Agile DSL Tools

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Abstract

Agility is one the key features of good DSL tool. The ability to flexibly and rapidly build new tools in a highly interactive fashion with stakeholders and developers pays huge dividends in the long run.

However, achieving that agility is not simple. Over many years our experience of developing software development tools has taught us that there are some key features that are required in order to produce generally useful and agile DSL tools. These include:

- Reflexivity: the ability to access and flexibly change all aspects of the tool in an open and transparent way (including how the tool executes and its definition is compiled to code).
- Syntax extensibility: Being able to conveniently define and rapidly extend both the diagrammatical and textual syntax of the languages supported by the tool.
- Extensive support for working with syntax, for example abstract syntax pattern matching technologies to support flexible code synthesis from richer syntax languages.
- Executability: the ability to interactively program DSL tools supported by on the fly compilation tools, and in rich languages that support event driven and data synchronisation primitives.
- Fully featured: provides fully featured user interfaces, including editors, browser, parsers etc.

Over the last 2 years we have been designing a tool called XMF-Mosaic, with the aim of providing all these features in a commercial product.

XMF-Mosaic is a general-purpose software development platform which has been designed from the ground up with agility and extensibility in mind. Underpinning XMF-Mosaic is a meta-programming environment, which is fully reflexive. XMF-Mosaic therefore has complete control of all aspects of itself, including its compiler, parser and execution engine.

On top of that flexible foundation, a large number of powerful programming capabilities for defining programming languages and visual editing tools has been developed.

XMF-Mosaic is being successfully used on large industrial projects where the investment in its agile foundations is paying off.

In our talk, we'll discuss why the above features are necessary and essential to realise the true benefits of DSL's. We'll describe some of the technological hurdles that have had to be breached in order to develop an agile software development platform that is rich enough and flexible enough to support DSL development.