MDEForge
an extensible software-as-a-service modeling platform

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Model-Driven Engineering

A software discipline that shifts the focus of software development from coding to modeling

Models

– are abstractions representing knowledge and activities that govern a particular application domain

– use domain concepts rather than computing concepts, ie they can be defined/used by non computer scientists

– have first-class status
Model-Driven Engineering

= Abstraction + Automation + Analysis
Model-Driven Engineering

Over the last decades many MDE technologies have been conceived to support a wide range of modeling and model management activities.
Challenges

A wider adoption of MDE technologies is still an issue*

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Modelling and model management tools are distributed as **software packages** that need to be downloaded and installed
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Discovery and reuse of existing modeling artifacts is very limited.

Modelling and model management tools are distributed as software packages that need to be downloaded and installed.
### Some tools providing storage features...

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Zoos

The MetaModel Zoos are a collaborative effort to share research effort intended to produce tools that support ATL. The tools are available to the public for use.

Software Language Processing Suite

Grammar Zoo

The objective of the Grammar Zoo is to accumulate grammar of various software languages, saved and retrieved from language documentation, parser specifications and other sources and make them available in a range of formats.

569 grammars and counting

Bulk download of the whole corpus [XML/BNF] [TXT/BNF]

ABS — Ada — API2MoL — Assembly — AWK — Basic — BibTeX
— C — C++ — C# — Conferences — Dart — SwDev — Dot — Eiffel
— FL — Formats — Fortran — HTML — Java — JavaScript
— Logo — Metamodels — Modula — OCL
— ODF — Pascal — PHP — Pico — PL/I — Python — OCA
— TESCOL — UML — XML — XPath — XSLT — XQuery

Other useful OCL-related stuff

Not the main goal of the repository but feel free to add also other OCL-related links, documentation and other things.
...we need more

An extensible platform that permits to

• store and manage any kind of modeling artefacts and tools
• use model management tools as software as a service
  • Modeling as a Service (MaaS) initiative*

*Hugo Bruneliere, Jordi Cabot and Frédéric Jouault, **Combining Model-Driven Engineering and Cloud Computing.** MDA4ServiceCloud'10 (ECMFA 2010)
MDEForge

Advanced model management as-a-service
- most functionalities are restful

Collaborative modeling platform
- workspace/project/team management
- artifact sharing mechanism

Open architecture to accommodate third-party functionalities
- core components
- extensions
MDEForge users

Developers of modeling artifacts: communities of users that might want to share their tools and enable their adoption and refinement by other users

Developers of MDEForge extensions: to contribute by proposing new extensions to be included in the platform

End-users: to search and use (meta)models, transformations, and editors available in the repository
MDEForge architecture
The MDEForge Repository

Explicit management of relations

- `conformTo`, `domainConformTo`, `similarity`, `difference`, `evaluatedOn`...

Megamodel representing and organizing the content of the repository
The MDEForge Repository

Repository metamodel fragment

Simple repository content
The MDEForge Core

Repository

Model Service
- Upload model
- Download model
- Delete model
- Find models by metamodel

Metamodel Service
- Upload metamodel
- Download metamodel
- Delete metamodel
- Find metamodel by URI

Transformation Service
- Upload transformation
- Download transformation
- Delete transformation
- Execute transformation
- Find transformations by source metamodel(s)
- Find transformations by target metamodel(s)

Editor Service
- Upload editor
- Download editor
- Delete editor
- Find editors by metamodel
DEMO
Public and Private MDEForge installations

Public MDEForge

Private MDEForge 1

Private MDEForge n
Conclusion and future work

• Lack of reusability during model-driven engineering (e.g., creating a DSL from scratch)
• Need to install and configure desktop-based applications to perform MDE development activities

• MDEForge has been proposed as an extensible modeling platform supporting the creation of a community-based modeling repository
  • core services that can be extended and all of them are remotely available as software as a service
  • users are not overwhelmed with intricate and error-prone installation and configuration procedures
Conclusion and future work

We want to:

- investigate more the support for advanced queries of the repository
- manage public and private installations of the MDEForge
- investigate issues that are typical in Cloud computing, e.g., scalability of the platform, and workload management
- deal with licensing issues
References


2. Juri Di Rocco, Davide Di Ruscio, Alfonso Pierantonio, Jesus Sanchez Cuadrado, Juan De Lara and Esther Guerra, Using ATL transformation services in the MDEForge collaborative modeling platform, in: 9th International Conference on Model Transformation (ICMT2016), Vienna (Austria), 2016


