Abstract

A humanitarian aid in an emergency system involves information from multidisciplinary environments. The humanitarian aid information systems have been increased in recent years by many humanitarian agents. Collaboration of humanitarian aid information systems is needed in order that they perform more smartly and more effectively. A large number of humanitarian information is separately stored in several relational databases. An ontology is one solution to enable the information reusing and sharing using a common vocabulary across heterogeneous application. Semantic interoperability between existing relational databases and ontology still remains a major practical issue. In this research, we design a pivot ontology framework to present pivot construction methodology and a PivotOntology-to-Database schema matching methodology. The pivot construction methodology is adopted from an ontology engineering technique. The pivot ontology is the semantic neighborhood among various databases. The schema matching between pivot ontology and a database focuses on linguistic relation approach. To integrate humanitarian aid in emergency information from several databases, the Humanitarian Aid for Refugee in Emergencies (HARE) ontology has been proposed. The evaluations demonstrate that the HARE ontology successfully integrates with extensive schema covering of the existing databases. In addition, Humanitarian Aid Information Processing (HAIP) Model has been designed with respect to situation awareness model. The HAIP model is combined the humanitarian aid information integration processes to achieve their knowledge. In order to forecast the future situation, the HAIP model helps to get the information needs for decision making systems.

Keywords: Ontology, Pivot Ontology, Humanitarian Aid in Emergency, Relational Database, Schema Matching, Interoperability, Knowledge representation