E-Commerce Integration
Meta-Framework

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E-Commerce Integration Challenge

- Why SME-s should join the e-commerce?
  - Automation, lower cost/transaction, less manual labor, reaching new markets and partners

BUT:
The existence of many e-commerce frameworks results in increased integration issues…
The rule of the Big Partners

- **Good:**
  - For the big partners 😊

- **Bad:**
  - Forces the big partner’s view of the business on the SME-s
  - Brings to SME-s unnecessary complexity → costs

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**Diagram:**

- **SME:**
  - Process
  - Ad hoc
  - Phone + paper

- **Enterprise:**
  - RNIF
  - ebXML
  - EDI
  - Phone + paper

- **EDI Client**

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Industry Portals – web technology

- Good:
  - Don’t require extensive IT infrastructure – easy start
- Bad:
  - Don’t really address the process integration issues
The Challenge

★ The needs:
  ★ For systematic approach
    ● “integration methodology”
  ★ For standardized descriptions
    ● “integration language”

★ The expectations:
  ★ Simplify the interoperability
  ★ Reduce the adoption costs
  ★ Simplify the maintenance
E-Commerce Integration Meta-Framework (ECIMF)

- The methodology - ECIMM
  - How to discover and model the integration areas

- The language - ECIML
  - How to describe the integration logic in a precise, machine understandable way

- The tools - ECIT
  - How to prepare the integration recipes, and how to implement them
ECIMM – the methodology

3-layer approach

- Semantics:
  - Actors
  - Use cases
  - High-level business objects

- Dynamics:
  - Business processes
  - Interaction patterns
  - Transaction boundaries

- Syntax:
  - Message formats
  - Data elements
  - Transport protocols

- Alignment with UMM
  - UMM can be used in modeling of all three layers

3-level abstraction

Building blocks for the models (notation)
Integration model
Data to transform
ECIML - the modeling language

- Another profile of the standard UML?
- Re-use of already existing profiles
- The same meta-meta model
- Precise rules for serialization of models into XML
ECIT – the Toolkit

- **ECIMF Navigator**
  - Based on Open Source Conzilla tool (CID/KTH)

- **Support for ECIMF**
  - 3-layer modeling (ECIMM)
    - Presenting the corresponding concepts with different levels of details, and in different contexts
  - graphical notation
    - Presenting the integration models with extended notation
  - scripting of the integration rules
  - code generation
    - Model transformation into the ECIML recipes ("MANIFEST")

- **Other commercial tools**
  - Industry involvement should ensure support for ECIMF in the commercial integration products
    - MS BizTalk Server, HP Process Manager, others…
ECIMF Overview

Semi-automatic and manual alignment between the frameworks based on the knowledge of domain experts.

ECIMFRT deliverable

ECIMF-GM deliverable

<<framework>>
F1
Dynamics Semantics Syntax

<<framework>>
F2
Dynamics Semantics Syntax

<<factory>>
ManifestFactory
create

<<use>>
F1F2Manifold

<<use>>
MANIFEST Interface
transformSemantics
transformDynamics
transformSyntax

<<use>>
Enterprise1

<<use>>
ECIT
ECIT interprets the MANIFEST recipe and facilitates the communication between the parties, providing necessary semantic, dynamic and syntax transformations as required by the two frameworks.

<<use>>
Enterprise2

ECIMF - Open standard, open tools

ECIT - Proprietary tools, conforming to ECIMF

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Working with ECIMF

Build the model of Framework 1
- Semantics
- Dynamics
- Syntax

Build the model of Framework 2
- Semantics
- Dynamics
- Syntax

Build the integration model $F_1 \leftrightarrow F_2$
- Semantics
- Dynamics
- Syntax

Semantic Integration
Dynamics Integration
Syntax Integration

Implement the Integration using an ECIMF-compliant software toolkits, according to the MANIFEST.
Example: Procurement Integration

- Semantics: identify actors, use cases, high-level business objects
Semantics: ECIMF Navigator tool
Dynamics: processes

- Identify business processes, transactions, interaction patterns
Dynamics: process modeling (1)

The messages convey precise legal modeling and legal consequences, and each of them changes the state of both the Initiator and the Responder.
Process integration: mediation

Process mediator controls the flow of activities in both interfaces, providing necessary processing.
Syntax: data mapping

- Identify the data transformations
  - mapping between data elements in messages exchanged
  - use of external data sources
  - Security elements (encryption, signatures)

Framework 1
- PurchaseOrder
  - POHeader
    - Party (Supplier)
    - Party (Buyer)
  - POBody
    - Item ID
    - Price
    - Units
    - Total

Framework 2
- PurchaseOrder
  - Agent (Supplier)
  - Agent (Buyer)
  - Total
  - Net
  - Tax
  - PODetails
    - Item
    - Cat. No
    - Price
    - Units
    - Subtotal

Syntax: transport protocols

* Identify the transformations and configuration parameters needed on the transport protocol level
MANIFEST: the ECIML recipes

<?xml version='1.0'?>
<Manifest>
  <Process name='Procurement'>
    <Framework from='WidgetsLtd'>
      <BusinessProcessDefinition>
        ...
      </BusinessProcessDefinition>
    </Framework>
    <Framework to='ebXML'>
      <BusinessProcessDefinition location='uddi:…'/>  
    </Framework>
  </Process>
  <MappingRules>
    <SemanticMapping> … </SemanticMapping>
    <ProcessMediating> … </ProcessMediating>
    <SyntaxMapping> … </SyntaxMapping>
  </MappingRules>
</Manifest>
ECIMF-compliant toolkit

- Provides configurable software adapters and the runtime environment for execution of the integration logic
Summary

- Deliverables according to the Proposal
  - General Methodology
  - Technical Specification
  - Reference Toolkit
- Timeframe: 18 months
- Coordination and support
  - ebXML, RosettaNet, OAG, EDI, TMWG …
  - Industry representatives
  - EC FP5 KAlI and upcoming FP6