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ROC+ as a consultancy service

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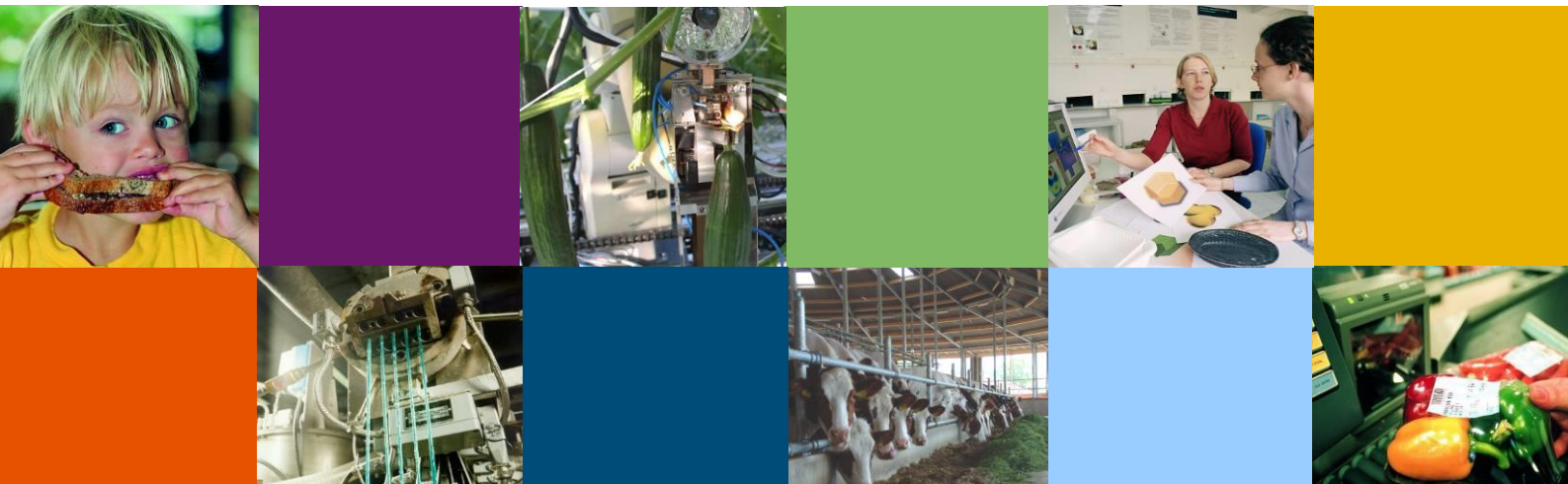

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1 Introduction

An ontology describes the important concepts in a domain, and the relationships between them. Figure 1 shows an example of an ontology relating to weeds on farms. Important concepts are dairy farm, pasture, weed, etc. The concepts may have alternative names, such as in the case of 'broad-leaved dock', which has the alternative names dock, sorrel, rumex etc. The concepts are related together with relationships, for example 'grassland weed' is a type of 'weed'.

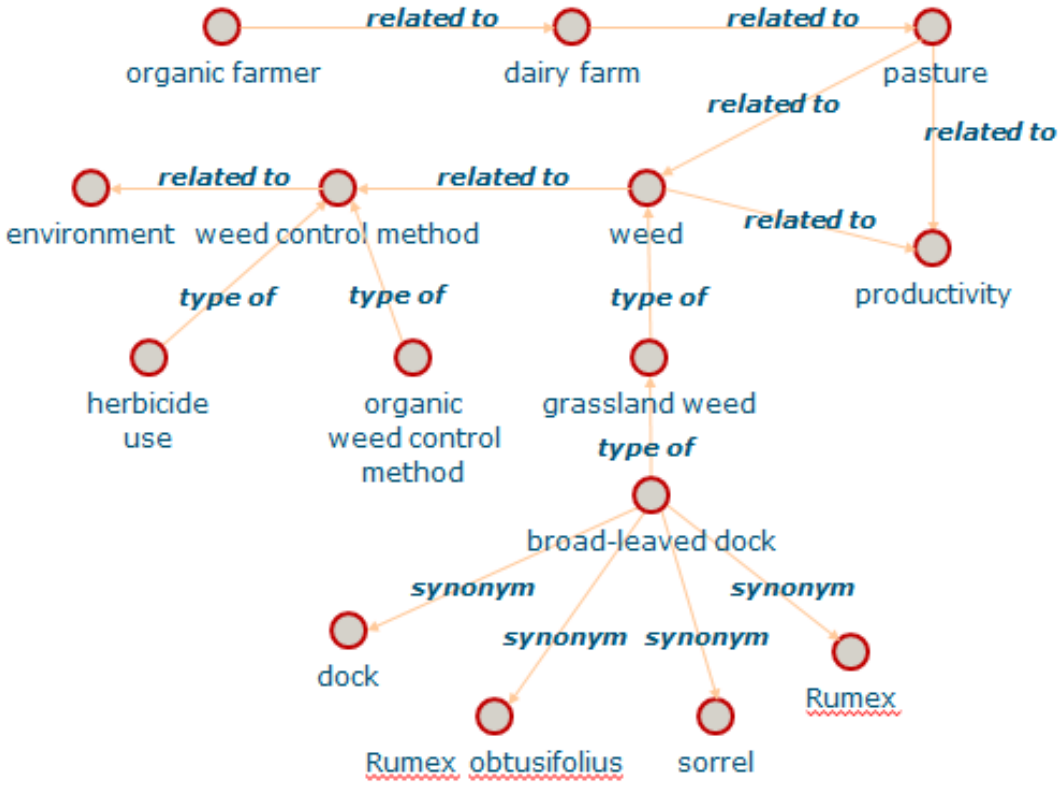

Figure 1: An example of an ontology

Such an ontology is invaluable for providing a clear, unambiguous picture of the knowledge in a given domain. The alternative labels provide the needed flexibility to accommodate the different terms which people use, while retaining the essential information that all these names are referring to the same thing. The relationships help to structure the terms, making it easier to understand than a simple flat list of terms would be.

A domain ontology makes knowledge explicit, so that it can easily be discussed, shared, and reused by others. As it is formally defined, the knowledge can also be used in computer applications. For example, the 'type of' and 'synonym' relations can be used in a search application to help the user to search more effectively – if they have typed in 'dock', then they will also find information on 'sorrel' and 'rumex', and can be offered the option to extend their search to 'grassland weed'.

Given the benefits of ontologies, we are frequently approached to create them for clients. Creating an ontology has traditionally been primarily a task for knowledge experts. In order to build a domain ontology, they would interview experts, use the results to construct an ontology, then report back to the experts to check their work, and repeat the iterations until the ontology was complete. This process was effective, but very time-consuming.

As it is the domain experts themselves who possess the knowledge needed to make the ontology, it would be more effective to let them undertake the task of producing the ontology. However, it is not simple to trigger the brainstorm process in the experts, it can be difficult for them to keep focus, and the modelling constructs used in ontologies are hard to understand for the uninitiated. These same technical barriers also make it very hard for domain experts to build on existing ontologies, wasting time on redefining areas which are already well covered in ontologies.

At Food and Biobased Research, Wageningen UR, we have created a method to assist domain experts in creating their ontology, called the ROC+ method. We have developed this method into a consultancy service for clients, to enable them to quickly achieve their goal of an accurate domain ontology.

In this deliverable, we will briefly recap on the functionality of the ROC+ method and the web tool which supports it, and then describe how this is now available for clients in the form of a consultancy service.

2 The Rapid Ontology Construction method (ROC+)

The Rapid Ontology Construction method – ROC+ - was developed by Food and Biobased Research, Wageningen UR to overcome the barriers domain experts faced in building ontologies. In the ROC+ method, the knowledge expert no longer takes centre stage. Domain experts brainstorm together to collect the necessary terms. Still working together, they structure the terms into a simple ontology. The knowledge expert guides and assists this process, and refines the result, where necessary, into the final ontology.

The collaborative nature of the process helps to get the brainstorm going, and in addition, existing documents and ontologies are used for inspiration. As the knowledge expert is not directly involved in the process, they are free to supervise at a higher level and to help the domain experts to keep focus.

To assist in this process, we have developed the ROC+ tool [1].

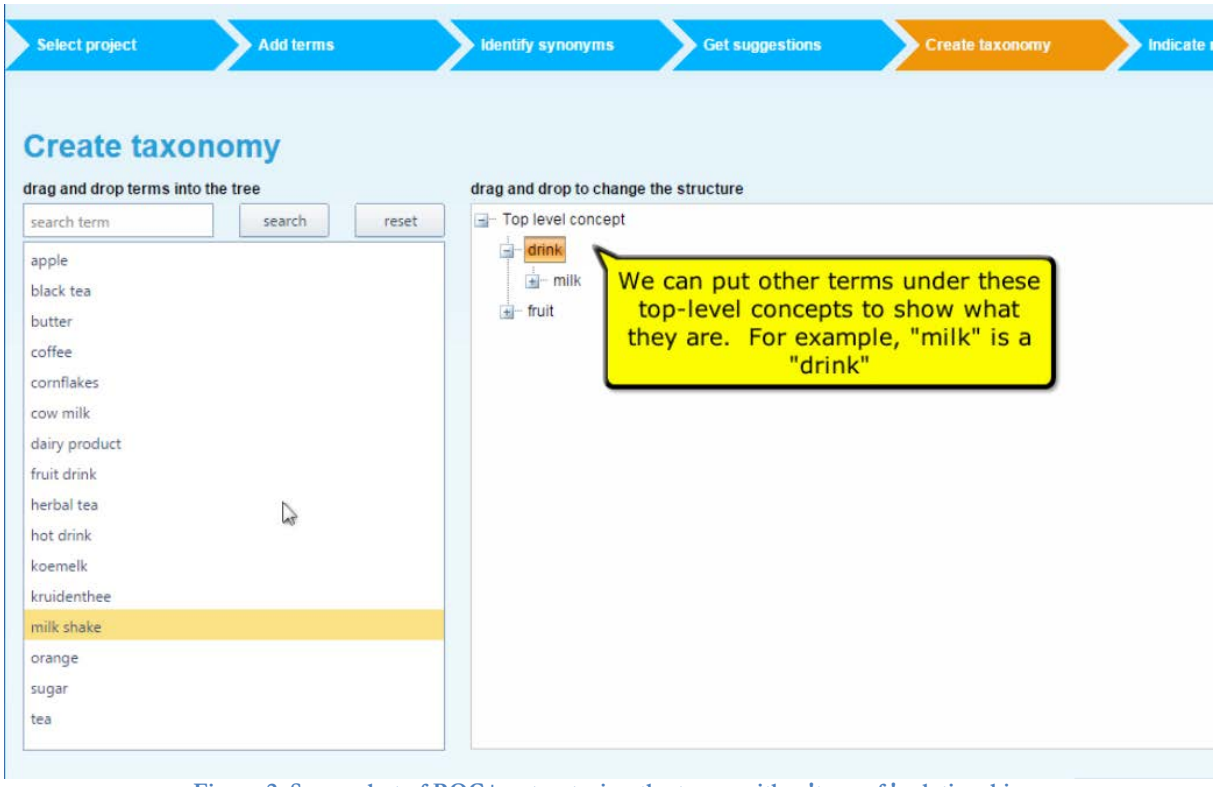

Figure 2: Screenshot of ROC+ - structuring the terms with a 'type of ' relationship

This is a web application. A screenshot is shown in Figure 2. The domain experts enter key terms from their domain. Behind the scenes, ROC+ searches in existing ontologies and documents to find additional terms. For example, if the user has entered 'milk', then ROC+ may suggest terms such as 'buttermilk', 'condensed milk', 'dairy' and 'cheese'. The user chooses if they wish to accept these suggestions or not.

Once the terms have been entered, the experts can structure the terms. This occurs in two steps, first the experts define 'type of' relationships (e.g. 'buttermilk' is a type of 'milk'), and then they

define 'is related to' relationships (e.g. 'milk' is related to 'cheese'). This structuring is done via a simple user interface.

The domain experts are never confronted with the technical details of the ontologies. ROC+ handles searching in existing ontologies, and translates the user's terms and visual structure into an ontology.

The ROC+ method has been successfully applied within a number of projects, including the Valerie [2] project. Comments van domain experts indicate that they are positive about the process, even regarding it as a form of teambuilding.

Figure 3: A ROC+ session

3 ROC+ as a consultancy service

Up until now, ROC+ has formed part of larger projects with clients, such as the creation of a smart search portal. However, there are many clients who are interested in an ontology but who do not need further services. It is therefore logical to set up a consultancy service for ROC+, so that it can be supplied separately.

Our experiences in developing the ROC+ method indicate that a workshop format is ideal as a basis for the consultancy service. The knowledge expert is then on hand to guide the participants through both the conceptual and technical aspects of the method. The workshop format also provides the opportunity for several domain experts to work together in a sustained manner, without distractions from other work.

After the workshop, the domain experts have had some experience in using the ROC+ tool. They can continue to work on the ontology, in their own setting. When they feel that the ontology is sufficiently complete, the knowledge expert can finalise it.

As questions invariably arise when the knowledge expert is finalising the ontology, a second workshop session is included to include the domain experts in this process, and also to discuss the way in which the ontology is to be used. This may, in some cases, lead to a project, for example to create a search portal, but this is not part of the ROC+ method. The client is free to use the produced ontology, which they receive in the form of a file, as they see fit.

To summarize, the ROC+ consultancy service includes the following steps:

- Scoping and preparation: Together with the experts we assess the knowledge domain for which the ontology will be created. We define which preparations need to be made by the knowledge experts. Amongst these are the collection of terms and relations in their domain.

- Ontology creation: In an interactive, 1 day workshop domain experts start with the ontology definition, using the ROC+ software tool. Terms and relations are discussed and constructed into an ontology. After the workshop, Wageningen UR ontology experts will process the work that has been done in the workshop into a first version of the ontology.

- Work on the ontology with the ROC+ tool: Domain experts will further work on the ontology, using the ROC+ tool in their own environment.

- Ontology Consolidation: if possible in a second workshop or otherwise with knowledge experts separately, the ontology is finalised and the next steps are determined. Possible next steps can be the integration of the ontology in an existing website or project site (these are new activities, not included in the workshop).

4 Conclusion

The ROC+ consultancy service has been developed based on our extensive experience in developing ontologies for clients. There is a clear demand for ontologies, and consequently for a cost-effective way of creating them. We are confident that the ROC+ consultancy service will fulfil this need and thus will contribute significantly to the uptake of semantic technology by industry, with all its concomitant benefits. The ROC+ consultancy service is now available from Wageningen UR Food & Biobased Research.

5 References

[1] – Koenderink et al, "ROC+ 2.1 for better ontology creation by domain experts," COMMIT/ eFoodLab deliverable Q2 2014
[2] – Koenderink et al, "Valerie user sessions", COMMIT/ eFoodLab deliverable Q1 2014

