PLM Services Standardization - A Leap forward in Product Data Communication

Lutz Lämmer, Max Ungerer, PROSTEP AG
Matthias Grau, PROSTEP ITS GmbH
1. PROSTEP AG and ProSTEP iViP Overview
2. OMG Standard PLM Services
3. Implementation of the PLM Services
PROSTEP AG Overview
We are...

• a product-independent service provider with a complete range of services in the field of Product Data Integration for manufacturers and suppliers.

• A vendor of complete solutions in the product data exchange sector.

in the business areas ...
PROSTEP AG Today

- 1993 founding of ProSTEP Produktdatentechnologie GmbH
- Company based in Darmstadt
- Offices in Berlin, Hanover, Munich & Stuttgart
- 2001 change of corporate form (PROSTEP AG)
- Currently 180 employees
- Sales in fiscal 2003: € 15,5 Mio.
- Stockholders:
PROSTEP Organization

ProSTEP Association

Responsible for:
- Standardization
- Organization and Implementation
- Worldwide Cooperation Management (VDA, PDES,...)

PROSTEP AG

Responsible for:
- Market penetration
- Product development
- Service solutions

www.prostep.org

www.prostep.com
ProSTEP Association
Members worldwide

Industry (Users)

- Techno-Chemie Kessler & Co. GmbH
- Tecoplan Informatik GmbH
- Teceplan Informatik GmbH
- Thyssen Industrie AG Maschinenbau
- Thyssen Umformtechnik + Guß GmbH
- TNO Bouw
- Tower Automotive GmbH & Co. KG
- TRW Automotive Safety Systems GmbH & Co. KG
- TRW Fahrwerkssysteme GmbH u. Co. KG
- TRW Occupant Restraint Systems GmbH
- T1-Systems
- TU Braunschweig - Institut für Regelungs- und Automatisierungstechnik
- TU Chemnitz - Institut für Regelungs- und Automatisierungstechnik
- TÜ V Gesellschaft für Technische Inspektion e. V.

IT Companies (System Vendors)

- PTC GmbH
- PDEtec GmbH
- PlanetCAD
- Takata-Petri AG
- Pgam Industrial Engineering GmbH
- Phoenix AG
- Pallas Technik Wroclawsk
- Porsche Engineering Services GmbH
- Preh-Werke GmbH & Co. KG
- ProSTEP GmbH
- Recticel Belgium
- Rheinmetall Informationssysteme GmbH
- REL International
- Robert Bosch GmbH
- Rücker GmbH
- SAAB Automobile AB
- SAC Automotive SAL GmbH
- SAP AG
- Scanit AB
- SDRC Software & Service GmbH
- Seiber GmbH
- Saint-Gobain Sekurit GmbH & Co. KG
- Siemens AG
- SMS Schoenemann-Siemag AG
- Software GmbH
- Softlab GmbH
- Steyr-Daimler-Puch Fahrzeugtechnik AG & Co. KG
- SupplyOn AG
- Tata Engineering & Locomotive Co. Ltd.
- Tekom Telematik-Systeme GmbH
- Tennecor GmbH
- Ten testing GmbH
- Texo Software GmbH
- Thyssen Umformtechnik + Guß GmbH
- TNO Bouw

Universities, Associations

- KET Karosserie Entwicklung Thueringen GmbH
- Kiekert AG
- 3K-Werner Turbo Systems GmbH
- KNORR-BREMSE GmbH
- KTH, Woxen Centre
- KUKA Schweisstechnik GmbH
- KUKA Werkzeugbau GmbH
- Leopold Kostal GmbH & C. KG
- Liebherr-Hydraulikbagger GmbH
- Lisa Dräxlmaier GmbH
- LKSoftware GmbH
- Lucas Automotive GmbH
- Lunke & Sohn AG
- MAN AG
- MAN B&W Diesel A/S
- MAN Nutechnologie AG
- MAN Roland Druckmaschinen AG
- MAN Turbosysteme AG
- Matra Datavision
- Matrix One GmbH
- Meta Motoren- und Energie-Technik GmbH
- Modine Europe GmbH
- Montaplast GmbH
- Möller IT GmbH
- MSCI Software GmbH
- MSG Mahle Service GmbH
- MTU Friedrichshafen GmbH
- MTU München GmbH
- Münchener Gummibau GmbH
- Nexolab GmbH
- Nikon Unisys, Ltd.
- Nissan European Technology Centre Ltd.
- Nord Micro AG
- OVE Arup & Partners
- PTC Deutschland GmbH
- PDEtec GmbH
- PlanetCAD
- Takata-Petri AG
- Pgam Industrial Engineering GmbH
- Phoenix AG
- Pallas Technik Wroclawsk
- Porsche Engineering Services GmbH
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Our Services

Technical Working Program

Standardization
Implementor Forums
Project Groups

Benchmarks

Public Relations

Personal Benefits
Standardization

Protection of investment through continuous optimization and enhancement of standards

• Maintenance

  **Scope:** AP214, AP212, Part28, ISO 10303

  Participants: EPM Technology, PDTec, T-Systems, Scania, TU Darmstadt, UNIMEP

• Extended Product Data Integration (XPDI)

  **Scope:** PDTnet/ISO10303-based online collaboration

  **Achievements:**

  Specification of OMG WEB services standards - 
  **Product Lifecycle Management Services**, Version 1.1

  Participants: BMW, Bosch, ContiTemic, DaimlerChrysler, Keiper, PartMaster, PDTec, PROSTEP AG, Scania, T-Systems, Volkswagen
2. OMG Standard PLM Services
Objectives of ProSTEP iViP XPDI

- Define a Platform Independent Reference Model for Product Lifecycle Services
- Extend and revise the PDM Enablers as a MDA specification
- Linking that PIM with the STEP Information Model
- Supporting compatible implementations on multiple platforms
- Standardizing a WebServices binding based on the PDTnet Schema
PLM Services - Bringing STEP to the Web

Partner 1

Online Collaboration
XML/SOAP

Partner 2

Asynchronous
STEP file based

System synchronisation

PLM services

PDM system

WT LCA VPM CMS

PLM services

Web-Services

PLM Services Schema

IMAN CPI

Asynchronous

Web-Services

PLM services

PDM system
Architecture of PLM-Services

Prerequisites for development of Web Services

- Step AP 214 CC8/AIM (EXPRESS)
- PDTnet Use Cases PDM Enablers

Total specification
- models
- implementation description
- Mapping

Functional description
- Basic Use Cases, UML

Platform independent model (PIM)

- Informational PIM (UML)
- Computational PIM (UML)

Data description Based on STEP AP214 and UML

System specific implementation, e.g. XML Schema and WSDL

Platform Specific Model PSM, XML, J2EE, CORBA

Basic model for data description (AP 214 AIM)
Road map and milestones

Task Force

TF

RFP

April 2004

Evaluation & Revision of submission by TF

Final AB Review & Approval

April 2005

Finalization

Board of Directors Approval

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References and Background Information

- Download on

- Download of PLM Services Specification
  - PLM Services 1.0 Final Adopted Specification
  - PLM Services (WSDL specification)
  - PLM Informational Model (XML Schema)
  - PLM Computational Model (XML Schema)
  - PDTnet Queries (XML Schema)

- Presentation concerned with PLM Services

- PLM Services Reference Implementation
3.

Implementation of the PLM Services
Implementations

- ProSTEP iViP Reference Implementation
  - Client and server software
    - PartMaster
    - PROSTEP

- Bosch and Keiper
  - PLM services as their internal company PDM data model. Delphi Automotive and BMW
  - Evaluation of PLM Services within collaboration scenarios for Engineering Change management

- DaimlerChrysler
  - Use PLM Services for their inhouse communication backbone

- PROSTEP AG
  - OpenPDM is based on PLM services
  - Together with IBM the integration of this product into the WebSphere
OpenPDM® supports the integration of company and partner processes and uses web services to realise flexible *event-oriented* engineering scenarios.

**Role-based user interfaces**

**Integrated business scenarios**

**Specialized development tasks**
OpenPDM® Modules
OpenPDM Reference Model

ISO STEP AP214 / OMG PLM Services

OpenPDM® Reference Model

Product structure data

Administrative data

Document data

Windchill

mySAP PLM

Team-Center

Agile

SmarTeam

ENOVIA VPM

OpenPDM Client

eMatrix

Windchill

Pro/INTRALINK
Applicability of OpenPDM®

1 Enterprise PLM Integration
Applicability of OpenPDM®

1 Enterprise PLM Integration

OEM 1st Tier

2 Supplier OEM Bridge

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Applicability of OpenPDM®

3 Supplier Portal for OEM and Supplier