Healthcare Informatics

Güney Gürsel
Gülhane Military Medical Academy, Turkey

INTRODUCTION

Healthcare institutions need qualified computer support both in managerial and end user level. This sector is so complicated that, there is no way of doing daily works without an information system. In addition, Research and Education works in medicine require extra computer help. Technology and medical field is so rapidly developing that only one information system is not enough and not capable of handling the services given. The field-specific sub-information systems in the medical domain are available and raising both in number and quality. With this rise, the need for communication of different Healthcare Information Systems arises. The term "Interoperability", is used for ability of different information systems to communicate and use exchanged data (HIMSS, 2013). Interoperability needs protocols and standards. Governmental and non-governmental organizations are constituted to organize and develop standards to make these information systems more qualified and standardized. The techniques, data, coding systems used in these systems are of great interest to the researchers.

To manage the computer and information needs of the healthcare, the discipline, healthcare informatics has arisen. It is the interdisciplinary field that makes use of computer science, information science and healthcare ("Systematized Nomenclature of Medicine," 2013). The standards, needs and concepts, related to computer systems and information for healthcare mentioned above, all belong to the discipline of Healthcare Informatics.

The purpose of this article is to give the in-depth definitions of the main terms and concepts related to Healthcare Informatics.

BACKGROUND

We have said that Healthcare Informatics is the interdisciplinary field that makes use of computer science, information science and healthcare. In the baseline of Healthcare Informatics lie the information systems. Healthcare institutions employ Healthcare Information Systems (HCIS) to provide the staff with the computer and information support they need. In the background section, the basic definitions related to HCIS will be given.

HCIS can be defined as the system composed of data, workflows, users and technology, used to collect, store, process and provide the needed information to support healthcare institutions and professionals (Wager, Lee, & Glaser, 2005). It helps staff do their daily work for the services given to the patient, supports medical education by the education tools and clinical data, and provides research facilities. The aim of HCIS can be stated as to contribute to a high quality, efficient health care, for patients, consumers and medical research (Haux, 2006). HCIS may be a field-specific, e.g., Radiology Information System, or may be an integrated big one having sub-systems such as Hospital Information System (HIS). HIS serves for a whole hospital. The possible well known sub-systems of HIS are given in Figure 1.

A HCIS may be a part of HIS, as given in Figure 1, or a standalone system. The most common HCISs are briefly defined below.

Laboratory Information System (LIS)

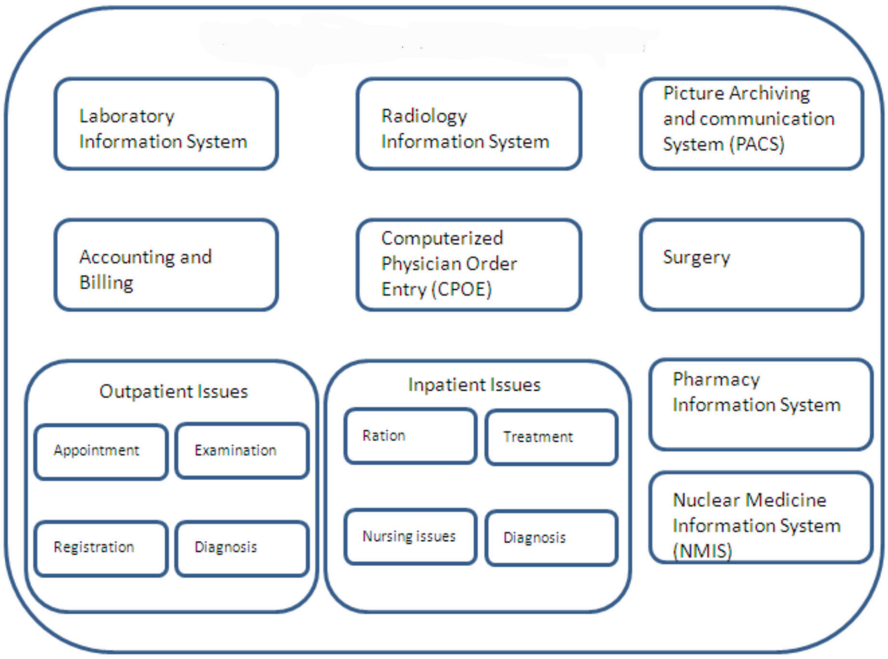
As the name suggests, it is the information system for the medical laboratories, Pathology, Microbiology and Biochemistry. LIS exchanges information with blood processing laboratory medical devices (auto-analyzer) automatically. LIS may be a part of HIS or it may be an independent information system.

Radiology Information System (RIS)

It is the information system for the radiology departments. Like LIS, it may be a part of HIS or it may be an

DOI: 10.4018/978-1-4666-5888-2.ch331

Figure 1. Hospital information system components (most commons)



independent information system. Its common functions are appointment, reporting and image tracking. If the department has Picture Archiving and Communication System (PACS), it exchanges information with it.

Picture Archiving and Communication System (PACS)

PACS is a special information system that deals with storing, processing, and communicating patients' radiological data of medical images. It has special software for post-processing facility of images captured by radiological imaging devices (modalities); such as magnetic resonance imaging (MRI). The images are stored in the database after capturing. The radiologist may report the result of the imaging by using the image post-processing facilities. It is an independent information system that works integrated with RIS/HIS.

Nuclear Medicine Information System (NMIS)

NMIS is the information system for nuclear medicine departments. Like RIS, it may be a part of HIS or it may be an independent information system. PACS is also used for nuclear medicine imaging.

Accounting and Billing

This part is for the finance issues of the healthcare given to the patients. Billing the services given to the patients or insurance companies, accounting the expenses of the healthcare institutions is done in this part of the HCIS.

Computerized Physician Order Entry (CPOE)

This is the module for entering electronic orders of the physician from the other departments of the healthcare institutions such as pharmacy, radiology etc. It also comprises the orders given to the nurses or care personnel, such as fever and tension measuring process.

Outpatient Issues

This part of the information system is used for outpatient tracking. Some common functions are;

- Appointment
- Registration
- Examination
- Diagnosis