INF5120 and INF9120
”Modelbased System development”

Lecture 1: 19.01.2015
Arne-Jørgen Berre

arineb@ifi.uio.no and Arne.J.Berre@sintef.no
Welcome to INF5120 and INF9120 “Model based System development”

- Model based System Development
  - [http://www.uio.no/studier/emner/matnat/ifi/INF5120/](http://www.uio.no/studier/emner/matnat/ifi/INF5120/)

- Lecturers:
  - Arne-Jørgen Berre
  - Guest lecturers
  - Email: inf5120-forelesere@ifi.uio.no

- Teaching Assistants responsible for Obligatory exercises:
  - Sijan Gurung, Hanieh Ali Bakhish, Mozhgan Pourabedin Islami
  - Extra support: Shazad Karamat, Yannick Lew
  - Email: inf5120-oppgaver@ifi.uio.no
3 parts of the course

- BAE (Business architecture engineering and Requirements models, with service innovation and design)

- SAE (System and Software Architecture Engineering - Model Driven system architecture and realisation)

- MDE (Model Driven Engineering) – Design of domain specific languages and editors
INF5120 - Lecture plan - 2015

1 (19/1): Introduction – MDA principles, class models, EA, BAE, SAE, MDE
2 (26/1): BAE-1: BM, VDML, BMC/VPC,– Strategyzer, Oblig 1&2 intro, establish groups
   Guest lecture, Prof. Peter Lindgren, Aarhus University, Sensing Business Model
3: (2/2): MDE-1 Method Engineering, Essence – Symphonical
5 (16/2): BAE-3: Service Design – Smaply
   Guest lecture, Ragnhild Halvorsrud, SINTEF, Visual Service Design language
6 (23/2): BAE-4: User experience and UI Design – Balsamiq
7 (2/3): BAE-5: Agile user stories and use cases – Symphonical/MD&Cameo
8 (9/3): SAE-1 IFML and Webratio and Mobile App development, Oblig 2 intro
9 (16/3): SAE-2 Domain/information modeling – more IFML – Server development Oblig 1 delivery and presentations
10(23/3): MDE-2 Metamodels, EMF
EASTER
11(13/4): MDE-3 Graphical Editors – Sirius Oblig 2 delivery and presentations
12(20/4): MDE-4 Model transformations
13(27/4): SAE-3 Non functional requirements
14(4/5): SAE-4 Service modeling - Oblig 3 delivery and presentations
15(11/5): MDE-5: EA and DSL examples – future MDE
16(18/5): Conclusion – preparation for the exam
Course components

"SenseIT"
3 OBLIGS

Business Architecture Engineering (BAE)-1
Software/System Architecture Engineering (SAE)-2

Model Driven Engineering (MDE)-3
Course parts

- **Business Architecture Engineering**
  - **BAE-1 (26/1):** Business Architecture – Business Model Canvas - Strategyzer tool.
  - **BAE-2:** (9/2) BA and BPMN process, VDML and BMC with Strategyzer, MagicDraw
  - **BAE-3 (16/2):** Service Innovation and Service Design, AT ONE, Smaply - Customer Journey
  - **BAE-4:** (23/2): User experience and Touchpoints/UI Design – Balsamiq/WebRatio
  - **BAE-5:** (2/3): Agile User stories and Use cases 2.0, Backlog, with MD/Symphonical o.a.

- **System/Software Architecture Engineering**
  - **SAE-1 (9/3):** IFML and WebRatio for Mobile App development
  - **SAE-2 (13/4):** Domain/Information/Ontology modeling, UML, ISO 19103
  - **SAE-3 (27/4):** Non Functional requirements – OCL and PLanguage
  - **SAE-4 (4/5):** UML Service Modeling, ServiceML,SoaML, UML 2.0 Composition, MagicDraw

- **Model Driven Engineering**
  - **MDE-1 (2/2):** Method Engineering, SPEM/EPF, ISO 24744, ESSENCE - Symphonical, IJI
  - **MDE-2 (23/3):** Model driven engineering – Metamodels, DSL, UML Profiles, EMF
  - **MDE-3 (13/4):** DSLs – Graphical and Lexical Editors, Eclipse Sirius etc.
  - **MDE-4 (20/4):** Model driven engineering, transformation technologies, MOFScript, ATL
  - **MDE-5 (11/5):** Enterprise Architecture, TOGAF, UPDM, SysML – DSLs etc.
INF5120 - Tools- 2015

- **Enterprise Architecture** –
  - No Magic – Cameo Enterprise Architecture MagicDraw

- **Business Architecture and Requirements Engineering**
  - Business Model Canvas – Strategyzer.com
  - Service AT ONE method/workshop – with Smaply.com for Service Design
  - Value Networks/VDML
  - Balsamiq
  - WebRatio
  - Agile User stories versus Use cases – Agile JIRA, Symphonical
  - Business-SoaML, Requirements Modeling, Goal Modeling, BMM, and Non Functional requirements

- **Model driven engineering**
  - Model-Driven Software Engineering in Practice (Brambilla & al)
  - ESSENCE book
  - Eclipse EMF og Graphiti
  - Model driven engineering, transformation technologies (M2M, M2T)
  - MDE and DSL in practice, with ThingML and CloudML

- **System Architecture and Service Engineering**
  - SoaML, UML 2.0 Service composition, ISO 19119 MagicDraw
  - System Architecture and Information/Ontology modeling, UML, ISO 19103
  - UI Models, WebML and IFML, Process models (WebRatio, Cordys Cloud)
  - System realisation models – WebRatio, JEE), MDA-ADM, SBVR, MDI
  - Platform models for the Cloud, with CloudML
Obligs

- Partially individual, partially group - in 3 parts

- Oblig 1 and 2 "SenseIT" – your "own" company to develop web and mobile app services with Bluetooth connected UV sensor for Sun protection – will be presented in more detail on January 26th
Course literature – available on web

- Material from all lectures and OBLIG 1, 2 and 3.
- Some selected articles and documents, and subset of standard documents from OMG - will be updated
- Web site for practices: Inf5120.modelbased.net

- **Practical use of tools for OBLIGs**
- MagigDraw – with No Magic Cameo Enterprise Architect (extended version of MagicDraw)
- WebRatio - [http://www.webratio.com](http://www.webratio.com)

- IFML - [http://www.ifml.org/](http://www.ifml.org/)
- SoaML - [www.soaml.org](http://www.soaml.org)
**Main Description**

**INF5120 Methodology** (release 1.0)  
[http://INF5120.modelbased.net](http://INF5120.modelbased.net)

**About**

The INF5120 Methodology provides practices that contain guidelines for service innovation, business model innovation, business motivation modelling, business process networked enterprises. The methodology adopts an OMG Model Driven Architecture (MDA) approach to software development and prescribes a set of model artefacts (BPMN) and Service oriented architecture Modelling Language (SoaML) that are used in the development of service-oriented solutions. In particular, the methodology service-oriented solutions from both a business and an IT perspective. The methodology also adopts the Scrum practice for project management and includes some w

**Navigation**

You can navigate the methodology website from different perspectives by using the links below or by using the tree browser on the left.

- Getting Started
- Delivery Processes
- Practices
- Role sets
- Work Products
- Tasks

**Practices**

The INF5120 Methodology is a collection of practices. The table below shows the practices categorized according to disciplines.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Practices</th>
</tr>
</thead>
</table>
| Networked business value analysis and innovation | • Service innovation  
• Business model innovation |
| Networked process and service modelling | • Business motivation modelling  
• Business process modelling |
| Requirements engineering                | • User story  
• Use case modelling |
| Software architecture                  | • Services architecture and contract modelling  
• Service interface and component modelling |
| Testing                                 | • Concurrent testing  
• Test Driven Development |
| Project management                      | • Scrum |
UML 2.0

- UML 2.0 and SysML Background and Reference material
- See www.uml-forum.com/specs.htm

- Also at OMG:
  - http://www.omg.org/uml/ (UML)
  - http://www.omg.org/mda/ (MDA)
  - http://www.omg.org/cwm/ (MOF, XMI, CWM)
UML 2.0 recommended books:

UML 2.0 in a Nutshell
by Dan Pilone (Author), Neil Pitman (Author)

The Unified Modeling Language User Guide
(G. Booch, J. Rumbaugh, Jacobsson)
Book on Model-Based system development

- Model-Driven Software Engineering in Practice
- ISBN 978-1-60845-882-0
- 2012, 166 pages
- Marco Brambilla, Jordi Cabot and Manuel Wimmer
IFML – for Model Driven Mobile Apps
Supporting literature

- Book: *Model-Driven Software Development: Technology, Engineering, Management (Paperback)*
  by Thomas Stahl, Markus Voelter, Krzysztof Czarnecki

- Engineering Service Oriented Systems: A Model Driven Approach, Karakostas, Bill; Zorgios, Yannis
  Cover: Hardcover
  April 2008
DSL Engineering

- Markus Voelter
Supporting literature – EMF and GMF

  - **Dave Steinberg** (Author), **Frank Budinsky** (Author), **Marcelo Paternostro** (Author), **Ed Merks** (Author)

- Book: Eclipse Modeling Project: A Domain-Specific Language (DSL) Toolkit (Paperback)
  - **Richard C. Gronback**
> 1 million copies sold

30 languages
Value Proposition Design

By Alex Osterwalder, Yves Pigneur, Greg Bernarda, & Alan Smith
Designed by Trish Papadakos

You're holding more than a book, it's the first step to design, test and deliver what really matters for your customers.

Strategyzer

From the team behind Business Model Generation, the global bestseller of over 1 million copies in 30+ languages.

October, 2014
Value Network Analysis

http://www.valuenetworksandcollaboration.com
Open Services Innovation

Book:
January 2011
Service Innovation

Authors:
Marc Stickdorn,
Jakob Schneider
Software engineering practices and methods

- modelbased.net
- practices.modelbased.net

- A practices framework, SEMAT,  www.semat.org
The Essence of Software Engineering
Applying the SEMAT Kernel

Rough Cuts

Ivar Jacobson
Ng Pan-Wei
Paul McMahon
Ian Spence
Svante Lidman
The Kernel is described using a small subset of the Language.

A stripped-down, lightweight set of definitions that captures the essence of effective, scalable software engineering in a practice independent way.
Alphas: The Essential Things to Work With
Alphas: Example

Requirements

Description
What the software system must do to address the opportunity and satisfy the stakeholders.
It is important to discover what is needed from the software system, share this understanding among the stakeholders and the team members, and use it to drive the development and testing of the new system.

Associations
scopes and constrains: Work

- Conceived
- Bounded
- Coherent
- Acceptable
- Addressed
- Fulfilled

- The need for a new system has been agreed.
- The purpose and theme of the new system are clear.
- The requirements provide a coherent description of the essential characteristics of the new system.
- The requirements describe a system that is acceptable to the stakeholders.
- Enough of the requirements have been addressed to satisfy the need for a new system in a way that is acceptable to the stakeholders.
- The requirements that have been addressed fully satisfy the need for a new system.
Activity Spaces: The Essential Things to Do

- Explore Possibilities
- Understand Stakeholder Needs
- Ensure Stakeholder Satisfaction
- Use the System

- Understand the Requirements
- Shape the System
- Implement the System
- Test the System
- Deploy the System
- Operate the System

- Prepare to do the Work
- Coordinate Activity
- Support the Team
- Track Progress
- Stop the Work
Update to the course in 2015

- We will start with a focus on enterprise architecture and business architecture and service innovation and business process modeling, illustrated with various new modeling tools.

- In part two we will focus on practical model driven software development of Mobile Apps with Bluetooth connected sensors – using IFML and WebRatio and System Architectures - with UML and UML profiles and with the transformations to mobile platforms, in particular for Android Smart phones and web apps.

- The third part will focus on the creation of Model Driven Engineering tools – i.e. to make a graphical editor with transformation possibilities.
New content started in 2012, continued in 2015

- Continued focus on “Service Science” – with Service Innovation (with BI/NHH), Service Design (OAH) and Service Engineering (UIO)

- VNA – Value Network Analysis, Verna Allee
- New standard: OMG MDA standard: VDML, ESSENCE
- Service Design: AT ONE
- Business Model Innovation: Osterwalder/Lindgren
Requirements for the course

- Student at UIO

- Only assumption is basic knowledge of UML and Java (but not necessarily UML 2.0)

- Links to other courses on software engineering, user interaction etc.
Exam

- Case-based (ref. earlier exams)
- All written material can be used

- 4 hours

- Monday June 1\textsuperscript{st}, 2015
OMG Model-Driven Architecture (MDA)

www.omg.org/mda
Automation in Software Development

1. **Requirements**
   - Manually implement
   - Source in a general-purpose language, e.g., Java or C++
     - Compile
     - Implementation

2. **Requirements**
   - Manually implement
   - Source in domain-specific language (DSL)
     - Compile
     - Implementation
     - (may generate code in Java or C++)

3. **Requirements**
   - Manually implement
   - High-level spec (functional and nonfunctional)
     - Implement with Interactive, automated support
     - Source in domain-specific language (DSL)
       - Compile
       - Implementation
       - (may generate code in Java or C++)

(Sources: [Telecom and Informatics](#))
MDA CIM, PIM and PSM/Code

**Computational Independent Model**
- **CIM**
  - ATL

**Platform Independent Model**
- **PIM**
  - MOFScript
  - ADM

**Platform Specific Model/Code**
- **PSM**
  - ADM
  - BPEL, WSDL, XML, XPDL, OWL-S, WSML, WSDL-S

**MDA CIM, PIM and PSM/Code**

- BPMN, POP*, ARIS, ArchiMate, GERAM, GRAI, Zachman, UEML, B.Rules
- BPDM, SBVR, EDOC, UPMS, PIM4SOA, ODM
- UML profiles and metamodels for Java JEE, BPEL, WSDL, XML, XPDL, OWL-S, WSML, WSDL-S
- Code, **Java JEE**, ....
Which OMG modeling standards will you learn?

- UML 2.0 – what is new in version 2
- VDML – Value Delivery Modeling Language – with VNA
- SoaML – SOA Modeling Language
- MDA – Model Driven Architecture
- BPMN 2.0 – Business Process Modeling Notation
- BMM _ Business Motivation Model
- SysML – Systems Engineering Modeling Language
- Essence – Software Engineering Framework
- SPEM – Software Process Engineering Metamodel
- QVT, MOF2Text – Query, View, Transformation
Which tools/environments will you learn?

- Agile team support - Symphonical
- BMI – Business Model Innovation/Generation - Strategyzer
- Balsamiq – UI Mockups – for further UI modeling
- UML and BPMN modeling tools - MagicDraw
- AT ONE – Service Design – use of Smaply
- VNA – Value Network Analysis
- MagicDraw with UML and BPMN
- WebRatio - IFML for Web and Mobile Apps
- Eclipse EMF and XMI, Principles of GMF
- Sirius for Eclipse
- EPF/SPEM Software Process Modeler
- Overview of ATL, MOFScript, KerMeta, OpenArchitectureWare-OAW, …
WebRatio

The New Business-IT Equation

Develop Web and Mobile applications quickly and easily - built to last!

Learn more

Boost productivity
WebRatio Platform allows Business Users and Developers to collaborate for better results. Shorter time to market, greater agility, dramatically lower maintenance costs – Results in just 1 hour!
See how WebRatio Platform can help

Focus on innovation
WebRatio Platform empowers your development teams to focus on innovation and creativity. Repetitive tasks are managed by the platform.
Discover WebRatio Platform’s features

Build long-lasting solutions
WebRatio Platform delivers scalable, industry standard-based solutions both On-Premises or in the Cloud. Applications are built both to evolve and to last.
See how WebRatio Platform works

Telecom and Informatics

SINTEF
Underlying technologies
Mobile App Architecture

PhoneGap Application Container

App
- HTML
- CSS
- JavaScript
- Resources

HTML Rendering Engine (WebView)

PhoneGap Plug-ins
- Accelerometer
- Camera
- Compass
- Contacts
- File
- Geolocation
- Media
- Network
- Notification
- Storage
- Custom Plug-ins

OS API’s
- Services
- Sensor
- Input
- Graphic

Mobile OS

HTML API’s

PhoneGap JavaScript API’s
Sirius
Sirius

The easiest way to get your own Modeling Tool

Visual  Declarative  Easy

Sirius 2.0 has been released!

WHAT'S NEW  TRY IT NOW
What is Enterprise Modelling?

Enterprise Modelling (EM) is a capability for externalising, making and sharing enterprise knowledge.

EM tools can either be:
• used stand-alone to produce various kinds of model views,
• integrated as front-ends to other systems,
• part of an environment providing a contextual user-environment.
Why Enterprise Architecture?

- How can I involve my people in improving the performance of the business?
- How can I use best practices to ensure the success of the business?
- How can I ensure that the IS technology helps the work of my people?
Representations of Architecture

ARIS

ZACHMAN

GERAM

EN/ISO 19439

Athena OEA

NIST
Three Views in DOD Architecture Framework and C4ISR-AF

**Operational View**
- Identifies What Needs to be Accomplished and Who Does It
  - Operational Requirements
  - Basic Technology
  - New Technical Capabilities

**Systems View**
- Relates Systems and Characteristics to Operational Needs
  - Specific System Capabilities Required to Satisfy Information Exchanges

**Technical Standards View**
- Prescribes Standards and Conventions
  - Technical Standards Criteria Governing Interoperable Implementation/Procurement of the Selected System Capabilities
### Zachman Framework – for Enterprise Architecture (IBM, 1987)

<table>
<thead>
<tr>
<th>VA Enterprise Architecture</th>
<th>DATA</th>
<th>FUNCTION</th>
<th>NETWORK</th>
<th>PEOPLE</th>
<th>TIME</th>
<th>MOTIVATION</th>
<th>Based on work by John A. Zachman</th>
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<tbody>
<tr>
<td>SCOPE (CONTEXTUAL)</td>
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</table>

**Examples:**
- **DATA**
  - What = Things Important to the Business
  - Where = Business Locations
  - Rel = Business Entity = Class of Business Thing

- **FUNCTION**
  - How = Processes Performed
  - Where = Business Locations
  - Rel = Function = Class of Business Process

- **NETWORK**
  - How = Business Logistics System
  - Where = Business Location
  - Rel = Link = Business Linkage

- **PEOPLE**
  - Who = Important Organizations
  - Rel = People = Major Organizations

- **TIME**
  - When = Events Significant to the Business
  - Rel = Time = Major Business Event

- **MOTIVATION**
  - Why = Business Goals and Strategy
  - Rel = Ends/Means = Major Business Goals

*Based on work by John A. Zachman*
IT/Business architecture transformation
BA Guild Model

- Stakeholders
- Capabilities
- Vision, Strategies & Tactics
- Organization
- Information
- Value Streams
- Initiatives & Projects
- Products & Services
- Policies, Rules, Regulations
- Metrics & Measures
- Decisions & Events

Questions:
- What?
- Why?
- Who? & Where?
- How?
- How Well?
TOGAF Content Metamodel
Meta model
Enterprise Architecture and Enterprise Engineering

Enterprise Architecture
- Business Architecture
- Systems Architecture (System of systems)
  - Software
  - Hardware

Future Essence-B ?
Enterprise Engineering
- Essence now!
- Future Essence-H?
- Future Essence-S
UPDM RFC - Domain Meta Model Summary

[Diagram of the UPDM RFC - Domain Meta Model Summary, showing various layers and products such as TV, AV, Ov, SOV, and SV.]
# Zachman with OMG standards

<table>
<thead>
<tr>
<th>Scope (Contexts)</th>
<th>Data (What)</th>
<th>Function (How)</th>
<th>Network (Where)</th>
<th>People (Who)</th>
<th>Time (When)</th>
<th>Motivation (Why)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>List of things important to business SBVR</td>
<td>List of processes that the business performs VDM</td>
<td>List of locations which the business operates VDM</td>
<td>List of organizations important to the business OSM</td>
<td>List of events/cycles important to the business DTFV</td>
<td>List of business goals/strategies BMM</td>
</tr>
<tr>
<td>Technology (Physics)</td>
<td>Physical Data Model IMM (CWM), UML</td>
<td>System Design SoaML, UML</td>
<td>Technology Architecture SoaML, UML</td>
<td>Presentation Architecture</td>
<td>Control Structure BPMN, CMPM, DTFV</td>
<td>Rule Design SBVR</td>
</tr>
<tr>
<td>Component (Assemblies)</td>
<td>Data Definition IMM (CWM), UML</td>
<td>Program UML</td>
<td>Network Architecture UML</td>
<td>Security Architecture</td>
<td>Timing Definition DTFV</td>
<td>Rule Definition SBVR</td>
</tr>
<tr>
<td>Operation (Instances)</td>
<td>Data</td>
<td>Function</td>
<td>Network</td>
<td>Organization</td>
<td>Schedule</td>
<td>Strategy</td>
</tr>
</tbody>
</table>

**Telecom and Informatics**

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**SINTEF**
OMG standards coverage

- **Data** (What)
- **Function** (How)
- **Network** (Where)
- **People** (Who)
- **Time** (When)
- **Motivation** (Why)

**Scope** (Contexts)
- SBVR
- VDM
- OSM
- BMM

**Business** (Concepts)
- ODM
- BPMN
- CMPM
- SBVR

**System** (Logic)
- IMM (CWM)
- SoaML
- UML
- DTFV

**Technology** (Physics)
- ODM
- BPMN
- CMPM
- DTFV

**Component** (Assemblies)
- ODM
- SoaML
- UML
- DTFV

**Operation** (Instances)
- Data
- Function
- Network
- Organization
- Schedule
- Strategy
Models on Different Abstraction Levels

Fig. 17. The framework’s abstraction levels.
Agile Service Development Framework

Requirements
- Context and Goals

Design
- Interaction
- Structure
- Function
- Coordination
- Decision
- Product
- Knowledge
- Processes
- Roles
- Functions
- Products

Implementation
- Interface
- Actors
- Tasks
- Orchestration
- Executable Rules
- Objects

Infrastructure
- Channels
- Resources
- Executors
- Orchestrators
- Enforcers
- Stores
CSI Norway – Center for Service Innovation
led by Norwegian Business School, Bergen, SINTEF, AOH, Telenor,..
(National Center for Research Driven Innovation (SFI) – 20 Meuro budget, 8 years 2011 – 2018)
## CSI planned Activities

<table>
<thead>
<tr>
<th>Long term</th>
<th>Research themes</th>
<th>Short and intermediate term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foresight</td>
<td>Innovations in customer and brand experiences</td>
<td>Innovation projects in WPs</td>
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<tr>
<td>Governance</td>
<td>Co-creation and open innovation processes</td>
<td>Innovation projects in WPs</td>
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<td>Business model innovations</td>
<td>Innovation projects in WPs</td>
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<td>Infrastructure- and structural innovations</td>
<td>Innovation projects in WPs</td>
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<td>New themes ...</td>
<td>Innovation projects in WPs</td>
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<td>Innovation projects in WPs</td>
</tr>
</tbody>
</table>
Business Model Innovation

The Business Model Canvas
Strategyzer (Osterwalder)
Value Proposition Canvas

Value offer (Opportunity)  
Value needs (Requirements)

Gain Creators → Gains
Pain Relievers → Pains
fit

Products & Services

Customer Job(s)
BMI – Canvases/Models
**Actors** - Services are often delivered by complex collaborations of actors in the form of a value network. There is considerable opportunity to be gained from innovating services based upon new actor constellations.

**Touch-points** - Services are delivered across multiple touch-points over time. Often, touch points are not exploited well, or are poorly co-ordinated. Focus upon touch-points and how new touch-points can be integrated allows a new view of service provision.

**Offering** - Services are usually based upon a core offering, although not all companies understand what their core offering actually is. By describing a companies projected offering and how this is perceived by the market, new services can be developed.

**Need** - Services should be based upon customer needs, wants and desires. This part of the method uses this as an innovation start-point.

**Experience** - Services are experiential in nature and experiences can be designed and staged. By defining desired experiences and developing a vocabulary for this, we hope that services can be developed from experience-pull rather than the traditional technology-push.

VDML – Revised submission (November 2012)

The Value Delivery Metamodel (VDM) RFP [OMG Document bmi/2009-03-09] solicits proposals for a metamodel specification for modeling customer value delivery, based on the concept of a value networks and value chains.


NEFFICS, represented by Cordys, Aalborg University and SINTEF, has been involved in the development of the Joint revised proposal for Value Delivery Modeling Language (VDML) version 1.0 [OMG Document bmi/2011-11-06].

- Official OMG document: http://www.omg.org/cgi-bin/doc?bmi/12-11-06 (Restricted to OMG members)

This revised proposal is a joint submission by submitters: Cordys Corporation B.V., CSC and supporters: Aalborg University, Adaptive, Agile Enterprise Design, AT&T, BizAgI, Ltd., Fujitsu, Mega International, Ministry of Defense, Netherlands, Oek Works, Vlastuin Group and XIBIX.
AT ONE Service Design
AT-ONE is a method aimed at improving the early stages of service innovation, through the integration of design-thinking into a structured innovation process.

Service Design is emerging as a response to industry needs to improve service innovation and user design skills such as customer insight, cultural understanding, creativity and the designers ability to create solutions that are attractive and desirable.

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A – Actors

Value Network (VDML)

Services Architecture (SoaML)

Hybrid notation

- Participants (from Value Network)
- Conversation (from BPMN 2.0)
- Groups a set of Flows
T – Touchpoints

Service Journey Map

- **Service Journey:**
  Chronological mapping (from the customer point of view) of a service encounter.

- Model as "Stages"
- Attach touchpoints to the different stages
- Library of different types of touchpoints to select from.
O – Offerings

Service Contract
• Detailing of the conversation.
• Conversation is the grouping of flows (messages).
• Service Contract defines the interfaces on both side (structure) and the protocol (behaviour) for how to use these interfaces.
N – Needs

Goals and Objectives
• We have not yet implemented modelling support for needs.
• One idea is to use a very small subset of BMM (Business Motivation Model) standard.
• Goal: a statement about a state or condition of the enterprise to be brought about or sustained through appropriate Means (i.e., Offerings expressed as Service Contracts).
• Objective: An Objective is a statement of an attainable, time-targeted, and measurable target that the enterprise seeks to meet in order to achieve its Goals

Example of Goals and Objectives diagram
E – Experiences

Experiences

• The idea is to extend the Service Journey Map.
• Each user/customer capture experiences (emotional icons) related to each touchpoints and deviations in the ideal/expected journey (seen from a Service Provider side).

Ref. also
myServiceFellow smart phone app
Business Motivation Model (BMM) with MeansRealizations
What is BPMN (Business Process Modeling Notation) ?

- BPMN is flow-chart based notation for defining Business Processes

- BPMN is an agreement between multiple modeling tools vendors, who had their own notations, to use a single notation for the benefit of end-user understand and training

- BPMN provides a mechanism to generate an executable Business Process (BPEL) from the business level notation

  ▶ A Business Process developed by a business analyst can be directly applied to a BPM engine instead of going through human interpretations and translations into other languages
BPMN example
EPF Composer

EPF Composer is a tool platform for process engineers, project leads, project and program managers who are responsible for maintaining and implementing processes for development organizations or individual projects.

Aims to:

- provide for development practitioners a knowledge base of intellectual capital that allows them to browse, manage and deploy content.
- provide process engineering capabilities by supporting process engineers and project managers in selecting, tailoring, and rapidly assembling processes for their concrete development process.
System and objects

A system is a part of the real world which we choose to regard as a whole, separated from the rest of the world during some period of consideration.

A whole that we choose to consider as a collection of objects, each object being characterized by attributes and by actions which may involve itself and other objects.
Next Lecture, January 26, 2014

Business Model Innovation – Business Model Canvas and Value Proposition Canvas

- Business Model Canvas – Osterwalder/Strategyzer.com
- Guest Lecture – Prof. Dr. Peter Lindgren, Aarhus University – on Business Model Cube and Sensing Business Models
- Introduction to OBLIGS 1 and 2, "SenseIT" company with Mobile Apps for Bluetooth connected UV sensor etc.