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plugIT Annual Report



www.plug-it.org, www.plug-it-project.eu

Today we're witnessing the necessity to align Business and Information Technology (IT). The plugIT project aspires to develop an IT-Socket that will realize the vision of businesses "plugging-in" to IT. Three demonstration scenarios deal with: (1) "Certification" of IT infrastructure, (2) "Virtual Organisation" by evolving the current service orientation to a higher business-driven abstraction as well as (3) "Governance" of IT infrastructure introducing business context into highly distributed and complex systems. The IT-Socket follows a model-driven approach to link human interpretable graphical models – partly semi-formal - with machine interpretable semantic formalisms in order to enable: (1) a tighter involvement of domain experts when expressing formal knowledge, (2) different graphical modelling languages for different views on the IT-Socket as well as (3) a domain-specific notation for semantics by relating formal concepts of semantics with the graphical notations from existing modelling languages.

Summary of Activities

plugIT started in March 2009 and focused in 2010 on the following three areas: (1) The specification of the Next Generation Modelling Framework by applying hybrid method engineering to associate graphical models and ontologies, (2) The implementation of the second prototype of the Next Generation Modelling Framework that introduces the so-called "Semantic Modelling Kernel" and (3) The realisation of concrete IT-Sockets at three use case sites has made progress by: (a) first modelling the IT-Socket, (b) then deriving IT-Socket specific ontologies out of the models, (c) by integrating the models into the legacy applications and by (d) developing a demonstrator at each use case site.

Besides conference publications and exhibitions the collaboration with other projects has been realized by bilateral project visits, the ICT 2010 and during a "hand-on" session at the SSAIE 2009 Summer School.

Within the next year, the key challenge is to establish the joint exploitation on the Open Model Initiative (www.openmodels.at) platform and to demonstrate the IT-Socket under realistic conditions.

Specification of the Next Generation Modelling Framework

The core idea of plugIT is to develop and apply a Next Generation Modelling Framework that uses graphical models as mediators between domain expert and formal ontologies. Based on the IT-Socket at the use cases and a broad collection of modelling languages the Next Generation Modelling Framework has been specified.

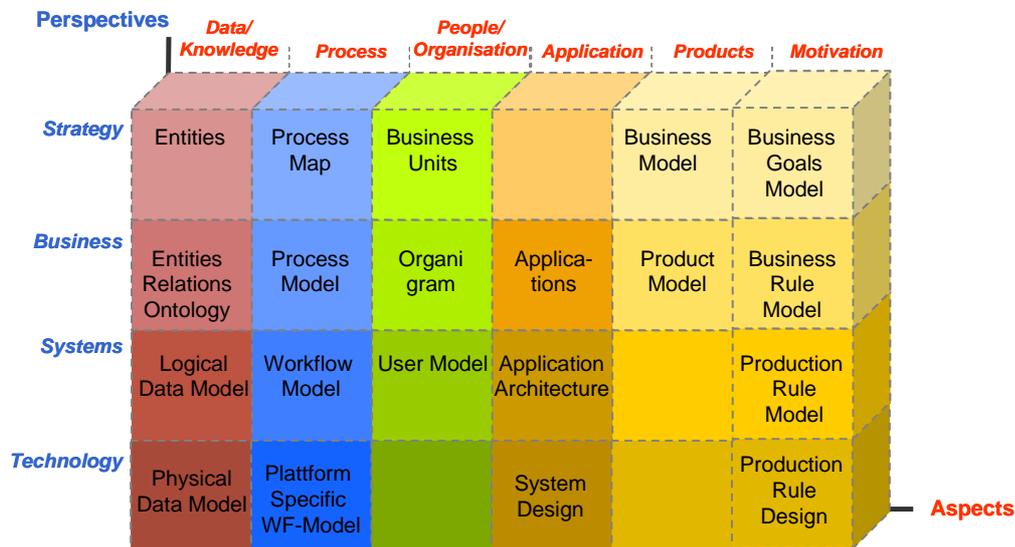


Figure 1 Next Generation Modelling Framework

source: www.plug-IT.org/plugITwiki

Figure 1 depicts the classification scheme of 52 modelling languages that are provided for the IT-Socket. plugIT lists the according modelling languages for each of the “cubes” in a Wiki that describes the different modelling languages. Based on the according meta-model, each modelling language is associated with an ontology.

Here the consortium distinguishes between (a) the domain ontologies – that describe the domain the users are currently modelling, (b) the modelling language ontologies – that describe the modelling concepts the users are able to use and (c) the model ontologies – that describe the particular perspective of the user considering the two aforementioned ontologies. Hence, each model ontology is a combination of annotations to existing domain ontologies, existing modelling language ontologies and user specific model input.

Implementation of the Next Generation Modelling Framework

The basic axiom of plugIT is that the IT-Socket can be modelled by using a set of different modelling languages. This basic axiom implies that different modelling languages need to be transformed into each other and furthermore different modelling tools need to be integrated into a homogenous modelling framework. The technical integration of different modelling tools follows a service oriented approach for modelling tools that has been implemented in the first prototype. A set of different modelling tools are wrapped as modelling services and registered onto a service middleware. Based on the functional-, the user interface- and the modelling language-requirements the appropriate modelling service is identified and provided.

The second prototype has been developed in 2010 that adds the so-called Semantic Modelling Kernel to the first prototype. The Semantic Modelling Kernel is concerned with (1) Model Processing, such as model validations, (2) Model Language Processing, such as model transformation, (3) Semantic Processing, such as ontology matching and (4) the graphical representations of ontological descriptions..

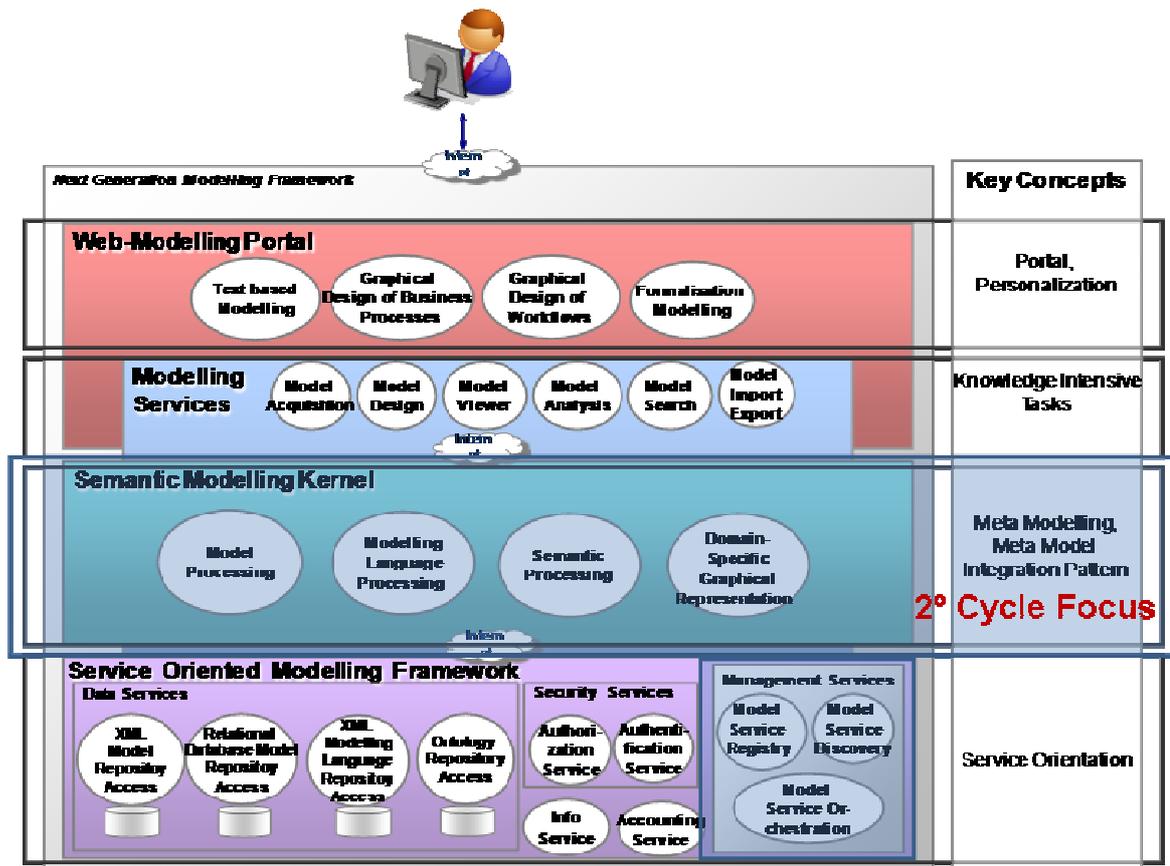


Figure 2 Prototype of the Next Generation Modelling Framework

Figure 2 shows the overall architecture of the Next Generation Modelling Framework. It has to be stressed that the service-oriented approach has been also applied for the Semantic Modelling Kernel, which basically is a set of orchestrated services that include (1) process models, (2) process modelling languages, (3) process semantic or (4) represent ontology concepts. The Semantic Modelling Kernel will be published in the Open Models Initiative (www.openmodels.at) as part of the exploitation.

Realisation of the IT-Socket

plugIT applies the model-driven approach for the realisation of the IT-Socket, hence the use case partners continuously design graphical models to reflect the research findings and to create a model repository that sufficiently externalises the knowledge about the IT-Socket at the use case sites.

In 2010 the use case partners produced a set of about 800 graphical models that describe the different aspects of the IT-Socket and established a laboratory situation for the researchers, although in case of commercial usage, the models will be much more focused.

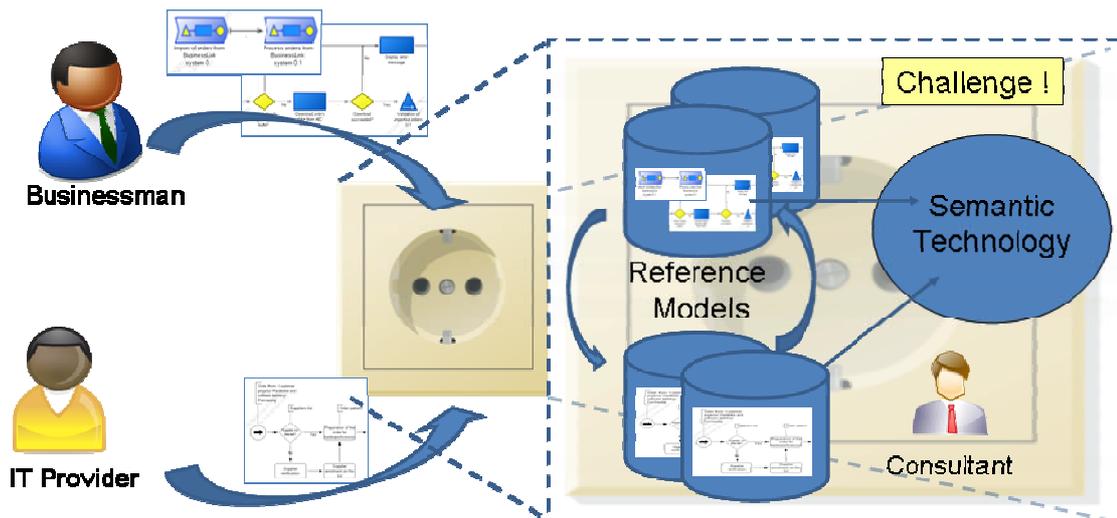


Figure 3 IT-Sockets Use Case Scenarios

Figure 3 depicts the use case scenario for certification where reference business processes and a reference IT-infrastructure are identified based on self-modelled business processes. A demo video of this first prototype can be watched at the plugIT homepage. The second use case demonstration is currently under preparation that identifies the IT-infrastructure configuration based on user requests.

User Involvement, Promotion and Awareness

plugIT has a promotion strategy that first introduces the project idea, second disseminates the research results and third provides demonstration success stories for a continuous transformation into exploitation. In the second year plugIT published papers on individual results on various conferences. Two plugIT workshops have been organised, one in front of a selected scientific advisory audience in the context of the Modellierung 2010 a second to start community building for plugIT in Open Models at the EKAW 2010. plugIT organised a “hands-on” session for PhD students in the context of the SSAIE 2010 Summer School (Software & Service Architecture and Infrastructure Unit) by demonstrating the IT-Socket and the first prototype.

The collaboration with other projects progressed based on bilateral project meetings, conferences like the ICT 2010 and eChallenges 2010 and partner collaboration—here especially with BREIN.

Future Work or Exploitation Prospects, as appropriate

Focus of next year’s work is to publish the plugIT results onto the Open Model Initiative (www.openmodels.at). The reference models that have been created will be published in terms of an Open Models project. The modelling languages that are specified in the Wiki will be conceptualised and provided in an open downloadable format. The Semantic Modelling Kernel will be provided as a contribution to the foundations in Open Models under the form of an open model processing platform.

Hence the next year will focus on the demonstration of the IT-Socket at the three use case sites and in transforming the research results into a community contribution within the Open Models Initiative.

Further Information

<http://www.plug-it.org>
<http://www.plug-it.org/plugITwiki>
http://www.plug-it.org/CMS/ADOWebCMS/upload/videos/ITsocket_demo/
<http://www.openmodels.at>