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Use of a Domain Specific Modeling Language for Realizing Versatile Dashboards

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**Presentation at the 9th OOPSLA Workshop
on Domain-Specific Modeling**

Institute for Computer
Science and Business
Information Systems (ICB)

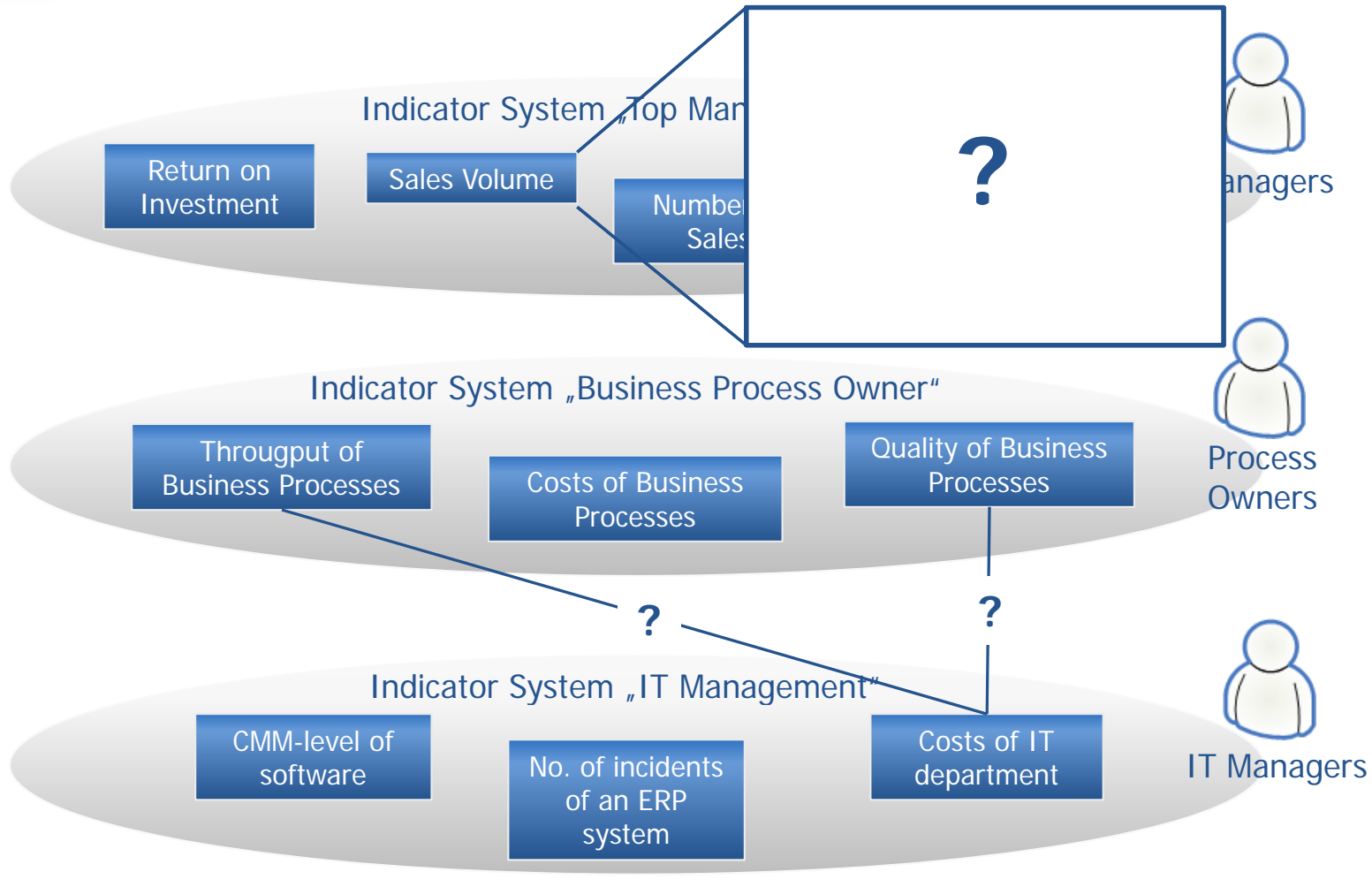


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Motivation

- 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



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

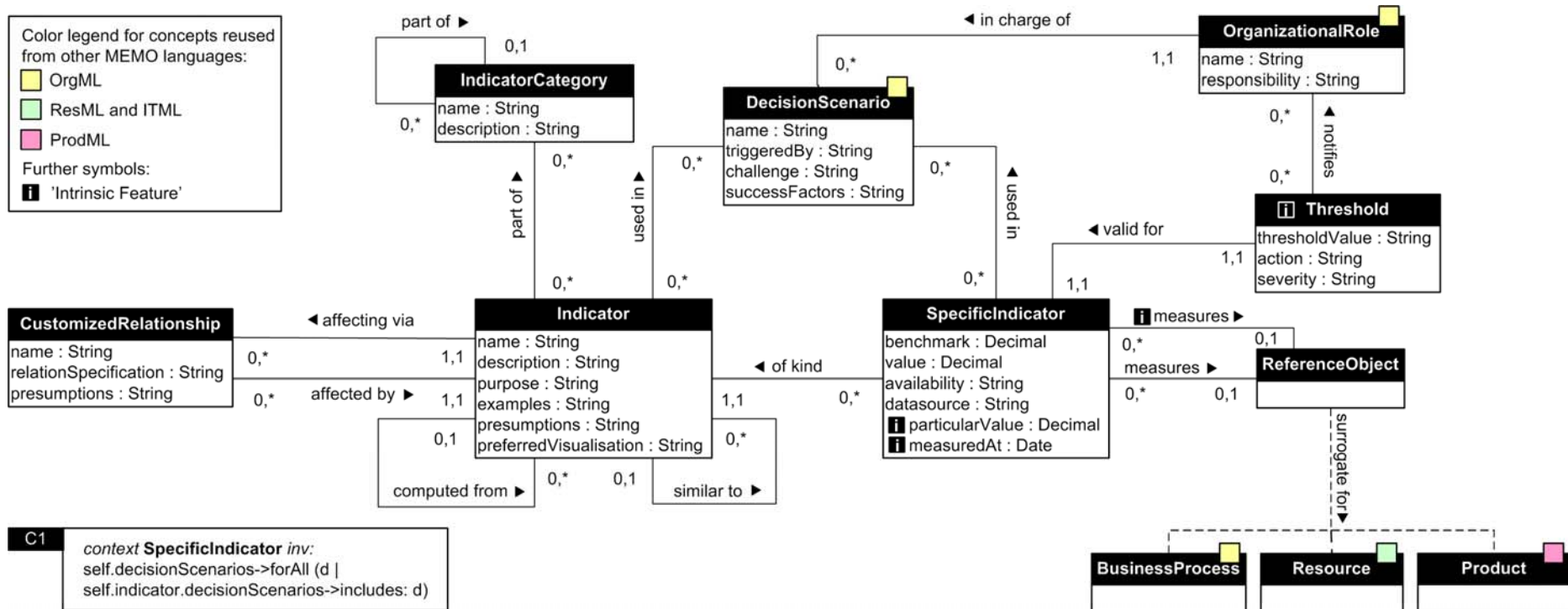
Language design: Meta Model

Color legend for concepts reused from other MEMO languages:

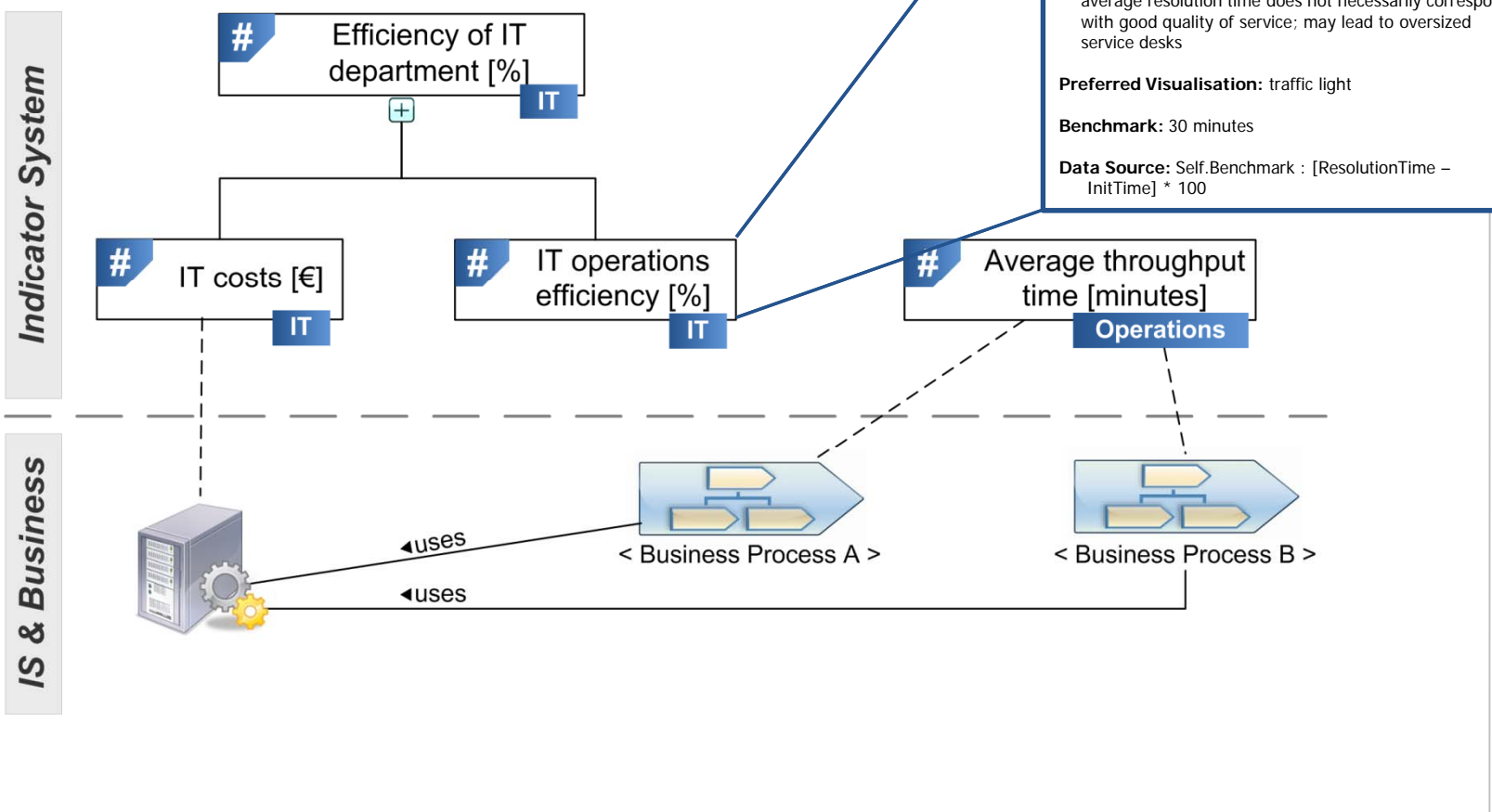
- OrgML
- ResML and ITML
- ProdML

Further symbols:

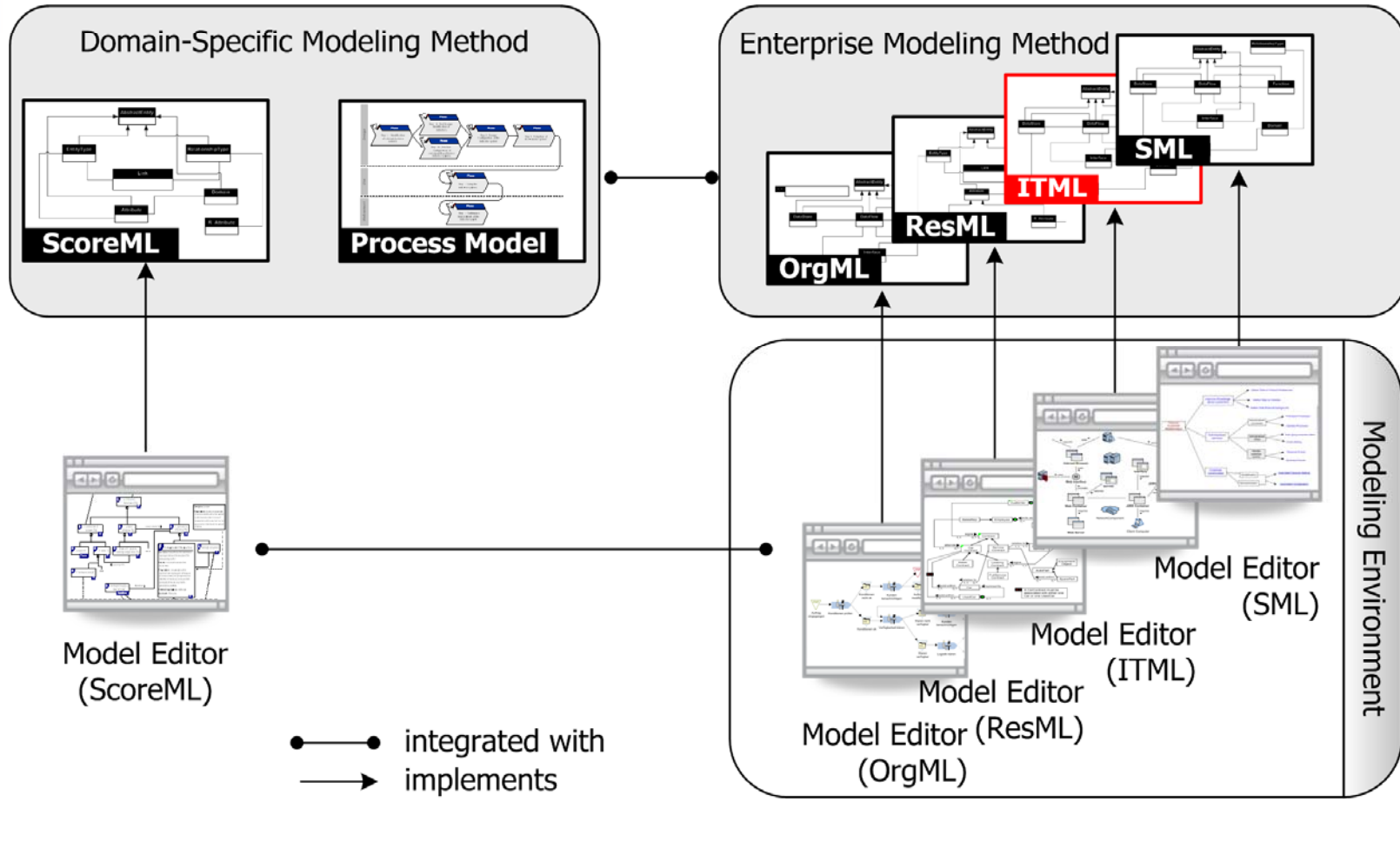
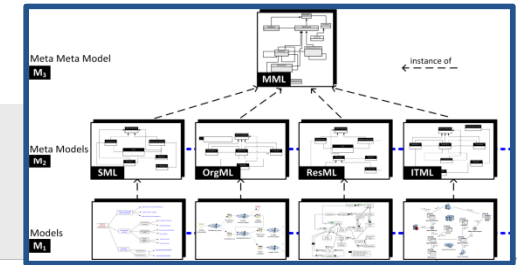
- Intrinsic Feature



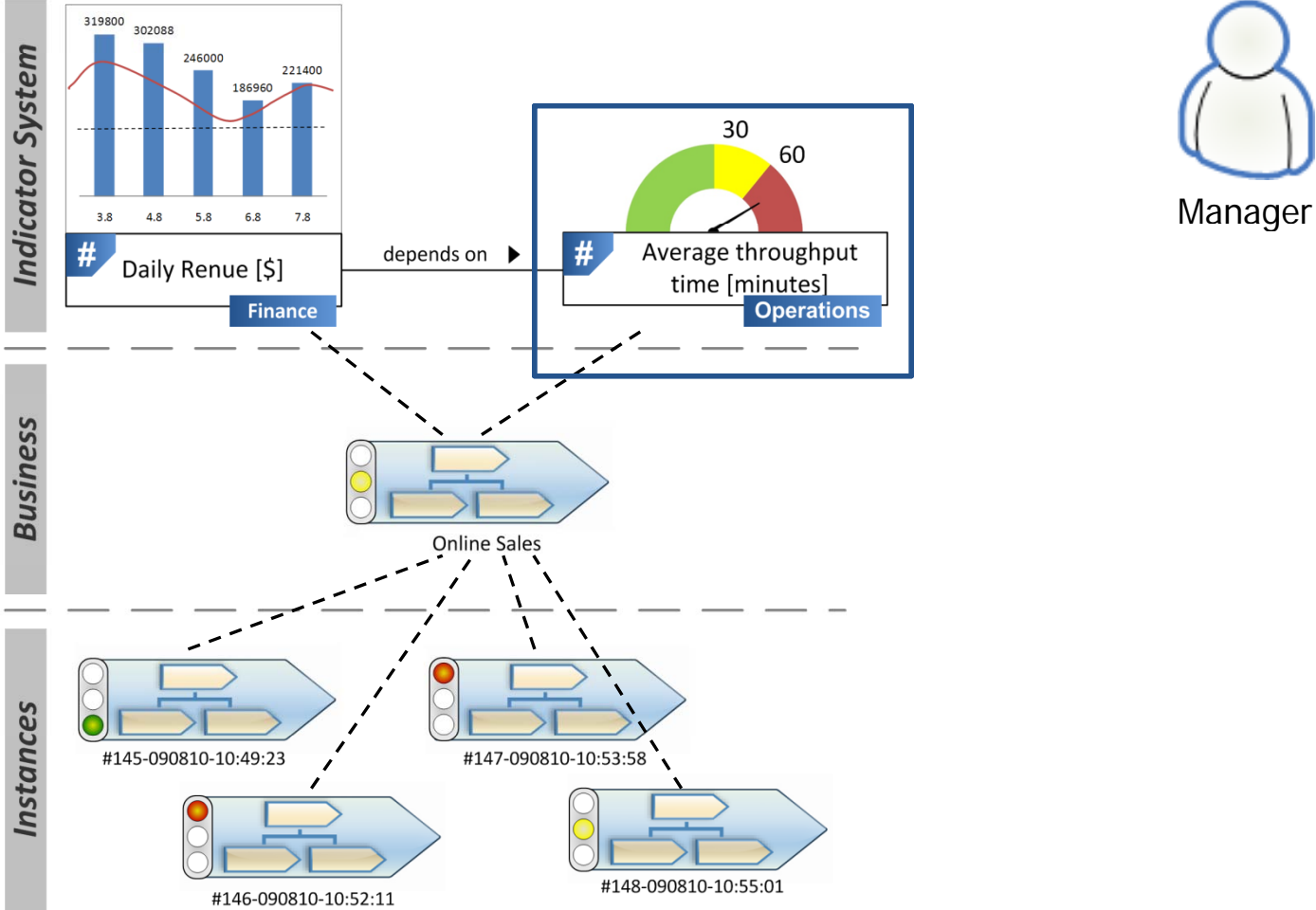
Example: DSML-based Indicator System (build-time)



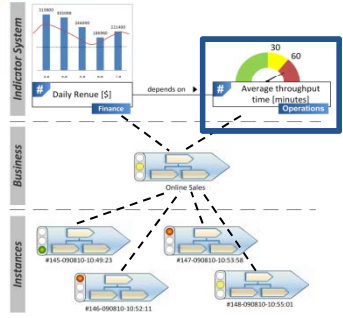
Architecture & Integration



Example: Model-based Dashboard (run-time) (1/3)

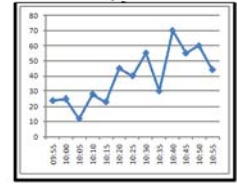
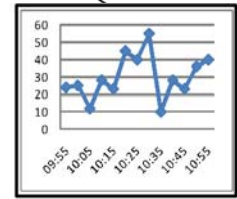
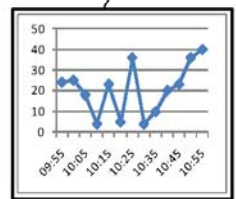


Example: Model-based Dashboard (run-time) (2/3)

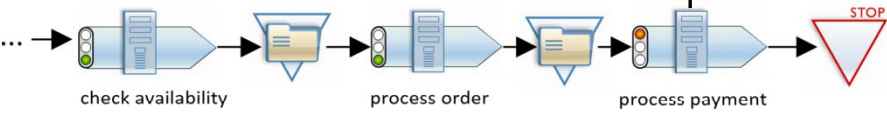


Indicator System

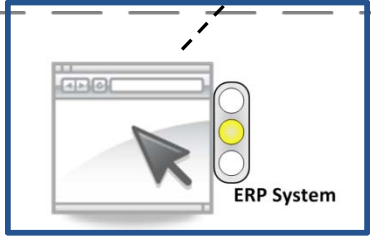
Average throughput time [minutes]
Operations



Business

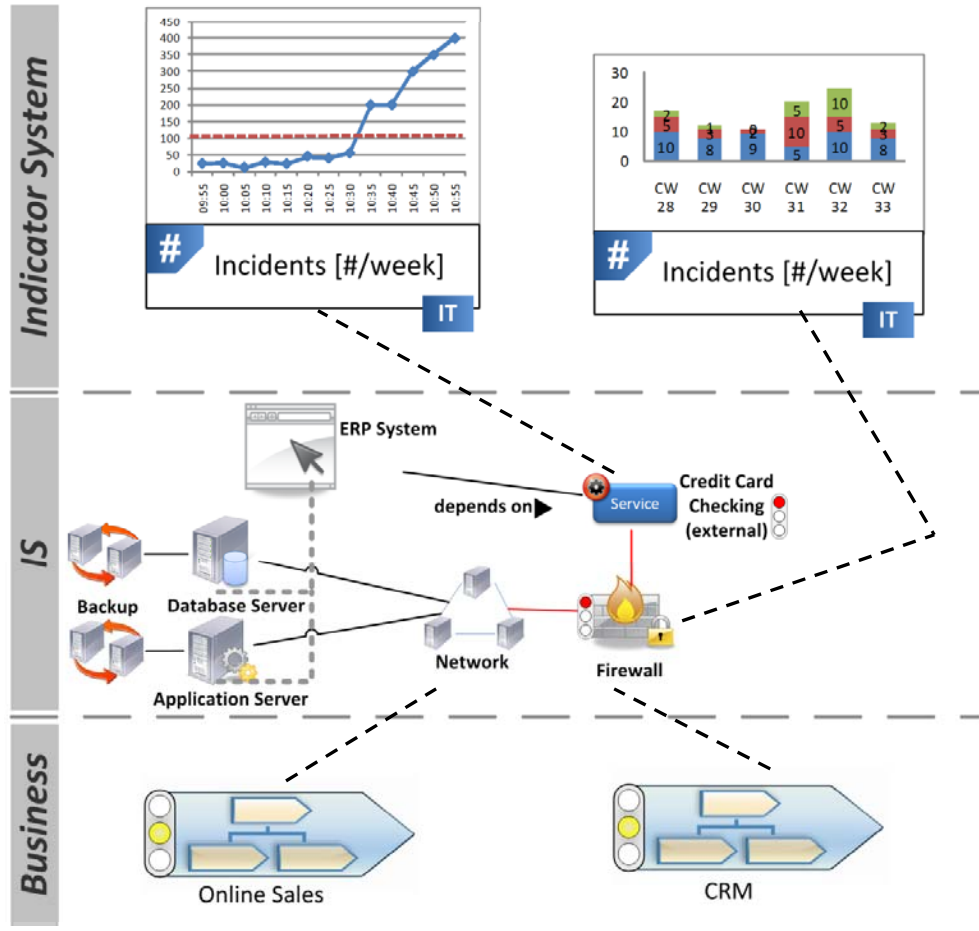
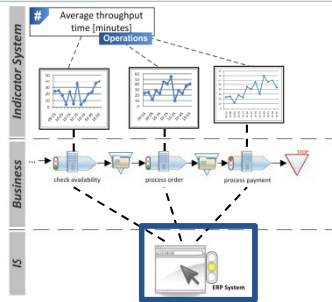


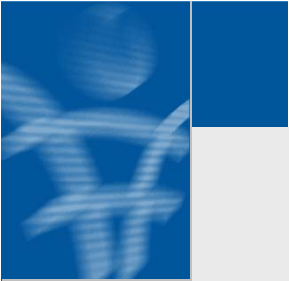
IS



Process Owner
„Online Sales“

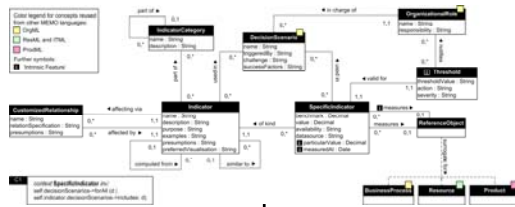
Example: Model-based Dashboard (run-time) (3/3)



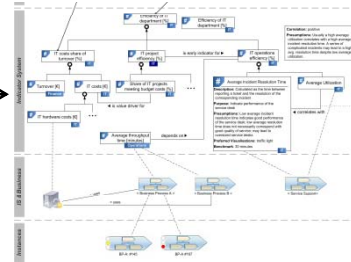


Questions, Answers & Discussion

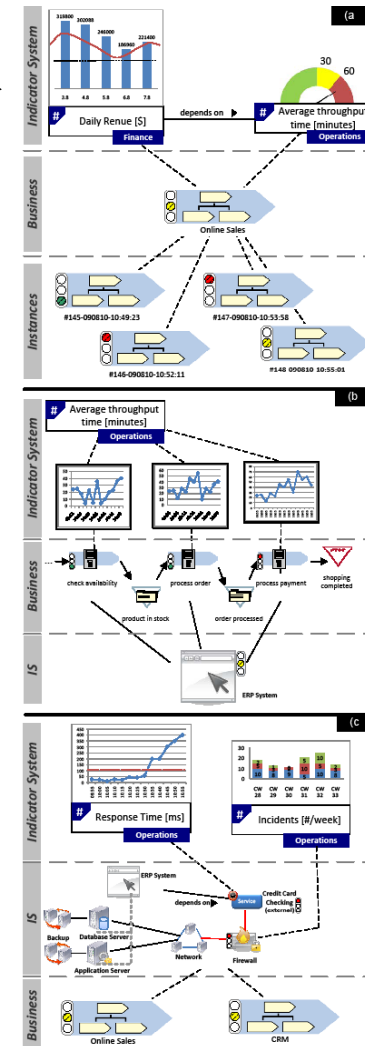
Meta Model



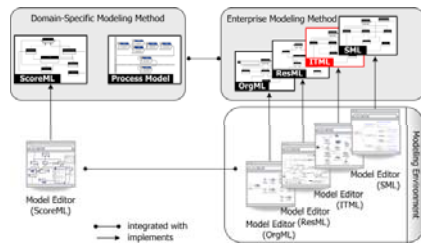
Indicator Model (build-time)



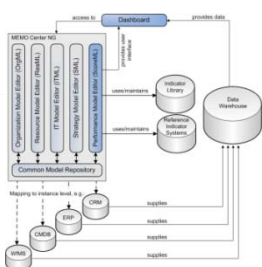
„Model-Based Dashboard“ (run-time)



Integration with Enterprise Modeling Method



Software Architecture



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References & More Information

- Ulrich Frank: "[Multi-Perspective Enterprise Modeling \(MEMO\): Conceptual Framework and Modeling Languages](#)" in Proceedings of the Hawaii International Conference on System Sciences (HICSS-35): Honolulu, 2002.
- Ulrich Frank: "[The MEMO Meta Modelling Language \(MML\) and Language Architecture](#)", ICB-Research Report, Institut für Informatik und Wirtschaftsinformatik (ICB), Universität Duisburg-Essen, No. 24, 2008.
- 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.
- Ulrich Frank; Stefan Strecker: "[Beyond ERP Systems: An Outline of Self-Referential Enterprise Systems](#)", ICB-Research Report, Institut für Informatik und Wirtschaftsinformatik (ICB), Universität Duisburg-Essen, No. 31, April 2009.
- <http://www.wi-inf.uni-due.de/FGFrank/index.php>