A study on Distributed Knowledge Service Environment

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March, 2004

Keyword: XML, Database, mapping, BML

In this thesis, I propose a necessary function and feature for the information system which supports human intellectual activity. The final target of my research is to propose the information system which supports human intellectual activity. I chose the medical treatment of the doctor from example of human intellectual activity. And, in medical treatment, the information system which supports the doctor's diagnosis and treatment is an electronic clinical record. I considered the electronic clinical record as one example of the information system which supported a human intellectual activity.

First, I make the prototype of the electronic clinical record in my research. And, I pick up the feature of the information system which supports human intellectual activity during the development of the prototype of the electronic clinical record. The prototype of the electronic clinical record runs on the Data Fusion Mediator (DFM) server.

DFM server mounted a part of concept of mediator, and was developed as a result of the research of the development of the medical knowledge handling technology. DFM server is a server system which included the security mechanism of each distributed object and runs on Tomcat server. DFM server has DAML which enhances BML (Bean Markup Language) for DFM application developer. BML is an instance of an XML-based component configuration or wiring language customized for the Java Bean component model. DFM assembles Java Bean and Java Classes unevenly distributed in WWW (World Wide Web) as a component, and constructs the Java application. And, DFM server provides the client the Java application. An electronic clinical record needs security for a handling of medical information. Therefore, I constructed the prototype of the electronic clinical record running under the high DFM server of security .

Then, I found two problems from the prototype of the electronic clinical record. The first problem is "about Input method" and the second problem is "There is form in the electronic clinical record". The diagnosis and treatment which is doctor's intellectual activity is written in the frame of the electronic clinical record.

However, I think that this frame becomes a problem when thinking about the more general one about the information system which supported human intellectual activity. In a word, the electronic clinical record can use only the format fixed to information exchange between a database and application. Though, Knowledge is dynamic. So, an information system must maintain the dynamic relation between a database and application, in order to attain the information system which supports intellectual activity. I solve the frame fixed problem by using general XML as a data exchange technology to maintain the relation between the data base and the application. I tried my idea that application can dynamically cover correction of data base by storing database structure in XML. By mapping the structure of a database to XML, application can respond to correction of a database. If the Application receives database structure on XML, the Application can learn about database structure.

In this research, the information system which builds in my idea is called the Distributed knowledge service environment. I maintained the dynamic relation between the application and the data base by the Distributed knowledge service environment. The Distributed knowledge service environment was able to achieve the function which can become base of the system which supports human intellectual activity.