

PODD Ontology Driven Database

Dr Peter Ansell

University of Queensland

13 March 2012

Outline

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

1 Scientific experiments

2 Structured data

3 PODD Ontology Driven Database

Scientific experiments

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Aim to test hypotheses in known, partially controlled, situations

Scientific experiments

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Aim to test hypotheses in known, partially controlled, situations
- Contain many variables

Scientific experiments

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Aim to test hypotheses in known, partially controlled, situations
- Contain many variables
- Experiment variables and results are noted and used in analysis.

Scientific experiments

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Aim to test hypotheses in known, partially controlled, situations
- Contain many variables
- Experiment variables and results are noted and used in analysis.
- Analysed results are used to make conclusions, which are published.

Scientific workbooks

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

■ Some common headings

Scientific workbooks

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Some common headings
- Structure can vary

Relational databases

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Two dimensional structure

Relational databases

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Two dimensional structure
- Suit simple relationships

Relational databases

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Two dimensional structure
- Suit simple relationships
- Single table not ideal for entire experiment

Relational databases

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Two dimensional structure
- Suit simple relationships
- Single table not ideal for entire experiment
- Not ideal for multiple different experiments

Structured ontologies

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- A common root

Structured ontologies

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- A common root
- Branches and leaves are independent of each other

PODD as a workbook

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Vital metadata about each experiment in a single ontology

PODD as a workbook

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Vital metadata about each experiment in a single ontology
- Variable number of headings and subheadings

PODD as a workbook

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Vital metadata about each experiment in a single ontology
- Variable number of headings and subheadings
- Acceptable use of headings and subheadings is configurable

PODD as a workbook

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Vital metadata about each experiment in a single ontology
- Variable number of headings and subheadings
- Acceptable use of headings and subheadings is configurable
- Each experiment is independent of other experiments

Ontologies to define structure

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Ontologies allow different structures for different experiments without changing the underlying database schema

Ontologies to define structure

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Ontologies allow different structures for different experiments without changing the underlying database schema
- PODD has basic constraints
 - 1 Each ontology must have exactly one Project
 - 2 Each node must be connected to the Project through a unique series of “part_of” links
 - 3 Each node can reference other nodes using “refers_to” links

Ontologies to define structure

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Ontologies allow different structures for different experiments without changing the underlying database schema
- PODD has basic constraints
 - 1 Each ontology must have exactly one Project
 - 2 Each node must be connected to the Project through a unique series of “part_of” links
 - 3 Each node can reference other nodes using “refers_to” links
- A single ontology can be used with different unique experiments if it is designed well

Phenomics ontology structure

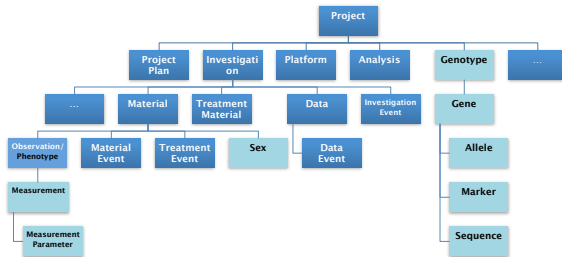
PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database



Publication

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Projects can be published on completion, both in HTML and RDF

Publication

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Projects can be published on completion, both in HTML and RDF
- Published projects designed to be immutable

Publication

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

- Projects can be published on completion, both in HTML and RDF
- Published projects designed to be immutable
- Each data item has a URI

Questions

PODD Ontology
Driven Database

Dr Peter Ansell

Scientific
experiments

Structured data

PODD Ontology
Driven Database

Code can be found online at:
<https://github.com/podd>