



MDA-CS

Agusti CANALS and Philippe DESANOIS
nom.prenom@c-s.fr

LA FORCE DE L'INNOVATION

Summary

- **Preface**
 - To be effective with the MDA approach
- **MDA-CS**
 - An introduction to MDA-CS
- **Conclusion**
 - General overview
 - Feedback
 - MDA-CS : Benefits, references ...



Preface

To be effective with the MDA approach

- **Choose**
 - A domain with recurrent applications
 - a modeling tool
 - a **target**
- **Configure the modeling tool**
- **Training teams**
- **Validate and adjust all on a first project**
- **Industrialize in the company**
- **Provide a support team**



MDA-CS

Information Systems

With

UML

Power AMC

And

JAVA/J2EE

Using UML-CS methodology



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• Description

- CS developed the UML-CS methodology and uses it since 1998. UML-CS is a specialized instance of the analysis and design part of the Unified Process :

- Requirements Analysis
- Object Analysis
- Architectural Design
- Object Design
- Physical Design

• Application fields

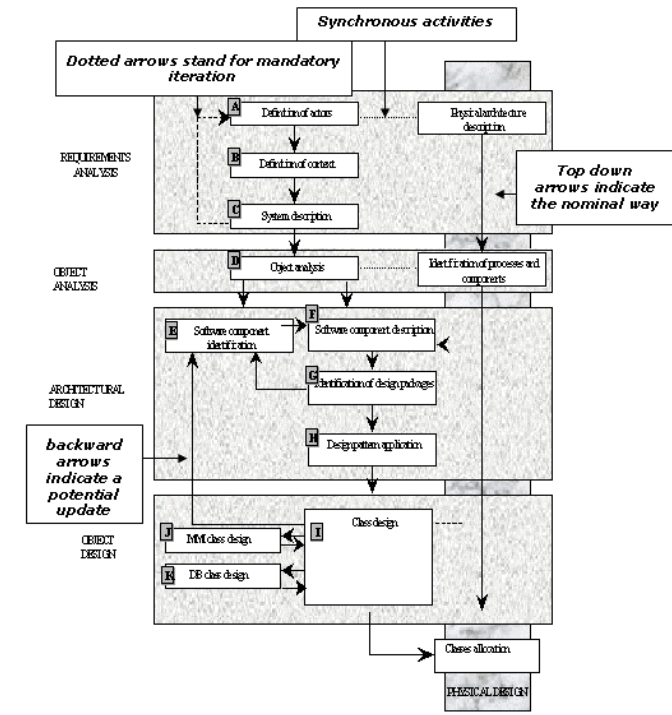
- ALL CS projects design

• Products

- Power AMC, Enterprise Architect, Topcased

• Benefits

- This approach allows us to capitalize on our expertise, while optimizing our developments



• Major references

- All CS projects using UML

• Standards

- UML

• Certifications





MDA-CS

Through **ELEVEN** transformations

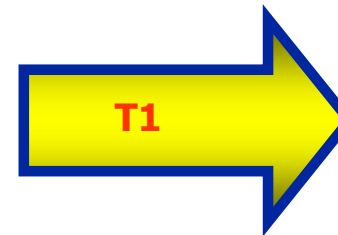
LA FORCE DE L'INNOVATION

From analysis to documentation

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Diagrams and associated text transformed

As RTF files



As HTML files



DOSSIER DE SFD : GESTION DE L'ADMINISTRATION

A CROQUIS_SFD_S_L1222-04
du 27 octobre 2009

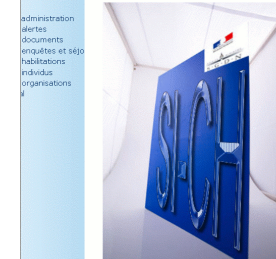
CS/SDS/INFORM

Document 2 / SfdProj.rtf

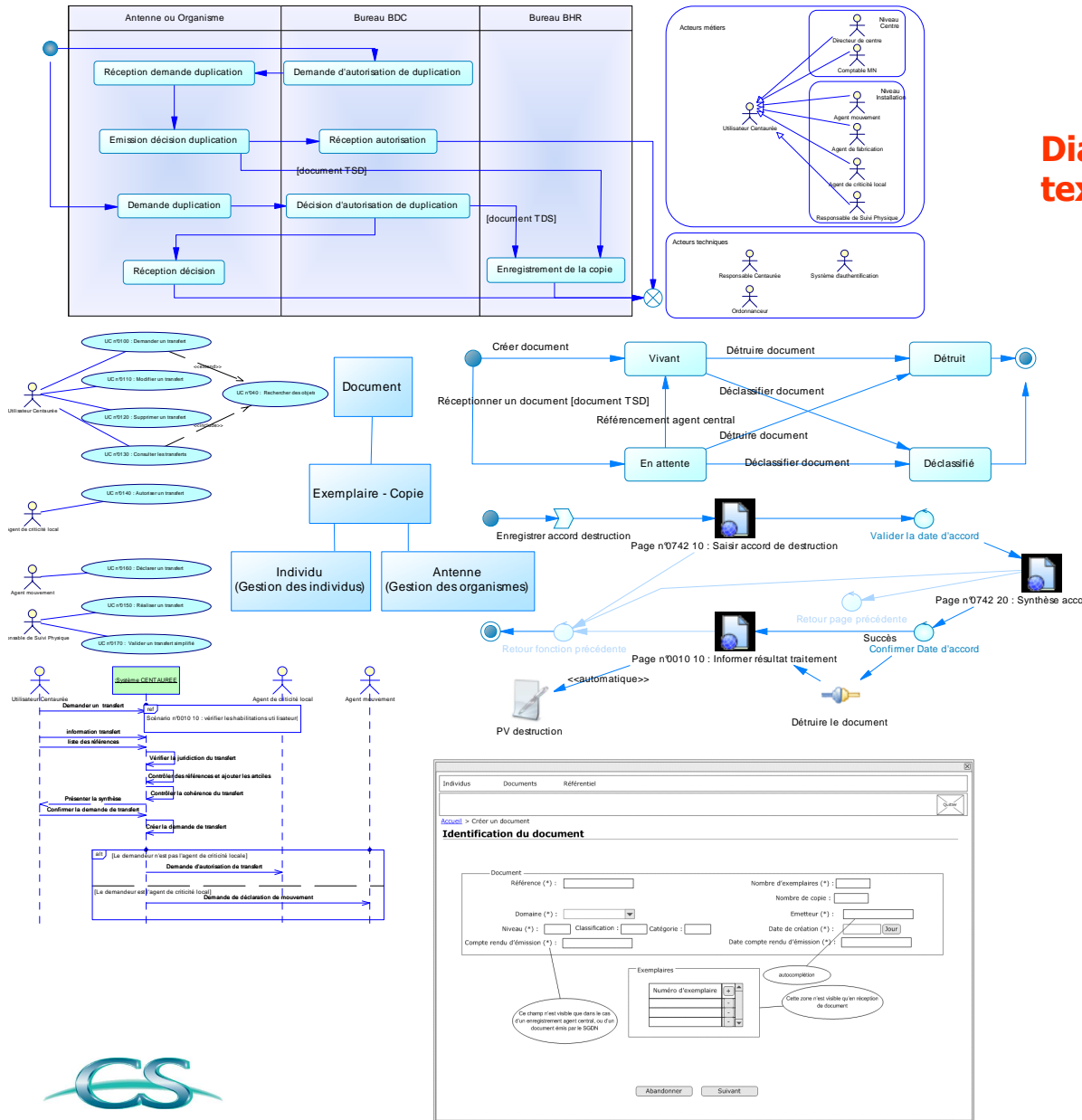


11, avenue de la République - 92000 Nanterre - France
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Projet SI-CH : Navigation et schémas des pages du 05/12/2009



administration
alertes
documents
enquêtes et séjé
habitations
individus
organisations



From analysis to design

From analysis

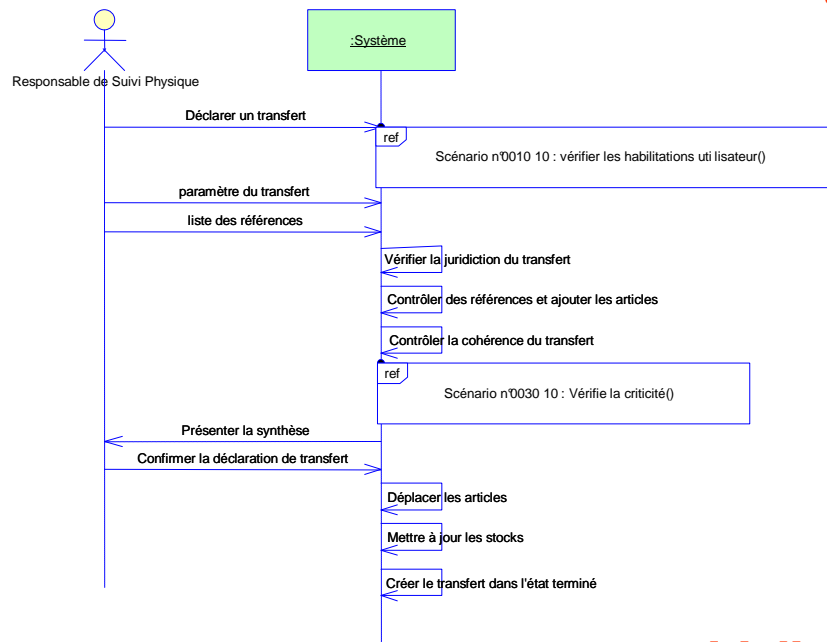
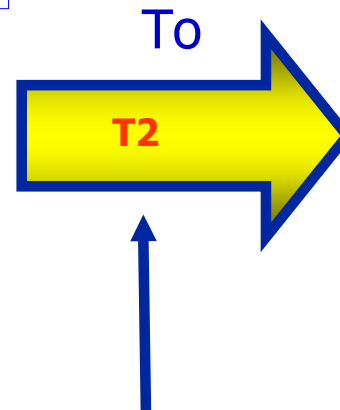
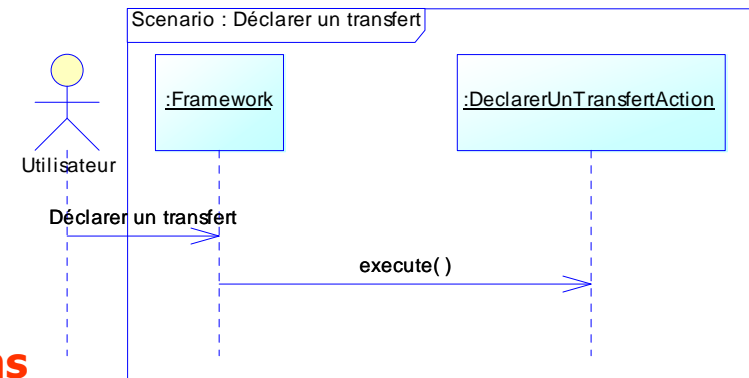
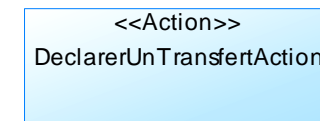


Diagram sequence transformed



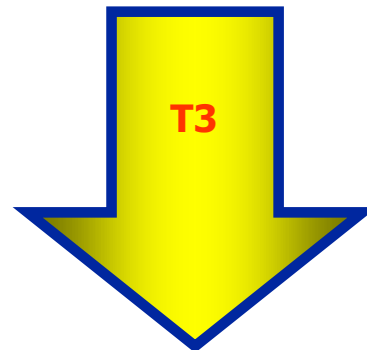
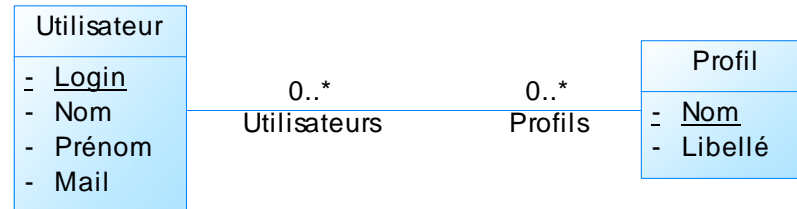
Design



**Initialize design diagrams
Create Class action**

From classes diagrams to data base diagrams (1)

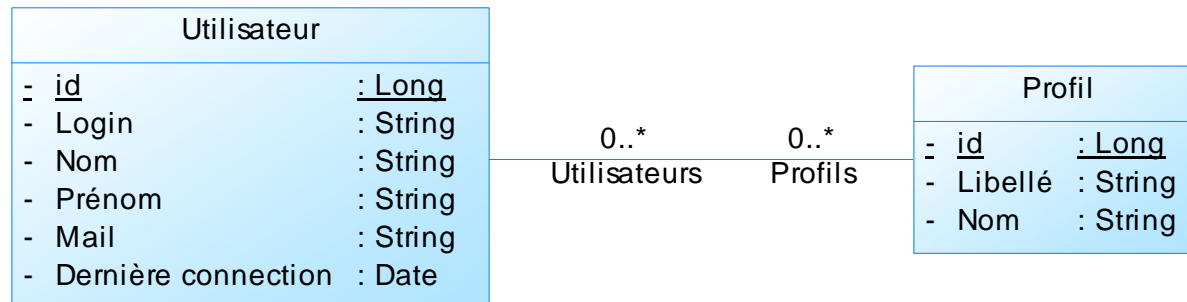
MOO (Domain)



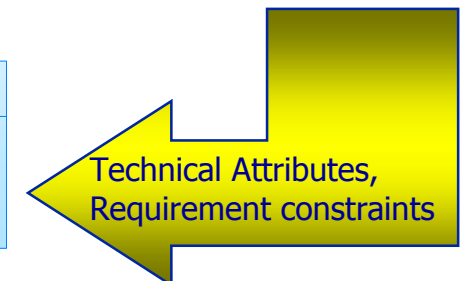
Technical Attributes (Design strategy)

Add technical key
Modify Association Class
Composition association

MOO (Design)

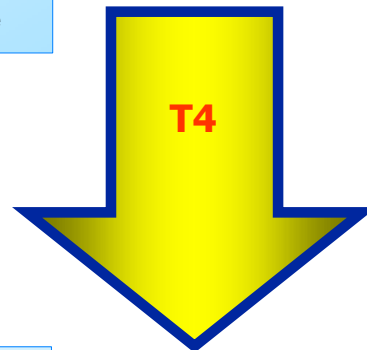
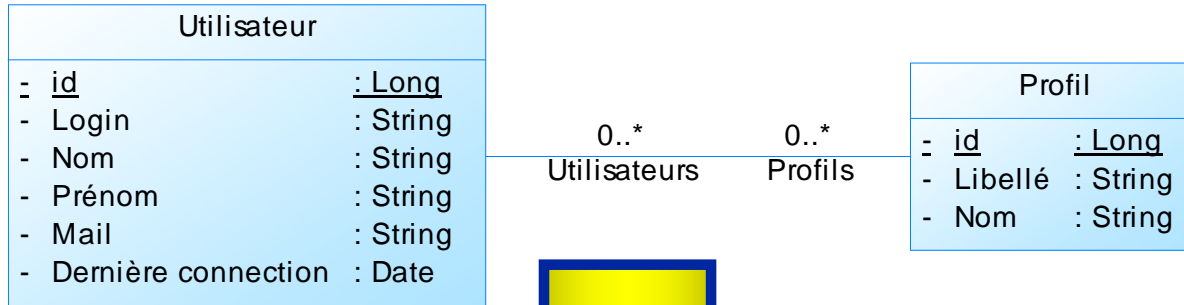


If necessary



From classes diagrams to data base diagrams (2)

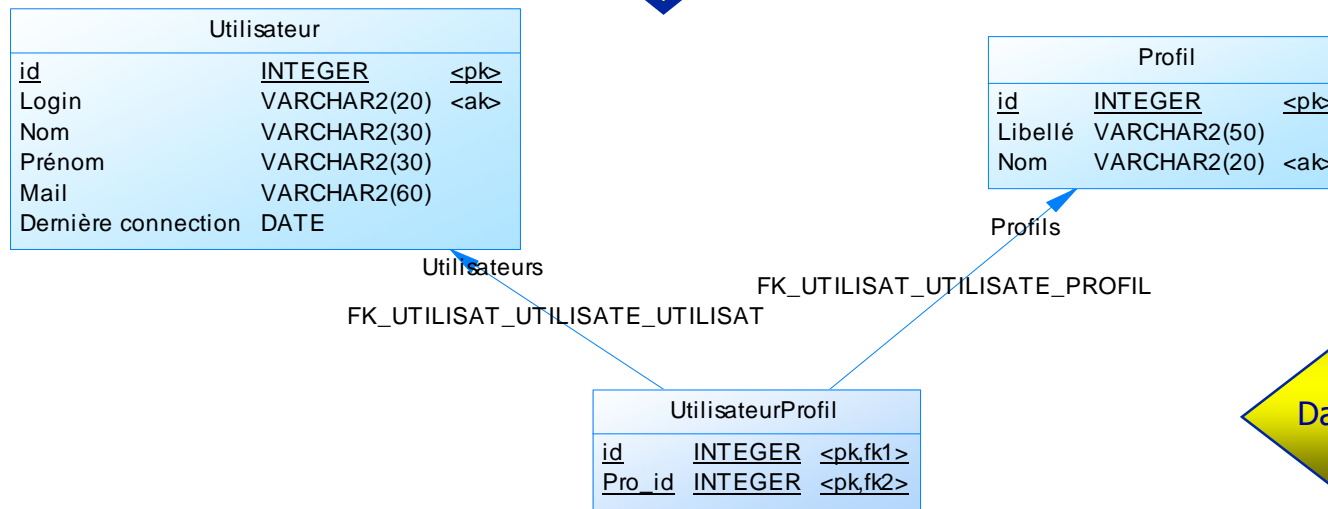
MOO



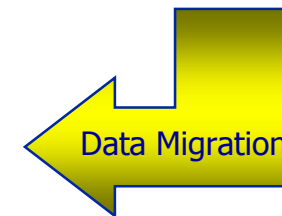
Specific strategy (inheritance ...)

Number of Table/Classe
Cardinality

MPD

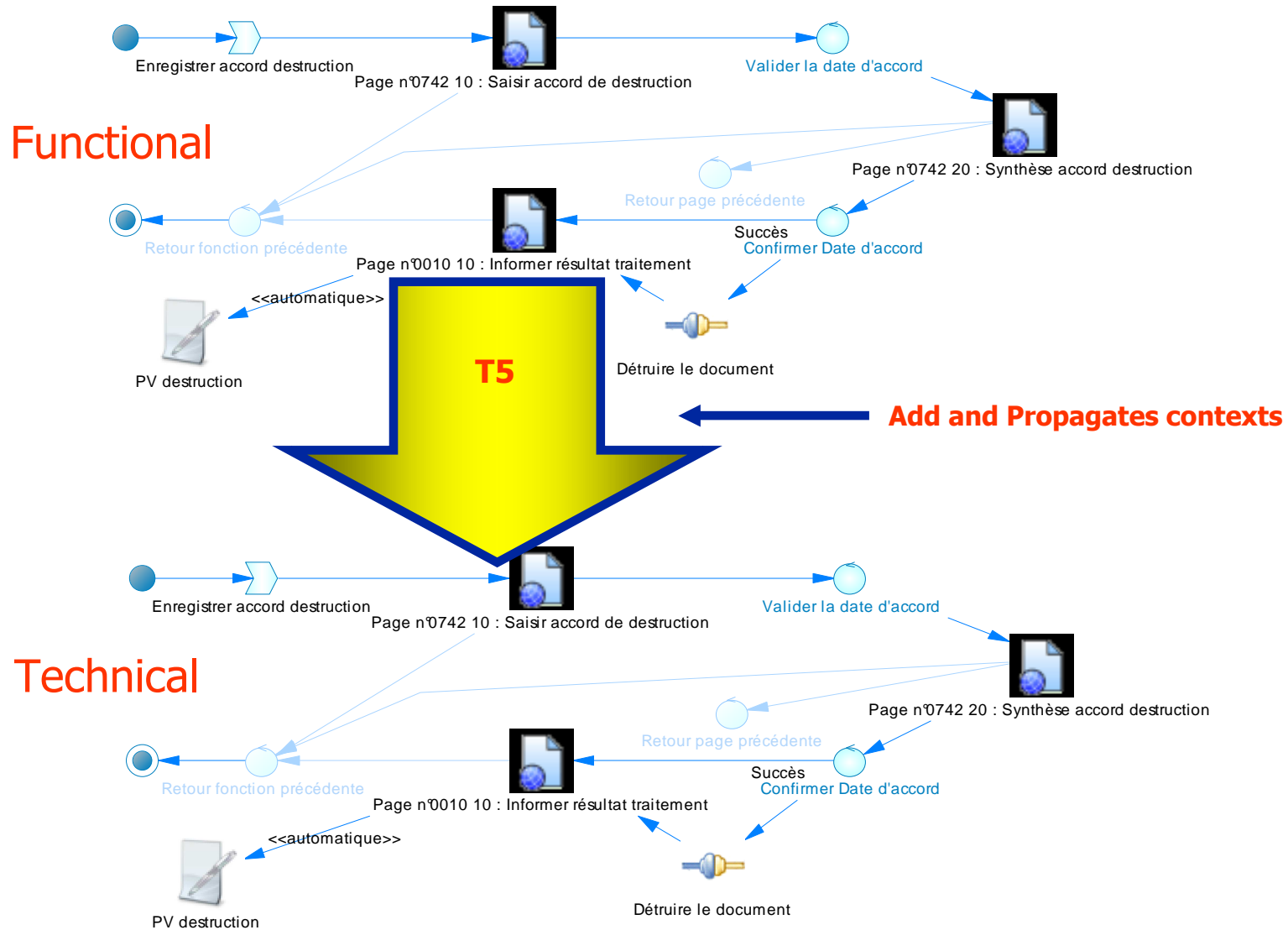


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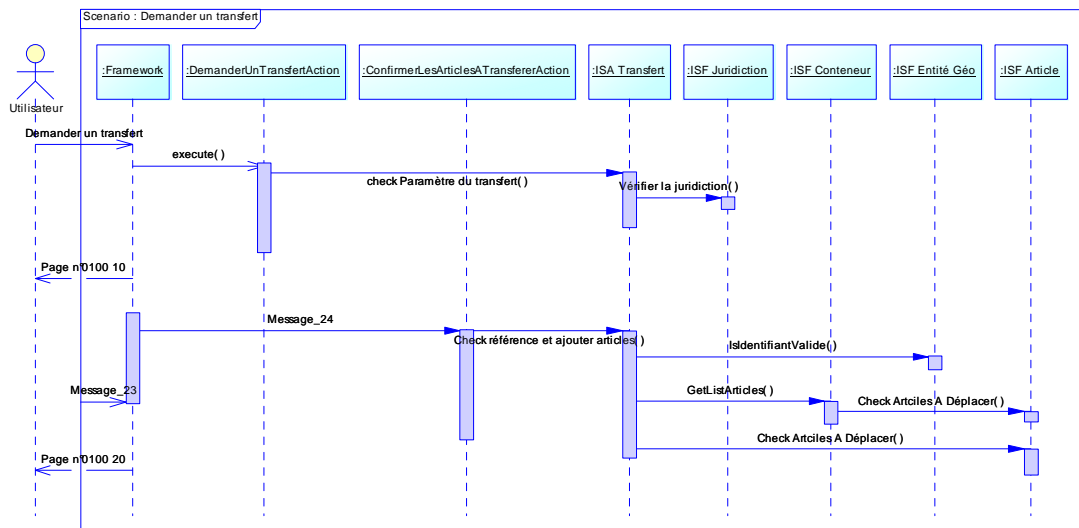


MMI : From functional model to technical model

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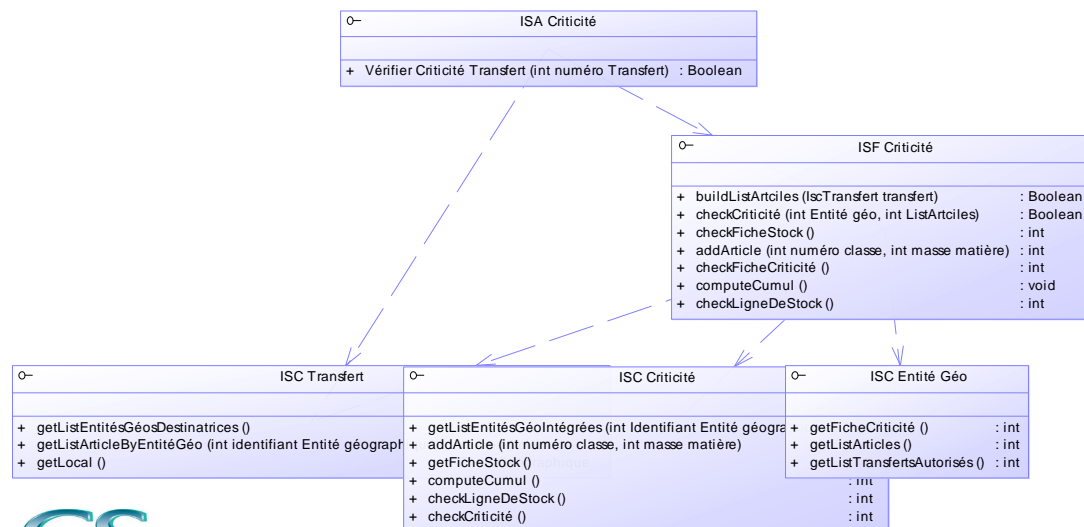
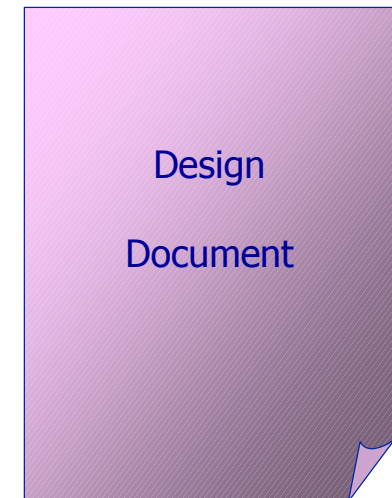
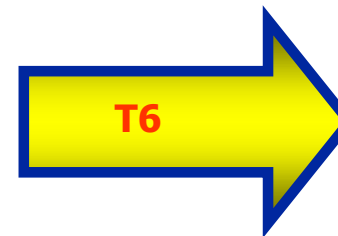


From design to documentation (1)



Diagrams and associated text transformed

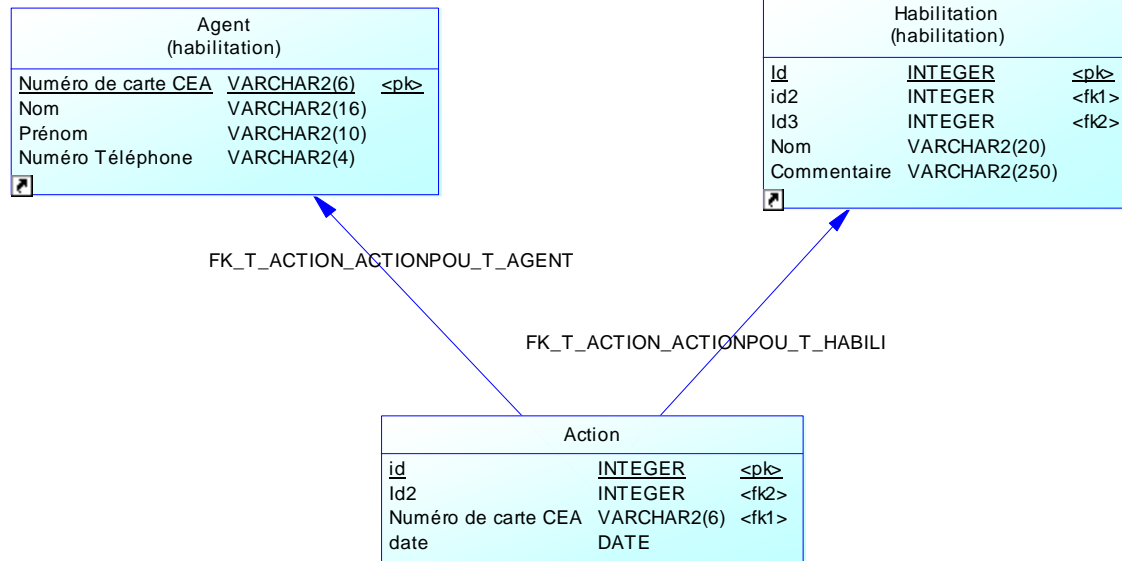
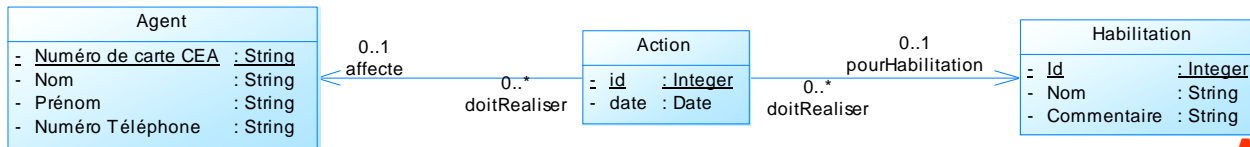
As RTF files



From design to documentation (2)

Diagrams and associated text transformed

As RTF files



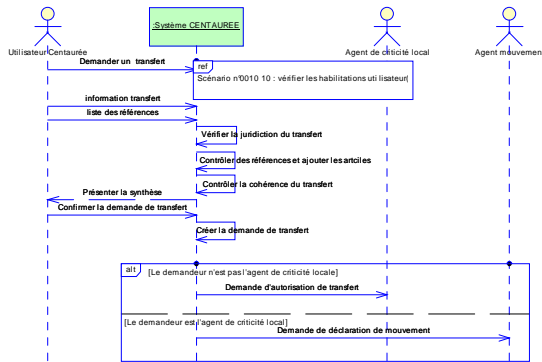
Persistent
Objects
Model

Physical
Model

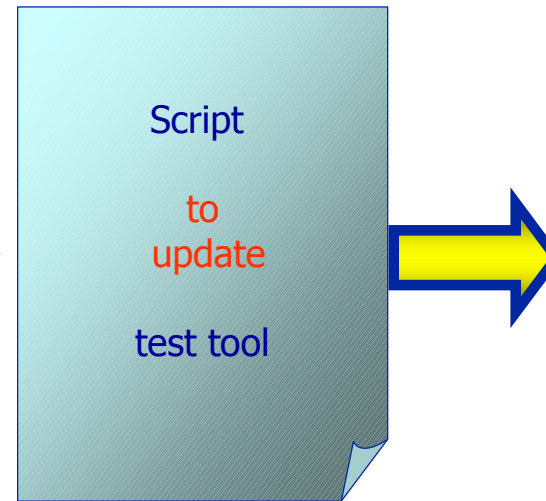
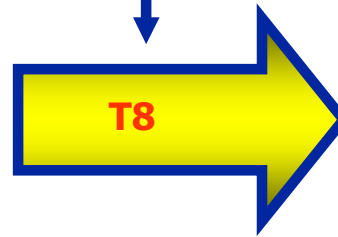
Migration
Model

From design to tests

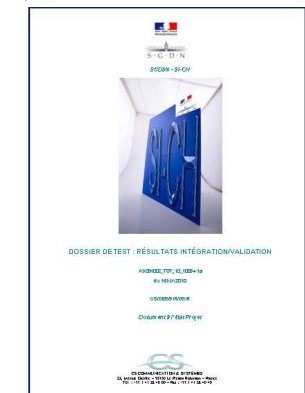
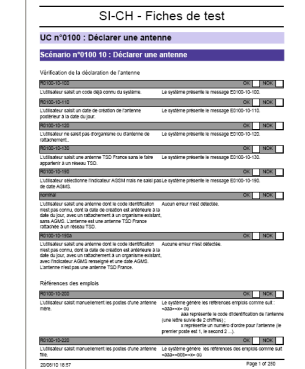
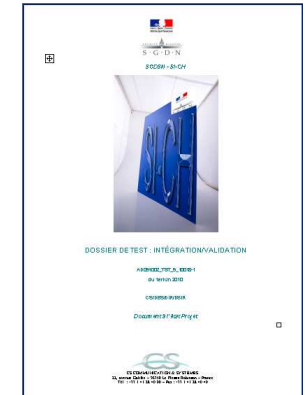
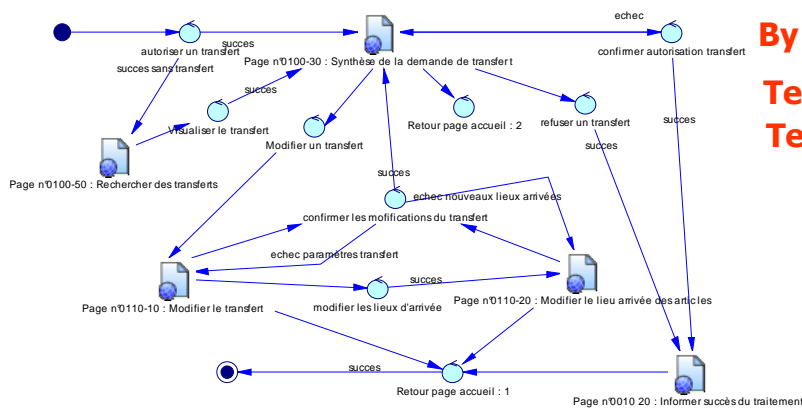
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Scripts Generation



By Use Case
Test business rules
Test navigation

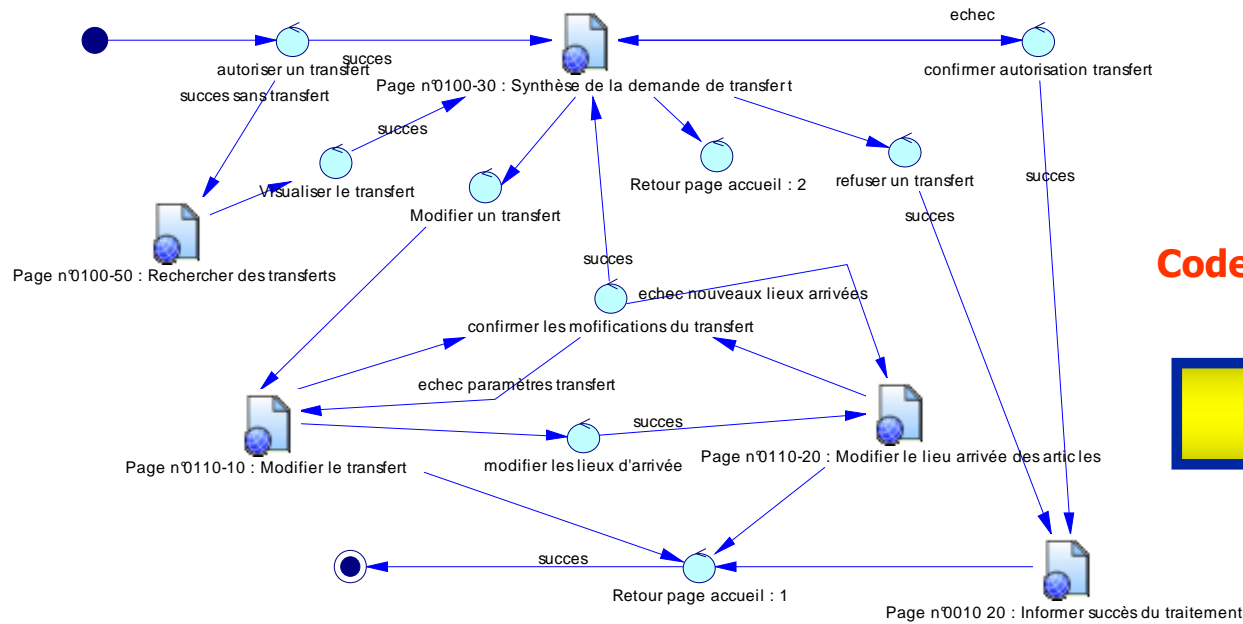


Our Test Tool:
- Salome TMF

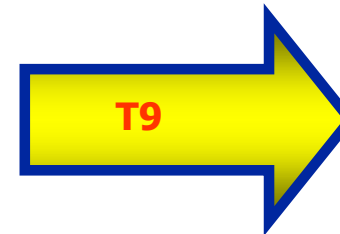


From design to presentation layer

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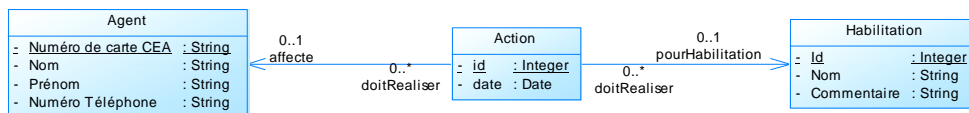
Code generation



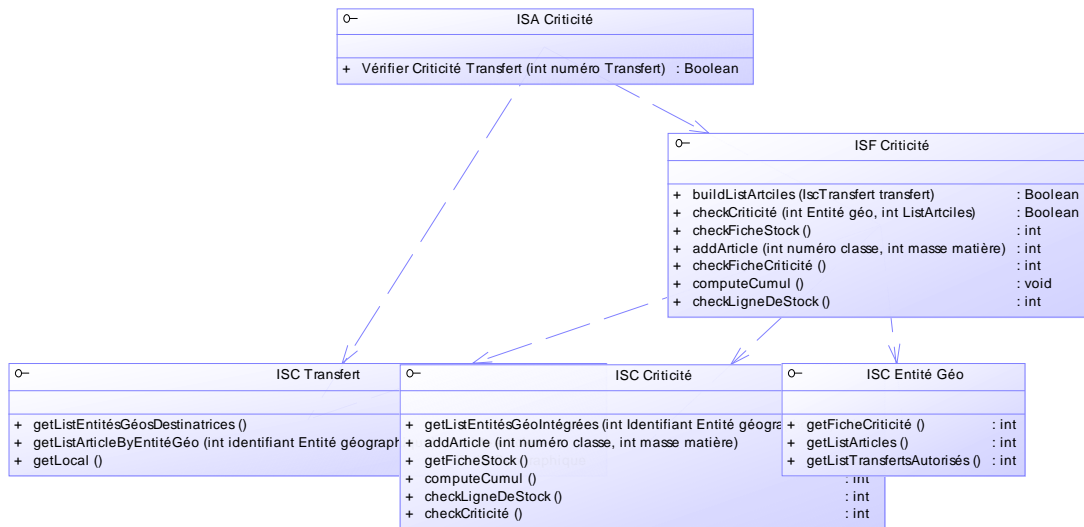
Navigation
(between
Pages)
description
file

Struts xml file

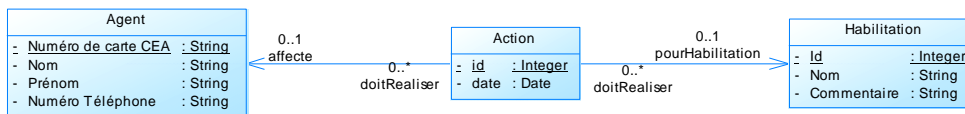
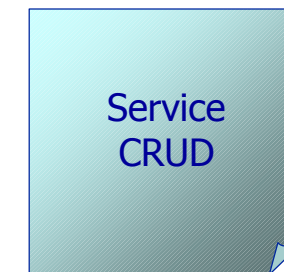
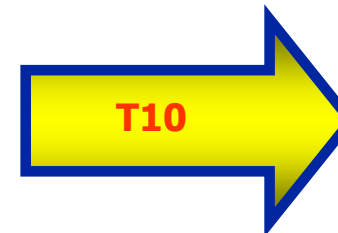
JSP CRUD



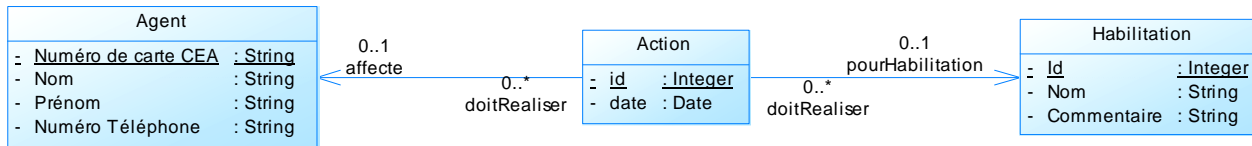
From design to business layer



Code generation



From design to persistence layer



Agent (habilitation)		
Numéro de carte CEA	VARCHAR2(6)	<pk>
Nom	VARCHAR2(16)	
Prénom	VARCHAR2(10)	
Numéro Téléphone	VARCHAR2(4)	

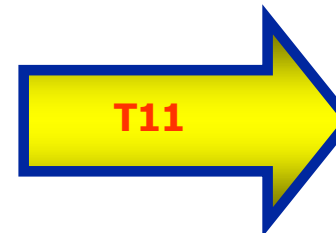
Habilitation (habilitation)		
Id	INTEGER	<pk>
id2	INTEGER	<fk1>
Id3	INTEGER	<fk2>
Nom	VARCHAR2(20)	
Commentaire	VARCHAR2(250)	

FK_T_ACTION_ACTIONPOU_T_AGENT

FK_T_ACTION_ACTIONPOU_T_HABILI

Action		
id	INTEGER	<pk>
Id2	INTEGER	<fk2>
Numéro de carte CEA	VARCHAR2(6)	<fk1>
date	DATE	

Code generation



Data base
generation
Script

Persistent
Classes

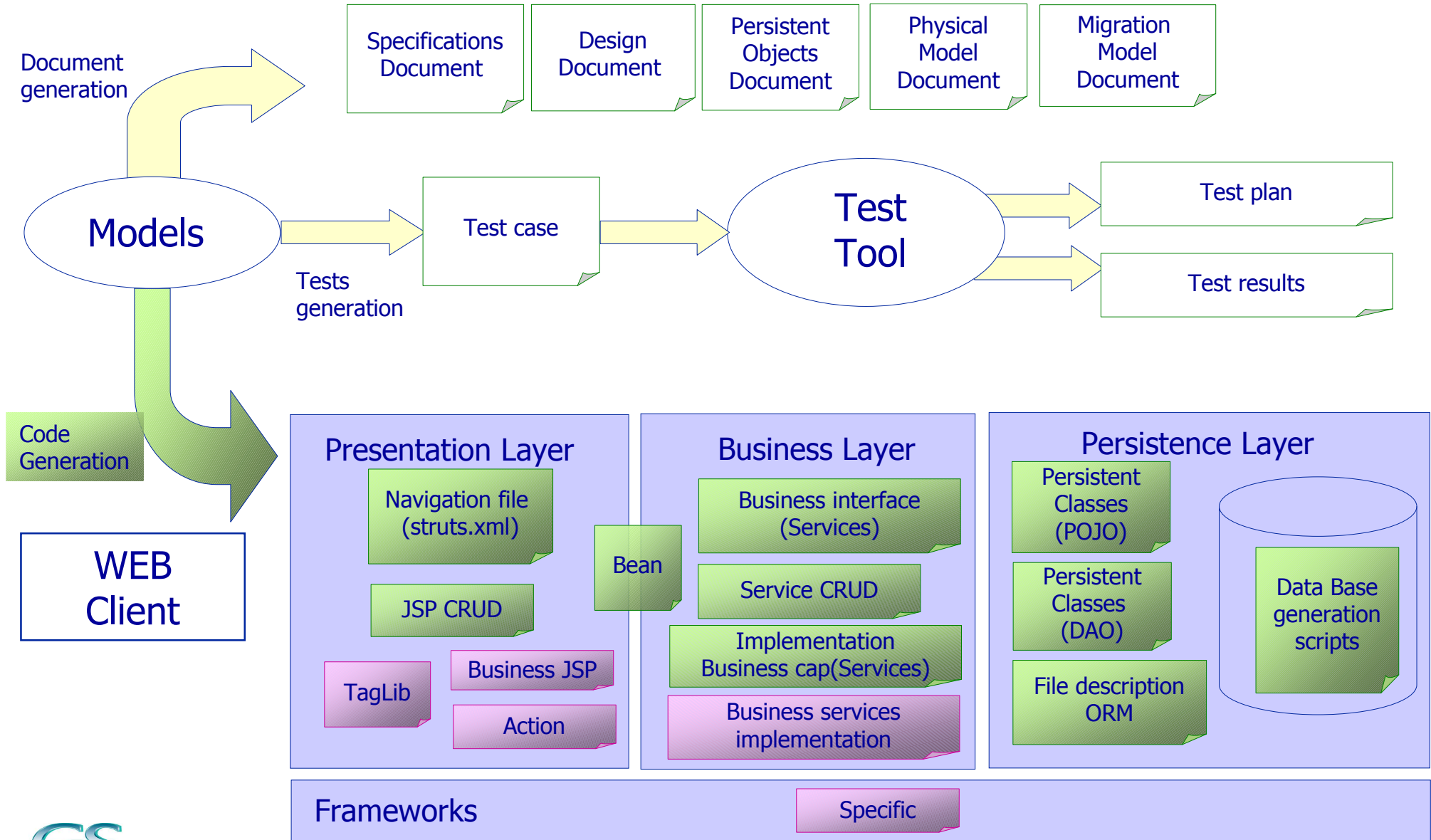
ORM
Files
description

Conclusion

- Specifications **focused on core** business aspect
- Capability to take into account **different customer technical architecture** target
- **Complete tracability** from requirements to code
- **Better reliability and maintainability**
 - Documentation and code from same model, easier impact analysis ...
- Increase **the productivity** of the development and maintenance phases
- **Help to clarify** the differences during the validation phase

Conclusion

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Feedback

- **Implications on development process**

- Work habit change
- Ratio generated code / overall code = 30%
- Specifications, Design, Code Ratios changes

	Without MDA		With MDA	
Specification	20	12%	40	30%
Design	15	9%	10	7%
Code	100	61%	60	44%
Integration	10	6%	14	10%
Validation	20	12%	11	8%
Total	165 Days	100%	135 Days	100%
Earnings			18%	
Maintenance (Bugs)	16,5	10%	8	6%
Maintenance (Evolutions)	33	20%	20	15%

UML/MDA-CS methodology



ES CRITIQUES

• Description

- CS developed the UM/MDA-CS (Model Driven Architecture initiated by Object Management Group - OMG) methodology and uses it since 2007

• Application fields

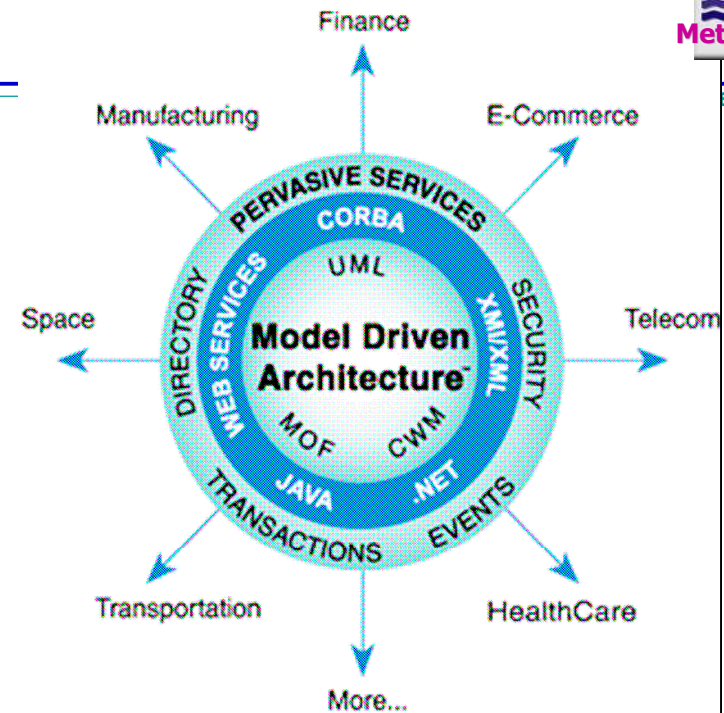
- ALL CS projects with JAVA/J2EE target

• Products

- Power AMC, Enterprise Architect, Topcased

• Benefits

- This approach allows us to optimize time and costs while improving the quality of our developments
- High level of abstraction, software development automation and target platform independence



• Major references

- Outils de gestion des déclarations de matière nucléaire (IRSN; 2000j/h)
- Centre de commandement pour la police (Ministère de l'intérieur; 1800j/h)
- PKI (CS; 1000j/h)
- SI-CH (SGDSN; 1000j/h)





Questions ?