

Ontology Summit 2018

Contexts for Integration and Interoperability

Integration and interoperability of independently conceived systems, ontologies and data using context & context aware ontologies

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Two senses of the topic

1. Integration and interoperability of independently conceived systems, ontologies and data using context and context aware ontologies
2. Integration and interoperability among ontologies using context

Assumptions

- Integration and interoperability requires independently developed systems and information repositories (source & target systems) to work together and/or be combined for a purpose.
- Source & Target systems represent redundant, similar or related concepts as defined within the context of these independent systems, these concepts may not be not represented in the same way. Defining context would make integration and interoperation more meaningful.
- The context of these systems are, in most cases, implicit.
- Safe and useful integration and interoperability requires these contexts to be understood
- Current methods typically deal with such context though human understanding. Automation and semantic validation requires contexts (and their consequences) to be explicit (formal).

Definitions

- **Interoperation:** The ability of independently conceived systems to share or exchange capabilities or resources. Such capabilities and resources include but are not limited to data, information, services and processes
- **Integration:** The combination of independently conceived systems and/or data acting together to provide a desired capability. Examples include: Migrating to new systems, creating new systems based on source/target systems, re-architecting new systems.....
- **Context:** A context is anything that impacts the interpretation or truth value of something else.
Examples: Situations, Processes, Time...
Context can be considered a top level class in a conceptual class diagram.

Example

Why would two mappings of the same data on the same day be different? Why would the fields not be the same?

Bethesda Hospital Records

Sue's Physical Report

Name: Sue Plankton

DOB: 1/15/1968

SSN: 390-55-8967

Weight: **134 lbs**

BP: **122/78**

Physical Date: **June 3, 2017**

Army Reserve Fitness Report

Sue's Fitness Report

Name: Sue Plankton

DOB: 1/15/1968

Weight: **Unknown**

BP: **Unknown**

Report Date: **Jan 10th, 2018**

Job Application for Fun Fitness Centers

Sue's Job Application

Name: Sue Plankton

DOB: 1/15/1968

SSN: 390-55-8967

Weight: **134 lbs**

Application Date: **Jan 10th, 2018**

Context of time and data determine data interoperability

- Weight measurement is in the context of the physical's date
- Potential data rules (data context)
 - Army Reserve Fitness Report must include Name, DOB, May include Weight and BP if known.
 - Job Application for Fun Fitness Centers must include name, DOB, SSN & Weight
- Business rules (mapping context)
 - Army Reserve: Recording of a soldiers weight must be based on a measurement within the last 60 days.
 - Fun Fitness Centers: Recording of weight must be reported from last physical

Ontologically, all living humans have a weight. The concept of weight may be used to ground data in multiple repositories – great!

- For interoperability, business and data context impacts data mappings and therefor interoperability.
- Understanding context and their implications is crucial.
- Time is an essential context

Potential Speakers

1. Dr. Giancarlo Guizzardi

<https://inf.ufes.br/~gguizzardi/>

2. Damires Souza (and/or other authors)

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3. Amit Sheth or Kashyap V.

TBD

Holding Pen

- Synchronization between systems, extracting a subset of systems
- Examples of context in Systems, Data, KB, ontologies, taxonomies etc. and at least one specific one in more detail.
- Literature review
- Main professionals working in or around context and ontology combination areas.
- Identify potential speakers.
- Ravi: templates, forms, implying current context (implicit).
- References.
- NEXT Steps for 2/21 and 3/21
- Cory: Develop the idea of context aware ontologies

References

Search “context ontology integration”

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<https://www.bioontology.org/node/569>

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<https://inf.ufes.br/~gguizzardi/vorte06.pdf>

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