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Development of the Generation Challenge Program (GCP) Scientific Domain Model-Associated Ontology

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Abstract

We present the construction of RDF/OWL Ontology for coding the semantic structure of the Generation Challenge Program (GCP) domain models and associated ontology for crop information systems. The ontology is an output of the GCP Subprogramme 4 commissioned research: “Task 22 - Development of GCP Domain (Data) Models,” and was concurrently developed with the common scientific domain model to ensure semantic compatibility across the GCP (see http://www.generationcp.org/model). Protégé-2000 was used to develop a formal "controlled vocabulary," or network of discretely enumerated named crop informatics concepts. Our ontology is focused on the representation of domain model feature types (attributes) and certain feature values as ontology and is explicitly modeled in the ontology metadata model of the GCP domain model (see http://pantheon.generationcp.org/demeter/Ontologies.html). Ongoing efforts are focused on the cataloguing of pertinent sub-domain entity ontology (using established international standards where available, e.g. Gene and Plant Ontology), the software implementation of the domain model and ontology in the GCP platform middleware (see http://pantheon.generationcp.org), and the translation of domain models into data type and service type ontology specifications for web services and semantic web implementation (see http://pantheon.generationcp.org/moby).

Keywords: crop, plant, agriculture, ontology, domain model

Topics: ontology development