An Ontological Study on Diabetes Sri lanka

G.G.A.L. Gamlath, A.M.N.K. Abeysinghe, W.G.S.A. Sarathchandra S.D.H.S. Wicramarathne and R.S.I Wilson

Department of Computer Science and Technology, Uva Wellassa University of Sri Lanka, Badulla, Sri Lanka

Diabetes mellitus is one of the serious diseases with a high risk spread across Sri Lanka society. Diabetes occurs when the body cannot produce insulin or at a consequences where body cannot effectively use the insulin, there are three types of diabetes exists namely Type I diabetes characterized by deficiency of producing insulin, the type I diabetes is known as an preventable disease, Type II diabetes is characterized by inefficient usage of insulin and it is the type of diabetes that the majority of people around the world suffering from. Gestational diabetes is occurring during the period of pregnancy and it can be diagnosed by prenatal screening. A set of competency questions were designed to decide up to which extend the users can get answered their questions using the ontology. By analyzing the data gathered from experts we identified some top classes and the subclasses of those top classes to be included in the ontology they are Person, Diabetes Types, Complications, Symptoms, Exercises, Dietary patterns, Sleeping Patterns, Family History and Working styles. The hierarchy of the ontology has been developed using subclasses and defining rules and constraints of the classes and sub classes, then the data properties and object properties were defined on classes to develop the hierarchy of the ontology. Constraints were used to verify the correctness of relationships in the ontology. Individuals were added to the classes using the existing knowledge. The tool we used to develop the ontology was Protégé 5.2.0. It is an Integrated Development Environment use to build intelligent systems. Extracting knowledge is the final outcome of an ontology, to extract knowledge from the ontology that we developed we use SPARQL which use to retrieve and manipulate the data stored in Resource Development Framework format. Natural Language processing was used as the approach to convert natural language into SPARQL and SPARQL into natural language to make it more user friendly.

Keywords: Protégé, Ontology, SPARQL, Rules, Diabetes, NLP