A Semantic Ontology for Disaster Trail Management System

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Abstract

Disasters, whether natural or human-made, leave a lasting impact on human lives and require mitigation measures. In the past, millions of human beings lost their lives and properties in disasters. Information and Communication Technology provides many solutions. The issue of so far developed disaster management systems is their inefficiency in semantics that causes failure in producing dynamic inferences. Here comes the role of semantic web technology that helps to retrieve useful information. Semantic web-based intelligent and self-administered framework utilizes XML, RDF, and ontologies for a semantic presentation of data. The ontology establishes fundamental rules for data searching from the unstructured world, i.e., the World Wide Web. Afterward, these rules are utilized for data extraction and reasoning purposes. Many disaster-related ontologies have been studied; however, none conceptualizes the domain comprehensively. Some of the domain ontologies intend for the precise end goal like the disaster plans. Others have been developed for the emergency operation center or the recognition and characterization of the objects in a calamity scene. A few ontologies depend on upper ontologies that are excessively abstract and are exceptionally difficult to grasp by the individuals who are not conversant with theories of the upper ontologies. The present developed semantic web-based disaster trail management ontology almost covers all vital facets of disasters like disaster type, disaster location, disaster time, misfortunes including the causalities and the infrastructure loss, services, service providers, relief items, and so forth. The objectives of this research were to identify the requirements of a disaster ontology, to construct the ontology, and to evaluate the ontology developed for Disaster Trail Management. The ontology was assessed efficaciously via competency questions; externally by the domain experts and internally with the help of SPARQL queries.

Keywords

Author Keywords: Semantic web; ontology; information retrieval; disaster trail management

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