Web based software for the study of USDA soil taxonomy and classification of newly found soil

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ABSTRACT ORIGINAL

United States Department of Agriculture (USDA) Soil Taxonomy is based on soil properties that can be objectively observed and measured in the natural conditions as they exist today. There are many soil classification systems but USDA Soil Taxonomy is most accepted worldwide. Ontologies are the new form of knowledge representation that acts in synergy with agents and Semantic Web Architecture. Soil ontology developed for USDA soil taxonomy has been used to develop a query interface that will help in detailed study of soil taxonomy, classification of new soil as well as exchange knowledge between software agents and systems. This is a web based application having N-tier architecture. Application development environment is NetBeans 6. 9 editor and Protégé. Web development technology is Java Server Pages (JSP). Programming languages JAVA and SPARQL are used for querying. Client interface is developed with Hyper Text Markup Language (HTML), Cascading Style Sheet (CSS) and JavaScript. Third tier of software consist of database which is in MS-SQL server 2005. Other two layers are Web Ontology Language (OWL) Ontology layer and Semantic Web Framework layer. OWL layer contains soil taxonomy information in the form of Ontology. Semantic Web Framework layer is implemented using JENA. In the search panel user can search anything related to USDA Soil Taxonomy, which comprises of twelve orders. However, this software contains information about seven soil orders reported in India. Domain experts can see and edit the knowledge base (i. e. Soil Ontology) or can suggest anything related to the creation of Soil Taxonomy Ontology through WebProtégé.