly recommended, and maturity models exist for many of the different domains of hospital information systems. The maturity model was developed based on the following dimensions: Clinical; Administrative systems; Patient management; Clinical support; Technology; Internal Integration – Administrative; Internal Integration – Clinical; External Integration. The survey showed that 79% of respondents expressed that they were not planning to implement a maturity assessment model and only 14% were using a mode