

PODD Ontology Driven Database

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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

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Structured data

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

Scientific experiments

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Structured data

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

Scientific experiments

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Structured data

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

Scientific experiments

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Structured data

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- 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 then published

Scientific workbooks

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■ Some common headings

Scientific workbooks

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- Some common headings
- Structure can vary

Relational databases

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- Two dimensional structure

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- Two dimensional structure
- Suit simple relationships

Relational databases

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Structured data

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

Relational databases

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Structured data

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

Structured ontologies

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- A common root

Structured ontologies

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

PODD as a workbook

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Structured data

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- Vital metadata about each experiment in a single ontology

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Structured data

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

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Structured data

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- 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

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Structured data

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- 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

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- Different structures for different experiments without changing the database schema

Ontologies to define structure

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- Different structures for different experiments without changing the database schema
- PODD has basic ontology 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 eligible nodes using “refers_to” links

Ontologies to define structure

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- Different structures for different experiments without changing the database schema
- PODD has basic ontology 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 eligible nodes using “refers_to” links
- A single ontology can be used with different experiments if it is designed well

Phenomics ontology structure

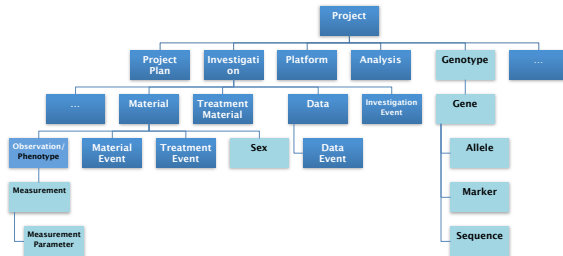
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Publication

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

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- Projects can be published on completion, both in HTML and RDF
- Published projects may be locked from future changes

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PODD Ontology
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- Projects can be published on completion, both in HTML and RDF
- Published projects may be locked from future changes
- Each data item has a URI for references

Questions

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