

As We May Link

A model to support aggregated scientific knowledge

Centre for eResearch
Dept. of Computer Science
University of Auckland

Prashant Gupta (PhD student)
Prof. Mark Gahegan
Prof. Gillian Dobbie

Centre for eResearch
The University of Auckland



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The current state of scientific practices

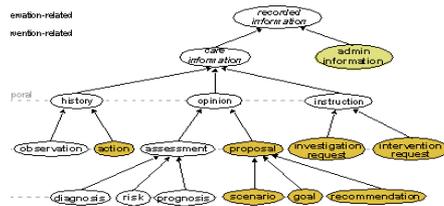
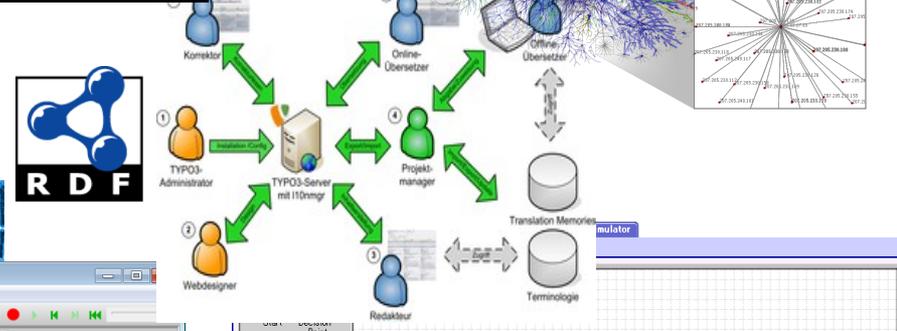
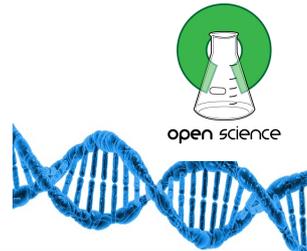
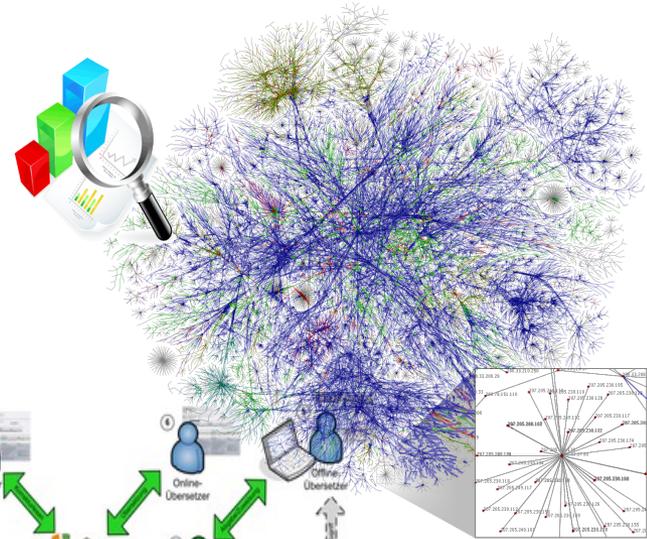
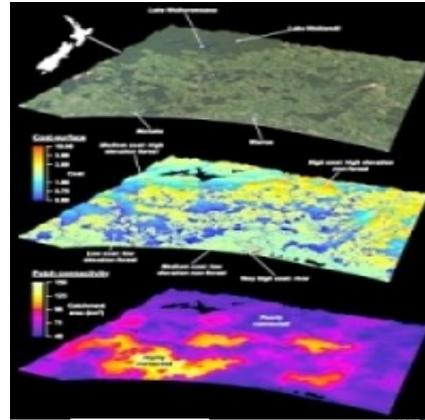
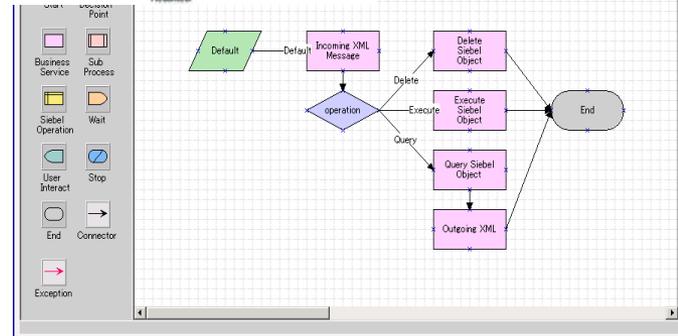
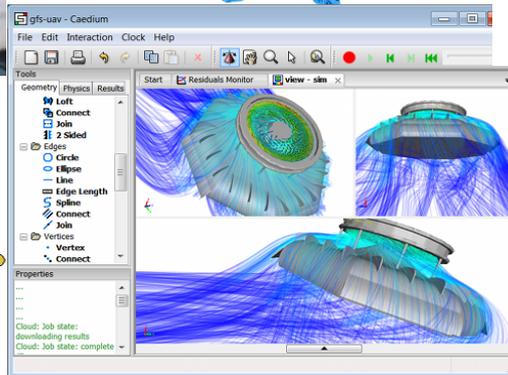
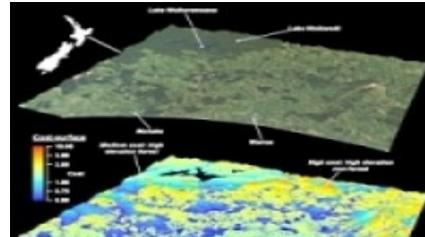


Figure 7 The Clinical Investigator Record (CIR) Ontology



The current state of scientific practices



How well are we carrying forward the core principles of science (reproducibility, communication, etc.) with these new practices?

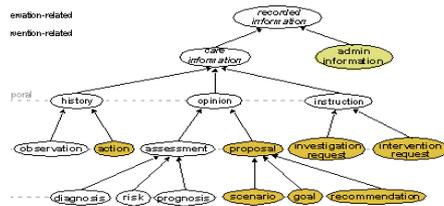
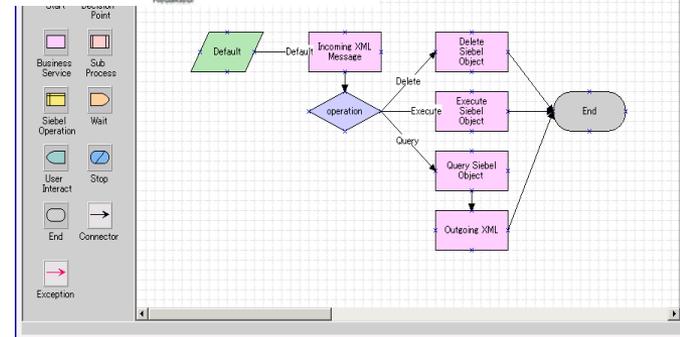
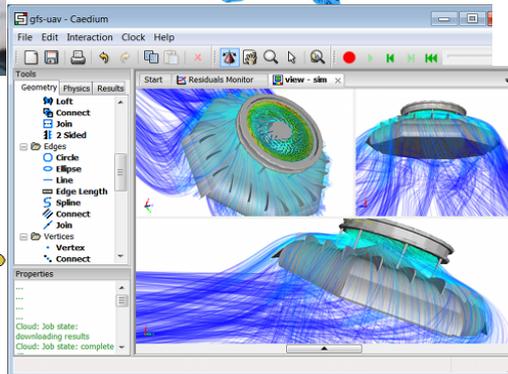


Figure 7 The Clinical Investigator Record (CIR) Ontology



Learning from the past



Learning from the past

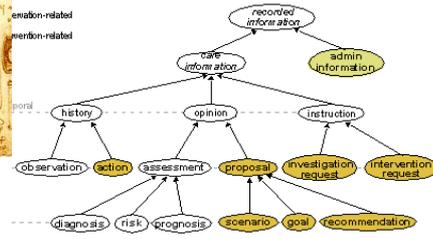
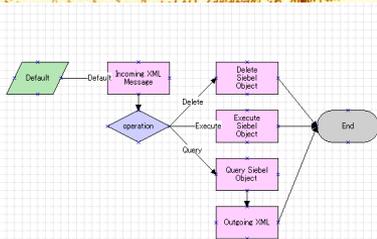
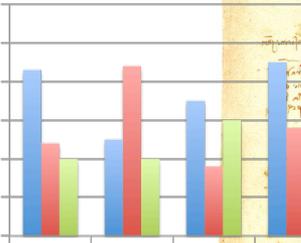
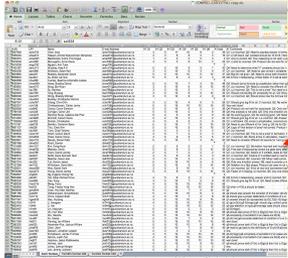


Figure 7 The Clinical Investigator Record (CIR) Ontology

Adventure of Categories
Modeling the Life-Cycle of Categories During Scientific Investigation

Product Owner: Mark Oudemans "Oudemans"
Case for Research: Top of Category Hierarchy
Version: 1.0
To be published in a peer-reviewed journal

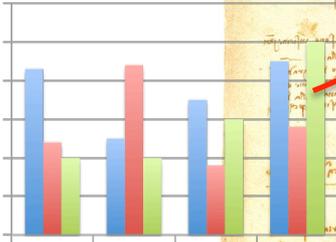
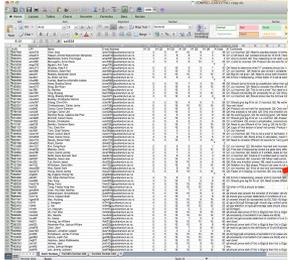
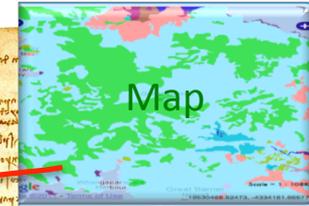
Abstract: Categories are the fundamental components of scientific investigation. They are used to describe the objects of study and to organize the knowledge about them. This paper presents a model of the life-cycle of categories during scientific investigation. The model is based on the idea that categories are created, refined, and eventually discarded as the investigation progresses. The model is implemented in a software tool that allows researchers to create and manage their categories in a structured and consistent way.

1. INTRODUCTION

The scientific method is a process of discovery that involves the creation and refinement of categories. Categories are the building blocks of scientific knowledge, and they are used to describe the objects of study and to organize the knowledge about them. The process of creating and refining categories is a central part of scientific investigation, and it is this process that this paper focuses on.

In this paper, we present a model of the life-cycle of categories during scientific investigation. The model is based on the idea that categories are created, refined, and eventually discarded as the investigation progresses. The model is implemented in a software tool that allows researchers to create and manage their categories in a structured and consistent way.

Learning from the past



How do we connect them back to synthesize an integrated view ?

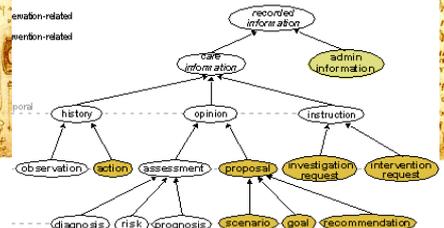
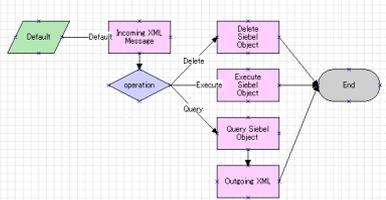
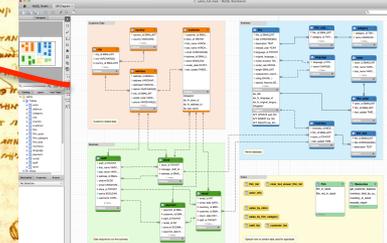
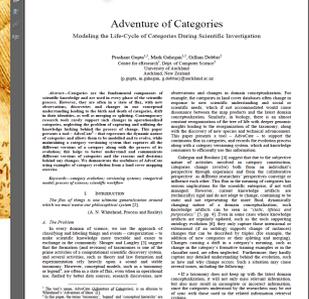
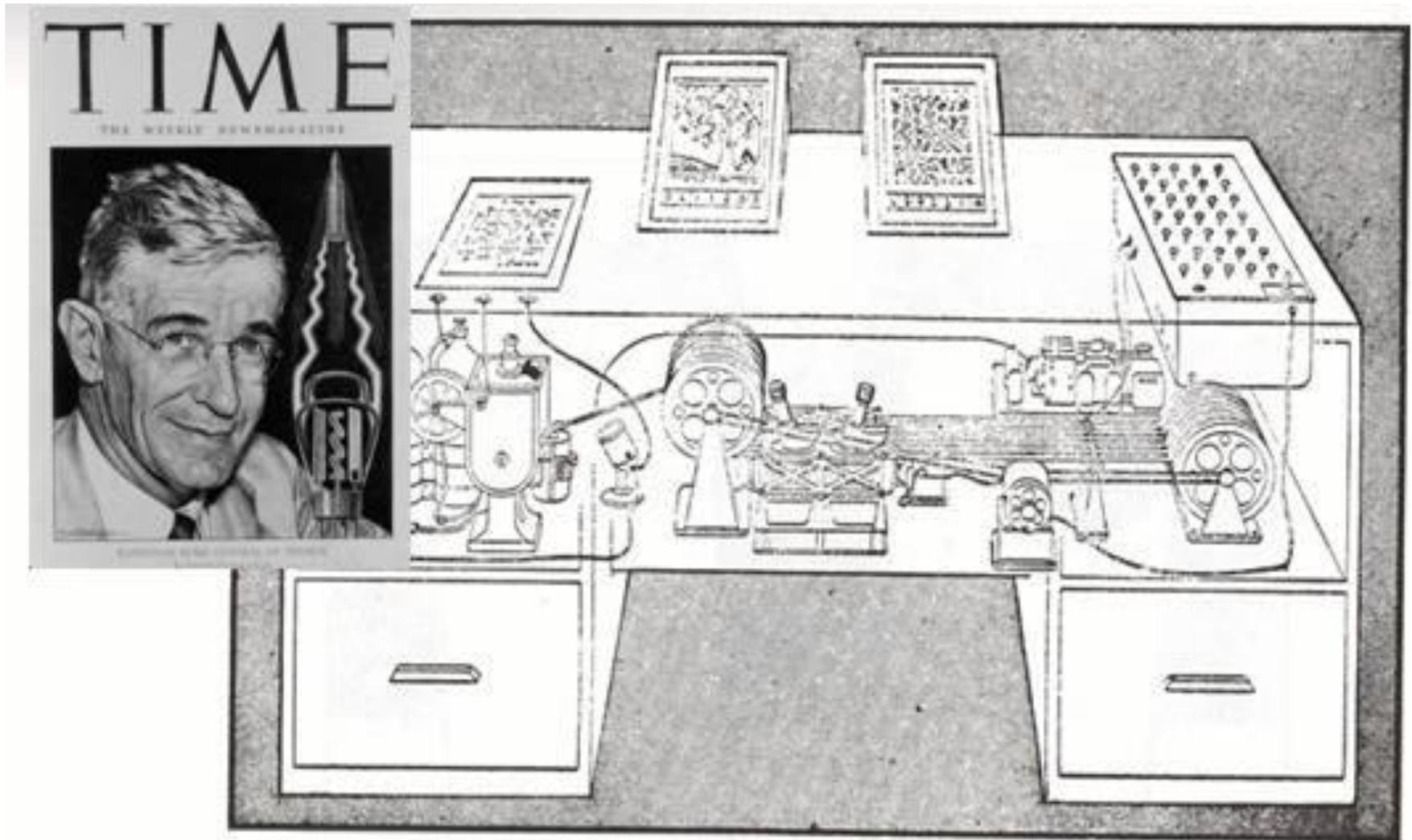


Figure 7 The Clinical Investigator Record (CIR) Ontology

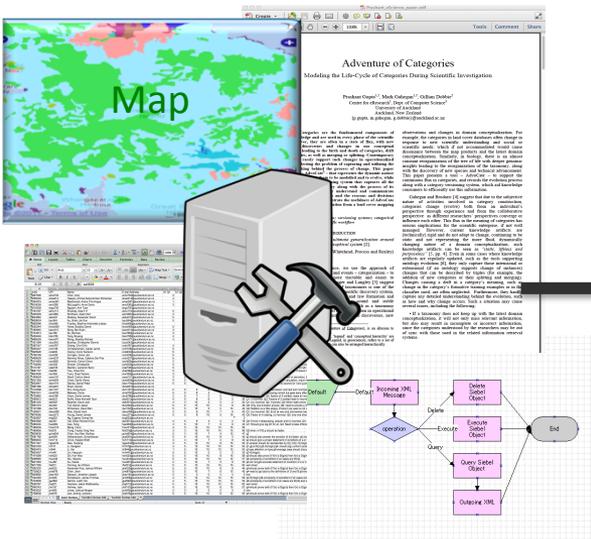




“As we may think” (*The Atlantic*, 1945)

Making conceptual connections explicit

Associationist view



A model that propose connected science

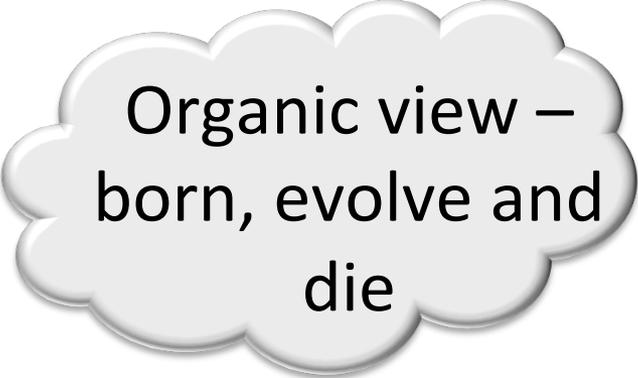


Associationist
view

A model that propose connected science

A light gray, cloud-shaped bubble with a drop shadow, containing the text "Associationist view".

Associationist
view

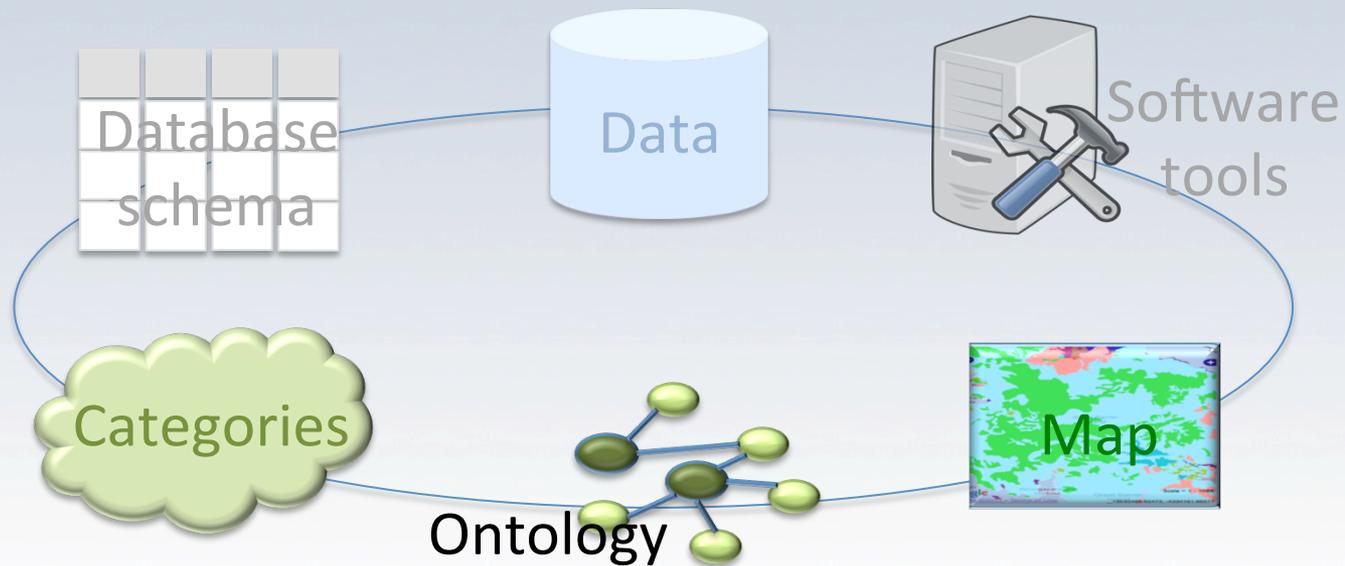
A light gray, cloud-shaped bubble with a drop shadow, containing the text "Organic view – born, evolve and die".

Organic view –
born, evolve and
die

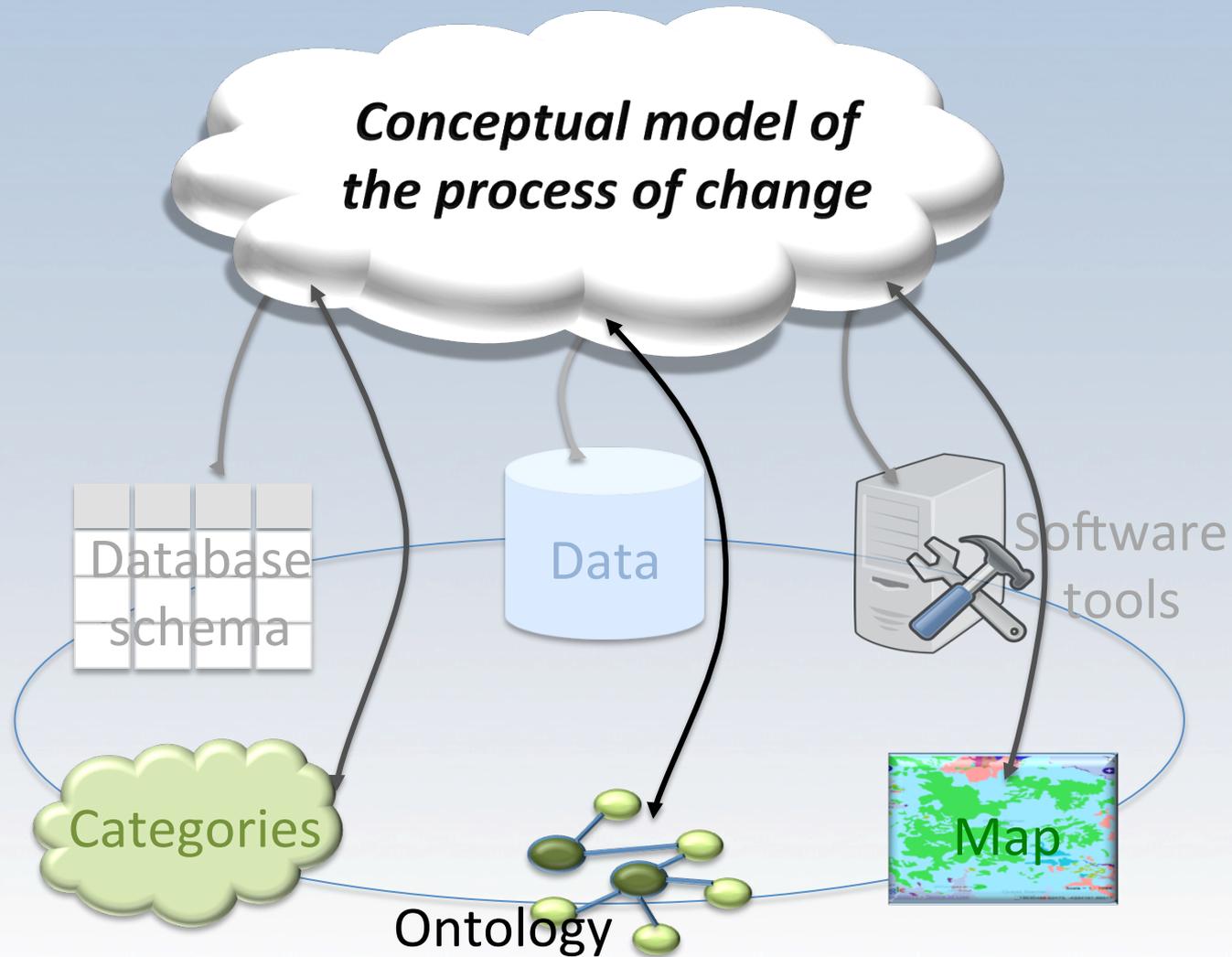
Live and

A model that propose[^] connected science

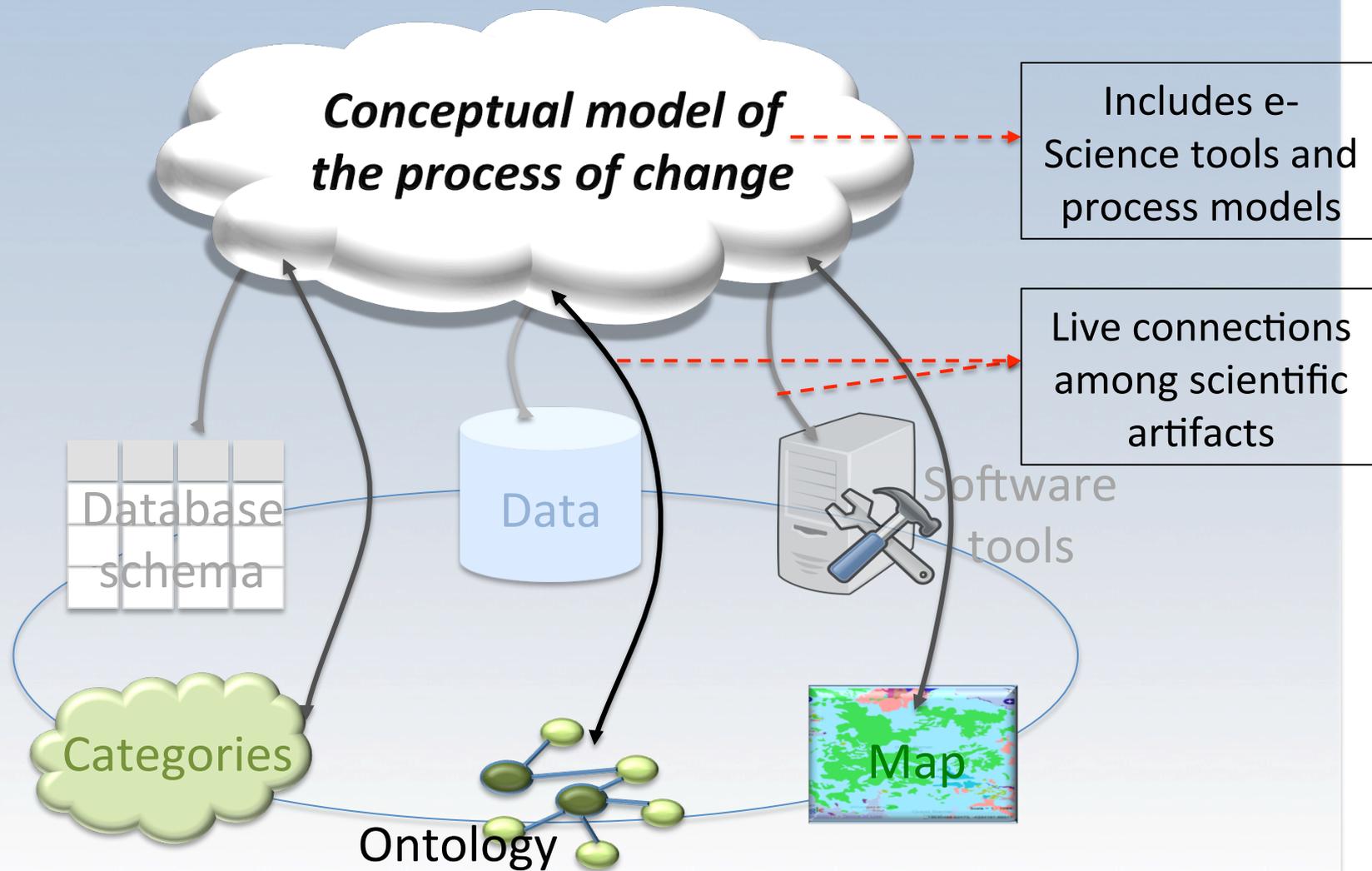
Connecting scientific artifacts



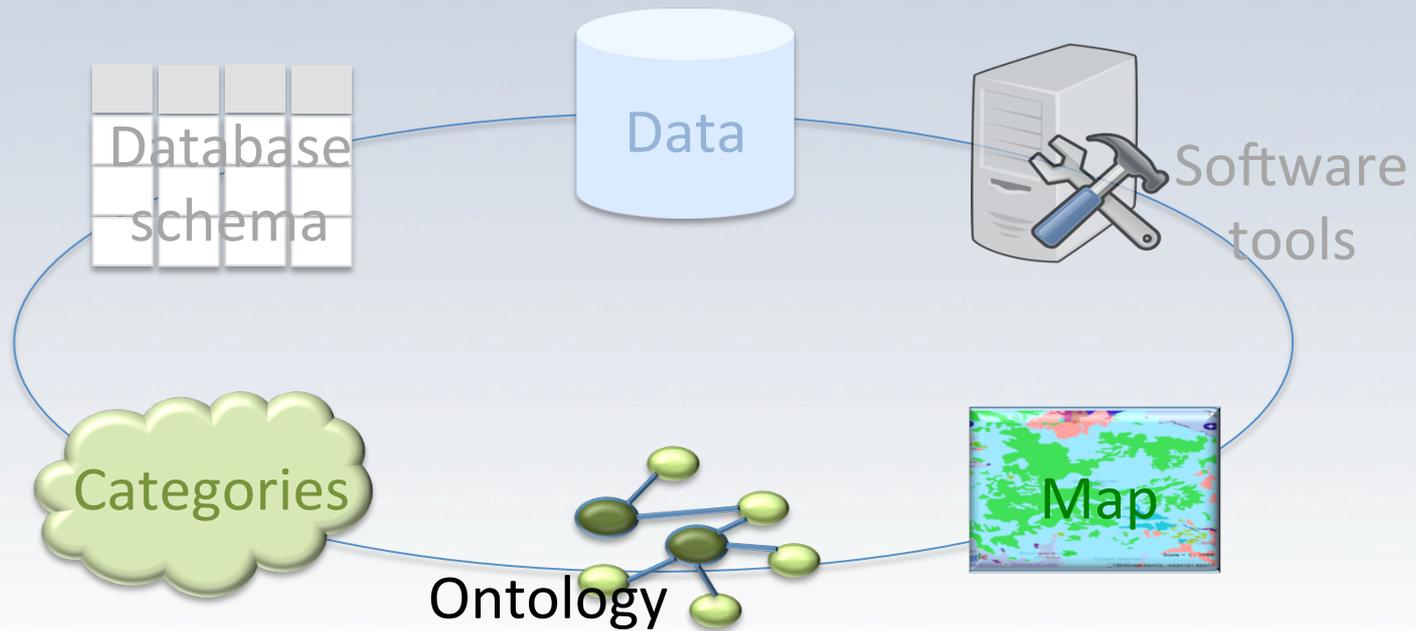
Connecting scientific artifacts



Connecting scientific artifacts

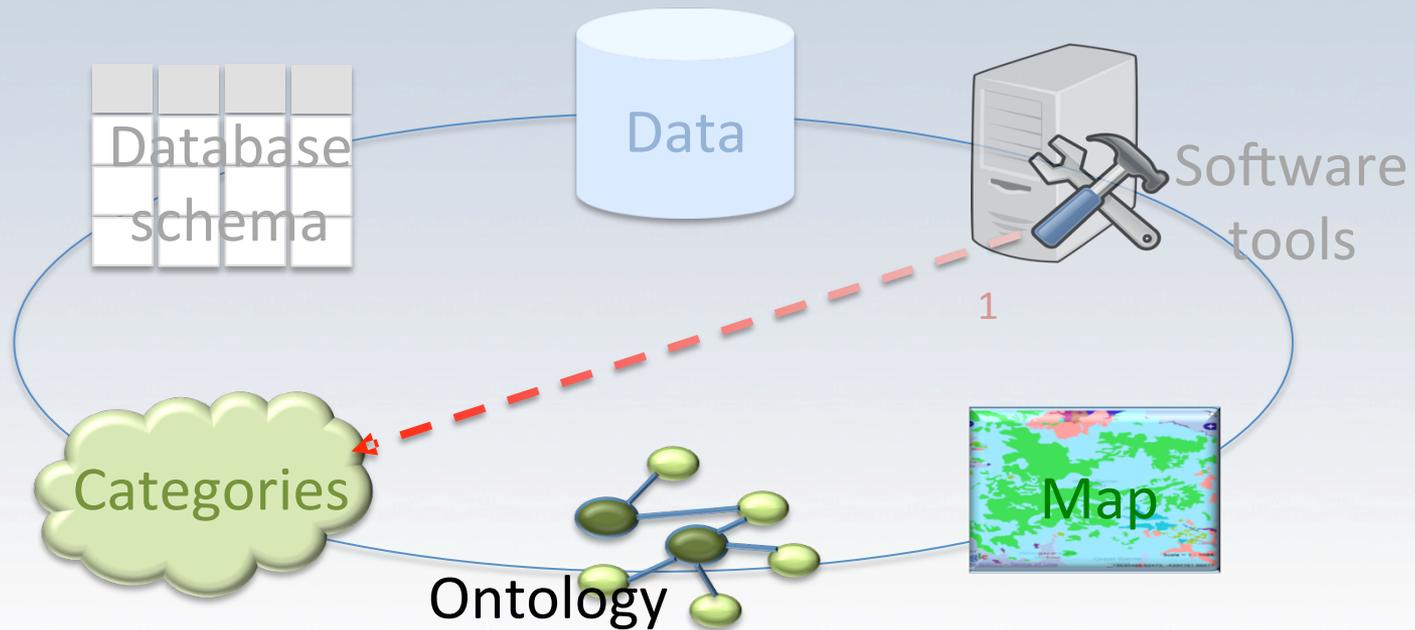


Example



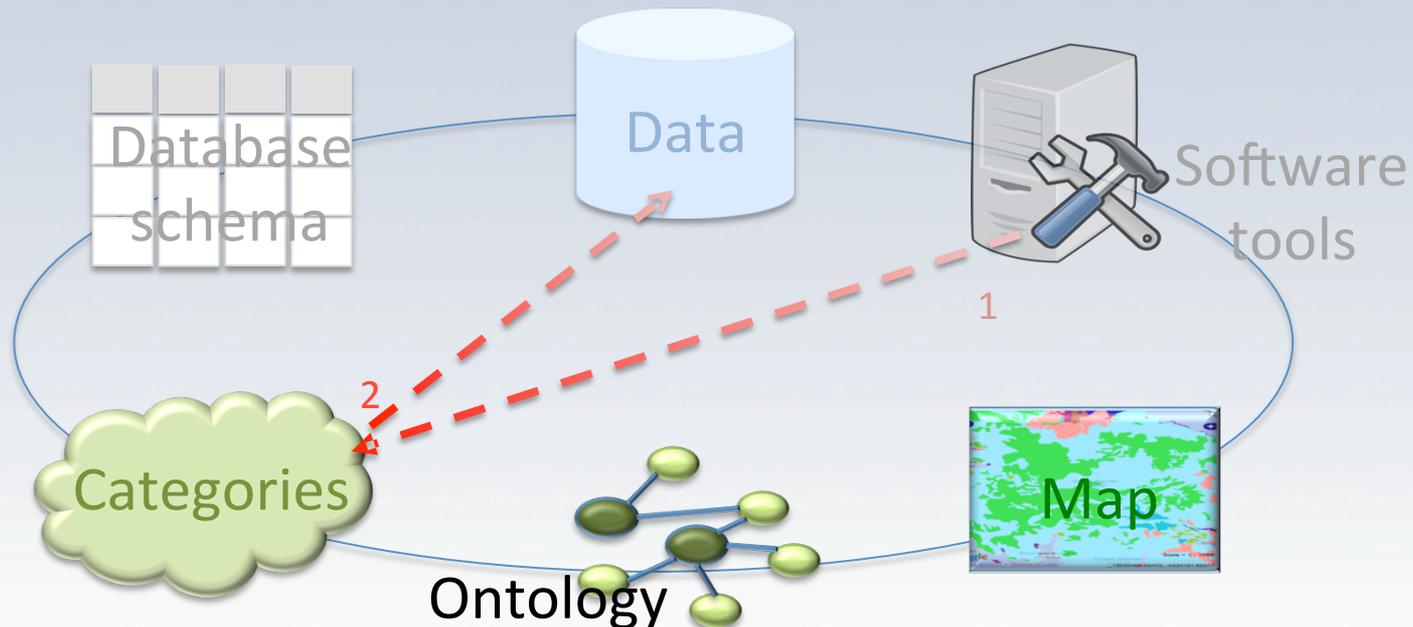
Example

1. The k-means classifier used for land cover classification changes, which lead to change in the categorical model



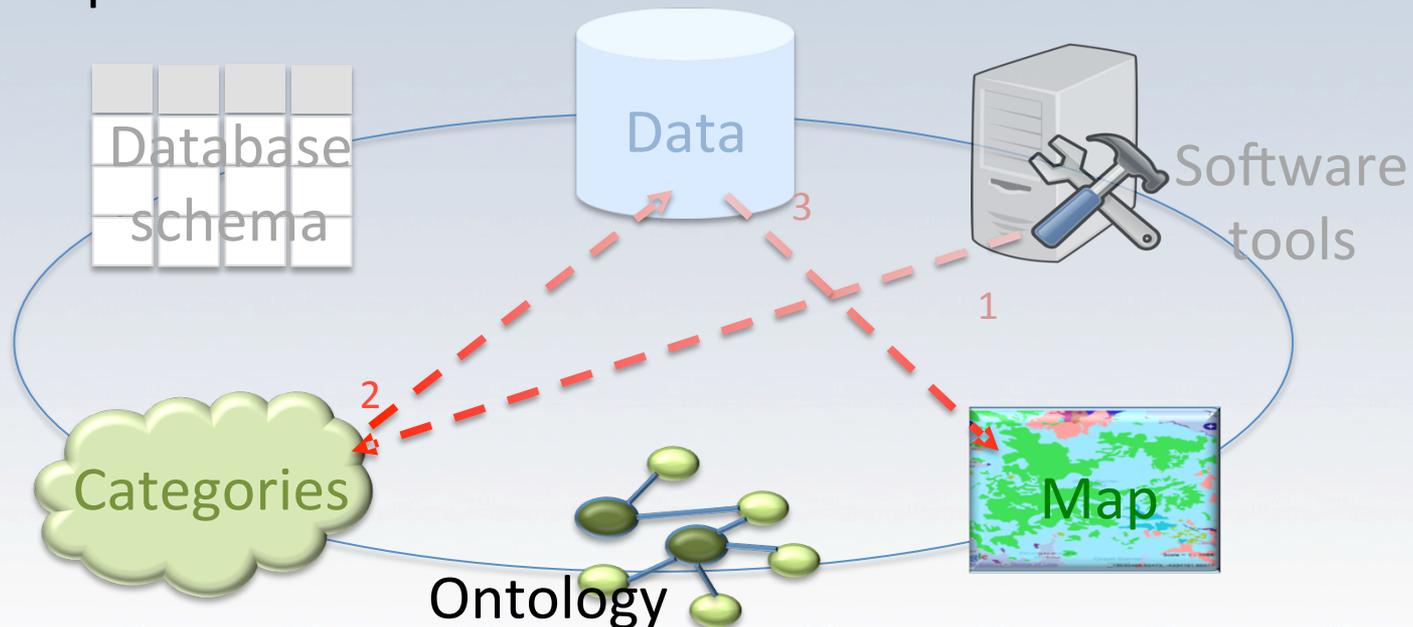
Example

1. The k-means classifier used for land cover classification changes, which lead to change in the categorical model
2. The extension of category 'Forest' changes leading to change in the data stored under the category.



Example

1. The k-means classifier used for land cover classification changes, which lead to change in the categorical model
2. The extension of category 'Forest' changes leading to change in the data stored under the category.
3. Finally, the change in data is reflected in the land cover map



Adventure of Categories (AdvoCate)

- Allows to model changes in categories
- Maintains a category-versioning system
- Connects data, methods and categories along with the different versions of them
- Connect changes in categories with the tools supporting database and ontology evolution tools

Conclusion

- E-Science tools not only enable scientific activities, but also provides an opportunity to bridge the gap between science and technology and ground our scientific tools in the process of science.
- This model supports live and connected science, which will surface up more scientific processes and deeper understanding in our computationally enabled science.

Questions?

Special thanks to Google for sponsored tickets to the conference 😊

Prashant Gupta
p.gupta@auckland.ac.nz
@pgupta_nz