Functional Assessment Model for Hospital Information Systems in I.R. Iran

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Abstract. Evaluation of Hospital Information Systems (HIS) enables the assessment of the extent to which HISs are fulfilling their objectives in supporting the services of healthcare delivery. This paper presents an overview of evaluation in health informatics and hospital information systems and provides a framework for the evaluation of Iranian Hospital Information Systems in a national scope.

Keywords. Hospital information systems, Evaluation Indexes, Functional assessment, Electronic Health Record

Introduction

Due to the development of health information systems in healthcare centers, the use of equipment, software and applications of these systems has also increased. A Hospital Information System (HIS) is a computerized system, a combination of a set of interrelated sub information systems that define as a system that supports and improves the quality of healthcare in a hospital. This system is composed of clinical and management information systems [1]. The convenience of HIS for healthcare providers in working with such programs makes specialized activities easy for these providers [2] and other definitions is a comprehensive system in a hospital which is available to users in a special form without restrictions of time and place [5]. Studies show that if the design of HIS is detailed, the effectiveness and productivity of healthcare providers and patient satisfaction will increase and healthcare costs will be reduced. Thus, it is necessary to perform continuous assessment of hospital information systems [3]. Evaluation of HIS is an intersection of medical science and healthcare delivery with computer science and assessment methodology [4].

We have more than 30 different vendors of HIS (developed with varying functionality and technical infrastructure) in Iran that are employed in about 1,000 hospitals (state, private, charity and military hospitals). Thus, because of the variety of hospital information systems in Iran, considering the minimum standards for the development of HIS is required. The development of Iranian integrated care electronic health records (ICEHR, locally called SEPAS, and acronym from its Persian title) requires data registration at healthcare centers such as hospitals. SEPAS has a distributed and service-oriented architecture based on ISO 13606 standards [6].

Decentralization of SEPAS enables every hospital to purchase a HIS according to its preferences and conveniences. [7]. To this end, we need to have a checklist to determine a minimum data set (MDS) of capabilities that are vital for a hospital with...
administrative and clinical approach, which would contribute to the formation of Iranian EHR.

1. Method

A model was designed for evaluation of Iranian hospital information systems that are employed in Iranian hospitals. The model is based on weighted base decision tree [8]. In order to identify the criteria and classify them, we enlisted the help of health informatics professionals, HIS producers and other experts. We also benefited from the collaboration of ISO corresponding technical committees in Health informatics (ISO/TC 215). Based on the results provided by experts, two main types arose: organizational components and service components. These evaluate systems according to 21 categories. According to the evaluation criteria identified in the framework, they were given expert ratings, that is, they were weighted from 1 to 30. Then, these qualitative indicators were converted to quantitative and metric indices.

2. Results

HIS with a functional approach is divided into different parts [9]. In this model we have more than 300 criteria which are assigned to 21 categories and 2 main types of organizational and service components. The organizational components are typically adapted with a specific part from the hospital and have their own separate functions. Service components are not used in specific parts of the hospital. They may be in different parts of the organization and functioning provisional authority and provide special services. We assess the system to determine whether it can support the functional criteria or not.

Organizational components and service components are two different levels which are complementary in HIS concept. The relationship between the components is shown in Figure 1.

Hospital information systems assessment is done twice in a national scope till now. In the first, 22 vendors and in the second, 30 vendors of HIS were assessed. These vendors cover more than 1000 hospitals in Iran. Each year, based on the needs and expert comments, the criteria will be revised. To force the issue, having a valid certification was included among the annual assessment indicators on accreditation of hospitals. This accreditation is done annually by the Monitoring and Accreditation Office of MOHME.

3. Discussion

We design and implement a biennial functional assessment framework and improve our criteria every year. In this process that is sponsored by the MOHME, Computer union organization (NGO) and High Council of Informatics (Under the supervision of president), we try to improve the functional capabilities of hospital information systems based on international and national standards. This means that Non-functional
indicators are not considered in the evaluation and only functionality of HIS in hospital is focused upon.

![Figure 1- Relationship among the components](image)

**References**


