Warp 10 – Semantic Data Modeling, Mapping, and Integration Engine

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Global Ecosystem and Partner Group
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## Mapping Methodologies: Today and Tomorrow

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Effect</th>
<th>Protagonists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schema-schema Mapping</td>
<td>1:1 mapping based on existing schemas, bilateral, static</td>
<td>High integration costs, N:N interfaces,</td>
<td>System Integrators Mapping factories</td>
</tr>
<tr>
<td>Standard development</td>
<td>Community effort to agree on <strong>one</strong> common data specification</td>
<td>Not very successful, have achieved to set some common understanding, however semantic differences lead to N:N interfaces</td>
<td>Standard Bodies (EDI, RosettaNet… Today 1000 orgs)</td>
</tr>
<tr>
<td>Metadata - modeling</td>
<td>All Data definitions semantically consolidated and harmonized to one meta data structure</td>
<td>Ongoing community process, reduces number of interfaces to 1:N</td>
<td>SAP – Warp10</td>
</tr>
</tbody>
</table>
Today: Manual
Message Mapping

- Requires expensive specialists
- High error-rates
- Results hard coded
- Poorly documented proprietary transformation scripts

Manual Mapping Interface:
User must manually find match between
tens of thousands of entries

Tomorrow: Automated
Mapping Generator

- Automated guidance and
documentation based on a self learning repository
- Higher repository usage
  improves mapping accuracy

Design Time Repository automatically
suggests mappings based on most common patterns and matches

Future: LinkedIn of
Business Information

- The Repository becomes the SAP Business Network
- Easy connections to partners
- Reduces maintenance by alerting network changes

Repository will evaluate interoperability
of data structures between companies.
and enable low-cost integrations to
drive supplier network agility

As Repository grows, network effect
becomes exponentially more powerful;
integrations between SAP customers
become pervasive

System 1.
PO RosettaNet:
25,000 Nodes

System 2.
PO GDT:
13,000 Nodes

Number of choices drastically reduced
and business users able to manage
system directly – no need for a specialist
SAP WARP10 will change the paradigm of business network collaboration by reducing TCO and error rates for interconnections to internal systems and business partners.

- Automated interface creation by a self learning repository reducing manual effort for interfaces
- Creation of canonical Meta Data Structure allows simple, centralized maintenance (1:n)
- Enables easy access, plug and play collaboration for business partners,
- Deployable to both SAP and non-SAP customers
- Usable for any level of logical data model

“It’s a revolution!”

*Customer words in a Workshop about Collaboration Tools*
Positioning in the Tool Support Landscape

Business Experts

Requirement Analysis

Specification

Consolidation Harmonization

Technical Experts

Modeling & Implementation

Design Time Mapping

Run Time Mapping

Today

Hard Media Break

Future

Warp 10

Automatic Integration

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Executive Summary
Collaborative Design Time Repository to Lower Integration Cost

Organizations want to interconnect enterprise applications in order to:

- Synchronize internal applications
- Interact with partners across the value chain

However, each organization has unique information representations; to integrate requires extensive, error-prone, manual mappings

**High integration costs per interface** for specification, mapping, integration, and testing. Additional 25% for yearly maintenance.

- The **design time repository** is a canonical data model following UN/CEFACT Common Methodology principles. It contains data structures for collaborative transactions like orders, invoices, or payments
- Existing specifications from industry standards and SAP’s global data types (GDTs) will be enriched with customer-specific data structures.
- Customers and partners can get guided and automated support for specification building and mapping. The repository also serves as a documentation for all uploaded data structures.
- Warp10 is a **self learning system**. With growing content, the statistical algorithms can provide precise interface specifications and mappings.

**Enterprise Service Design Time Repository**

- **Search and Find**
  - interfaces, data types, and mappings
- **Modify and upload**
  - according to customers' business needs
- **Download and integrate**
  - tailored interfaces and transformation scripts
- **Continuous updates**
  - about changes, new interfaces, or new partners
Warp 10 Repository

- The repository is a canonical data model following the CCTS principles. It contains data structures for collaborative transactions like orders, invoices or payments.
- Pre-loaded with existing specifications from industry standards – such as ANSI X12, OAGIS, EDIFACT, RosettaNet, UBL – SAP’s GDTs, SAP IDOCs. Enriched with customer specific data.
- Based on the repository customers and partners can get guided and automated support for specification and mapping. The repository serves also as a documentation for all uploaded data structures.
- Warp10 is a self learning system. With growing content the statistical algorithms can provide precise interface specifications and mappings.
Warp 10 Architecture

Client
- Connection Layer
  - RTMF Processing
  - Generation
  - Session Layer
    - Session Beans
  - Machine Learning Layer / Reasoner
    - Optimization / Mediation
    - Semi Automatic Mapping
    - Tracking / Statistics
    - Natural Language Processing / Text Mining
    - Context Logic
  - Foundation Layer
    - CRUD Services
    - Cross Functions
    - Query / Persistence Connection
  - Persistence Layer
    - MaxDB

Presentation Layer
- Web Browser
- Eclipse Plugin

Server
- Any structured Schema (different Formats, B2B Standards)
- Context specific extraction of tailored:
  - XML Schemas / WSDL
  - Transformation Scripts (XSLT)
  - OWL / RDF
  - XMI/UML Profiles
- Context Logic

Client
- ByD
- NW

Server
- Ontology Foundation
- Dictionary’s / Libraries
- Acronyms / Abbreviations
- Synonyms / Homonyms

Client / Server
- Galaxy

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Integration in SAP Architecture

Tight connection with Metadata Repository (MDRS) for integration of physical data models
- Consistent, reusable and homogeneous use by Business Suite and Business by Design

Direct connection to NW PI for integration of any mapping

Process of data modeling & integration:

Current:
- Isolated projects
- Manual handover
- Different tools
- No/weak loop back of findings or further requirements

With Warp 10:
- Collaborative work on projects
- Common use and understanding of data models
- Smooth and integrated handover between process steps
- Automatic loop back with automatic learning curve

Efforts:

Business Experts:
- Requirements & Analysis
- Definition Specification
- Review & Harmonization
- Implementation

Technical Experts:
- Mapping
- Testing

Warp 10 Handler:
- Machine Learning
- Social Networking
- Automatic calculation of ontology (canonical format)
The effects of Warp10 can be found across all A2A and B2B Interfaces

**EFFECTS**

- Interface documentation will be automated
- Documentation has standard format + high quality
- Accessible, not proprietary

- Semi-automated interface development
- Self learning system
- Reduction of interfaces from n:n to 1:n
- Harmonization and Standardization

- Design time repository allows flexible adjustments
- Automated download of transformation scripts to specific EDI/XML or SAP definitions
- Potential alert function for business partners

- Design time repository accessible internally but also by business partners or sourcing provider
- Basis for runtime services (e.g. NetWeaver/PI)

**IMPLICATIONS**

- Improve quality
- Reduce documentation costs

- Reduce interface creation and testing effort
- Reduce mapping cost due to learning system suggestions

- Reduce maintenance costs
- Automated mapping to known standard structures
- Reduce error rate

- Specifications drive development of a de facto standard
- Flexible use of different runtimes
3. Presentation of WARP 10 at Work

Creating Successful Multi-Enterprise Business Networks
12/08/08 - Successfully mapped: UN/EDIFACT D.08A
12/08/08 - New member: Audi
11/08/08 - New defined: Message type: „Direct Debit. Notification”
11/08/08 - New defined: Data type: „Processing. Details”
10/08/08 - New member: Adidas
10/08/08 - New member: Progress Werk

**Updates in Your Business Partners**

<table>
<thead>
<tr>
<th>Date</th>
<th>Bus. Partner</th>
<th>Message / Data Type</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/08</td>
<td>BMW AG</td>
<td>Manufacturer. Party. ...</td>
<td>Element added</td>
<td>☢☢☢</td>
</tr>
<tr>
<td>12/08</td>
<td>BMW AG</td>
<td>Seller. Party. ...</td>
<td>Element deleted</td>
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<td>Daimler AG</td>
<td>Purchase. Order. Request.</td>
<td>Element changed</td>
<td>☢☢</td>
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<tr>
<td>11/08</td>
<td>Dunlop</td>
<td>Invoice. Response</td>
<td>Element changed</td>
<td>☢☢</td>
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<tr>
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<tr>
<td>11/08</td>
<td>Deutsche Bank</td>
<td>Devery. Schedule. D...</td>
<td>Element name ...</td>
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<tr>
<td>11/08</td>
<td>BMW AG</td>
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<td>Code added</td>
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<tr>
<td>10/08</td>
<td>Continental</td>
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<td>10/08</td>
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<td>Transport. Details</td>
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</table>

**Updates in Your Groups**

<table>
<thead>
<tr>
<th>Date</th>
<th>Group</th>
<th>Message / Data Type</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/08</td>
<td>Automotive</td>
<td>Delivery. Party. Details</td>
<td>Element name changed</td>
<td>☢☢</td>
</tr>
<tr>
<td>12/08</td>
<td>Sales Order</td>
<td>Schedule. Line. Details</td>
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</tr>
<tr>
<td>12/08</td>
<td>Sales Order</td>
<td>Product. Line Item. D...</td>
<td>Element added</td>
<td>☢☢</td>
</tr>
<tr>
<td>11/08</td>
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</tr>
<tr>
<td>11/08</td>
<td>Manufacturing</td>
<td>Delivery. Location. D...</td>
<td>Element descri...</td>
<td>☢☢</td>
</tr>
<tr>
<td>11/08</td>
<td>Sales Order</td>
<td>Sales. Order. Request</td>
<td>Element name ...</td>
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</tr>
<tr>
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<tr>
<td>10/08</td>
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<td>Tax. Details</td>
<td>Code deleted</td>
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</tr>
<tr>
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<td>Automotive</td>
<td>Transport. Details</td>
<td>Element added</td>
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</table>
This demo shows how you can select an interface such as a Purchase Order that may fit to a specific business need in a given context.
This demo shows how to extend and restrict an existing model in the repository.
This demo illustrates how Tailored Syntax Interfaces can be automatically generated.

- Canonical XML Schema follow the international standard "UN/CEFACT XML Naming and Design Rules".

- Supports other XML NDR expressions – OAGIS BODS, UBL Schema, RosettaNet PIPs

- Supports other technical syntax representations such as XMI, RDBMS, Java-Classes, OWL, etc.

- All of these technical structures will have exactly the same representation of the business semantics, which helps to decrease the integration efforts significantly.
This demo illustrates the automatic mappings of other B2B schemas with the CCTS based canonical format by just clicking one button.

It gives also an brief overview, how transformation scripts (XSLT) between already mapped B2B interfaces can be automatically generated.
This demo illustrates how the Warp 10 generated XML schemas and transformation scripts (XSLT) can be uploaded and activated in NW Enterprise Service Repository (ESR).
Summary

• WARP 10 is next generation Semantics based Data Modeling, Mapping and Integration Tool

• Uses UN/CEFACT Common Methodology Standards Stack

• Will be fully Integrated with SAP Suites

• Will be usable by non-SAP customers

• SDO’s will have access and use rights for maintaining their B2B standards
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