



University of New Brunswick  
Faculty of Computer Science

**Rule Enhancement of Personal Health Record For Diabetes**

Project Proposal

CS 6795 – Semantic Web Techniques

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## **Introduction:**

Chronic diseases are becoming more widespread. Many international reports predict that in the near future about one out of ten adult individuals will have diabetes [4]. According to the fact that there is no cure for it, we have to try to control it as much as possible. One way to control chronic disease such as diabetes can be continuous monitoring vital signs, analyzing them to see improvement or deterioration over time and intervening in patients' lifestyle depending on their results. Personal Health Record which means keeping track of patients' records, open the doors for personal health monitoring (PHM) by which patients get involve with their diseases. By measuring, keeping track of physiological signs and comparing them with historical data, patients can control their disease themselves..

According to what mentioned in previous paragraph, the idea of storing patient health records (PHRs) in a patient-centered database would help maintaining chronic conditions optimal. Presenting these PHRs on the web provides the opportunity for patients to access their records regardless of their location; also it would be helpful in emergency situations. The most important matter in the web based PHRs would be the semantic structure that data should be stored upon, in order to get the most related results when a patient query on stored data. A good design for PHRs will enhance structured health data and unstructured documents for health information.

## **An Overview of our Approach:**

In our proposed work we shall design a web PHRs semantic for diabetes patients. In order to have this done, we aim to use patient supporter which supports an online- interactive patient community as an instantiation of Rule Responder and early prototype of such rule enhancement[2]. So we need to know about the architecture of the Patient Supporter which uses three different types of agent:

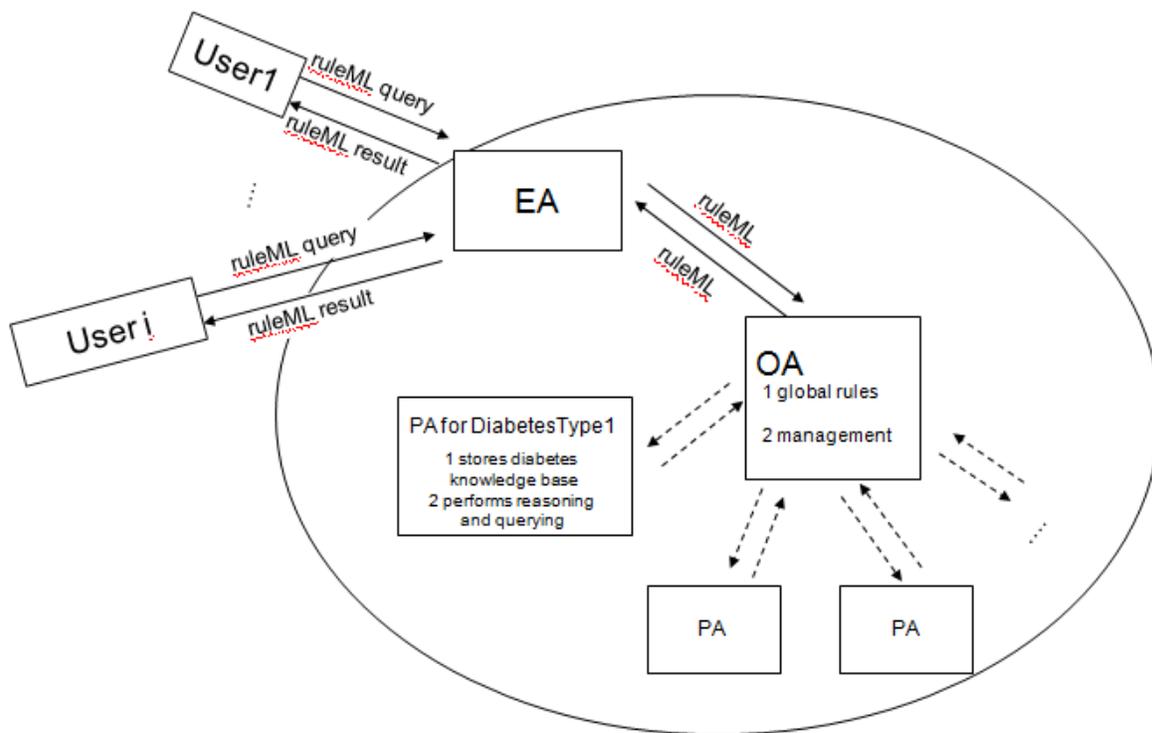
Organisational Agent(OA) , External Agent(EA) and Personal Agent(PA)

OA has a global knowledge base which is shared between OA and all the PAs. It receives query from an EA and direct it to the most related PA that have detailed local knowledge (Using OA helps privacy protection).Here is our plan for our project:

First, we shall define our taxonomy and rules and make our GRM(Group Responsibility Matrix),

for diabetes patients. We shall also define the PAs knowledge base, using vocabularies related to diabetes patients.

Second, we are planning to put our knowledge base and rules into the Rule Responder and implement our design. In our design, the EA acts as an interface between the user (patient) and the OA. Through the EA the user interact with their knowledge bases(records).In PatientSupporter, each kind of injury has one PA to perform tasks such as reasoning and querying, while in our implementation, each type of diabetes has one PA to do so. The OA acts like a manager for all the PAs. It stores the global rules and is in charge of managing access right. For example, if one patient wants to view another one's profile, the OA will deny the query. The relation between EA, PA, and OA is shown as in Figure 1.



**Figure 1 The relation between EA, PA, and OA**

## **Tools and Technologies**

1. Using Protege to create and edit the ontology of diabetes;
2. Using POSL to implement knowledge bases for both OA and PA;
3. Using Rule Responder, which is based on Prova and OOjDrew, as the development platform;
4. Using Eclipse as development environment.

## **Bibliography:**

1. Harold Boley, Omair Shaq, Derek Smith, and Taylor Osmu, The Social Semantic Subweb of Virtual Patient Support Groups
2. <http://ruleml.org/PatientSupporter/documentation.html>
3. [http://en.wikipedia.org/wiki/Personal\\_health\\_record](http://en.wikipedia.org/wiki/Personal_health_record)
4. Davy Preuveneers, Yolande Berbers: Mobile Phones Assisting With Health Self-Care: a Diabetes Case Study