### Reasonable Ontology Templates

**Overview**

- Modular macros for OWL/RDF — in OWL/RDF
- Good for ontology construction and maintenance
- Clear interface, consistent pattern use, hide complexity
- Reasoning support
- DRY — don’t repeat yourself
- Leverage W3C stack and tools
- Implementation, OWL vocabulary, and template library available at http://ottr.xyz

**Preliminaries**

- An (ontology) template has a head and a body:

\[
T \left( \rho_1, \ldots, \rho_n \right) : \text{head} \rightarrow \text{body}
\]

- A template instance \(T(a_1, \ldots, a_n)\) specifies a substitution of the template's parameters in the body with the instance's arguments.
- The template body is a regular ontology that can contain template instances and where parameters may be used as placeholders for concepts, roles, individuals and data values.
- A template instance is expanded by recursively replacing template instances with substituted template bodies.

**Extensible Framework**

\[
T(\rho_1, \ldots, \rho_n) \xrightarrow{\text{lifting}} \text{body} \xrightarrow{\text{lowering}} O
\]

- Bulk data formats: XLSx, XML (XSD + SAWSDL), RDF, OWL
- Bulk lifting and lowering transformations: XSLT, SPARQL

**OTTR OWL Vocabulary:** http://ns.ottr.xyz

- Template

\[
\text{Template} \left( \text{hasParameter} p_1, \ldots, p_n \right) \xrightarrow{\text{withValues}} \text{body}
\]

- Template instance

\[
\text{TemplateInstance} \left( \text{hasArgument} p_1, \ldots, p_n \right) \xrightarrow{\text{withValues}} \text{body}
\]

**Examples**

- Template \(\text{PartOf}(\text{Whole}, \text{Part})\) :: \{ \text{Whole} \sqsubseteq \exists \text{hasPart.Part} \}

**Examples**

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- **Examples**

- **Future Work**

- Large-scale evaluation — prototype successfully tested in industry
- Language design and extensions
- Support template pre-conditions — with also template head as ontology
- Methods for template library maintenance — with ontology interrelationships
- Protégé plugin
- Template-based visualisations