



Case Study :

Setting up a Domain Specific Tooling

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Cédric Brun - Eclipse Modeling expert

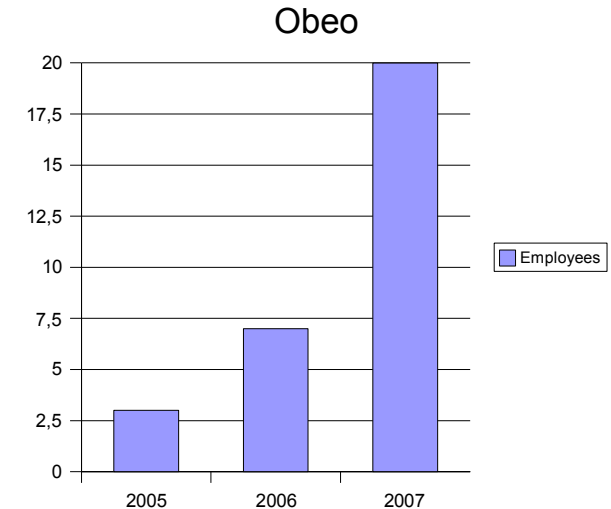
: cedric.brun@obeo.fr

- Who is Obeo ?
- Some background on Unédic and Eclipse
- Building a Domain Specific Model
- Building a Domain Specific Modeler
- Code generation
- Packaging and deployment
- Conclusion

Obeo : Model Driven Company



- OSS Vendor since 2005
 - Model Driven **experts**
 - 20 employees by end 2007
 - Nantes, **Paris** by end 2007
 - Self funded and **profitable**
- Our customers and partners



THALES



LA REDOUTE

- Our MDSD offer :
 - “*Designing **Software Factories** based on Eclipse technology*”
 - Consulting on Eclipse, EMF, GMF, M2M, M2T ...
 - Support, training
- Our ADM offer :
 - “*Model Driven **Migration Factories**, software cartography*”
 - Available for JEE, VB, ASP, C, C++, Ada, Forte, SQL, Progress...
- Our products :
 - Acceleo : <http://www.acceleo.org>
 - Acceleo Pro Traceability, Acceleo Pro DSM
 - Agility
 - More information on <http://www.obeo.fr>



- Obeo – Eclipse foundation member

- 7 Eclipse committers
- Eclipse Modeling Project
 - EMFT : EMF Compare (leader : Cedric Brun)
 - M2M : QVT Relation (leader : Quentin Glineur), ATL
 - Modisco
- Eclipse SOA Tool Platform
 - SCA Composite Editor – IP review in process



- OW2 Consortium (ex-ObjectWeb)

- Acceleo
- OW2 Board member



- Collaborative project and R&D

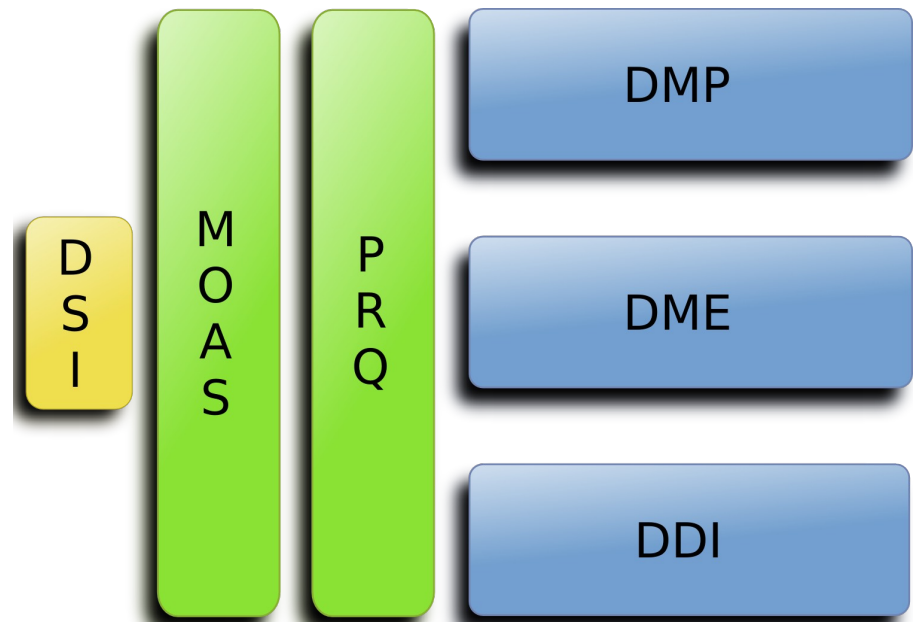
- Topcased member (<http://www.topcased.org>)
- Papyrus
- Clusters System@Tic
- Research (Lina, Inria, Imag, ...)



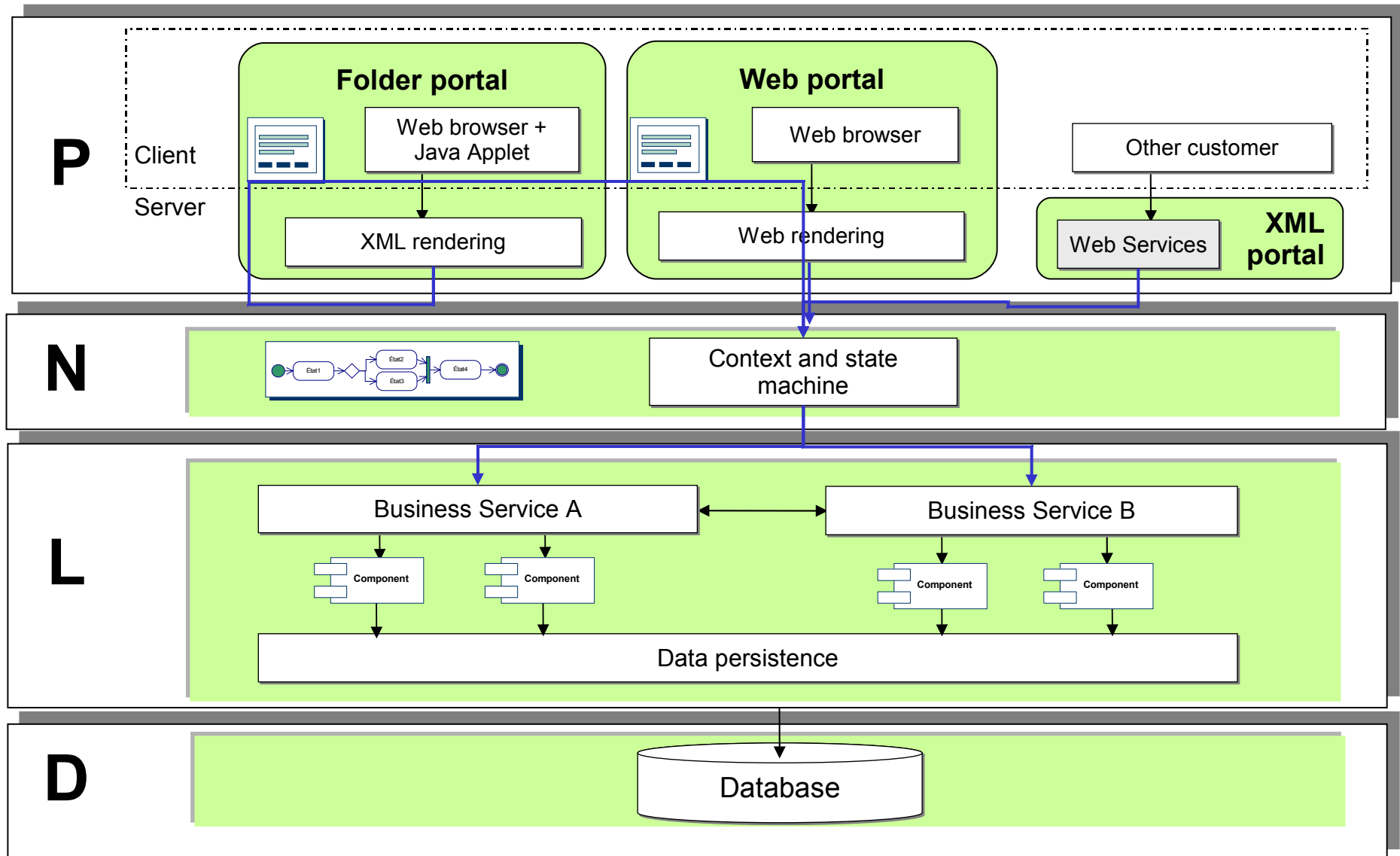
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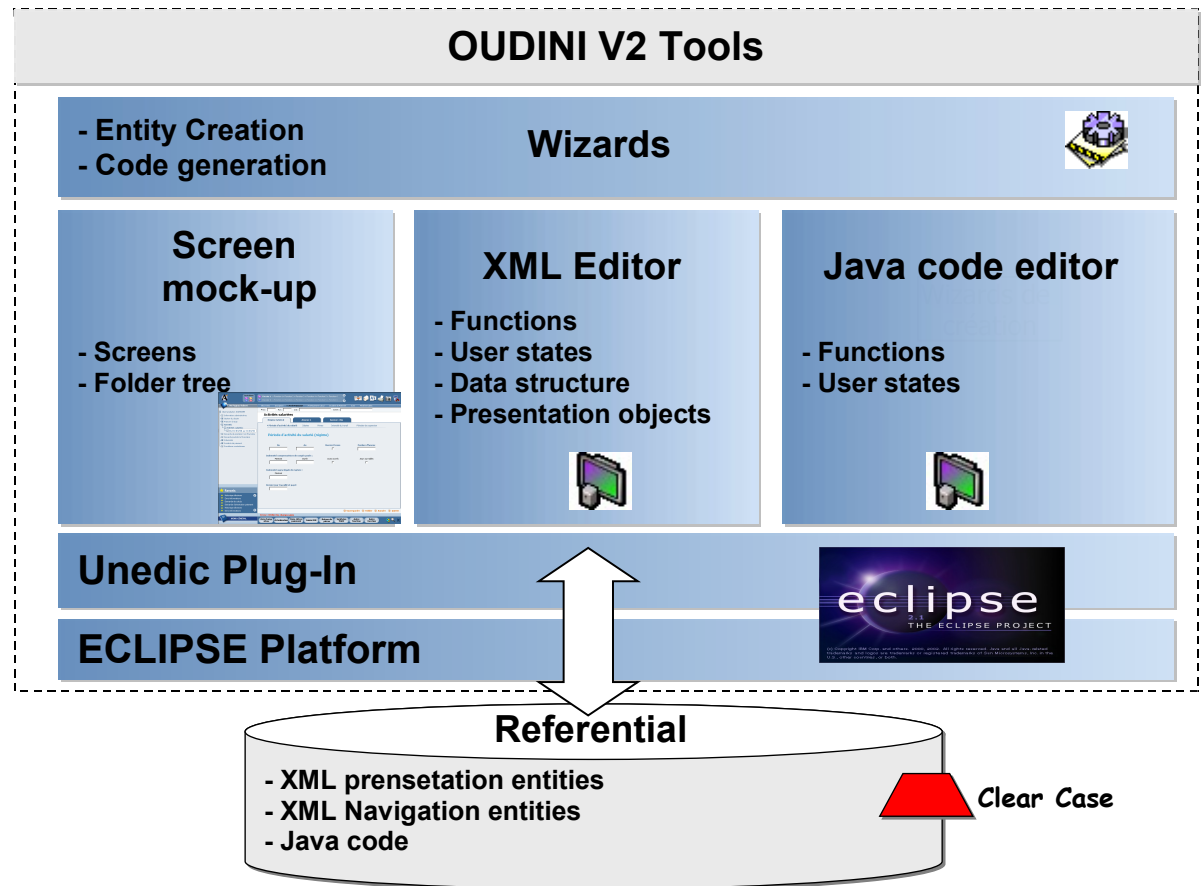
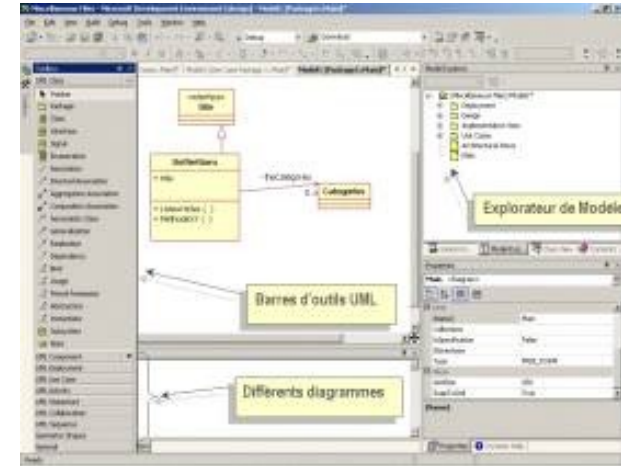
- Creation : 31st, december 1958
- French Administration, 15 000 employees
- Missions
 - Job seekers - social care
 - Assedic (unemployed people administration) coordination
- IT department
 - 1 500 employees
 - outsourcing



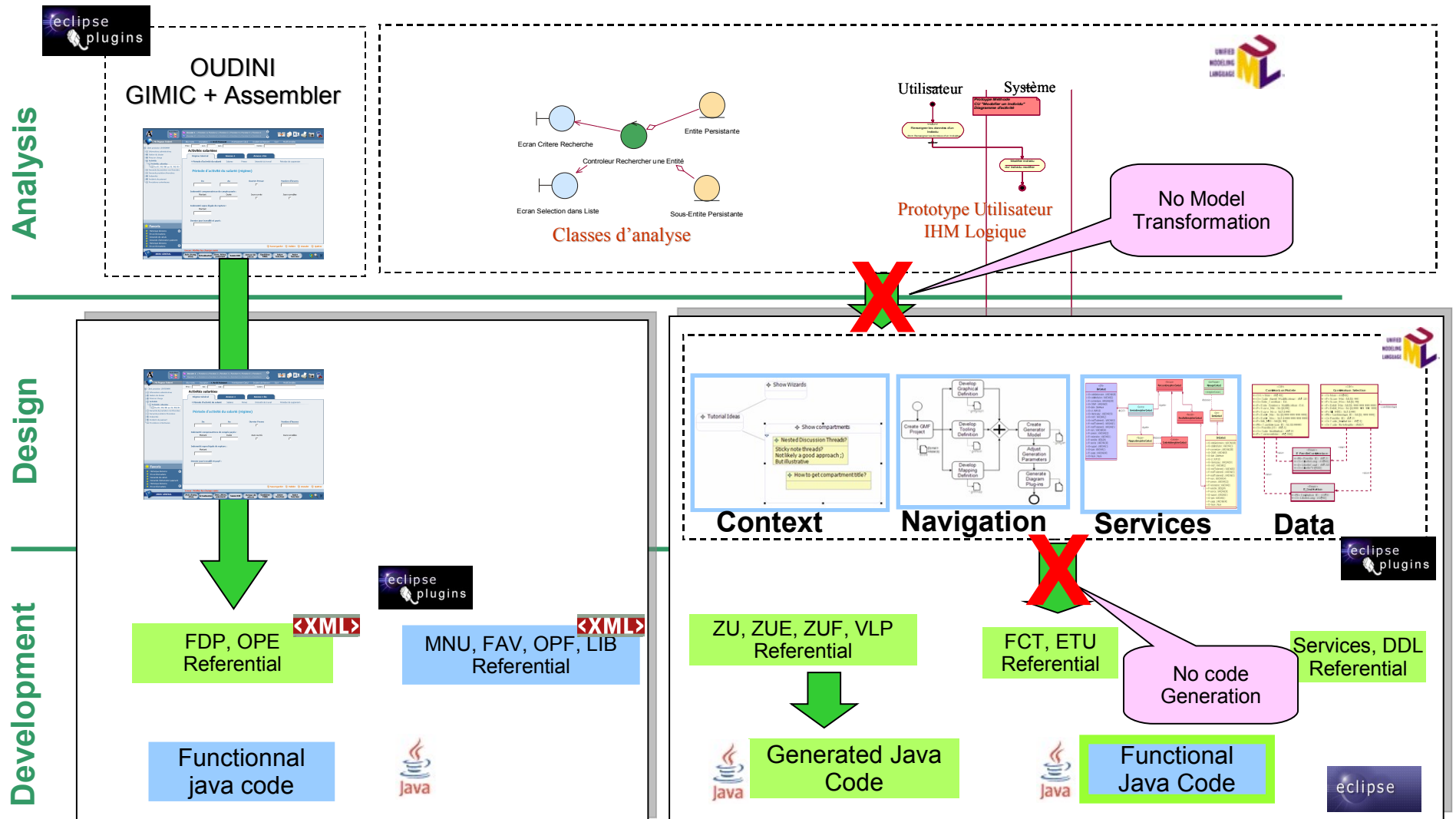
Business applications are built on a **4 layers architecture** - JEE



- Eclipse : an **early choice**
 - Eclipse as a Java IDE
 - Modeler : Rational XDE
 - 2004 : design of 2 Eclipse based tools
 - Analysis and Design
 - GEF + Ecore + Jet

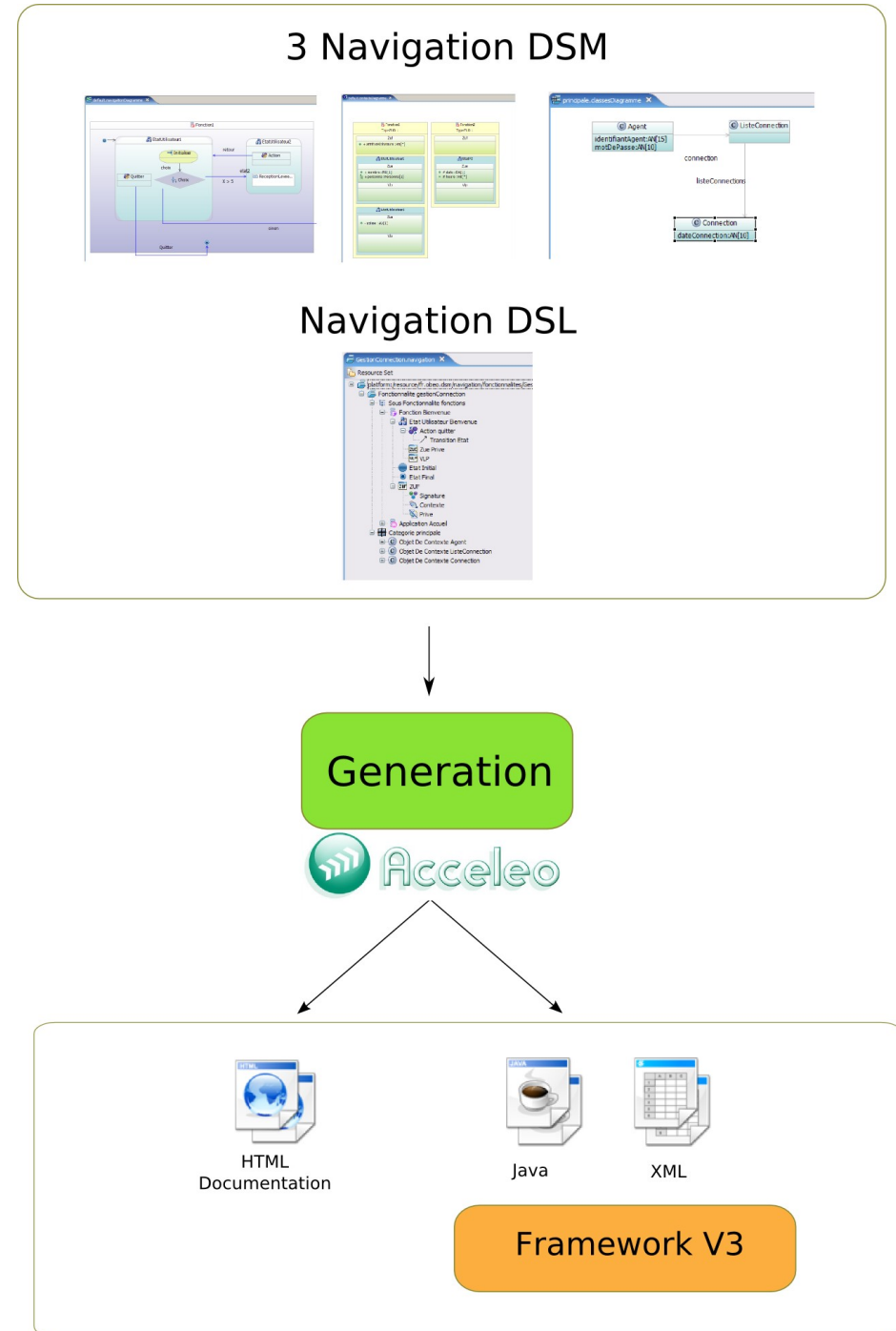


The software factory is started but models are still not productive



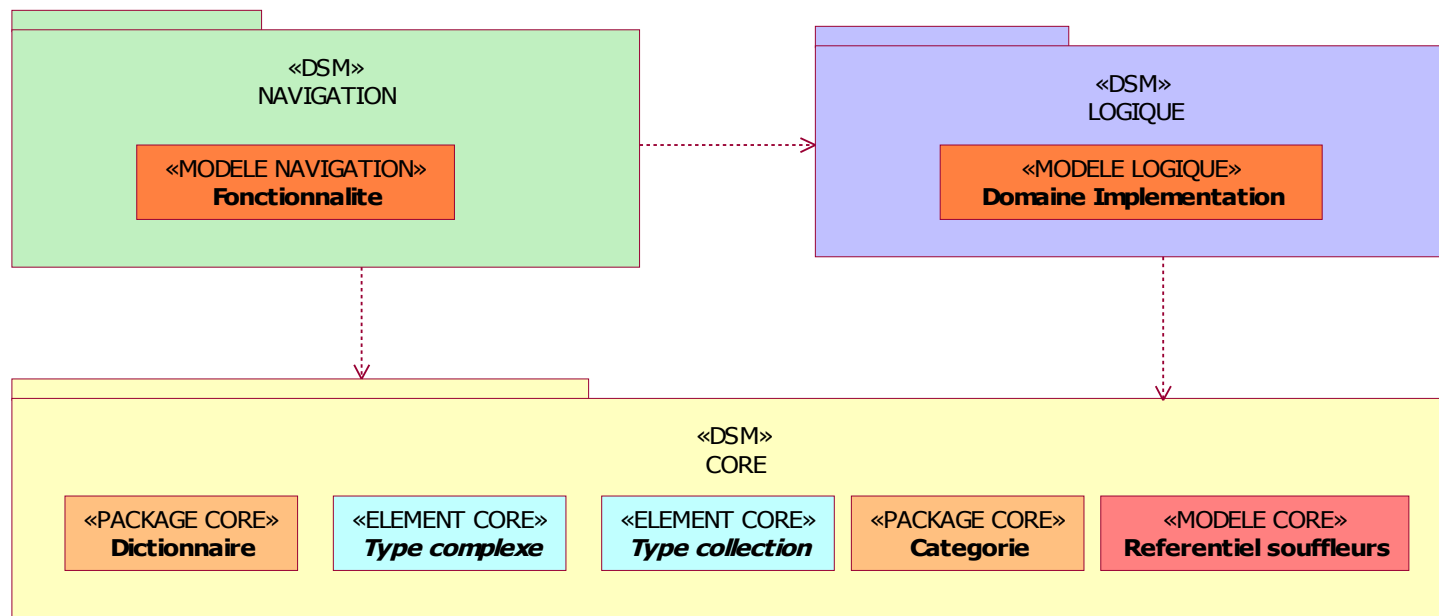
- Architecture evolution
 - JSF/Ajax
 - Tooling improvement
- From UML to a DSM approach
 - Language closer to the Unédic logical/functional concepts
 - Based on Eclipse standards : EMF, GEF, GMF
- Generative approach with Acceleleo Pro
 - Automate projection between functional models and Unedic JEE Framework
 - MDSD and Traceability
- Unédic collaborates with Obeo on their Software Factory

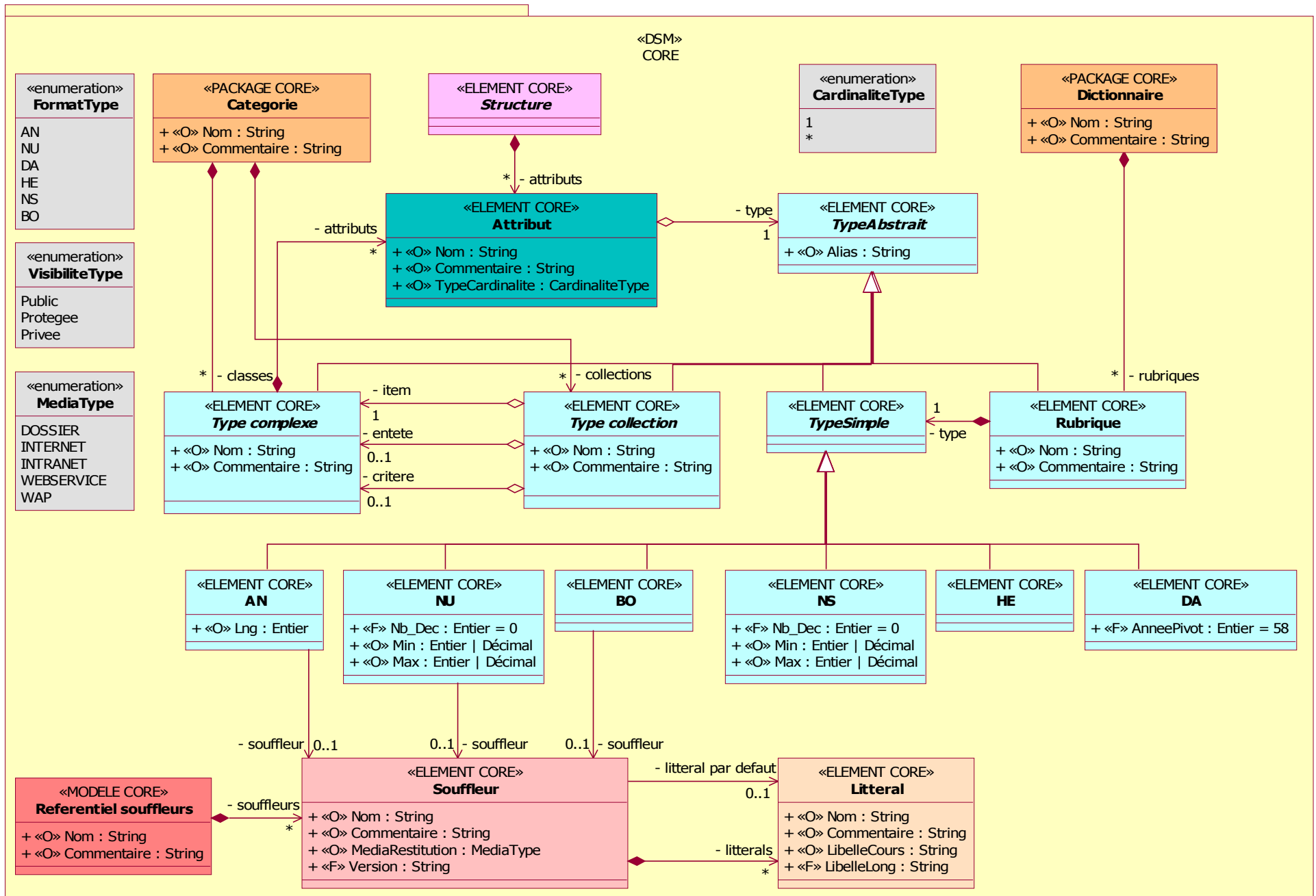
- Two phases project
 - Prototype
 - Industrial version
- Main steps
 - DSM Design
 - EMF-GMF implementation
 - **Extended features**
 - Code generation
 - Packaging and deployment

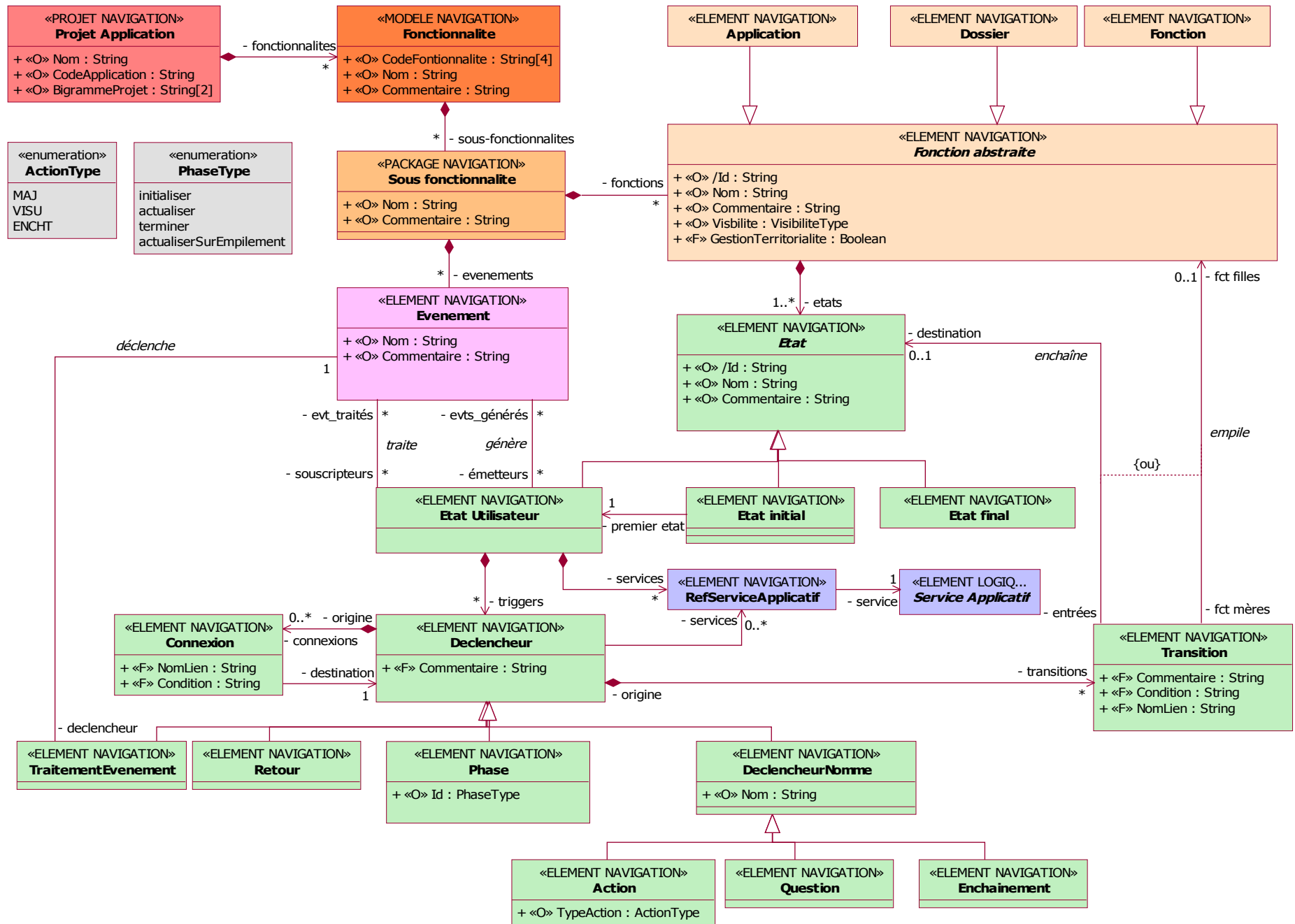


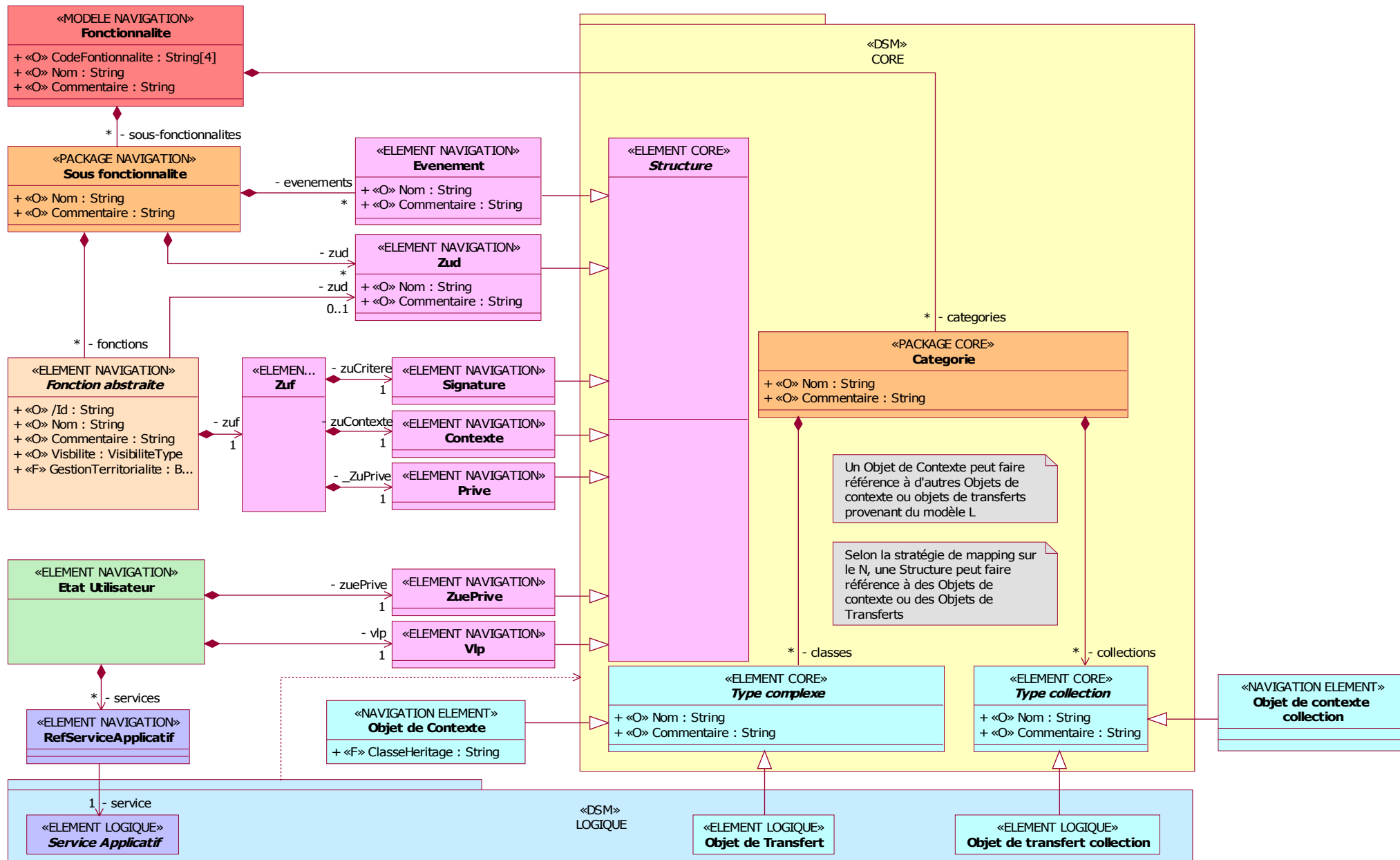
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- How to design a Domain Model ?
 - Find out **Business concepts**
 - Cut them into logical meta-models
- Who
 - Modeling tool expert
 - Business and methodology expert



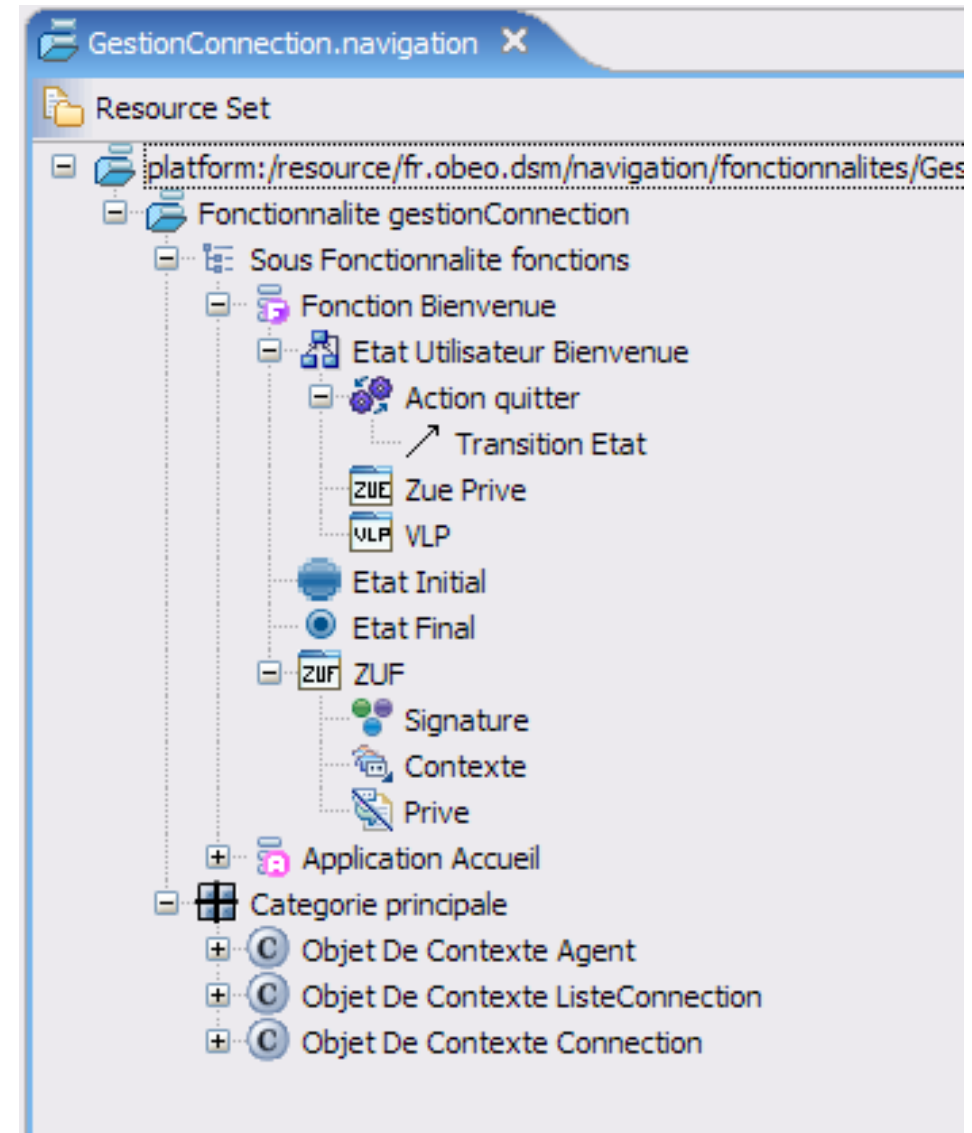








- Ecore implementation
 - Topcased Ecore editor
 - EMF standard generation
 - Icons
- Difficulties
 - A good meta-model ?
 - Model hierarchy
 - GMF and tooling impacts
 - Not all Business rules modeled
- A key task !
- Around 100 meta-elements

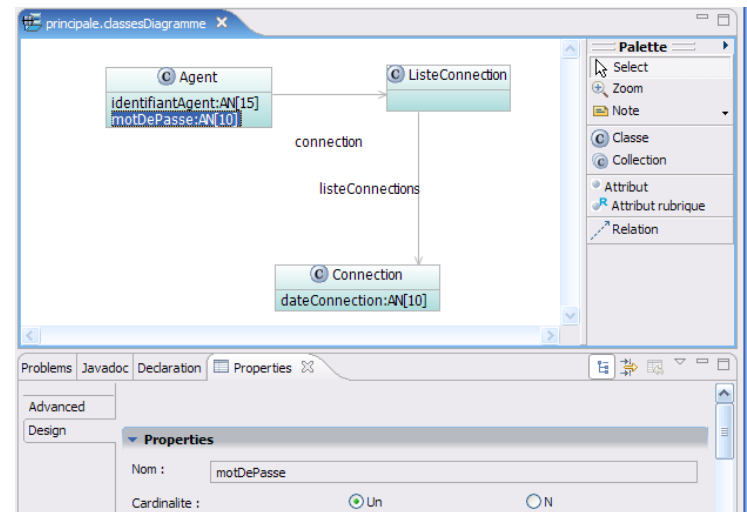
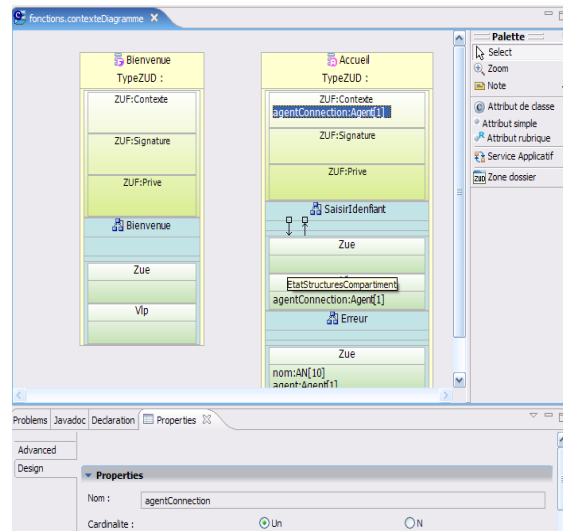
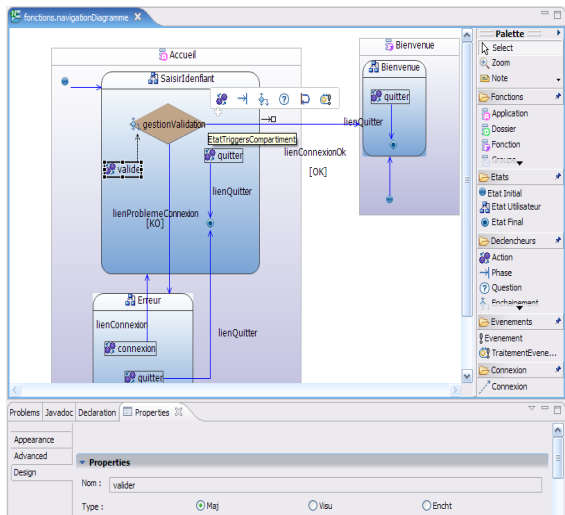


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- **Building a Domain Specific Modeler**
- Code generation
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-

- Steps to build a Domain Specific Modeler with GMF
 - Set-up the GMF models (graphical, tooling, mapping)
 - Generate Java code from gmfgenerator
- Extending GMF
 - Using GMF **extension points** when possible
 - Modifying generated code
- Extensions
 - Properties edition on double click
 - Creation **wizards**
 - Diagram navigation and **shortcuts**
 - Diagram **synchronization**
 - Model refactoring, Model validation, Clearcase integration

Demo



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- Acceleo : <http://www.acceleo.org>
 - Open source (EPL) code generator based on Eclipse and EMF
 - Easy learning curve, end user features
 - Incremental generation, performance
 - Template editors, **debugging**
 - **Plug-in packaging** of generators
 - Generation module **repository** (JEE, C#, Php, Python...)

A screenshot of an Acceleo template editor window titled "dto.mt". The code is a template for generating a DTO class. It includes a script tag, a package declaration, user code imports, and a class definition. There are two error markers (red 'X' icons) on the left side of the editor. The first error is on the line "//<%end user code%>" with the message "Unresolved comment". The second error is on the line "the class : <%comment%>" with the message "Unresolved comment".

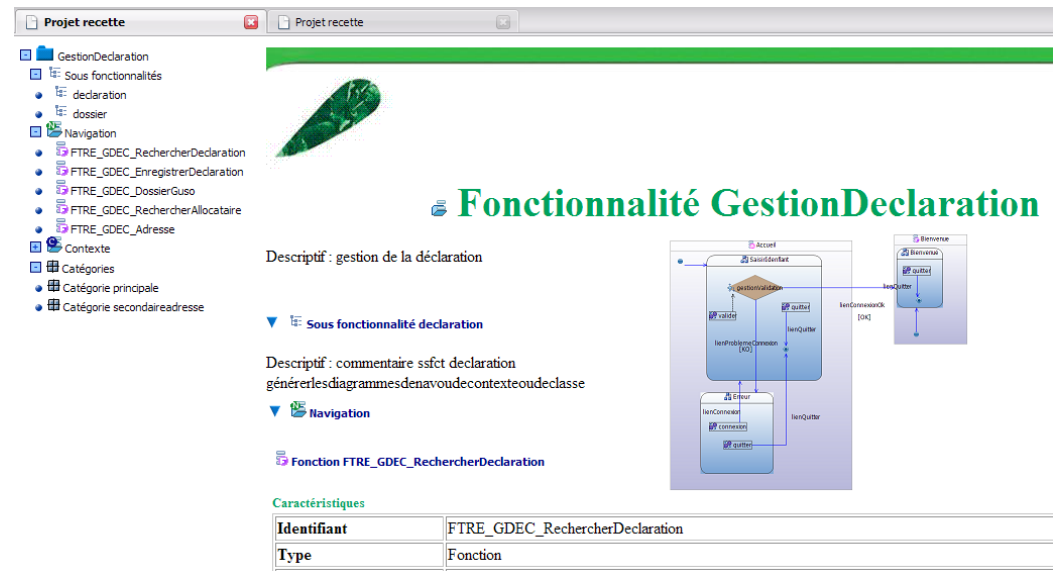
```
<%script type="uml2.Class" name="generate">
<!-- DTO class generation-->
package <%dtoPackage%>;

//<%beginUserCode%>
import java.io.Serializable;
import java.util.*;
//<%end user code%>

/**
 * Unresolved comment the class : <%comment%>
 */
public class <%name%>Dto<%extensions%> impl
```

- Acceleo Pro Traceability :
 - Model-code-Model navigation and **round-trip**
 - Generation preview, **de-synchronization detection**
 - Partial regeneration, generated code modification

- How to design a code generator from a Domain Model
 - Have a prototype of your generation target
 - Identify **patterns** and things that can be automated
 - Make sure that you've got the required information in models
- Two generators
 - Application code : Java, JSP and XML code generator
 - Documentation : HTML
- Around **70 templates**



http://localhost:9003/portail3sf/frameset_IE.jsf?FW_ID_MULTISESSION=1 - Microsoft Internet Explorer fourni par SINDBAD

Echier Edition Affichage Favoris Outils ?

Précédente Recherche Favoris Média

Adresse http://localhost:9003/portail3sf/frameset_IE.jsf?FW_ID_MULTISESSION= OK

VMN optimisé par YAHOO! RECHERCHE Recherche Web Wiktionnaire Rang : N/A Off Nantes 11°C (0) Jeux

Liens Application Artemis Coonexion SQL Doc CME Oudini Processus Dév Aladin V2 Application Distant Forum UNEDIC Mercury TestDirector 8.0 SP2 Apache Tomcat-5.0.28 - Rapport d'erreur

DevToolBar View DOM Disable View Outline Validate Images Resize Misc Show Ruler

ACCES APPLICATIONS COPIER COLLER IMPRIMER DÉCONNEXION

Guso

Dossier EMPLOYEUR Dossier ENTREPRISE Dossier INDIVIDU Dossier TIERS Dossier INSTITUTION Dossier ATTENTE Dossier PARAMÈTRE

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Accès aux différents dossiers

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DOSSIER INDIVIDU

DOSSIER INSTITUTION

DOSSIER ATTENTE

DOSSIER PARAMÈTRE

BIENVENUE SUR LE PROTOTYPE APPLICATION EMPLOYEUR

AUBLE Christian (cauble)

Code territoire 083

Prestataire

Vos actes métier

INFOS

Intranet local

http://localhost:9003/portailJsf/frameset_IE.jsf?FW_ID_MULTISESSION=1 - Microsoft Internet Explorer fourni par SINDBAD

Fichier Edition Affichage Favoris Outils ?

Précédente Revenir Arrêter Rechercher Favoris Média Imprimer Application Artemis Coonexion SQL Doc CME Oudini Processus Dev Aladin V2 Application Distant Forum UNEDIC Mercury TestDirector 8.0 SP2 Apache Tomcat-5.0.28 - Rapport d'erreur

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Dossier Entreprise

Alain Dupond
083 123456789 A
083 123456789 A

Bloc note

Compte

Compte RG

Caractéristiques

Synthèse financière

Compte GUSO

Caractéristiques

Synthèse financière

Déclaration

Paiement

Divers

Vos actes métier

INFOS

Le numéro de déclaration 12EREE doit être numérique

RECHERCHER DECLARATION Critères de recherche

Critères Onglets2 TestCombos

Critères Déclaration

N° déclaration : 12EREE

Date de mouvement : []

N° pli : [] N° pièce : [] Origine : []

Date FCT : [] ou plage de dates : [] à []

Etat de la déclaration : []

Statut greCtx / Ctx : [] ☐ Exclure les déclarations annulées

Critères Employeur

Identifiant Aladin : 083 [] []

SIRET [] []

NIR [] []

Rechercher

Critères Salarié

Identifiant GUSO : []

NIR [] []

Rechercher

Changer Update combo Réinitialiser Rechercher Rechercher Quitter

Terminé Intranet local

http://localhost:9003/portailJsf/frameset_IE.jsf?FW_ID_MULTISESSION=1 - Microsoft Internet Explorer fourni par SINDBAD

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Divers

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INFO

LISTE DES DECLARATIONS Déclarations issues des critères

Liste

Synthèse des déclarations répondant à vos critères de recherche : Déclarations (page 1/1)

Número Décl	Número de pli	Identifiant Aladin	Dénomination Empl	Salaire	Date déb
1357924680	21/03/2007 1 116 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 116 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 117 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 118 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 119 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 120 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 121 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 122 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 123 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 124 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 125 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 126 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 127 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 128 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 129 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 2 01		FLESCHE FERNANDE		15/01
1357924680	21/03/2007 1 3 01		CHATEAU WALCK		15/01
1357924680	21/03/2007 1 5 01		CHATEAU WALCK		15/01
1357924680	21/03/2007 1 8 01		EXPRESSO FRANCE		15/01

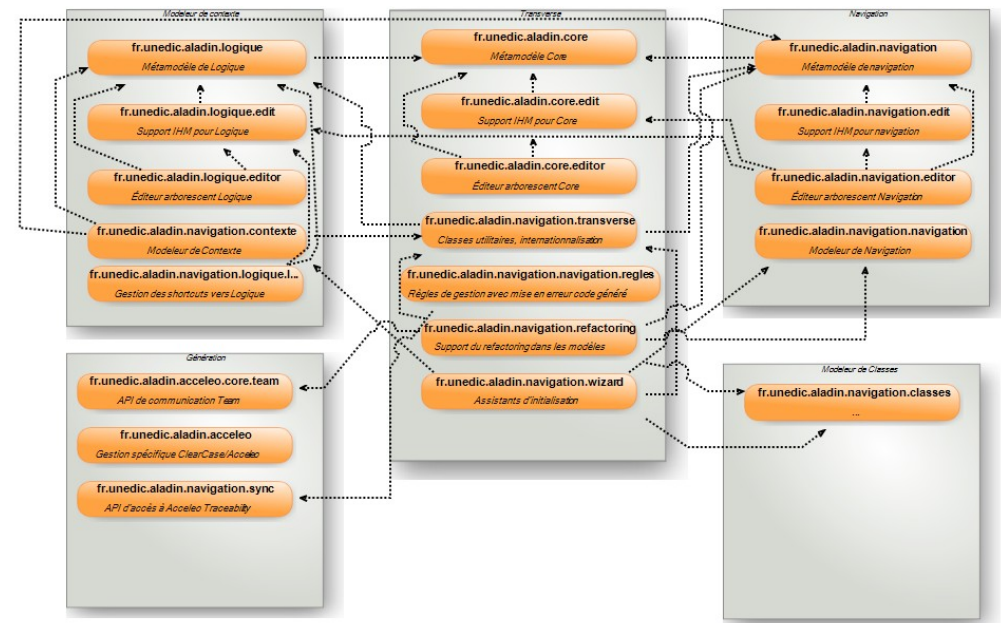
Affiner Retour Ouvrir Quitter

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- Packaging

- 20 plug-ins (Eclipse 3.2)
- Build issues (GMF/JDK 1.4/Windows)



- Deployment

- Tools delivered to a third party company
- Eclipse bundle delivery (Eclipse, Modeling, WTP...)
- **Regular updates** through Eclipse update sites
- User training

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- Time and duration
 - Prototyping : 35 m.d
 - Industrial version : 95 m.d
 - Duration : 5 months
- Unédic
 - Specification, tests and validation, user documentation
 - Code generation
- Obeo
 - Meta-modeling and Eclipse tooling
 - EMF-GMF implementation
 - Acceleo training and coaching
 - Collaboration using Trac system + Mylyn

- Customer results
 - Deployment of the tooling on an **industrial project** with Unilog (LogicaCmg) - 5000 m.d
 - 15 persons in **parallel** using the software factory since June 2006
 - Huge **productivity gains**, easiest maintenance
 - **Migration** of existing projects
 - Standard and integrated tooling made on a tight schedule and budget
- Difficulties
 - Meta-models **evolution** impacts
 - Testing the GUI
 - Clearcase integration
 - Numerous models management with shortcuts (coherency, validation)
 - GMF2 migration ?