Guidance for Domain Specific Modeling in Small and Medium Enterprises

11th Workshop for Domain Specific Modeling

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Outline

- Project Context
- Partner Survey
- Guidance for Modeling
- Guidance for DSL design
- Conclusions and Outlook
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Project Context: The „BIZWARE“ Project

• Duration: 09/2010 – 08/2013, Budget € 11.5M, Funding € 6.5M
• 2 academic, 8 industrial partners from Berlin
• 4 joint projects with 17 sub-projects and 6 single projects
• Develop a systematic approach to DSL engineering for small and medium enterprises

http://www.bizware.org
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Partner Survey: Perceived & Demanded Benefits of DSM

• interviews conducted with the industrial partners
  • domains:
    • health care
    • finance
    • publishing
    • facility management
    • industrial production
    • web application development
    • system integration

• motivation for investing into a DSL development
• identify challenges
  • individual and systematical
Partner Survey: Perceived & Demanded Benefits of DSM

- categorize DSL developments
  - vertical (business) vs. horizontal (technical)
  - to be used by partners vs. their end customers
  - requirements and challenges for the engineering process
- interview pattern used
  - standards used within the domain
  - software engineering standards used at the partner
  - what is currently being modeled, and how
  - project goals
  - purpose of the DSLs and future modeling
  - perspective users of the DSLs
  - examples provided
  - requirements identified
Partner Survey Results: Motivation

- need to abstract from implementation details
- ease the software development process
- to be able to systematically involve customers and end users
- overcome discontinuity in requirements, design and specification documents and artifacts
  - to use design artifacts as first class development artifacts, without interrupting refinement processes
- to improve documentation
- to ease the software configuration
- ease deployment on different target platforms
Partner Survey Results: Benefits

- better documentation already is achieved during DSL development
- effort reduction
- higher levels of abstraction
- improvement of development processes and their organizational aspects
- improved internal and external communication
- leverage existing documents
- integrate into existing development landscape
- overcome business/technical view mismatches
Partner Survey Results: Challenges

- methodological support required (guidance)
- difficulty in measuring design effort and communication benefits
- versioning and consistency preservation
- tool evaluation required
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Guidance for Modeling

1. DSL Engineer interacts with Domain Model.
2. Domain Model develops extract terms and relations.
3. Extractor creates and executes queries.
4. Query Wrapper integrates results.
5. Domain Guidance provides model suggestions.

Word-net

DB-pedia

...
Guidance for Modeling

- Abstract Syntax
- Model Refinement
- Language Workbench
- Modeling Suggestions
- Domain Exploration
- Model Advisor
- EXAMINE System
- Knowledge Acquisition
- Knowledge Bases
- Text
- Extractor
Guidance for Modeling: Example

Hospital performs 0..* Medical Examination

+examination

Medical Examination

Anamnesis

Imaging

X-raying

Hospital performs 0..* Medical Examination

+examination

Medical Examination

Anamnesis

Imaging

X-raying

Creche

Sanatorium

X-raying

Radioscopy

Sonography
Guidance for Modeling

- generated guidance model from existing knowledge sources
- assistance to overcome problems:
  - completeness
  - correctness
- not automatically added
  - brain power still required
- then use feedback from domain expert
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Guidance for DSL design

Framework for **Domain-Impelled Engineering** and **Supervised Evolution of Languages**
Guidance for DSL Design

- identify concepts required and used in the DSL
- survey domain expert’s associations of common symbols or concepts in a questionnaire
  - to assess concepts known to the user of the DSL
- identify possible syntaxes considering the assessment and the required expressivity
- test user acceptance of proposed syntaxes
- make a selection of the best approaches
- provide metrics support
- perform the next step of DSL rapid prototype implementation
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Conclusions and Outlook

• let DSL engineering processes benefit from the use of knowledge bases and metrics
• novel features required for better adoption of domain specific modeling in small and medium enterprises (SME)
  • lower the entry barrier
• supply guidance to both DSL engineer and domain expert
  • guidance for when using the DSL
Thank you for your attention

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