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Project Impact Model

Ontology Overview

Version 0.2 ()  
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# Introduction

Large construction project can have a significant impact on the region surrounding them. These impacts may significantly affect the quality of life of people in the region. Some of these impacts will benefit people and some will impact them negatively.

This document is an introduction to an ontology that defines a vocabulary for describing such impacts and projects that may be proposed and implemented to mitigate them.

Competency questions that this model is able to address include:

1. What predicated impacts affect my community?
2. Which predicated impacts have no mitigation?
3. What proposals are there to mitigate impacts on a community?
4. What has been done to mitigate or offset the impacts on my community

Detailed documentation of the vocabulary can be found in the owldoc documentation.

# Core Concepts

A typical use of the core concepts and the relationships between them is illustrated in the following diagram:

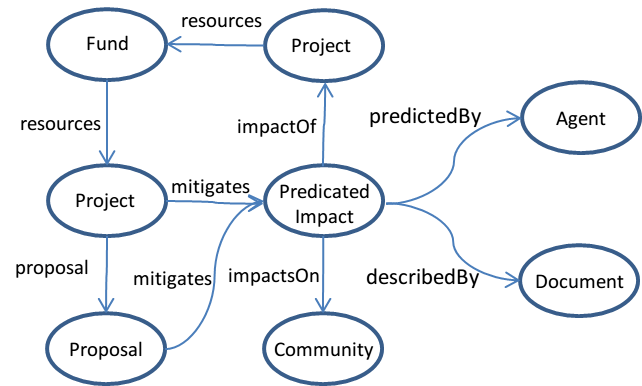


Figure 1 Core Concepts

The central concept is that of an *impact*. An impact is a consequence. It may, for example, be a consequence of a large scale construction project, but there are many kinds of things that may have an impact.

An impact has an impact on something. For example, an impact may have an impact on a community. However an impact can have an impact on a variety of different kinds of thing such as the environment or the economy. A *predicted impact* is a prediction of an impact that an activity may have, where the *actual impact* is not known. There are many reasons the actual impact may not be known. For example, impacts that will occur in the future are likely to be predicted rather than known. A predicted impact is created by one or more agents, typically a local government organisation, the management of the impacting project or an interested third party.

There may be many predictions of the impacts of a project. Some of these will conflict. There are different approaches to predicting impacts that will produce different predictions for the same phenomena.

Impacts may, and many do, have an impact on a specific *community*. Roughly speaking, a community is a collection of people. A community is considered to be a collection of people that meet some criteria, such as the residents of a village, rather than the specific set of people resident in the village at a particular time. The individual people in a community may vary over time.

A community may be related in some way to a particular location. It may be that residents of that community are resident in that location. However people in community may be related to the location in other ways. For example they may commute to or through that location or they may carry out some leisure activity at that location.

A community may also be restricted to particular classifications of people. Examples of such classifications include mothers and toddlers, commuters and rugby players.

Some impacts are negative and as a consequence *proposals* may be generated for projects to mitigate one or more impacts. Some of those proposals may be approved and result in the creation of *projects* to mitigate impacts. Some such projects may directly modify the impact in question, e.g. planting trees to reduce noise levels. Some project may not directly modify an impact but may offset one or more impacts by improving the quality of life of the affected community in other ways.

Some activities, such as large construction projects, may provide a fund or other resources to be used to resource projects to mitigate the effect of the activity.

# Describing the Core Concepts

The following class diagram represents the core concepts and their properties in more detail.

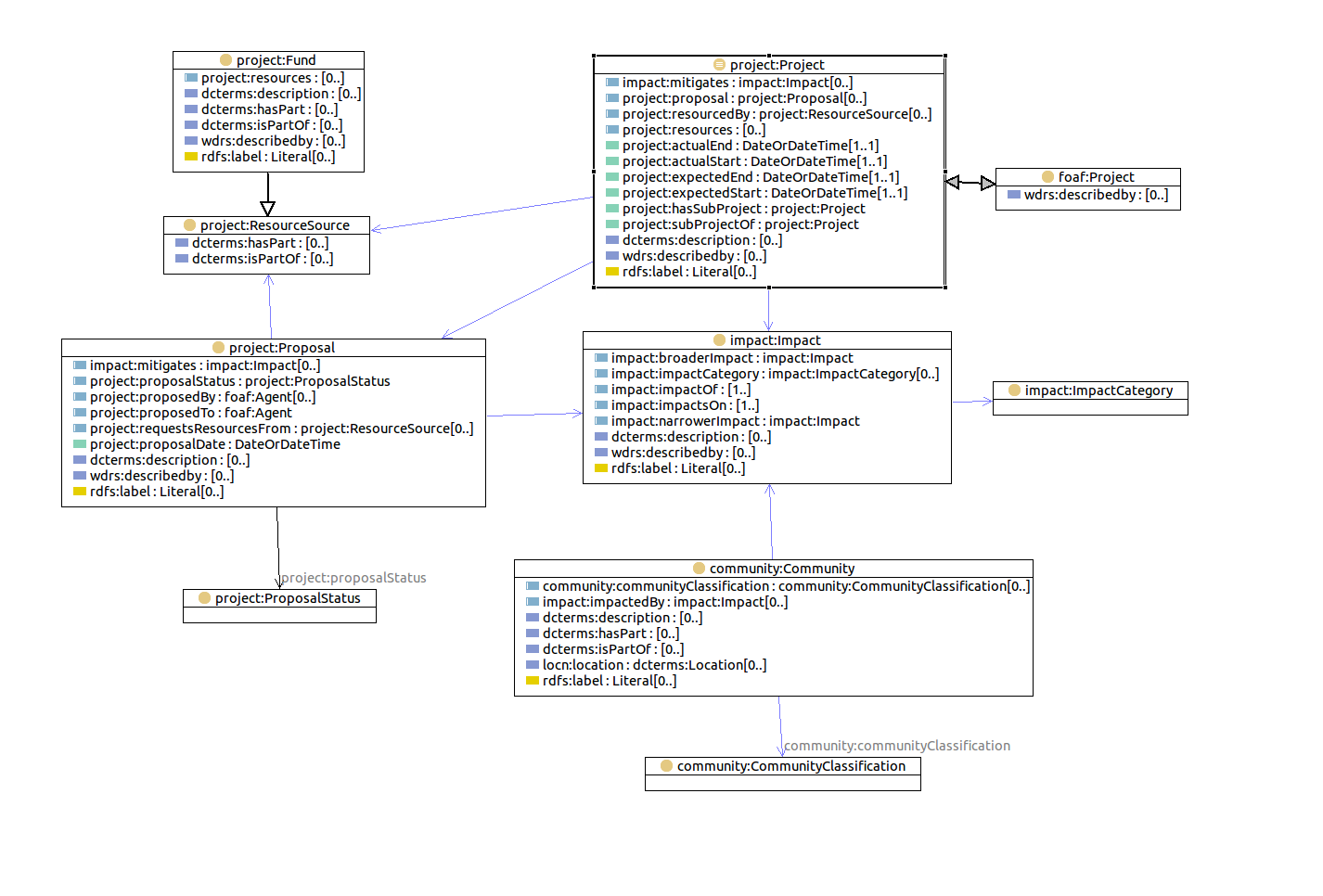


Figure 2 Class Diagram

## Common properties

This section describes common properties of many types of resources.

Resources may have a name, indicated by the property rdfs:label and a description indicated by the property dcterms:description.

The property wdrs:describedby may be used to relate a resource to another such as a document, set of documents or a fragment of a document that describes it.

A fragment of a document may be represented using Dublin Core terms. The fragment is a resource which may be related to the document of which it is a part using the property dcterms:part of. The fragment may use the property dcterms:identifier to specify the an identifier such as a section or paragraph number. If no such identifier is available the property dcterms:description may be used to describe the fragment. This structure is represented in the following diagram:

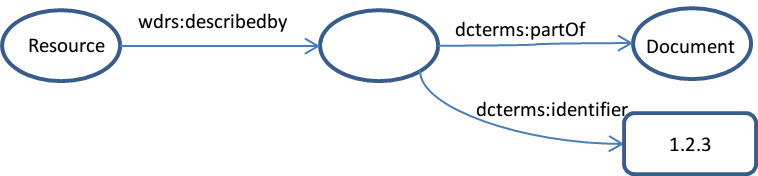


Figure 3 representing a fragment of a document

## Impacts

Impacts may have a narrower/broader structure, i.e. one impact may be a specialization of another. For example, increased delays on a particular roundabout may be a specialization of a more general impact of increased traffic congestion on a particular road.

The concept of impact provides a basis for potentially very rich descriptions of an impact. In this core ontology however, we provide only a minimal set of descriptive properties.

An impact may have a wdrs:describedby property that relates it to a description of the impact.

Impacts may fall into categories of impact. In principle, there may be many different categorization schemes for impacts. This model will provide one categorization scheme which is described below.

## Communities

Communities are described by an extensible collection of facets. Two facets are defined in this ontology, a location facet that limits the community to people at a particular location and categorizationfacet that restrictsthe community to people in a particular category such as mothers and toddlers or commuters.

Communities also have a broader/narrower structure. The community of commuters from a particular village is part of the community of the village as a whole. The properties dcterms:partOf and dcterms:hasPart are used to represent this structure.

## Projects

Projects are activities. They are a very general concept with a wide variety of potential application and consequent opportunities for a rich vocabulary for describing them. They appear in two roles in this ontology; firstly as a cause of impacts and secondly as activities to mitigate the effects of impacts. Projects intended to mitigate the effect of another project, may themselves have further impacts.

A project can be a source of resources for other projects. For example, a large construction project might resource a fund which in turns resources other projects and activities.

This ontology provides only a limited vocabulary for describing projects.

## Project Proposals

A proposal is the action of making or submitting a proposal.. A proposal may be proposed by one or more agents and may be described by one or more documents or a document set. A project proposal may request resources from a fund or other source of resources. A proposal may be accepted or rejected.

## Funds

Funds are a source of resource. They may have structure, with an overall fund being divided into multiple sub-funds to spend on particular kinds of project, e.g. projects located in particular areas or addressing particular categories of impact.

Funds will typically have an amount of money to be spent and a schedule for spending that money.

This ontology provides no vocabulary beyond the common the properties of name and description, and the properties mentioned in the core concepts diagram for modelling funds.

## Agents

Agents are entities such as people and organizations that are capable of intentional action. This ontology provides no vocabulary beyond the common properties of all resources for describing agents.

# Versioning

Things change over time. Modelling to be able to describe the state of things at different times adds significant complexity to a model for both the data producer and the data consumer. Consequently, it should only be undertaken when necessary.

Where it is necessary to represent multiple versions of a resource, we will treat each version as a separate resource. Each version will have its own URI. This enables any resource to refer to a specific version.

Further, there is a URI that always refers to the current version of a versioned resource. This URI is linked to all previous versions of the resource. It serves as a generic name for the resource and as an anchor point from which all versions of a resource can be found. This structure is illustrated in the following diagram:

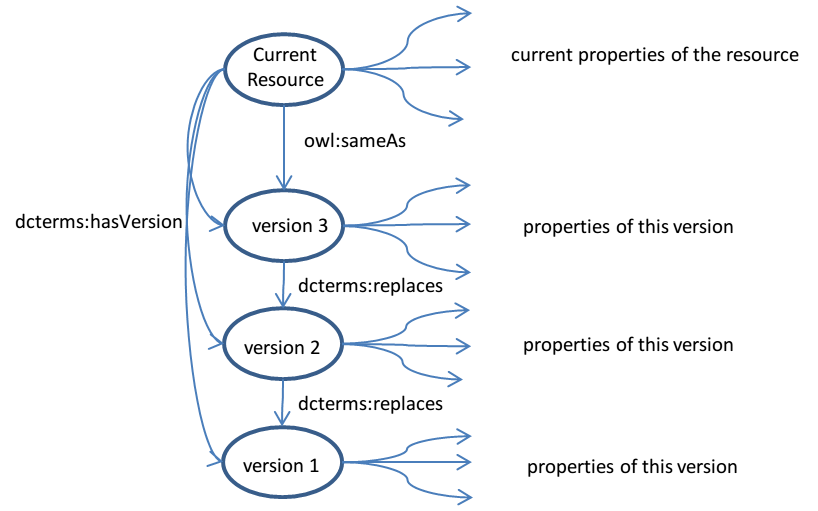


Figure 4 versioning a resource