Re-Write TANGO Code Generator using openArchitectureWare Technology

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TANGO is a distributed object oriented control system toolkit based on CORBA.

It has been initially developed at ESRF.

It is now also developed and used by Soleil, Elettra, Alba, Desy and many labs.

Tango objects are representations of devices and support methods, attributes, properties...

History

This code generator (designed at the beginning of TANGO ~1999) was based on java parsing methods. It can generate Tango classes in C++, java or python
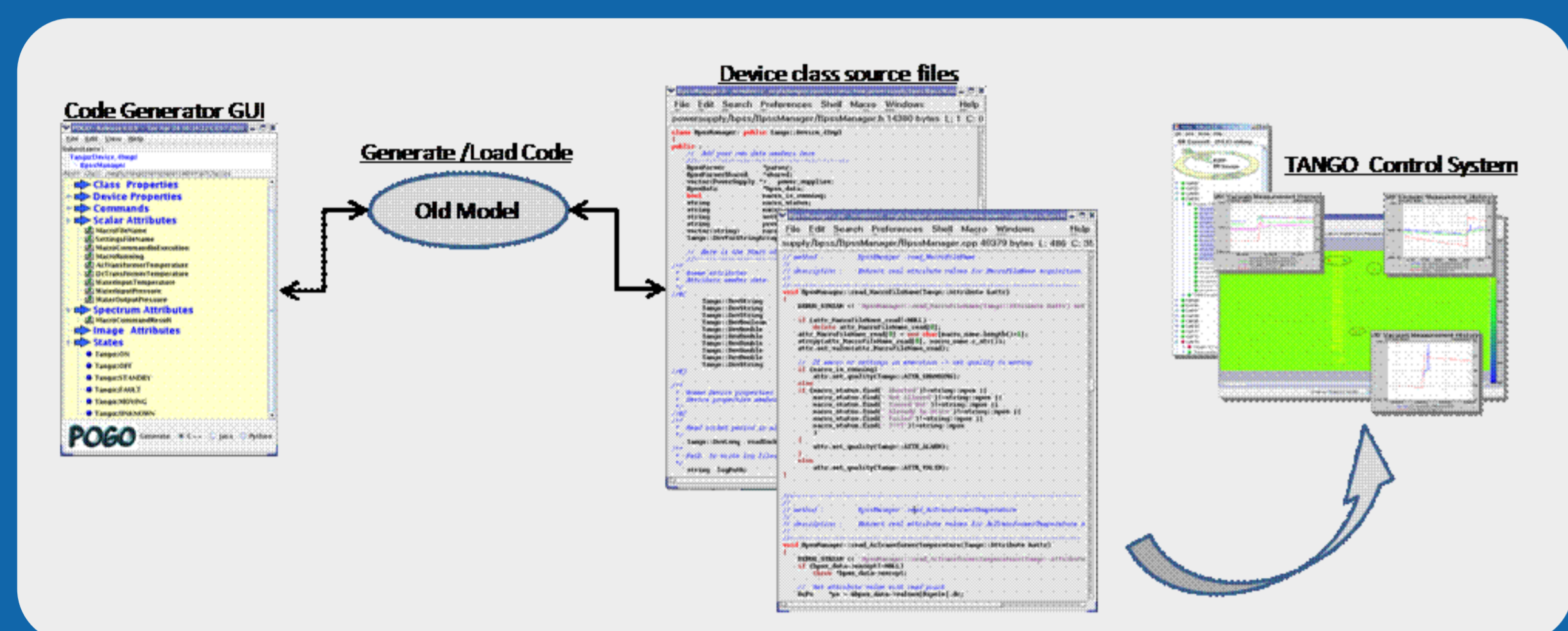
To follow many evolutions and features of TANGO control system, it was more and more difficult to maintain compatibility.

The code generator has to be re–designed using a new and efficient parsing technology.

It appears that openArchitectureWare is a good candidate.

The Parsing Technology

openArchitectureWare (oAW) is a modular MDA/MDD generator framework implemented in java(TM).

It support parsing of arbitrary models, and a language family to check and transform models as well as generate code based on them. Supporting editors are based on Eclipse platform. oAW has strong support for EMF (Eclipse Model Framework) based model.
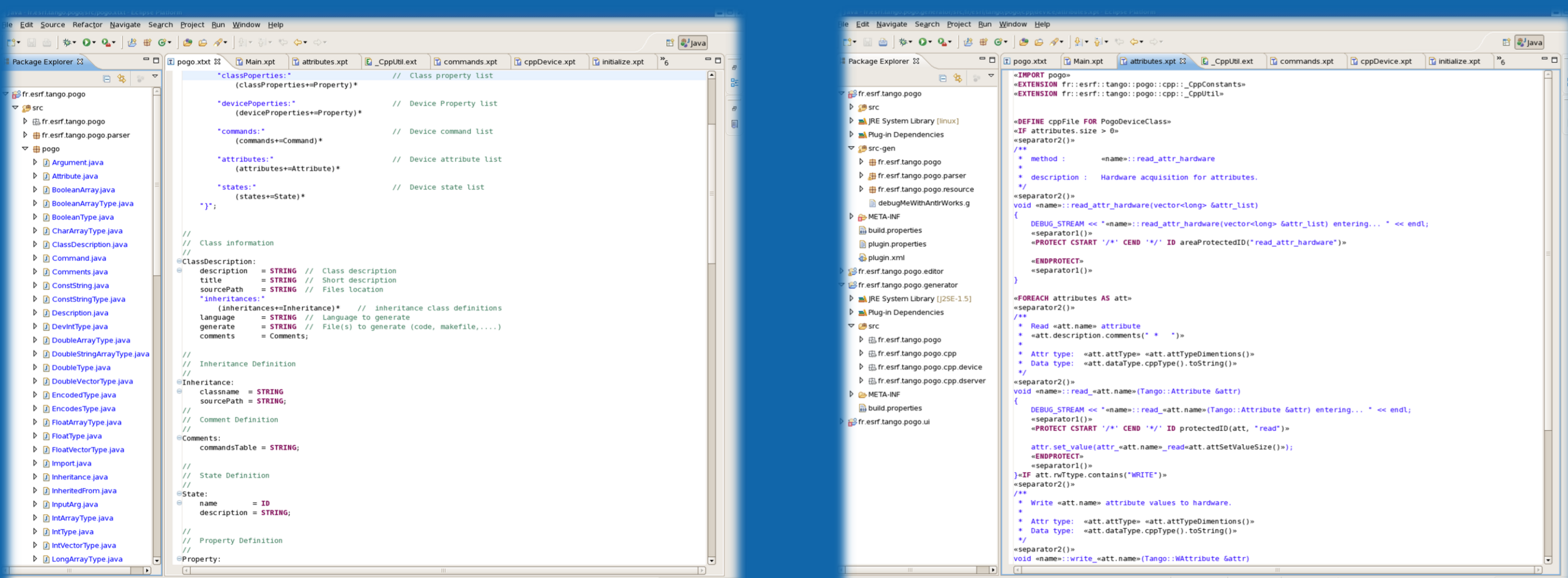
The Model

The TANGO class model is defined with Eclipse using xtext grammar. oAW will generate a java API with classes and methods for commands, attributes, properties,...

The TANGO class code is defined by templates with Eclipse, using Xpand language. This template can contain protected zones for programmer code.
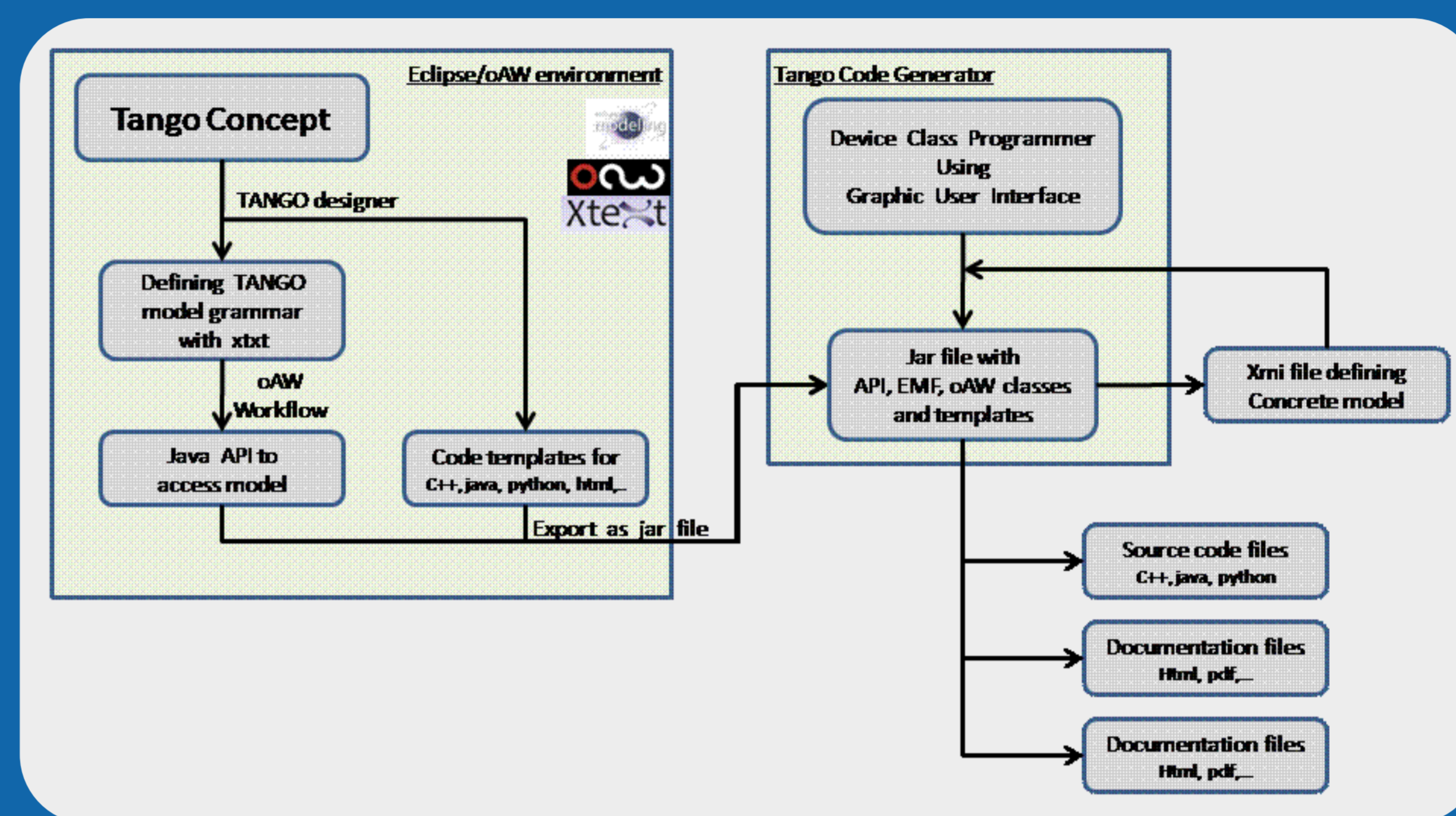
TANGO model with Xtext

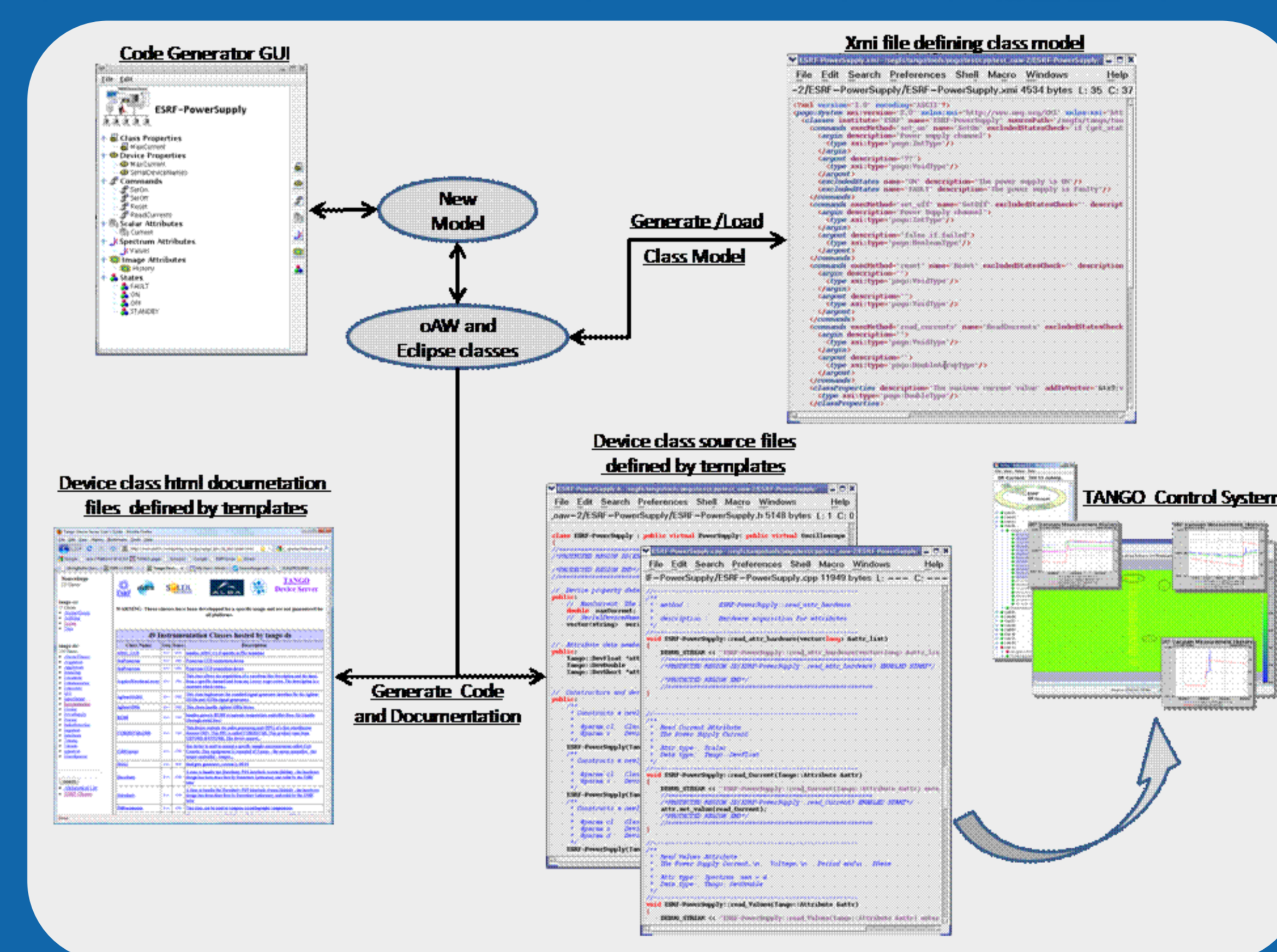

Code templates with Xpand

The model and the templates can be exported in a jar file and interfaced with any java application (e.g. GUI)

Development diagram

Tool Principle diagram

Compatibility

There are more than 500 device classes already developed with the old code generator (225 on sourceforge, 150 on ESRF repository, many classes on each institute).

When the new code generator will be available, it will have to be able to read and translate these classes from the old model to the new one. It will also have to parse the programmers' added code, and to be able to insert it in the new generated code.

Conclusions

openArchitectureWare is very powerful code generator tool for object oriented control system.

The development of the device class code generator for TANGO has started few months ago. Everything has not been yet tested, but the first results are very encouraging in term of code readability, and for further evolutions and maintenance.