Use of a Domain Specific Modeling Language for Realizing Versatile Dashboards

Chair of Information Systems and Enterprise Modeling
University of Duisburg-Essen, Germany

Presentation at the 9th OOPSLA Workshop on Domain-Specific Modeling
Management of (parts of) enterprises requires an instrument to manage performance, e.g.,
- of a business unit
- of a business process
- of an IT resource, e.g., an information system

Increasing demand for indicators and sets of interrelated indicators ("indicator systems") …

… and corresponding performance management information systems!
Indicators and Indicator Systems: Examples

- **Indicator System „Top Management“**
  - Return on Investment
  - Sales Volume
  - Number of Sales

- **Indicator System „Business Process Owner“**
  - Throughput of Business Processes
  - Costs of Business Processes
  - Quality of Business Processes

- **Indicator System „IT Management“**
  - CMM-level of software
  - No. of incidents of an ERP system
  - Costs of IT department

Ulrich Frank, David Heise, Heiko Kattenstroth | October 25th, 2009
The approach in a nutshell

Domain-Specific Modeling Language (DSML) for indicator systems integrated with a method for multi-perspective enterprise modeling

- Promises benefits at build-time …
  - promotes consistency of indicator systems
  - fosters adequate interpretation of indicators
  - serves as conceptual foundation for software development

- … but also at run-time (“model-based dashboards”)
  - opens up new functionalities and types of analyses
  - allows to benefit from the specific advantages of domain-specific modeling languages at run-time, too
Language design: Meta Model

Color legend for concepts reused from other MEMO languages:
- OrgML
- ResML and ITML
- ProdML

Further symbols:
- 'Intrinsic Feature'

Ulrich Frank, David Heise, Heiko Kattenstroth | October 25th, 2009
Example: DSML-based Indicator System (build-time)

**Description:** Calculated as the time between reporting a ticket and the resolution of the corresponding incident.

**Purpose:** Indicate performance of the service desk.

**Presumptions:** Low average incident resolution time indicates good performance of the service desk; low average resolution time does not necessarily correspond with good quality of service; may lead to oversized service desks.

**Preferred Visualisation:** traffic light

**Benchmark:** 30 minutes

**Data Source:** Self.Benchmark : \( \text{[ResolutionTime} - \text{InitTime]} \times 100 \)
Example: Model-based Dashboard (run-time) (1/3)
Example: Model-based Dashboard (run-time) (2/3)

Process Owner
„Online Sales“

Average throughput time [minutes]

Operations

check availability → process order → process payment

ERP System

Ulrich Frank, David Heise, Heiko Kattenstroth | October 25th, 2009
Example: Model-based Dashboard (run-time) (3/3)
Questions, Answers & Discussion

Meta Model

Integration with Enterprise Modeling Method

Software Architecture

Indicator Model (build-time)

„Model-Based Dashboard“ (run-time)

ICB Institute for Computer Science and Business Information Systems

Dipl.-Wirt.-Inf.

David Heise

Information Systems and Enterprise Modelling

University of Duisburg-Essen
Wirtschaftswissenschaften
Universitätsstrasse 9
D-45141 Essen, Germany

Phone: +49 (201) 183 2719
Fax: +49 (201) 183 4011
david.heise@uni-due.de
http://www.icb.unidue.de/um


Ulrich Frank; David Heise; Heiko Kattenstroth; Hanno Schauer: "Designing and Utilising Business Indicator Systems within Enterprise Models – Outline of a Method" in Peter Loos; Markus Nüttgens; Klaus Turowski; Dirk Werth (ed.): Modellierung betrieblicher Informationssysteme (MobIS 2008), GI, Bonn, Vol. 141, Lecture Notes in Informatics, 2008, pp. 89-105.


http://www.wi-inf.uni-due.de/FGFrank/index.php