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Experience of Adopting MLM engine for Drug-Drug Interaction

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Abstract and objective

For nationwide dissemination of standard CDSS, we have developed a MLM engine for the Arden Syntax. As a first step of practical use of the MLM engine, we adopted it to a development server of Seoul National University Bundang Hospital (SNUBH), for drug-drug interaction (DDI) domain. We improved our previous version of MLM engine, and the work process of integration process was established. We evaluated the MLM engine to validate possibility of practical use. The overall evaluation results showed possibility that our system can replace existing DDI system and can reduce knowledge management cost.

Keywords:

Arden Syntax, CDSS, HL7

Methods

For successful integration of Arden Syntax based CDSS into an existing HIS, we had to give trust about our system that it is safe and give idea that this standard CDSS adaptation can be useful decision to the institution. And the MLM engine developers and system engineer group in SNUBH, ezCaretech Co. LTd., both needed to understand each other's system. We tried to sufficiently communicate each other via temporal meetings, messengers, phone, and email during nine months. From this preparation phase, we derived requirements, improved MLM engine design, decided to adopt our MLM engine to a development server in SNUBH.

We refined and improved our previous version of MLM engine, MLMPlusX. The MLMPlusX is a core running environment for the Arden Syntax based decision supports. In order to use the MLMPlusX in practical HIS environment, we improved interface to other systems it interacts, separated engine components independently, improved performance, accuracy, and reliability, and simplified MLM system configuration setting work. And to minimize modification cost on the existing HIS application processes, we added a MLMGateway, a middleware that handles HIS events between HIS and MLM engine, and changed event detection method.

We integrated our improved MLM engine to development server in SNUBH. It was fast and simple work that only two person did it in three days. And we also built DDI knowledge base. We converted 930 DDI rules used in SNUBH into 930 Arden Syntax MLMs.

We evaluated our MLM engine to validate possibility in practical use. Performance, knowledge building and management cost, integration and migration, and usability was measured by comparing our engine with locally developed DDI system in SNUBH (local CDSS). The evaluation environment was Zeon dual core 3.0GHz CPU, 4G memory, 80G SATA HDD.

Discussion & conclusion

We refined MLMPlusX that it can be used in practice. To validate our system, we applied the MLM engine to SNUBH development server of SNUBH and built Arden Syntax knowledge base for DDI rules used in SNUBH. The overall evaluation results were promising. Performance was lower than local CDSS but it can be solved by modifying MLM engine design. Knowledge management cost was expected to be lower when using our engine, and there was no reduction in usability. The integration work was simple and fast that it showed high migration property. For the future work, we plan to adopt our system in real-time HIS.

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