An Expertise Ontology for Cooperative Extension

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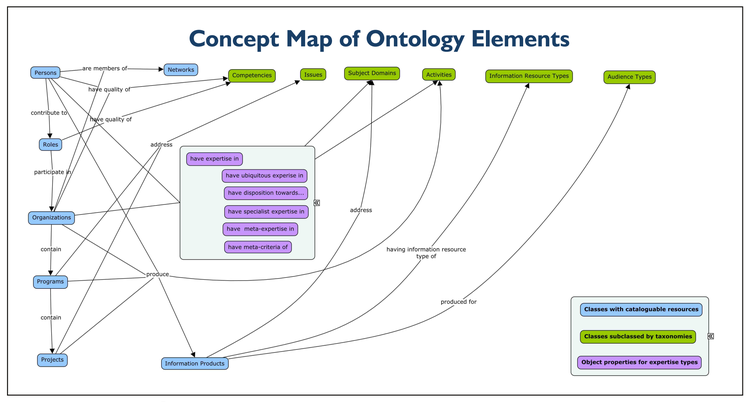
Introduction

The national Cooperative Extension System is a non-formal educational network with a mission of advancing agriculture, the environment, human health and well-being, and community economic development that is coordinated through and distributed across the state land-grant universities. At present there is no easy way to query knowledge assets across individual extension organizations with respect to expertise, accomplished projects, or successful interventions.

In collaboration with the umbrella organization eXtension.org, we have developed a prototype ontology for describing expertise across the cooperative extension network. This ontology aims to provide a framework enabling linking experts, projects, organizations, competencies, digital resources, and other related assets.

Conceptual Design

As shown at right, our ontology links entities that we expect to catalog (illustrated in blue) such as persons, organizations, and projects, with entities with established or newly created taxonomies (illustrated in green), for instance lists of professional competencies or types of information resources. Linking these resources are a set of object properties describing different sorts of expertise.



This hierarchy of expertise types has been drawn from scholarship by Harry Collins and Robert Evans (2007) to describe general categories of expertise especially in science and technology, characterizing these in a taxonomy they call the Periodic Table of Expertises. This taxonomy has been translated directly into our ontology. Much of their discussion concerns distinguishing between linguistic knowledge of a domain and embodied practices.

By contrast, competencies in our ontology refer to desired qualities that are specific to practitioners in the cooperative extension domain. These have been collated by reviewing lists of competencies from several different state extension organizations.

Elements of the Ontology

There are 12 major classes in this ontology: persons, roles, organizations, programs, projects, networks, competencies, subject domains, issues, activities, information resource types, and audience types. All these classes are anchored in the Basic Formal Ontology. Other ontologies used for these classes are FOAF, SKOS, the VIVO Ontology for Researcher Discovery (Mitchell 2018), AgriVIVO, an extension of VIVO for agricultural research (GFAR 2018), and the ASI Sustainable Sourcing Ontology (Hollander 2018).

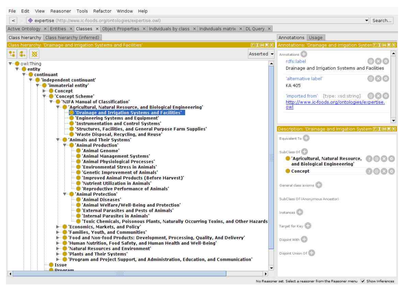
A couple of these classes such as information resources and subject domains tie into existing taxonomies, for instance subject domains being drawn from the National Institute of Food and Agriculture's (NIFA) Manual of Classification for Agricultural and Forestry Research, Education, and Extension (USDA 2005), illustrated at right.

Object properties come from the Relations Ontology and VIVO, as well as a newly created set of object properties for the expertise types from Collins and Evans (2007).

Major Classes in This Ontology

Class Name	Source
Person	FOAF
Role	BFO
Organization	FOAF
Program	This ontology
Project	VIVO
Network	AgriVIVO
Competency	This ontology
Subject Domain	SKOS
Issue	ASI
Information Resource Type	This ontology
Activity	VIVO
Audience Type	This ontology

Portion of NIFA Taxonomy

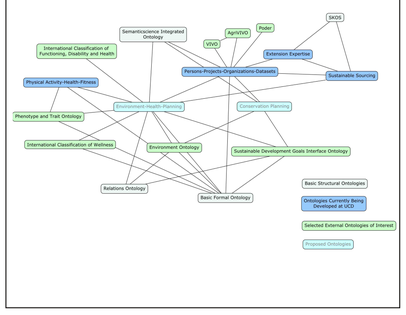


Context and Future Work

An immediate use for this ontology will be to supply a tagging scheme for a series of e-books being created by the company Eduworks as field notebooks for cooperative extension professionals. Currently under development is the creation of subject taxonomies for e-book modules including one concerned with opioid response and another with diversity, equity, and inclusion issues.

Our creation of this expertise ontology is part of a broader initiative to create a set of ontologies describing entities and interactions across the entirety of the food system, ranging from food production, impacts and linkages to the environment, to food consumption, nutrition, and human well-being. Illustrated above are some of the major ontologies that will be joined together or developed in this multi-ontology framework.

Linkages to Other Ontologies



Further Information

For more information about the ontology please contact Allan Hollander (*adhollander@ucdavis.edu*) or Matthew Lange (*mclange@ucdavis.edu*). The ontology will be available for download at *https://github.com/adhollander/eexp/*.

References

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