Towards an Operational REA Ontology Using Web Ontology Languages

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Outline

1. Overview REA research Ghent University
   - Evaluation Quality REA pattern
   - Operationalization Business Domain Ontologies

2. Position paper
   - Background, Motivation and Research Goal
   - Adjusted Enterprise System Architecture
   - Design Approach and Current State of the Project
   - Future Research
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Evaluation Quality REA pattern

Research Directions

- Effectiveness of REA-pattern based models w.r.t. user comprehension
- User quality perception of REA-pattern based models
- Pattern recognition of REA patterns

Publications

- Poels G, Maes A, Gailly F, Paemeleire R. The Pragmatic Quality of Resources-Events-Agents Diagrams: An Experimental Evaluation. Accepted for Information Systems Journal
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F. Gailly and G. Poels 2nd REA Technology Workshop
Operationalization Business Domain Ontologies

Research Directions

- Formalization Business Domain Ontologies
- Conceptualization Business Domain Ontologies
- Evaluation Business Domain Ontologies
- Applications Business Domain Ontologies

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Background and Motivation

Background

- Business domain ontologies can improve communication between people and organizations
- Business domain ontologies can create interoperability between systems
- Business domain ontologies can improve system engineering process

Motivation

- Use of ontologies in practice limited
- Scarcity well-formalized ontologies
Background and Motivation

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**Motivation**

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Research Goal

Operationalization existing business domain ontologies:
- improving quality business domain ontologies using existing ontology engineering techniques
- formalizing business domain ontologies
- evaluating and comparing business domain ontologies
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Adjusted Enterprise System Architecture

PURCHASE P line
INVENTORY V-P VENDOR BUYER B-P P-CD CASH DISBURSEMENT CASH RECEIPT CASH outflow inflow

SALE S-CR WAREHOUSE W-H ST C-CD CASHIER C-CR CUSTOMER C-S SSS line item

V supplies V-CD Item # Weight Color
PO# $ Amount Vendor # Individual AP Employee # Telephone # Check # Check Amount Quantity-of-item Purchased Quantity-of-item at-this-warehouse Warehouse # Location Account # Account Balance Remmittance Advice # Amount Employee # Fidelity Bond Customer # Name Address Individual AR Employee # Commission-Rate

CORE Ontology

complies to

REA-ontology

complies to E³ value ontology

Business Domain Ontology

complies to E³ value ontology

Enterprise Schema

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Enterprise Schema
Design Approach

Ontology engineering techniques used for improving business domain Ontologies:

- Reengineering extension METHONTOLOGY framework
- Top-level ontological analysis business domain ontology constructs and relations
  - BWW analysis
  - SOWA analysis
  - SUMO analysis
- Conceptualizing business domain ontologies using existing modelling languages following DOGMA approach
- Formalizing ontologies using transformation rules conceptual modelling languages and ontology languages
Current state of the project

- Reengineered Conceptual model basic REA pattern

Formalization basic REA-pattern in OWL available at http://users.ugent.be/~fgailly/phd
Future Research

Business Domain Ontologies

- Applying ontology engineering techniques on different business domain ontologies
- Investigating relation between business domain ontology and enterprise schema following the DOGMA approach
- Comparing different business domain ontologies

The REA business domain ontology

- Ontological analysis REA constructs and relations using formal core ontologies like DOLCE and SUMO
- Extending reengineered conceptualization basic REA-pattern with constructs and relations REA-ontology
- Development applications that use the REA business domain ontology