An Ontological Model for Courses and Academic Profiles Representation: A case study of King Abdulaziz University

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Outlines

- Introduction
- Related Work (University Ontology)
- Ontology Development Method
- Evaluation
- Discussion
- Conclusion

Introduction

- Semantic is effective in decision making processes
- It is essential to use semantic within universities
- Semantic in universities and educational institutions e.g.
  - Open education
  - Improve evaluation
  - But, not all areas are covered . . . .

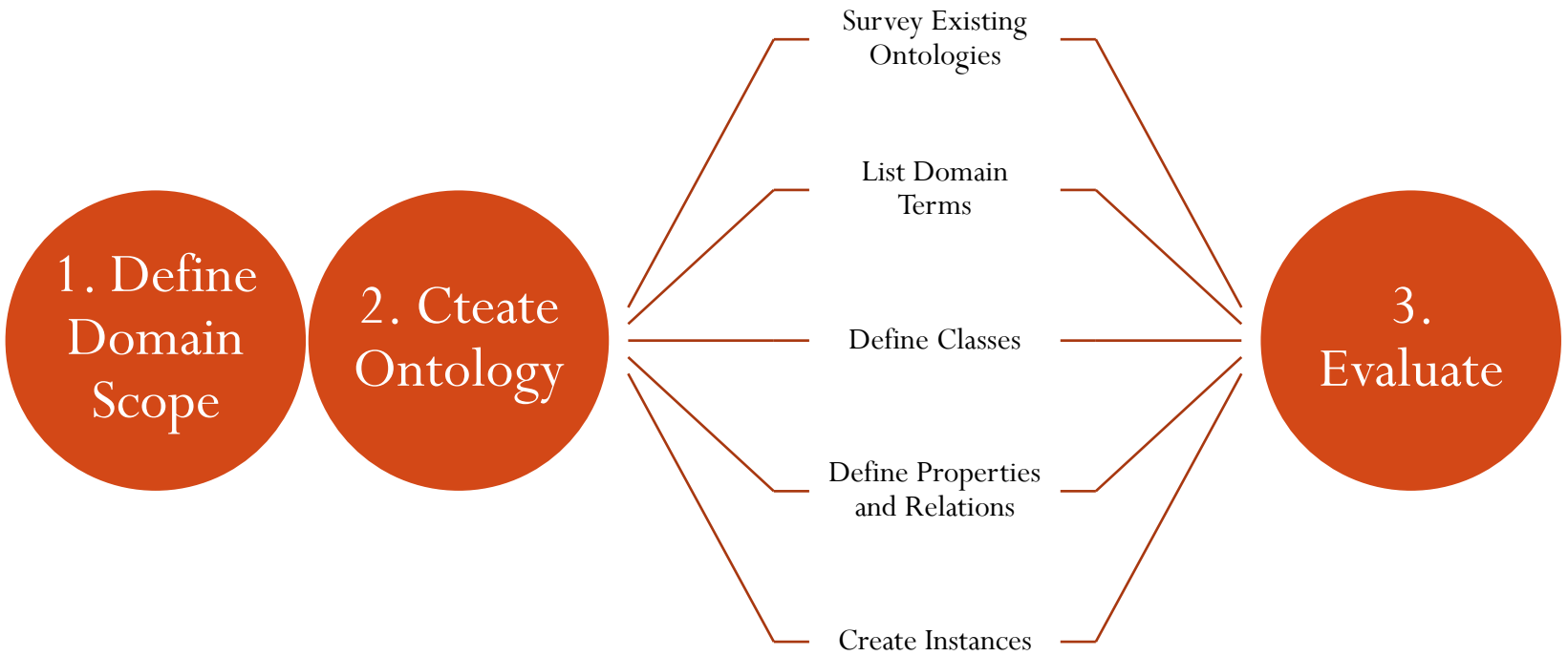
Related Work (University Ontology)

- Academic Institution Internal Structure Ontology (AIISO)
  - A university ontology that emphases on the university domain's systemic perspective
- Bowlogna Ontology
  - Describe entities and relations in an academic institution across European universities to improve student mobility
- Curriculum-Course-Syllabus-Ontology (CCSO)
  - An educational ontology that describes Curriculum, Course, and Syllabus semantically to support teaching and learning processes

Related Work

- CURONTO
  - A curriculum management system that bases on national and international standards.
- OLOUD ontology
  - A collection of existing ontologies linked to describe course information at Hungarian universities

Ontology Development Method



1. Domain Scope

- Challenges in educational domain
  - Modern vision of education
  - Traditional systems
  - Selected scenario
  - King Abdul Aziz University (KAU)
  - Faculty of Computer and Information Technology (FCIT)
  - National Commission for Academic Accreditation & Assessment (NCAAA)

- Official documents
  - Staff profiles
  - Courses description

1. Domain Scope

- Competency Questions
  - Test quality
  - Specify requirements
  - Evaluation

CQs Example	Expected Answer
• **Who can teach which course?**	A list of all the academic teachers that possibly can teach each course in the department depending on their research areas that match the course topics for each course
• **Which academic teacher is the best to teach a specific course?**	A list of all the academic teachers that possibly can teach a course depending on their research areas that match the course topics
• **How many academic teachers can every course have?**	Every course should have at least one academic teacher

2. Create the Ontology

1. Reusing Existing Ontologies
   - Different domains
   - Universities use different standards forms
   - Language and tools
   - Availability
   - Licence

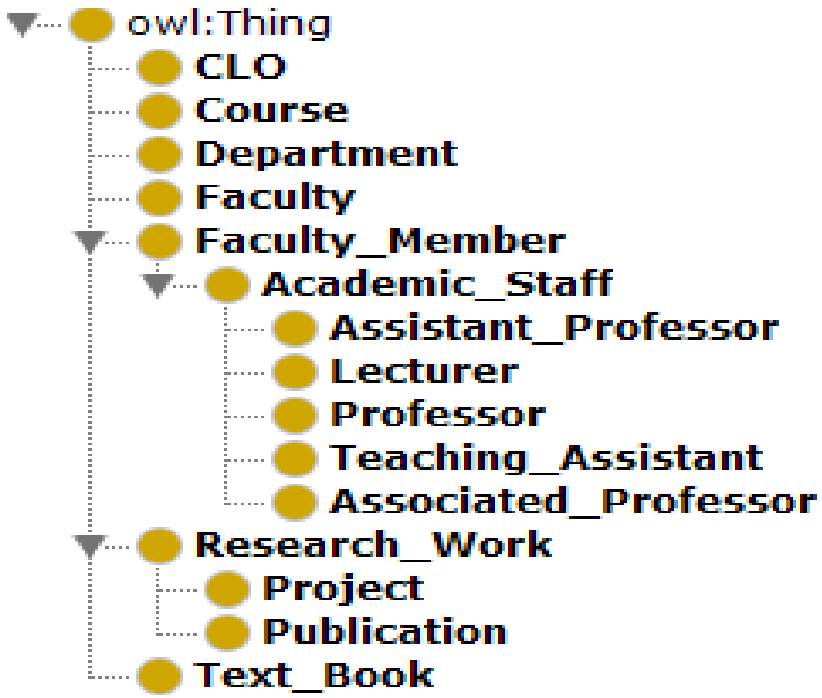
2. Create the Ontology

2. Domain Terms

Syllabus	Teaching Staff
Course	Faculty
Department	Faculty_member
Syllabus	Teaching_staff
CLO	Research_work
Text_book	Project
Topic	Publication
Evaluation	Interested_research_area
Coordinator	

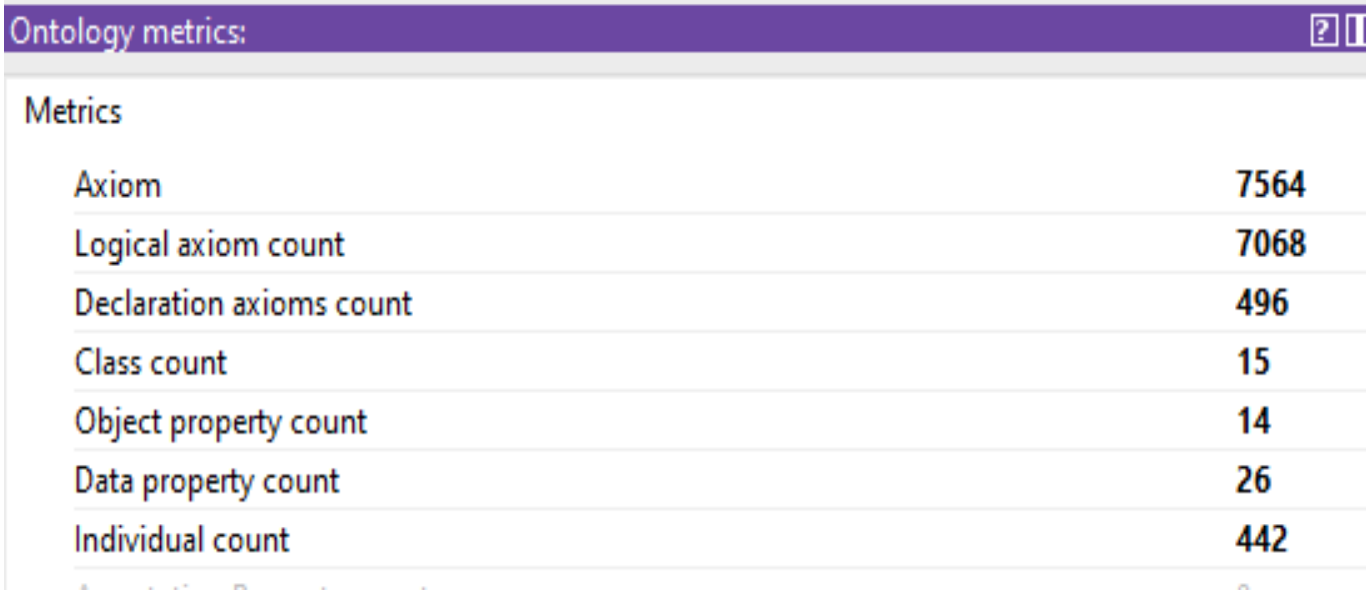
2. Create the Ontology

3. Classes and Class Hierarchy



2. Create the Ontology

4. Relationship between Classes
   - Object Properties
   - Data Properties
5. Create Instances



3. Evaluation

CQs Example	SPARQL Query
• **Who can teach which course?**	SELECT ?Department ?Course ?Teacher ?Topic WHERE { ?Course dss:belongs_to ?Department. ?Teacher dss:member_of ?Department. ?Course dss:course_topics ?Topic. ?Teacher dss:staff_research_area_of_interest ?Topic} ORDER BY ?Department
• **Which academic teacher the best to teach a specific course (for example "Introduction to computing")?**	SELECT ?Teacher WHERE {?Course dss:belongs_to ?Department. ?Teacher dss:member_of ?Department. ?Course dss:course_topics ?Topic. ?Teacher dss:staff_research_area_of_interest ?Topic. ?Course dss:course_title ?aa FILTER regex(?aa, "^Introduction to Computing").}
• **How many academic teachers can every course have in each department?**	SELECT ?Course (count(?Teacher) as ?number_of_teachers) WHERE {?Course dss:belongs_to ?Department. ?Teacher dss:member_of ?Department. ?Course dss:course_topics ?Topic. ?Teacher dss:staff_research_area_of_interest ?Topic.} GROUP BY ?Course

Discussion & Conclusion

- Support decision-making process
- The ontology is adaptable to be reused
- Can be extended in the future
  - Solve more challenges
  - Use linked data for more accurate results

THANK YOU

Any questions?