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FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

DEPARTAMENTO DE INFORMÁTICA

Software Languages Engineering

SOFTWARE SYSTEMS / SE.MOVA Team

CENTER FOR INFORMATICS AND INFORMATION TECHNOLOGIES

Vasco Amaral

Assistant Professor

Vasco.amaral@fct.unl.pt

Research interests:
Software Language Engineering, Domain Specific Languages, Visual Languages, Model-Driven Development, Modelling Formalisms and Model Transformations (specification and validation)

Objectives

Domain Specific Languages (DSL) can be seen as powerful interfaces tailored to express computing activities in the several domains of knowledge (High Energy Physics, Energy, Robotics, Financial, Chemistry, Biology, Psychology,…). Our work focuses on:

- **Application Development**: Design **adequate Domain Specific Languages** for the the experts of the different Domains and integrate them with domain software tools (e.g. Labview, VHDL, HTML, CHEM, Matlab and many other,…).
- **Foundational research:** Study **Sound Systematic Approaches** to develop DSLs, Usability of languages, Multiparadigm, Models, Rapid Prototyping of software Applications, build adequate tools for language development.

Methodology

Domain Engineering and Software Languages Engineering

- Applying a **Model Driven Development (MDD)** where system models are explicitly represented to guide the development process.
- Use of an **User Centric** development process.
- Design and implementation of **Languages tailored to express sentences in the problem Domain** (with domain concepts and constructs) instead of the solution domain (i.e. Programming languages).
- Use **domain formalisms and theories** to ground the semantics of the languages.
- Use of Domain tools for **Simulation**, **Computation**, **Documentation** and use of additional computer Science tools for **Analysis** (Verification) of the abstractions.

Expected Results

Boost the activity in the application Domains by:

- Increasing **Productivity**
- Decreasing of the **Learning Curve**
- Improving the **Quality** of the results and resulting software
- Allow to program with **Visual Models** (and using domain concepts instead of computing terms)

Ultimately we target to help the expert from a specific domain to deal with the complexity of the required computational tools.

Examples of DSLs developed by our team

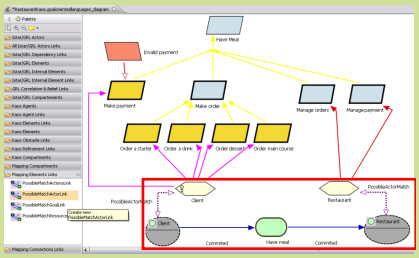

Fig.1 DSL for Requirements Engineering - KAOS

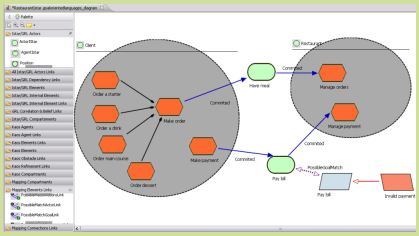

Fig.2 DSL for Requirements Engineering – I*

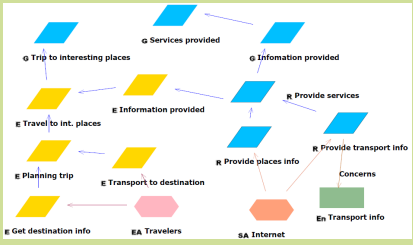

Fig.3 DSL for Requirements Engineering – Hybrid solution KAOS and I* (two paradigms)

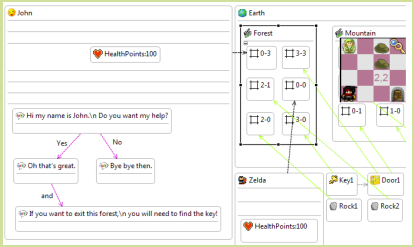

Fig.4 DSL for Game Development – RPG games for mobile phones.

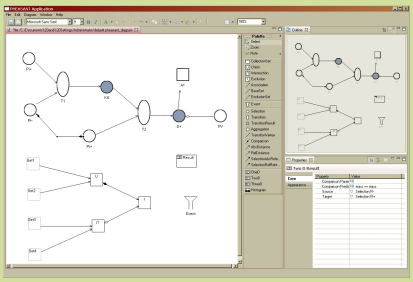

Fig.5 DSL for High Energy Physics Datamining for Hera-b Experiment– Pheasant.

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MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

SINFIC Soluções Analíticas