

Whole Platform

LWC 2014 Submission

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LW technical and functional description

The Whole Platform is a mature open source technology for engineering the production of software. Based on the idea that programming is an activity concerning the development of languages, the Whole Platform provides an Eclipse-based Language Workbench for developing new languages, manipulating them using projectional domain notations and transforming them using a model driven approach.

In using the Whole LW, business knowledge can be expressed with domain specific languages and made independent of the technologies used to realize the products. The introduction of domain languages and notations enables the problem domain experts to work together with the programming experts for the development of the software products: the former write the business knowledge, the latter write the generators.

The Whole LW enforces an economy of scale. The fact that the generators are coupled to the domain languages and not to a particular business knowledge expressed with them, means that the effort of the software development is not spent in a singular product but rather in building a software product line.

The Whole LW aims to minimize the explicit metamodeling efforts and to reduce the use of monolithic languages.

Base assignment implementation

Starting from our LWC 2013 submission, we will submit a new reengineered solution that targets the provided reference implementation based on HTML5 + CSS + JavaScript instead of the previously used SWT + Java. Furthermore, the new QL solution leverages modularization of sections to address the requirements of the focus assignment.

Scalability and teamwork support

Large models are supported by means of modular storage, projectional and lazy notations, and stream processing. The persistent representation of a model is decoupled from its in memory representation: for instance you are able to split a model in multiple files. A notation is able to perform a projection of the underlying model by showing just a subset of the model itself, furthermore, can postpone the construction of the presentation level of the parts not shown. Models can be processed by persistences and transformations using streams (of events) in order to limit the use of an in memory representation.

The Whole LW supports all of the facilities provided by the Eclipse platform related to project management, resource versioning and team collaboration. Such facilities are customized by providing a domain level comparator and merging tool, which can be paired to a version control system of your choice.

In addition, the Whole LW provides a complimentary native support for model evolution.

Continuous evolution and multiple simultaneous versions are regarded as the natural development scenario, in clear contrast with the classic and still widely accepted approach to software evolution that prescribes backward compatibility and API stability.

The Whole LW is able to manage multiple (simultaneously deployable) versions of models and supports the evolution of metamodels, model instances, and behavioral models (i.e.

transformations) by using specific domain languages and tooling to define migrations and derive regression tests.

Finally, comparison and merging behavior is aware of versioning, variability and modularization.

Merge conflicts are modeled using a domain language so you are also able to internalize them and defer conflict resolution.

Scalability and teamwork demonstration

The demonstration of the Whole LW will be split into three parts: the first will address the scalability features, the second will showcase the teamwork capabilities, and the last will present some distinctive features pertaining to automatic model evolutions.

Scalability will be demonstrated using a sample (instance) generator implemented according to the binary search tree assignment. More specifically, we will show how QL models with increasing size, in terms of number of questions, can be easily generated, edited, and used as input for the target questionnaire generator.

The teamwork demonstration will be held using multiple Whole LW instances running concurrently to simulate simultaneous users. At first we will introduce the audience to the Whole LW specific tooling, subsequently we will demonstrate how the scenarios outlined in the focus assignment can be addressed using that tooling.

We consider managed model evolution capabilities a distinctive feature: it will be demonstrated by showing how to evolve the solution languages and instances. Complex scenarios including language splitting, merging and integration, and structure inlining and nesting will be showcased too.