Application of an RDF to an Ontology-Based Database for Nonwritten Materials

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The need for intellectually processing massive nonwritten information such as smells, scenery and tactile sensations has been increasing. Our research team had conducted a study on the establishment of an ontology-based database for folk implements to offer a new perspective by proving that it is possible to create an ontology-based database for nonwritten materials. Yet, we did not come up with a definite solution for an inference engine needed to compile such a database. This time, we tried a Jena-based resource description framework (RDF) to derive new relationships between resources to show the significance of ontology for nonwritten materials.

An RDF is a semantic data format used as a semantic web technology to describe linked data and metadata. It functions as a framework to describe relationships between resources identified by a uniform resource identifier (URI) and provides readable metadata for computing machines to information resources on the web, based on RDF data. An RDF finds new information not directly included in data according to rules like ontology and schemas.

Jena is a framework to develop Java-based semantic web applications. The semantic web is a movement to convert the current web to a new type that is comprehensible to computers. Jena provides various functions to process and use RDF data or knowledge.

The following is how we used Jena for this research. We asked Jena to make inferences on two sets of RDF data. This data included Kiri or an awl; Mitsumegiri as a local name of Kiri; and Hole as a purpose of using Mitsumegiri. Jena then inferred that a purpose of using Kiri is Hole. In other words, it added a tag Kiri to Hole and another tag Hole to Mitsumegiri. These tags were not contained in the original RDF data. This means that Jena automatically added them while performing the inference task and that the significance and feasibility of ontology for nonwritten materials have been demonstrated.

Nevertheless, some issues and challenges have been revealed. It takes a long time to build a system. Furthermore, an inference system that can be easily used for information in Excel format and a system to derive new relationships while building an ontology are yet to be developed.