EDOM - Engenharia de Domínio

Mestrado em Engenharia Informática

Lecture 11.1

MDSE Mainstream Tools

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Modeling SDK for Visual Studio - Domain-Specific Languages[1]

- At the heart of MSDK is the definition of a model that you create to represent concepts in your business area.
- You can surround the model with a variety of tools, such as
  - a diagrammatic view,
  - the ability to generate code and other artifacts,
  - commands for transforming the model,
  - the ability to interact with code and other objects in Visual Studio.
- As you develop the model, you can combine it with other models and tools to form a powerful toolset that is centered on your development.
- MSDK lets you develop a model quickly in the form of a domain-specific language (DSL).

[1] https://msdn.microsoft.com/en-us/library/bb126259.aspx

MPS - DSL Development Environment[2]

- With MPS you can design your own extensible DSLs and start using them right away to build end-user applications.
- Unique technology of **projectional editing** allows to overcome the limits of language parsers, and build much richer DSL editors, such as ones with tables and diagrams.
- Along with the editors, you can write comprehensive generators from your DSL to multiple target languages, be it another MPS DSL, or any of the "base" languages such as Java, C, XML, and other.

[2] https://www.jetbrains.com/mps/

Rational Software Architect[3]

- Provides comprehensive design, modeling and development tools for model-driven development (MDD) using robust support for Unified Modeling Language (UML).
- It uses the Unified Modeling Language (UML) for designing enterprise Java applications and web services.
- Rational Software Architect is built on the Eclipse open-source software framework and is extensible with a variety of Eclipse plugins.

[3] http://www-03.ibm.com/software/products/en/rational-software-architect-family

Borland Together[4] [5]

- A visual modeling tool which enables teams to analyze, design and implement software architectures and to stay in sync by sharing a common, visual understanding of them.
- Together incorporates Unified Modeling Language (UML) for all-purpose systems modeling, flexible Model Driven Architecture (MDA) for software architectures, and data modeling.
- Borland is a leading promoter of Model Driven Architecture (MDA), specifically QVT, by contributing breakthrough model transformation technology.
- Today, this technology enables architects to transform any kind of Eclipse Modeling Framework (EMF).

[4] http://borland.com/en-GB/Products/Requirements-Management/Together

[5] Borland is now Microfocus: https://www.microfocus.com/products/requirements-management/together

MetaCase / MetaEdit+ Domain-Specific Modeling (DSM) environment[6]

- MetaEdit+ enables companies to radically improve development productivity and quality by generating full code directly from models.
- First you design the modeling language with MetaEdit+ Workbench and then other developers model with the language in MetaEdit+ Modeler
- This is a very successful comercial MDSE Tool that is similar to Generic Modeling Environment (GME)[7], an open source and academic MDSE Tool.

[6] http://www.metacase.com

[7] http://www.isis.vanderbilt.edu/projects/gme/

Xtext - A framework for development of programming languages and domain specific languages[8]

- It covers all aspects of a complete language infrastructure, from parsers, over linker, compiler or interpreter to fully-blown top-notch Eclipse IDE integration.
- It comes with great defaults for all these aspects which at the same time can be easily tailored to your individual needs.
- It is based on EMF and integrates with EMF related technologies.
- It will soon integrate with other IDEs...

[8] https://eclipse.org/Xtext/

Back to Eclipse EMF

- Eclipse EMF and GME are the grand-fathers of the MDSE tools
- EMF is the most open and has the most extensive community
- EMF also embraces standards (MDA)
- EMF enables us to see how the conceptual foundations of MDSE are implemented

With EMF we can, for instance, ...

- ... handle/explore java code as a model using the MoDisco plugin
- ... handle/explore UML models using the Papyrus plugin
- ... do artifact generation using Acceleo
- ... etc.

For an example of using EMF for **full application generation** see `https://cloudfier.com`