Standard Code based Integration of Hospital Information System

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Abstract. Purpose Integration based on open standards, in order to achieve communication and information interoperability, is one of the key aspects of modern health care information systems. However, this requirement represents one of the major challenges for the Information and Communication Technology (ICT) solutions, as systems today use diverse technologies, proprietary protocols and communication standards which are often not interoperable. In this paper we proposed Hospital Information System (HIS) through the HL7 based with legacy system that improves both the efficiencies of medical office and medical treatments.

Keywords: Hospital, Information, HL7

1 Introduction

Healthcare delivery environments are under constant pressure to rationalize the cost of care provisioning while at the same time having to preserve or even increase the quality of care pathways and clinical processes. In the process of evaluation how to address this stringent set of requirements, integration and integrated personalized care based on the well-founded Information and Communication Technology (ICT) solutions are recognized as the major quality component [1,2]. In that sense, Hospital Information Systems (HIS) and integrated healthcare information infrastructures need to address these issues by defining business processes in care delivery settings, and identify the integration mechanisms that include business scenarios and use cases, semantics and communication technology[3, 4].

As competition between hospital is deepened efficient administration is needed through the quick and correct grasping of management state and improvement of medical service [5]. Therefore, the partial hospital information system in use up to date should be improved and be replaced by HIS (Hospital Information System) form the synthetic information system.
However, most of information systems are developed individually in each medical institution with diverse environmental situations that information interchange between hospital is not consisted easily. Each medical institution should upgrade the quality of medical examination and treatment level of patient to share information for efficient work of medical institution. To create a standard data exchange environment of this medical treatment information, HL7(Health Level 7) is introduced, a transmission standard of medical information. HL7 is easy method for sharing medical treatment information because normalized most contents occurred in medical practice. However, because of various selection items, it is the difficult matter to process HL7 message, and possibility that unexpected high level of mistake happens at work with legacy system.

In the case of PACS, upgrade and replacement process have been required essentially during the course of development from the primitive Mini-PACS form to the synthetic Full-PACS. Also, these upgrade procedure need a lot of times, manpower and equipment that the effective economical plan and preparation of transfer method are required. Therefore, in this paper, HIS system will be constructed so can work legacy systems such as OCS or PACS with HL7 base. And we present an efficient HIS system construction method by analysis of integration module.

2 Related Works

Introduction of HIS is essential to maximize inflection of information through computerization of hospital management to manage medical information more efficiently. General hospital computerization system can be divided generally into medical examination system and treatment information offer system, and this hospital computerization system has switch-over trend from the administration support in the past to the medical examination and treatment support presently[3]. Characteristics of these systems enable elevation, cost reduction and save patient's waiting time for medical service by controlling the effective flowing of information associated mutually. These systems create the competitive power by a prospective hospital[5].

HL7 used for interface transmission standard in this paper acts as a standard protocol in the information interchange between software as standard for the information interchange between medical treatment software. Application of HL7 standard help to interchange and co-ownership of information between other independent systems.

3 HL7-based Interworking

In this paper, we wish to present the interface solution and the united synthesis medical treatment information system in consideration of system networking, compatibility and extensity for systematic interworking of OCS and PACS for HIS development. The
efficient interface system development method is connected with OCS and PACS of two different systems to systematic exchange data mutually. For this, an efficient interface system will be embodied for communication of necessary data to exchange information and to synchronize between OCS and PACS.

4 Development of HIS System

- Queue Table
  All exchanged data are attained through queue table. Basic work for the interface is completed when input the data on the table of decided form. Information of all queue tables has logarithmic character and it does not be removed until integrity of exchanged data is verified. Data management of queue table does in HIS.
- Queue Table Field Mapping
  The composition field of queue table is fixed. Because this has constant name rule according to hospital situations, a table name and field name can be changed. That create queue table if connect with relevant element with creating field after relevant field on specify constituent use. Next figure 1 shows mapping in order field. Since queue table was created, a relevant field can be used if created field and relevant elements are connected. The figure 1 shows mapping in ordered field.

Fig. 1. Ordered Field Mapping

As seen in figure, the mapping related to ordering fields and relevant element can be provided. And the figure 2 shows mapping image for user master field.
Figure 3 shows example of HL7 message in developed HIS system.

The figure shows layout of the photographic prescription order data based on the HL7 protocol, the reservation prescription data and the photographic requisition data. And the figure 4 shows the HL7 message for examination enforcement and interpretation result.
The figure shows the message that the data has been examined by mean of layout of data based on the HL7 protocol, and input message on the result of examination and reading.

- System View
Firstly, the result screen in order view is shown in the figure 5.

External environment condition confronted by hospital management forwards changing to difficult direction continuously. However, current management information system estimated as insufficient level to support enough efficiency for improvement and
rationalization of hospital management. Hospital information system is real condition attempting computerization in dimension of cost-saving.

Therefore, in this paper presented aiming to the efficient construction of HIS and existed legacy system of HL7 basis. For this, among the hospital information system, such as by introduction of PACS, the HIS system which is a total medical treatment system was produced. In conclusion, for the present situation the synthesis of medical treatment information system is efficient in the procedure of the integration module for the cutting of huge expenses and for time saving from loss and damage occurred in medical treatment information system and remove inefficient elements.

References

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