MEDINFO 2007
HISA Ltd Australia
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MR Item as an Intermediate Terminology Between Terms and Clinical Document

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Abstract

Medical Record System is changing from paper document to electronic document. New era of electronic medical document system needs the basic terminology, however, it is difficult to realize Electronic Health Record (EHR) system through current terminology system. For the connection between terminology and clinical document (CD), the Medical Record (MR) item was innovated as a new concept. The basic concept and result of MR item is discussed.

Keywords:

terminology, EHR, MR item, CD

Introduction

The Clinical Document (CD) is a document that contains whole information derived from the process of interaction between patient and medical professionals. This kind of stored data should not be changed and interpreted differently as times go by. So, the structured terminology system has been developed, such as UMLS, SNOMED-CT, etc. However, authors find that terminology itself can not describe the interrelated characteristics of CD. We need more properties for the term and CD to express in reality. As an intermediate concept, so called MR item was used between terminology and CD.

Methods

All data was retrieved from the Electronic Health Record (EHR) system of one hospital located Seoul, Korea. The hospital has 2,100 beds, 2,500 clinicians, and 54 medical departments. All content item of CD were collected from 950 paper based CD. All items divided and subdivide by its usage and properties according to its own individual meaning. For this process, document analyzing tool was developed by the methodology of construction of database. This tool involves the variables of code, name of CD, type, unit, division, item group, and sub-item, etc. The collected data was transformed into Excel and MS SQL database to differentiate and extract same meaning in similar CD, same item from different CD, similar structure of items from different CD. The final items were managed by the MR item registration module.

Results

950 paper-based CDs were collected and analyzed. 63,232 terms are collected. The extracted final term with meaning properties, named MR item, are 13,287. Each MR item has 32 meaning variables, such as Type, Character Length, TxtBaseData, Numeric Base Data, Unit, Button Y/N, Action, Multi Line Y/N, Attribute, Width, Height etc. All clinical departments created 1,200 CDs through combination of MR items before implementation of EHR system. Continuous revision of MR item has been done for 1 year after implementation. 9,488 (41.7%) of MR items have been added (total 22,775) and 240 (1.8%) MR items have been changed.

Discussion

The priority of issue was how to create the vast of electronic CD easy to use and accurate to descript. The SNOMED CT has properties of term and concept as its characteristics. This enables to use one concept into several expressions. The other characteristic is the relation definition between terms. These characteristics enable the fine and self-controlled expression of clinical phenomenon. However, it can not express the objective of CD, the usability of CD. As an example, the item ‘admission path’ can be a same item in admission record and triage record of emergency room. if we hypothesize that this item is essential (should be recorded) item in admission record and is optional item in triage note, the SNOMED CT can not express this property, regardless of the content of record. This kind of property is significant for the working process in the real. This is a reason why the CD needs exchangeable property of meaning. It involves data type such as text, numeric, date, time, and etc. Also it involves the properties of check box, radio box, dropdown list, triggering event, whether or not to store in DB, and etc. These properties can be granted to MR item. The essentiality of ‘admission path’ could not be granted at the term level, instead it can be granted at higher level, MR item, in our

system. This intermediate concept of level can facilitate the usability of electronic CD and will maximize the efficiency of work process through CD.

The initial number of MR item has been increased continuously and only 1.8% of MR item has been changed. This means self-development and it would give maximum utility of EHR system.

Conclusion

The MR item, as an intermediate concept between terminology and clinical document, would facilitate the usage of clinical document and implementation of EHR system.

Acknowledgments

This study was supported by a grant from the Korea Health 21 R&D Project, Ministry of Health & Welfare, Republic of Korea(Grant No A050909)