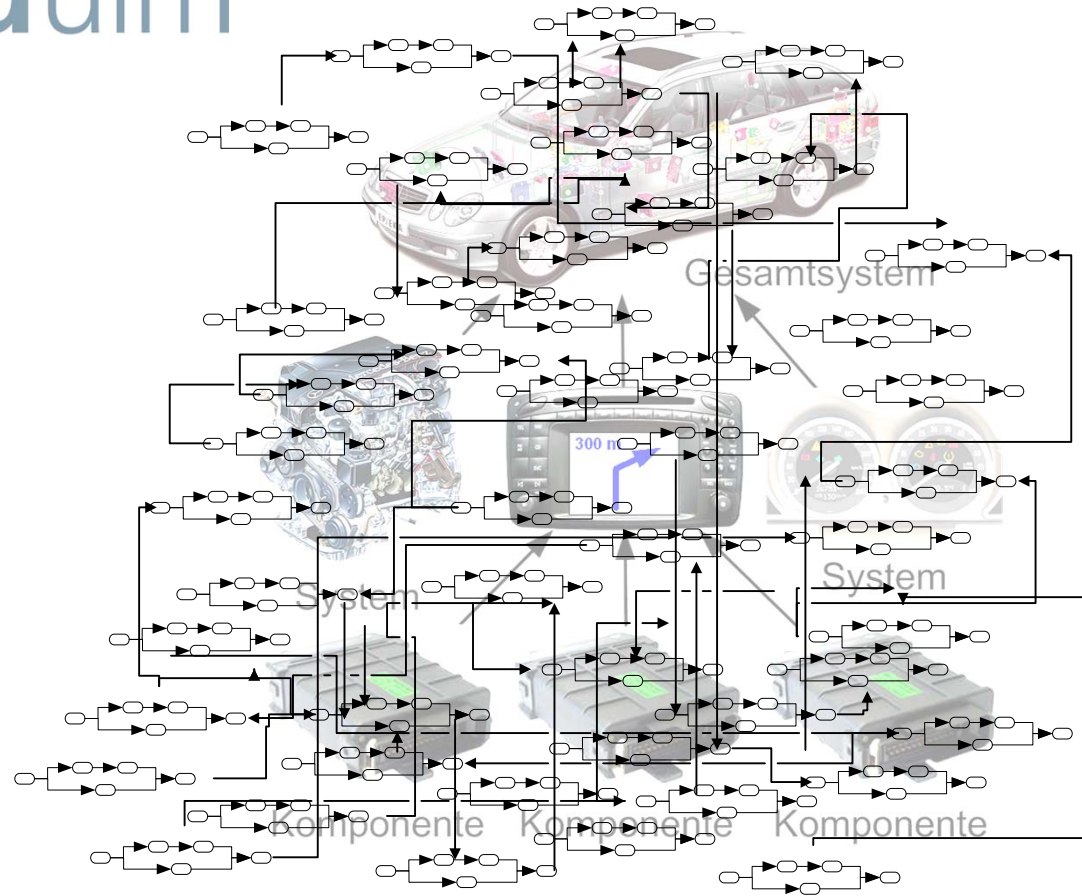




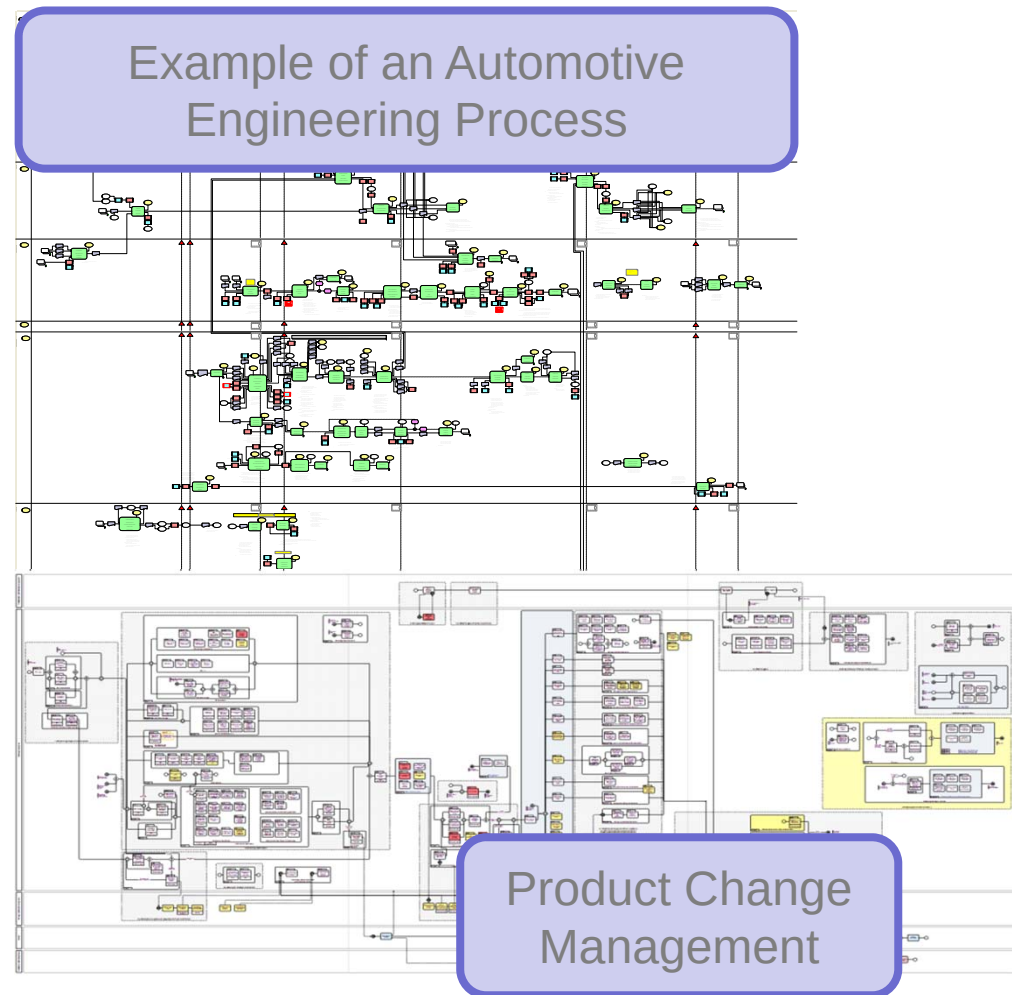
A Decade of Research on Next Generation Process Management Technology: Challenges and Achievements

Manfred Reichert

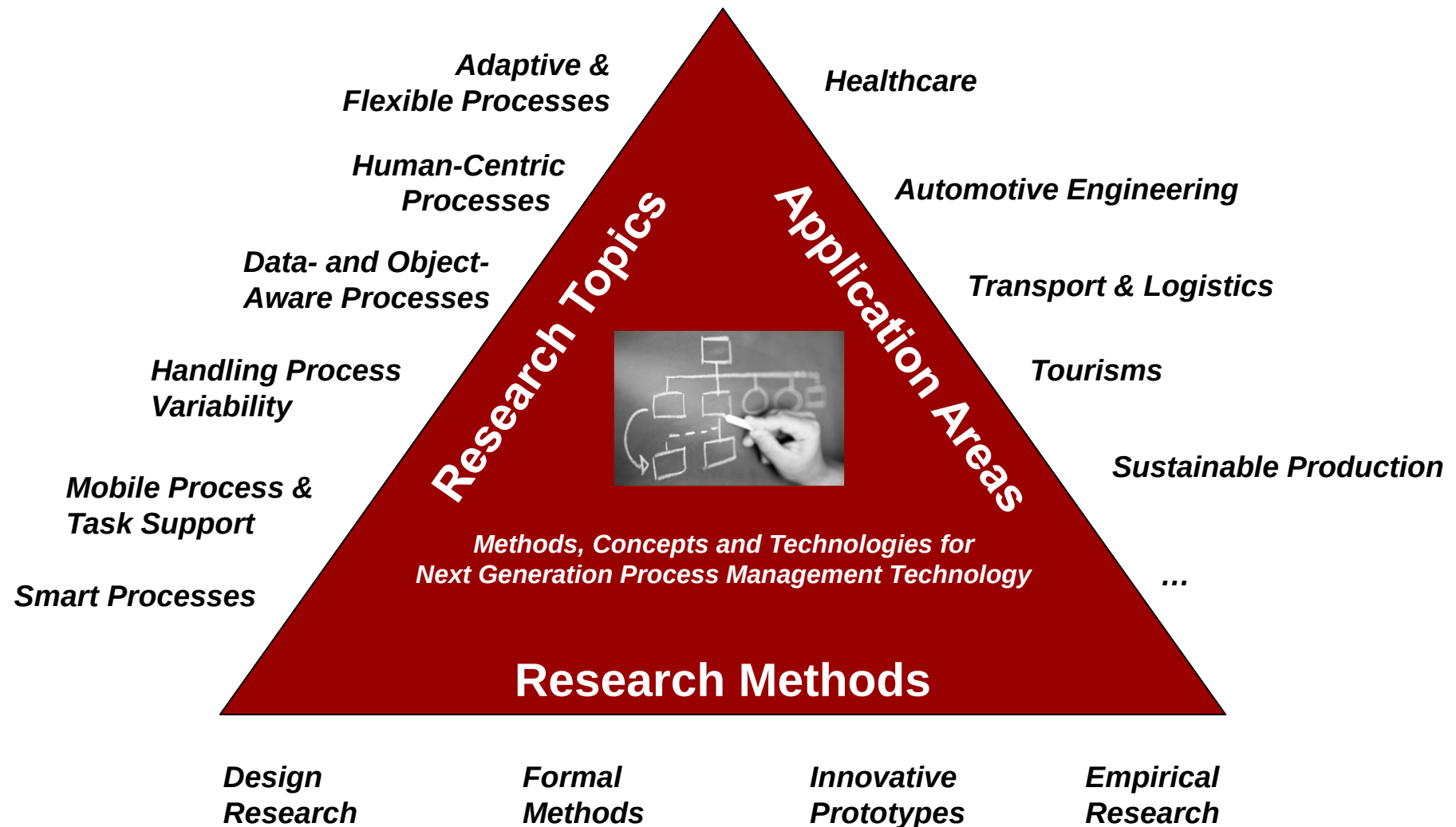
www.uni-ulm.de/dbis

Motivation

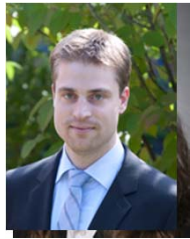
- ❑ Processes can become very large and complex
- ❑ Thousands of concurrently executed process instances
- ❑ High need for flexibility in all phases of the process lifecycle
- ❑ Support for application integration is fundamental
- ❑ Correctness and robustness are crucial features of any process-aware information systems
- ❑ Integrated support of all phases of the process lifecycle required



Process Science at Ulm University



DBIS Team



Andreas
Freymann



Markus
Hipp



Ulrich
Kreher



Vera
Künzle



Mathias
Lohrmann



Christian
Manz



Alexander
Bachmaier



Sebastian
Steinau



Dominik
Deuter



Michaela
Weiss



Kevin
Andrews



Andreas
Lanz



Nicolas
Mundbrod



Rüdiger
Pryss



Bernd
Michelberger



Julian
Tiedeken



Klaus
Kammerer



Carolina
Chiao



David
Knuplesch



Prof. Dr. Manfred Reichert



Prof. Dr. Martin Theobald

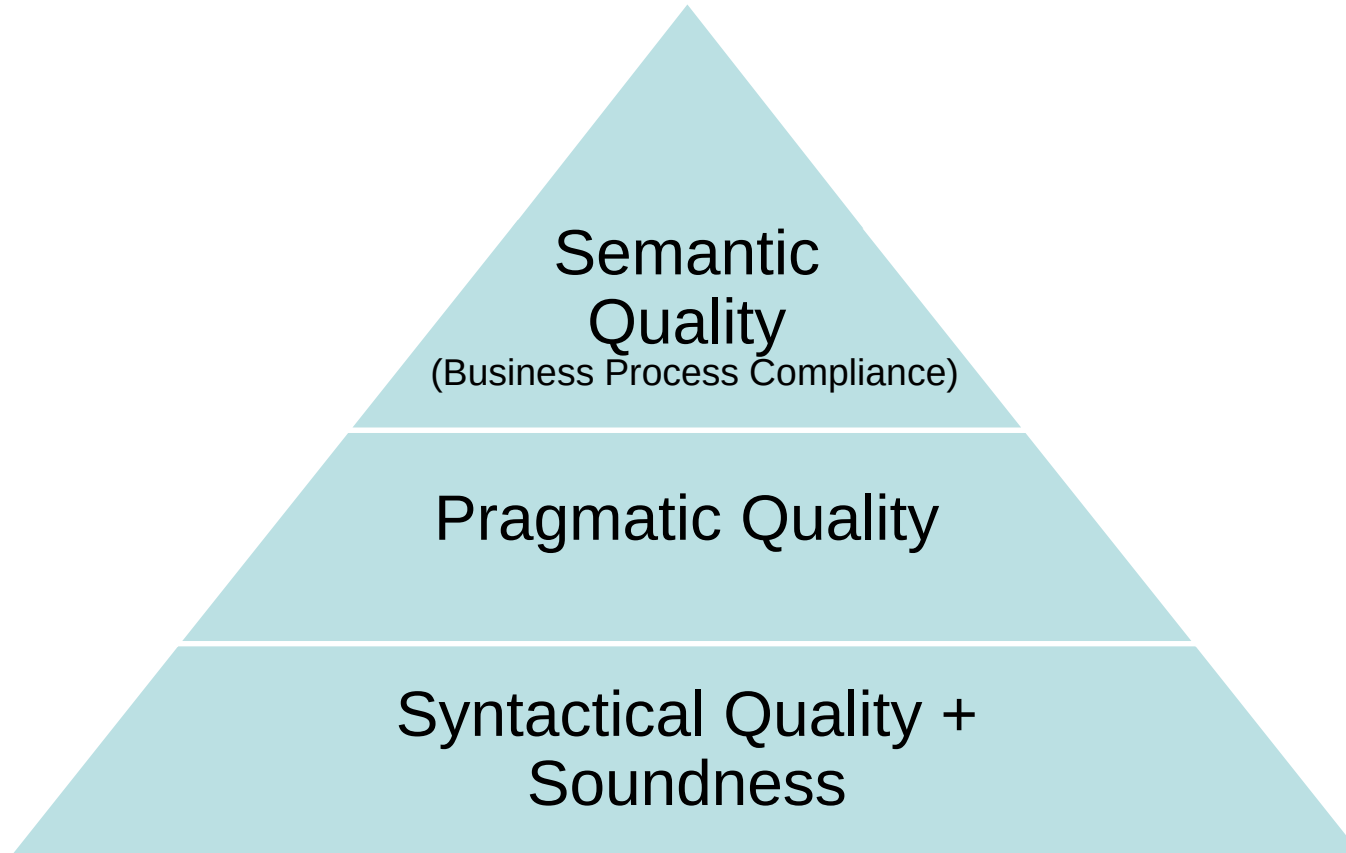


Marc
Schickler

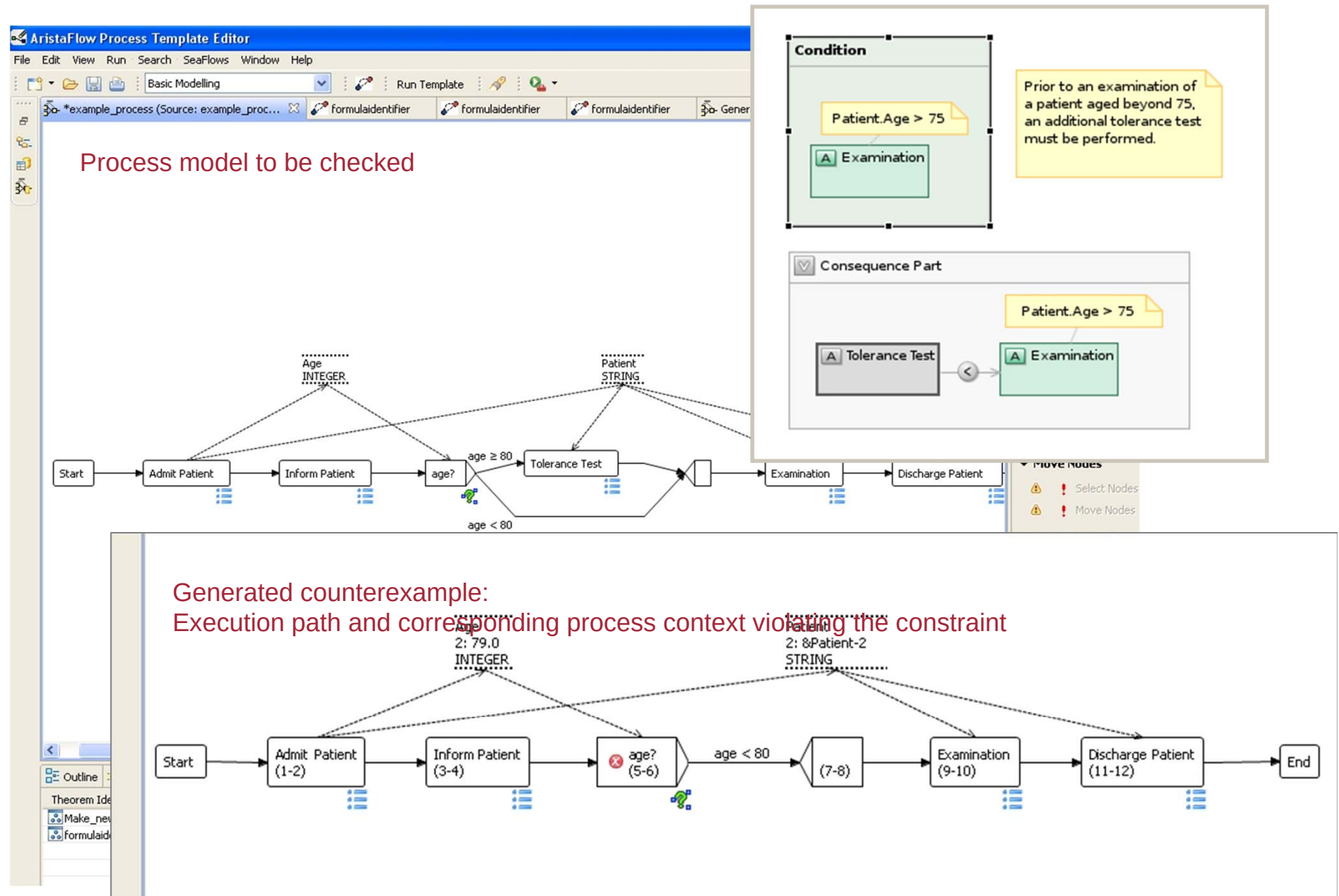


Johannes
Schobel

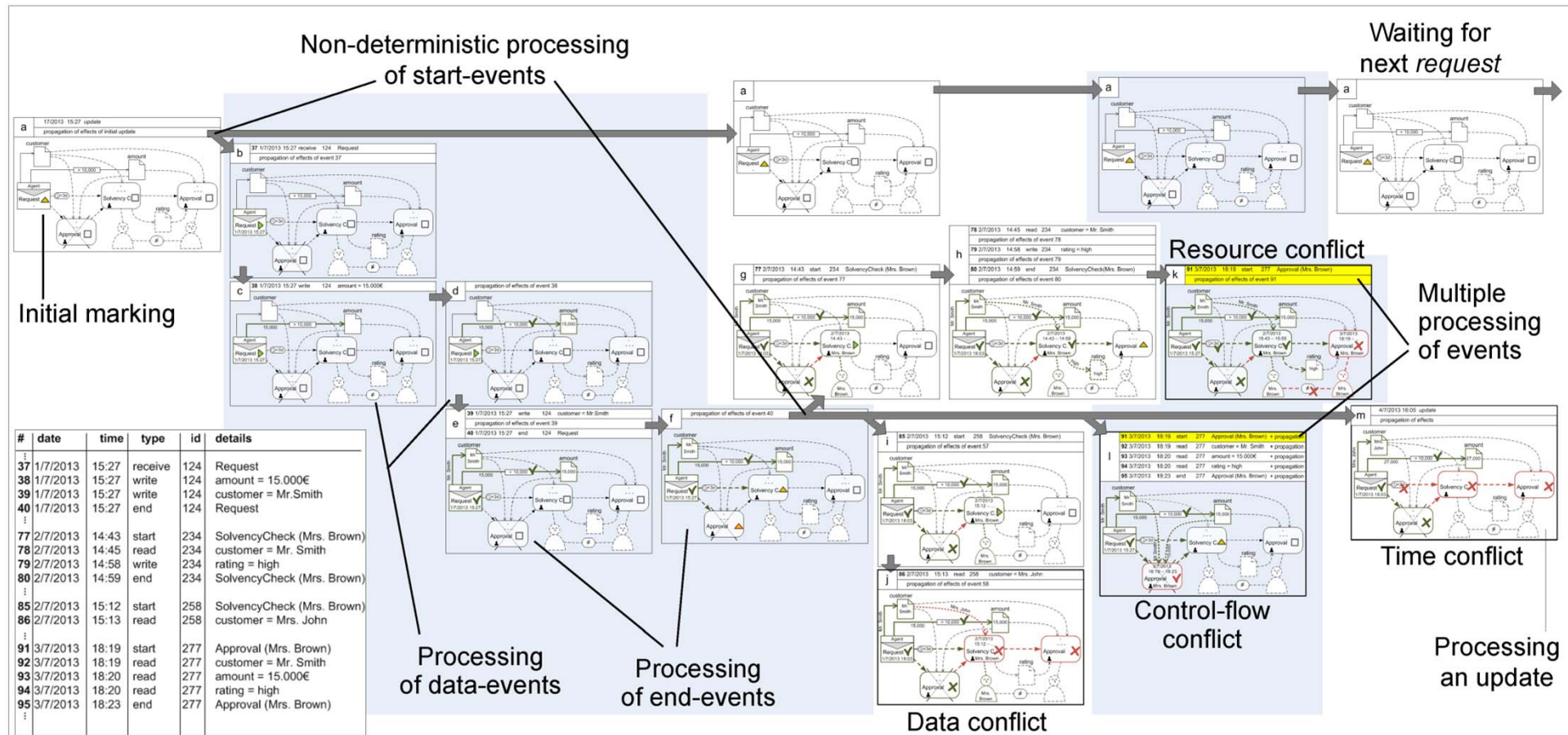
Process Modeling: Quality Dimensions



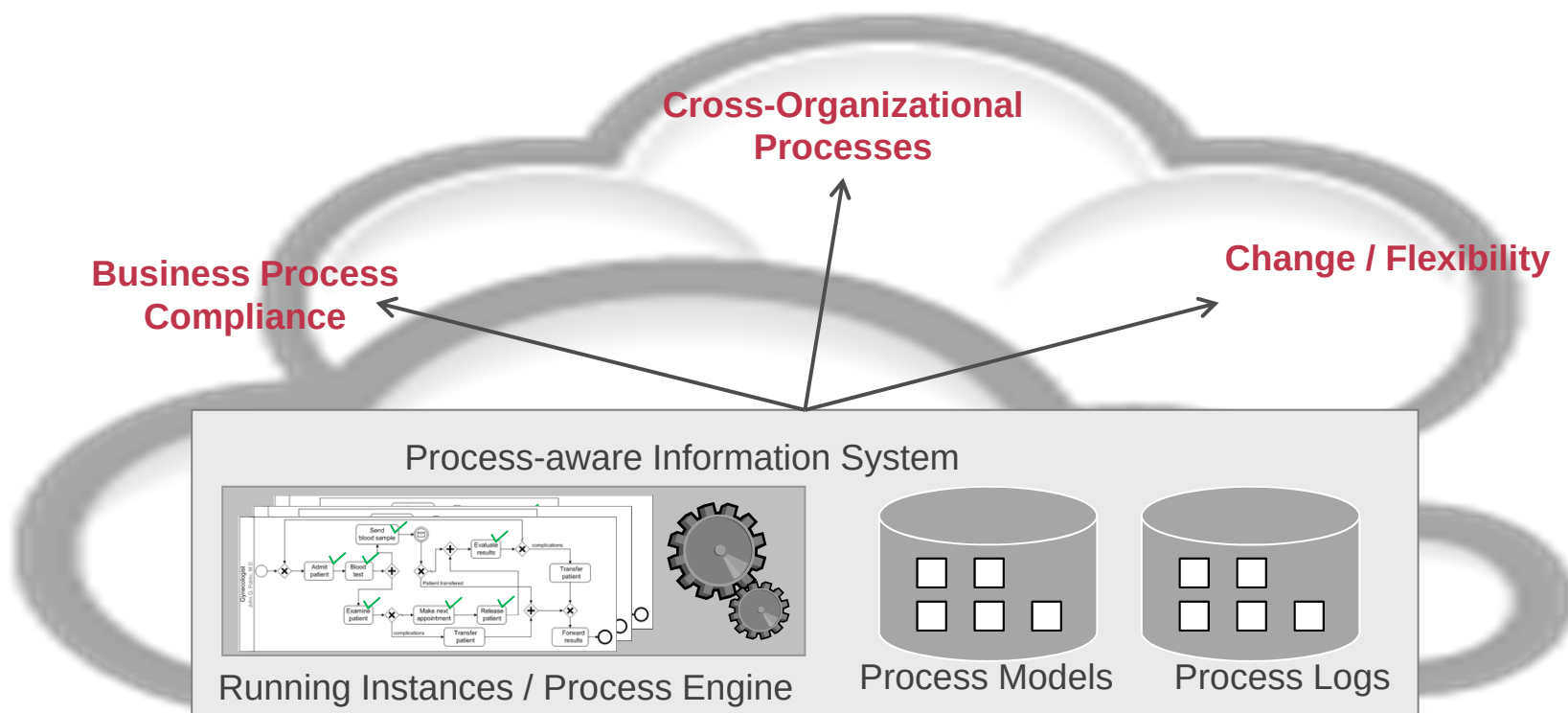
SeaFlows: Business Process Compliance



C3Pro: Extending Business Process Compliance to Multiple Perspectives

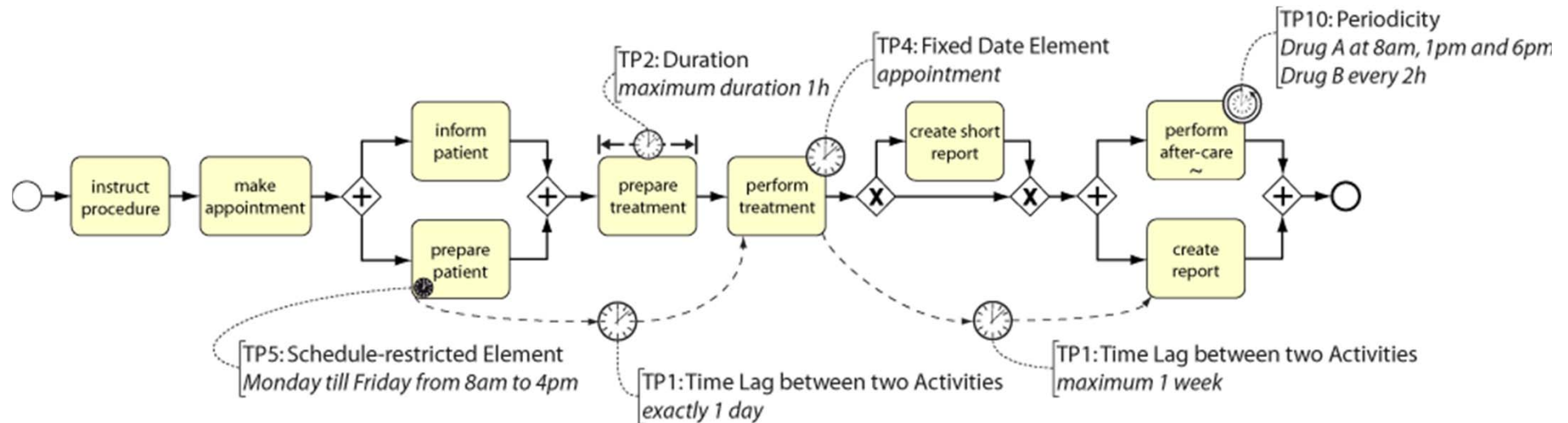


C3Pro: Ensuring Business Process Compliance in a Cross-Organizational and Dynamic Setting



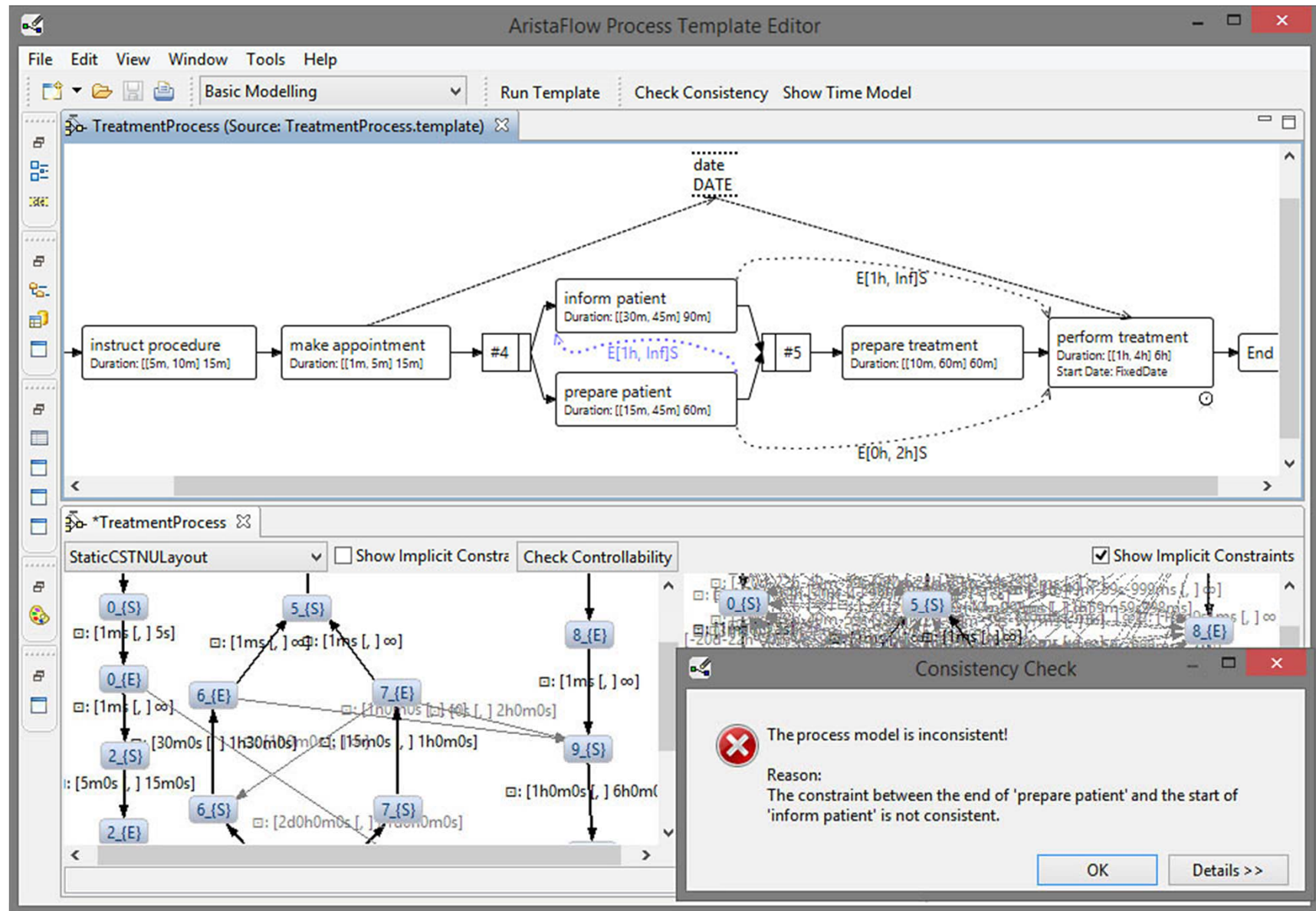
☞ Combining these areas raises numerous challenges.

ATAPIS: Handling Temporal Constraints along the Process Lifecycle

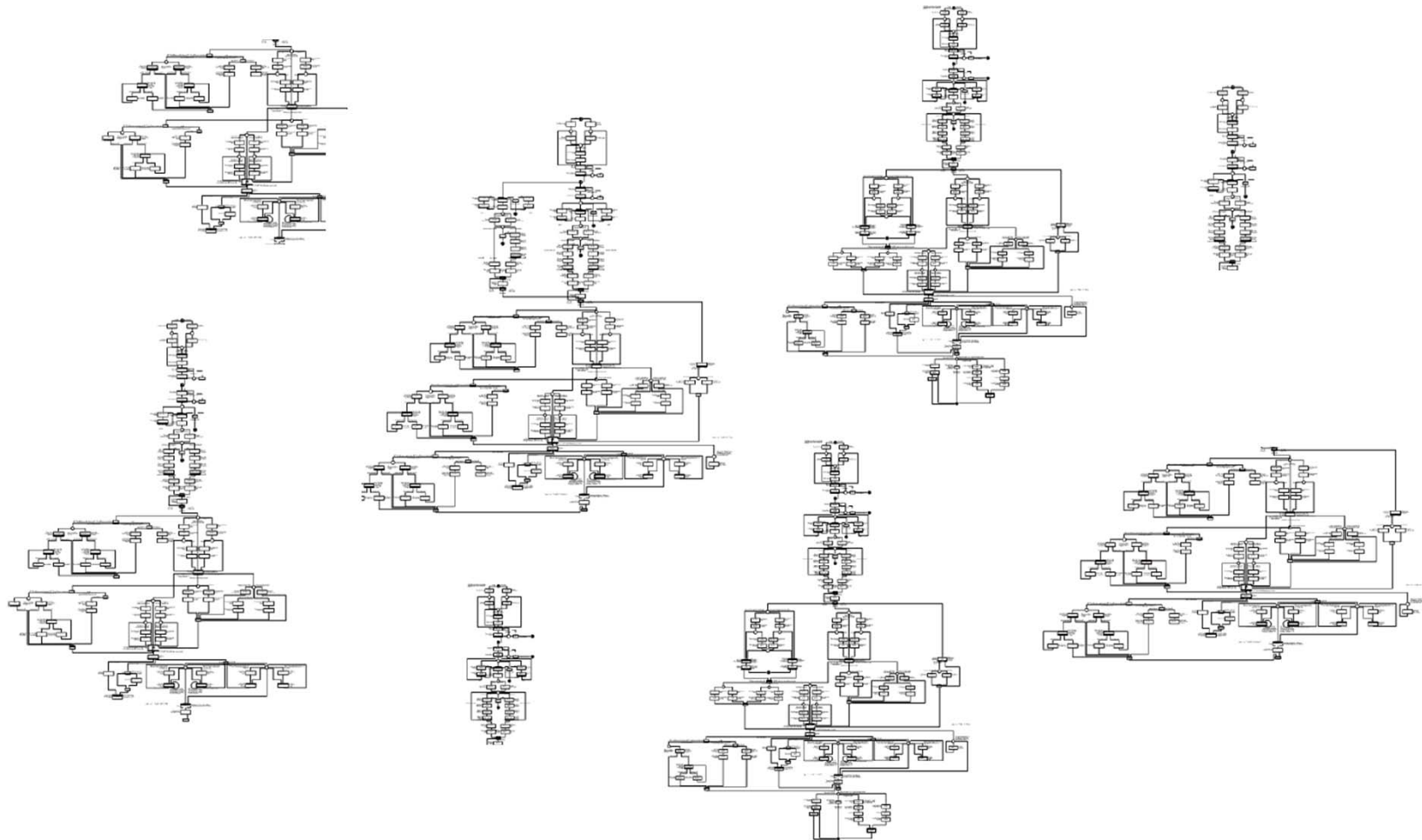


ATAPIS: Handling Temporal Constraints

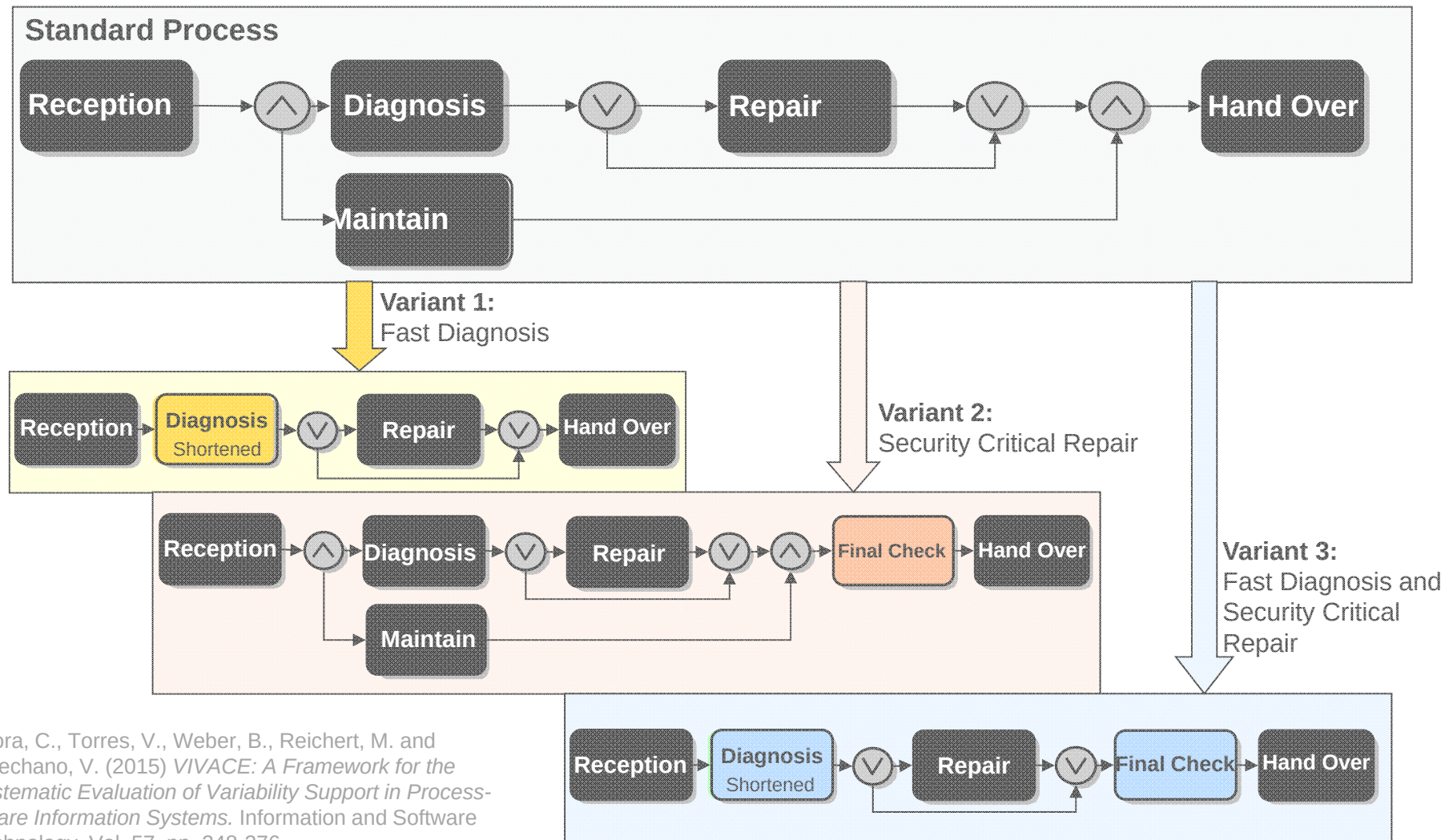
Lanz A., Posenato R., Combi C., Reichert, M. (2014):
Controllability of Time-Aware Processes at Run-Time, Proc. CoopIS'14, pp. 39-56



Provop: Coping with Process Variability

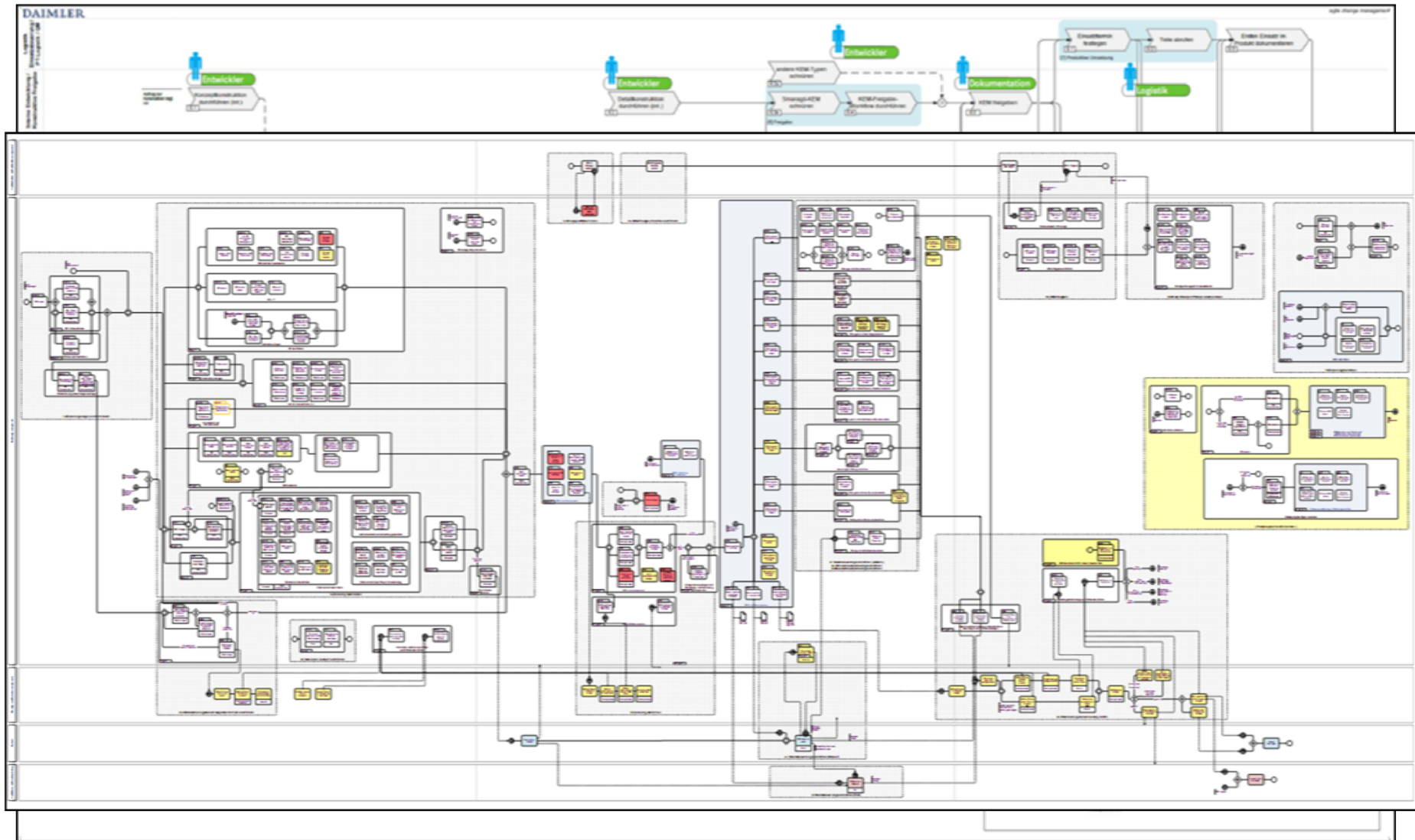


Provop: Coping with Process Variability

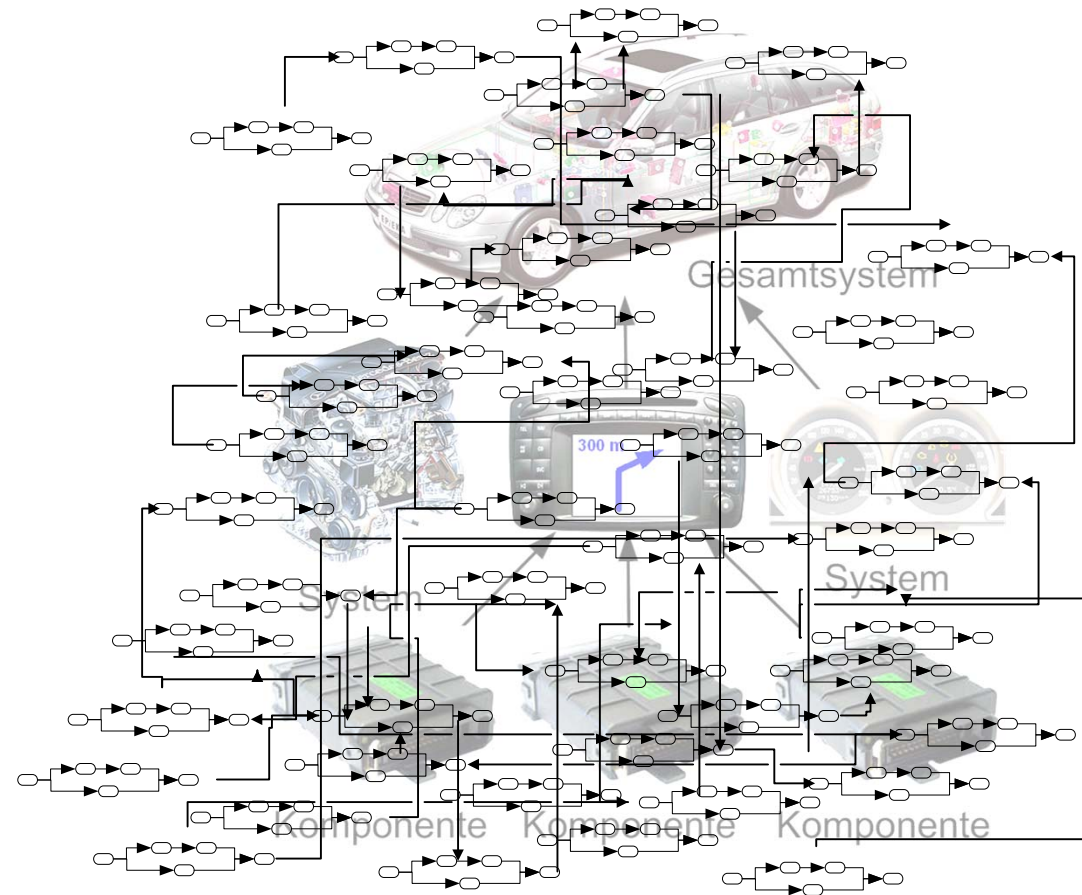


Ayora, C., Torres, V., Weber, B., Reichert, M. and Pelechano, V. (2015) VIVACE: A Framework for the Systematic Evaluation of Variability Support in Process-Aware Information Systems. Information and Software Technology, Vol. 57, pp. 248-276

ENPROSO: Business IT Alignment

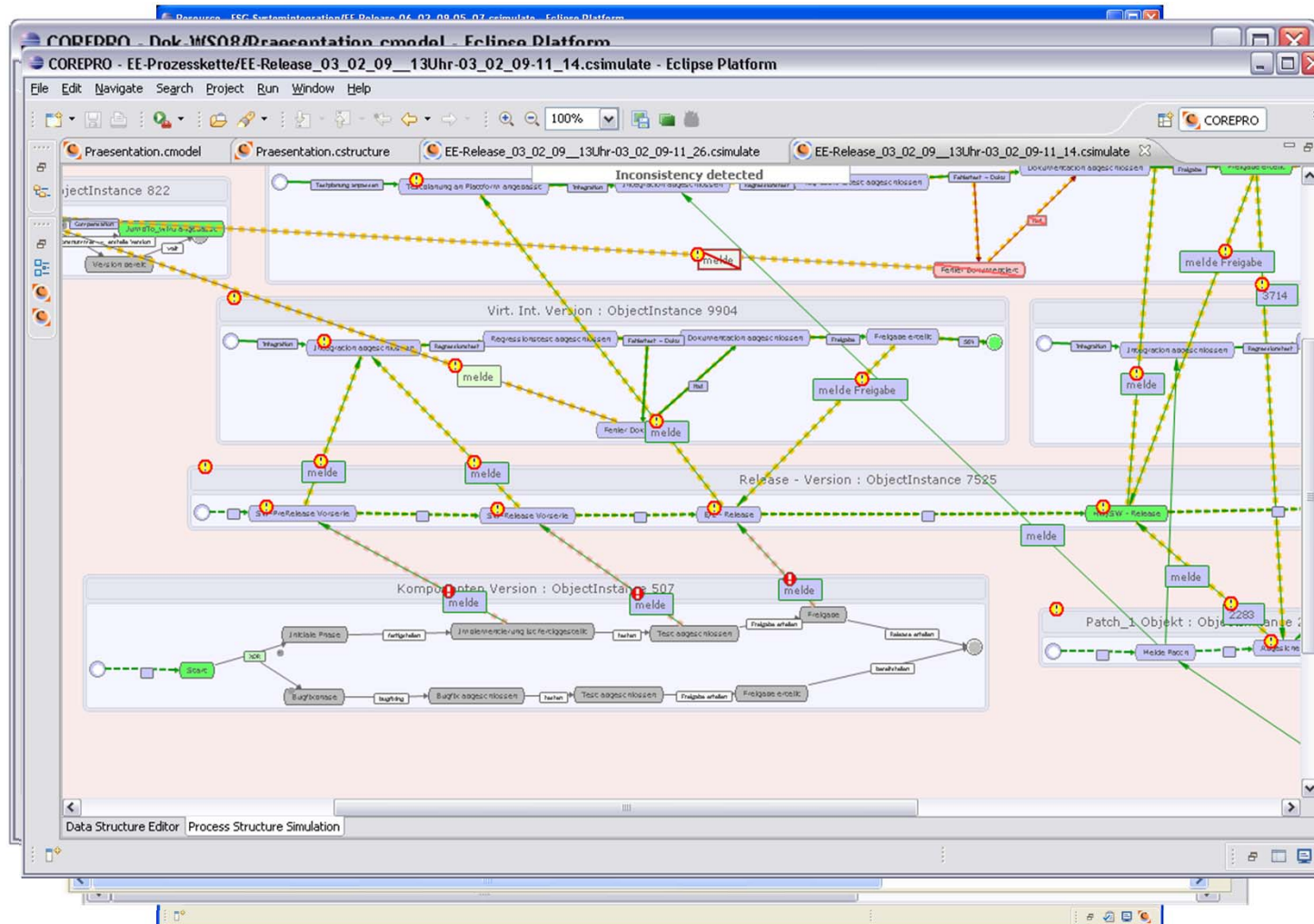


Corepro: Data-Driven Process Structures



Corepro: Data-Driven Process Structures

Automating the Modeling of Data-Driven Process Structures



ProView: Collobarative Process Modeling



ADEPT: Process Flexibility

Enforcement

Guardrails (on a road) prevent deviation, but also prevent anything not predicted.

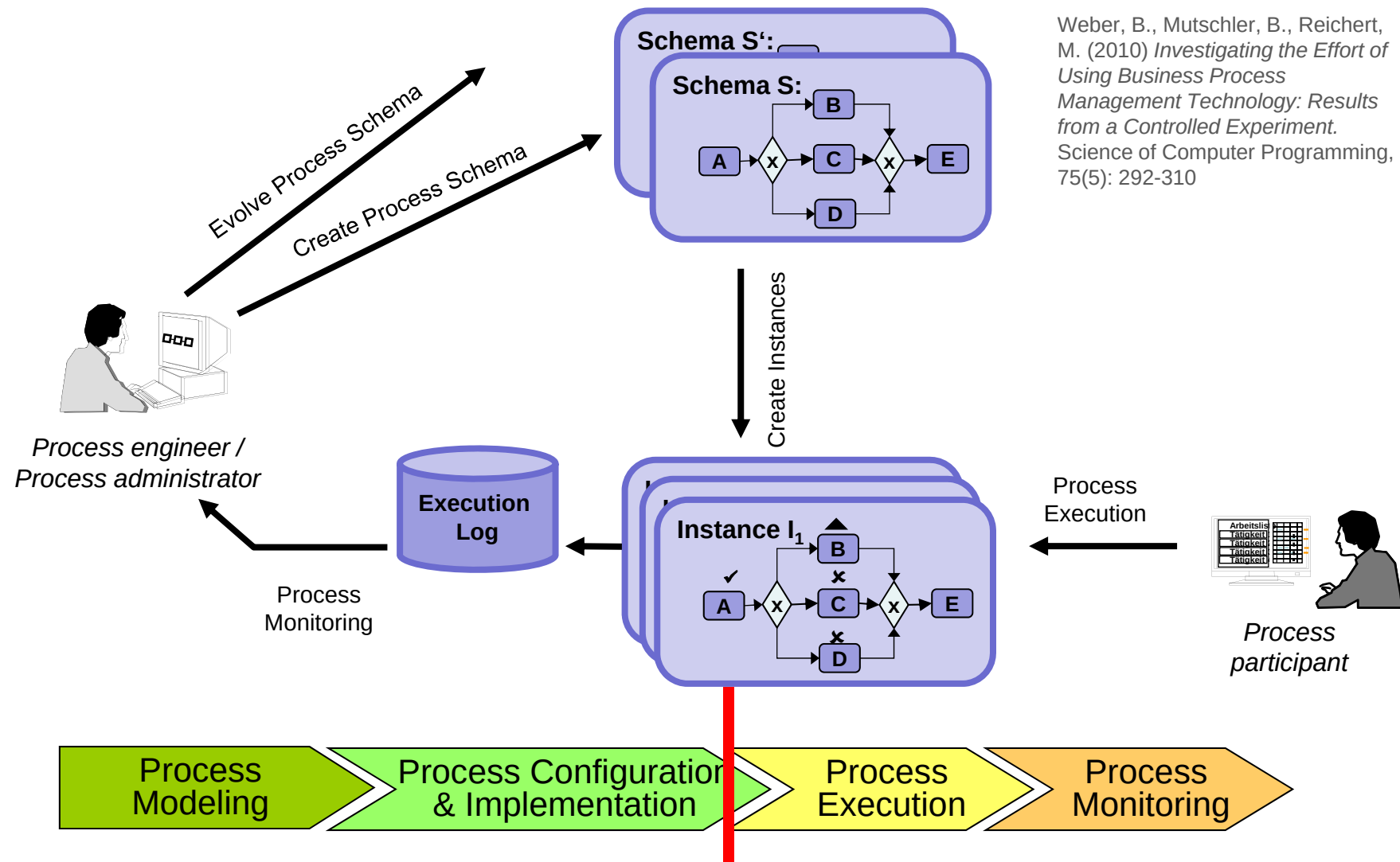
Guidance

Guidelines (on a road) show people where to go, but do not prevent deviations if they are necessary.

"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change."

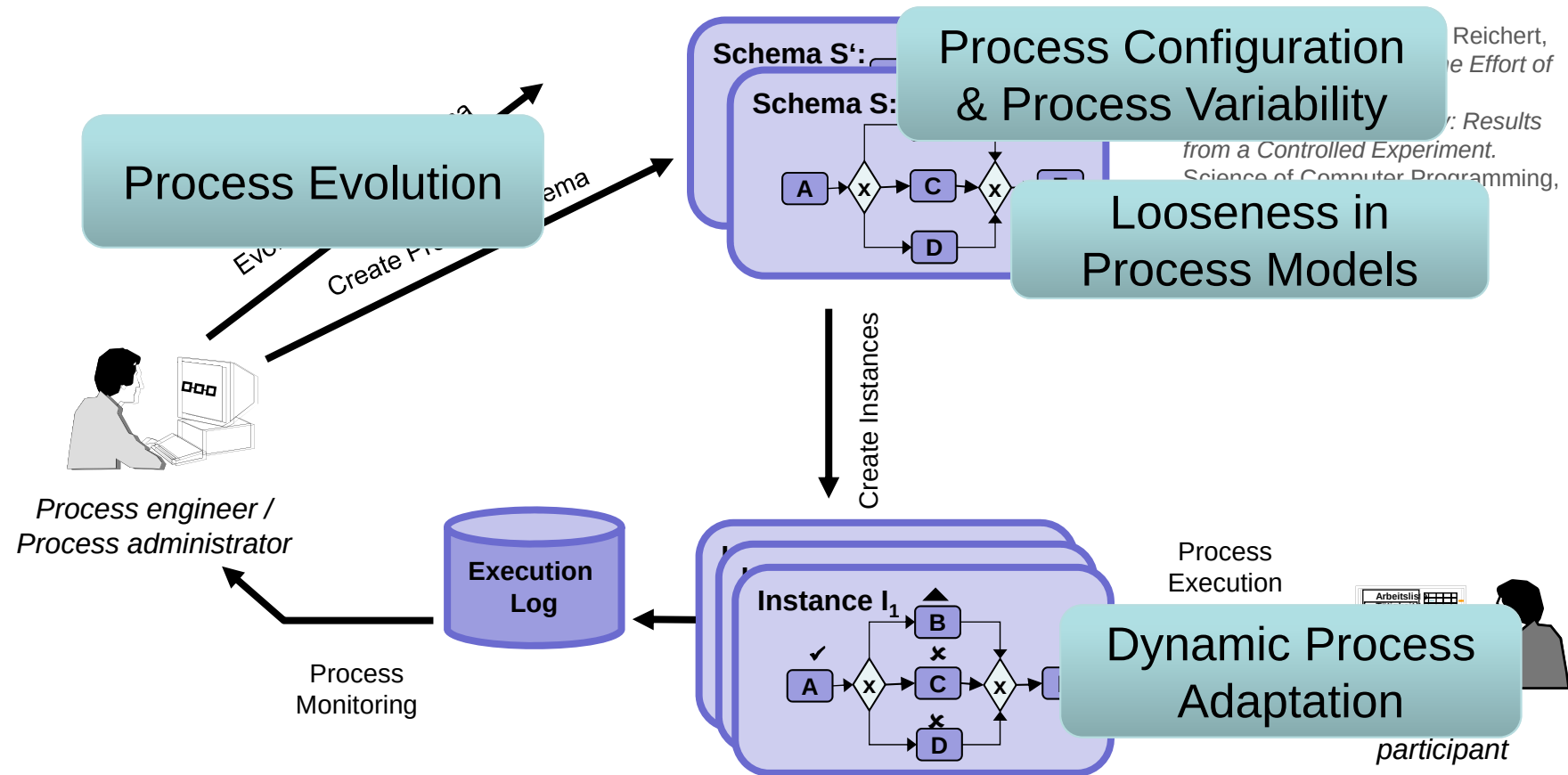
Charles Darwin

ADEPT: Process Flexibility



Weber, B., Mutschler, B., Reichert, M. (2010) *Investigating the Effort of Using Business Process Management Technology: Results from a Controlled Experiment*. Science of Computer Programming, 75(5): 292-310

ADEPT: Process Flexibility



ADEPT: Process Adaptation

a)



jumpForward(CES: ... G_1 ...)

Many other fundamental issues:

b)

- Ensuring soundness of dynamic process changes

- Providing proper end user assistance

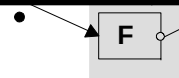
- Enabling adaptations based on model abstractions

c)

- Balancing process flexibility and security

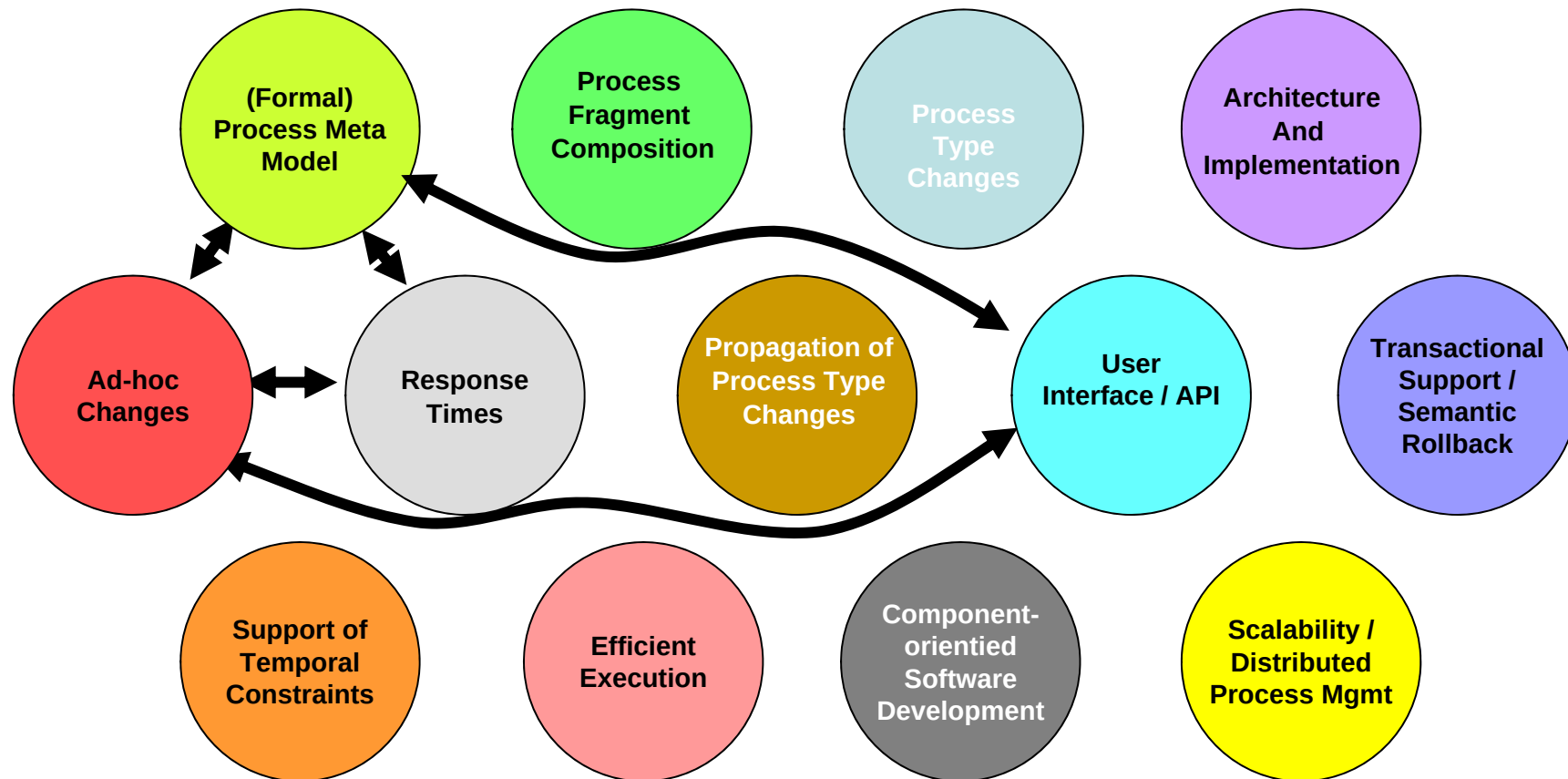
- Mining of process variants and deviants

d)

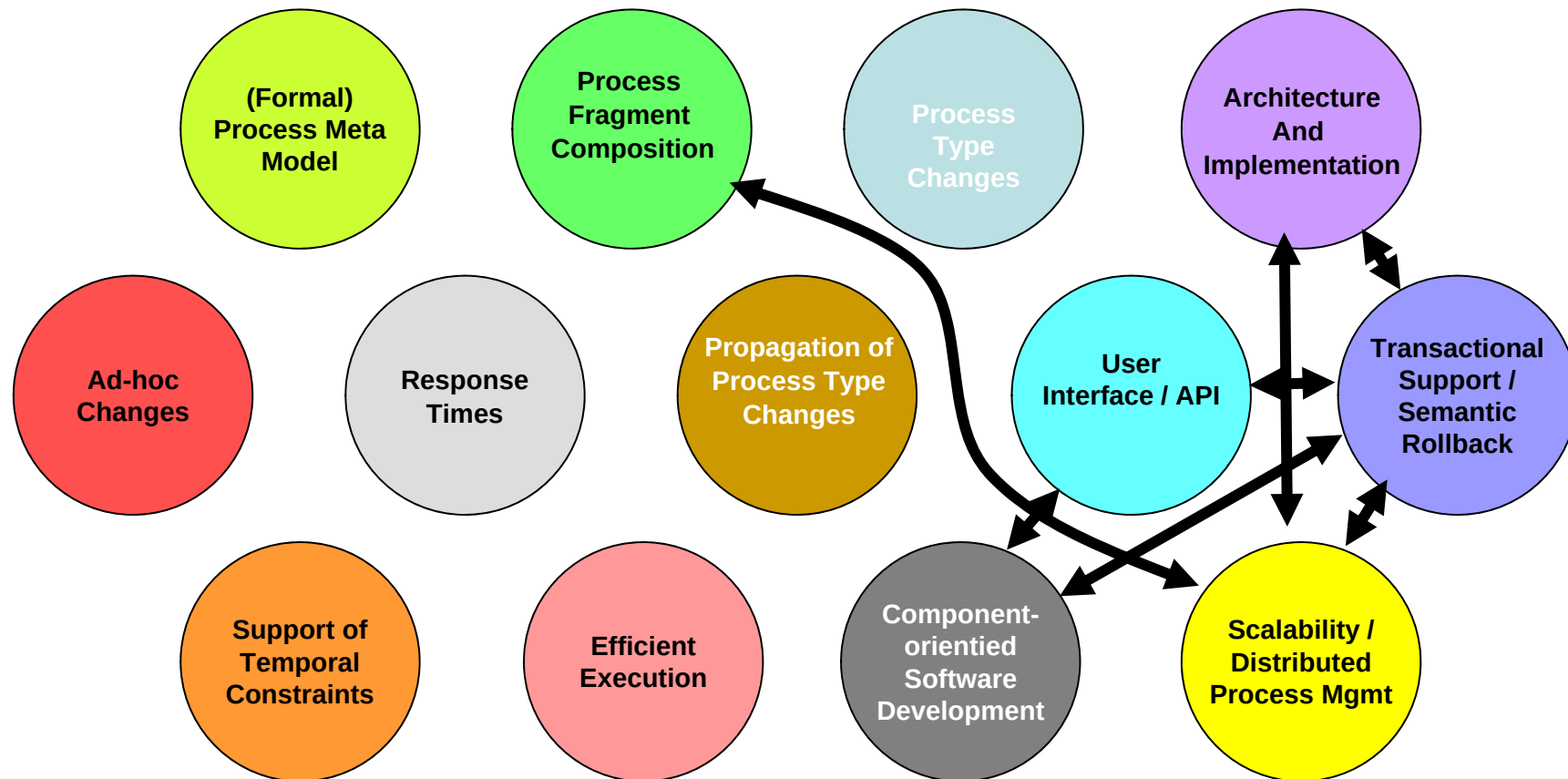


Reichert, Manfred and Dadam, Peter and Bauer, Thomas (2003) *Dealing with forward and backward jumps in workflow management systems*. Int'l Journal Software and Systems Modeling (SOSYM), 2(1): 37-58

ADEPT: Technology Development

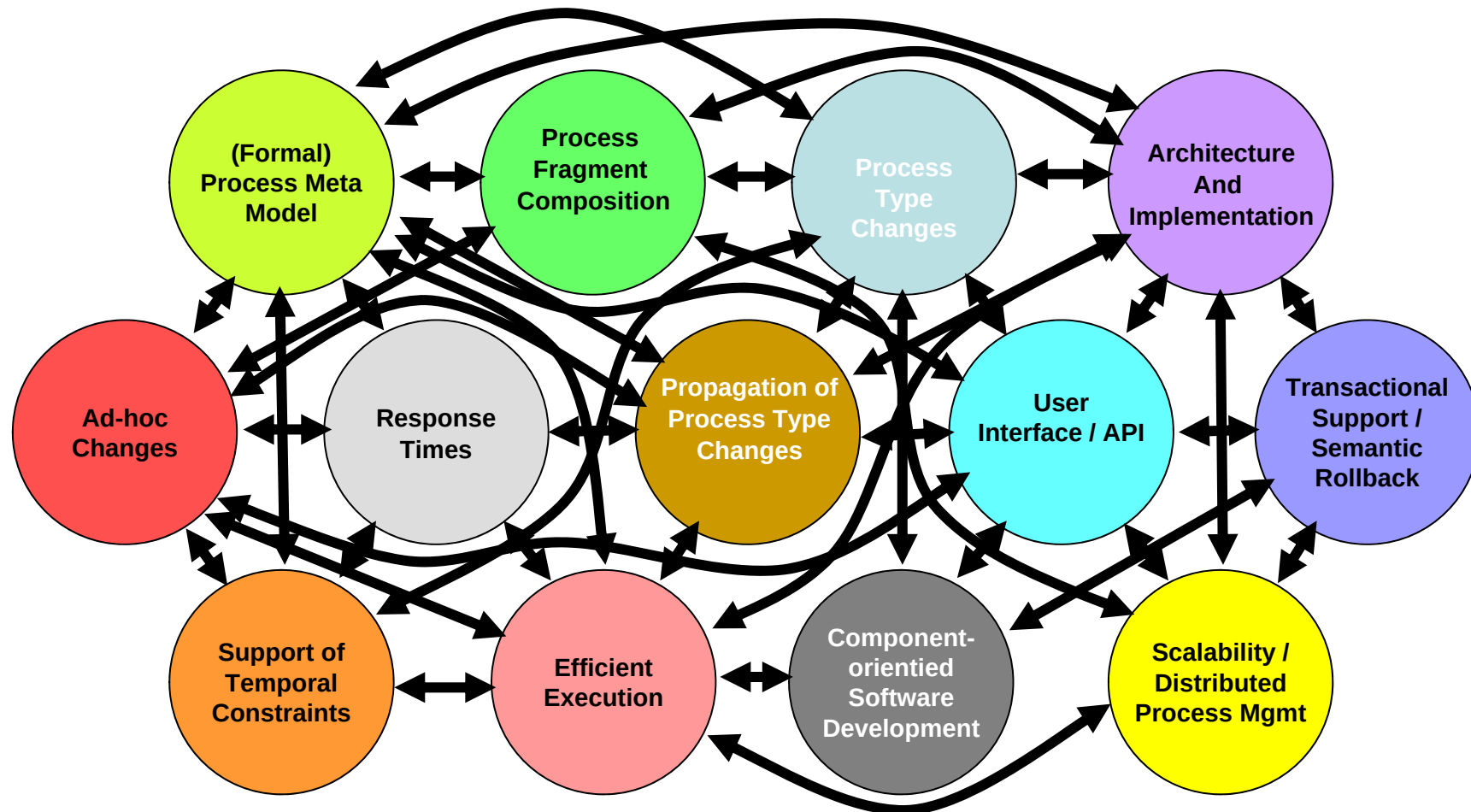


ADEPT: Technology Development

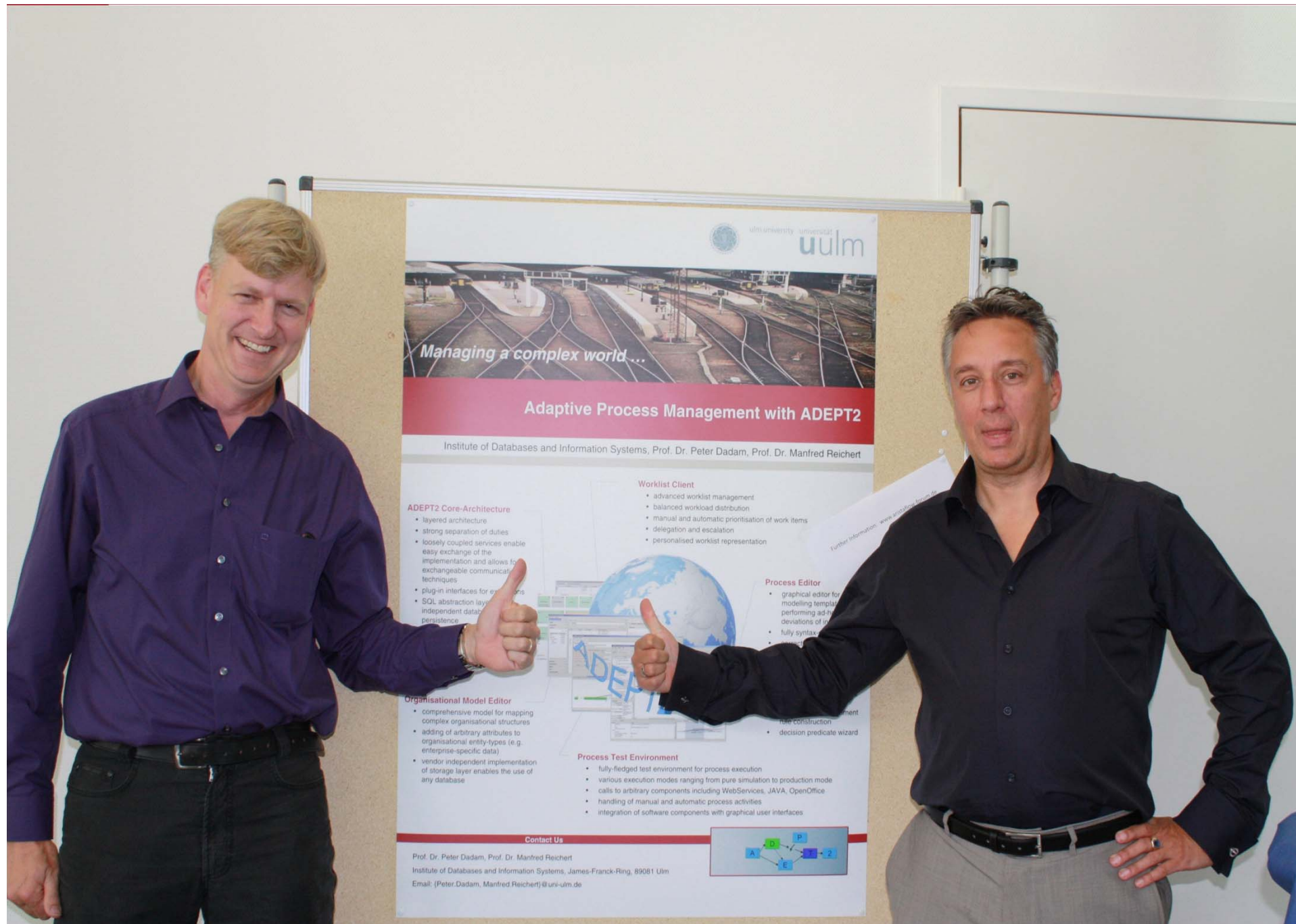


Dadam, Peter and Reichert, Manfred (2009) *The ADEPT Project: A Decade of Research and Development for Robust and Flexible Process Support - Challenges and Achievements*. Computer Science - Research and Development, Vol. 23, No. 2, pp. 81-97.

ADEPT: Technology Development



Dadam, Peter and Reichert, Manfred (2009) *The ADEPT Project: A Decade of Research and Development for Robust and Flexible Process Support - Challenges and Achievements*. Computer Science - Research and Development, Vol. 23, No. 2, pp. 81-97.



Managing a complex world...

Adaptive Process Management with ADEPT2

Institute of Databases and Information Systems, Prof. Dr. Peter Dadam, Prof. Dr. Manfred Reichert

ADEPT2 Core-Architecture

- layered architecture
- strong separation of duties
- loosely coupled services enable easy exchange of the implementation and allows for exchangeable communication techniques
- plug-in interfaces for extensions
- SQL abstraction layer for independent database persistence

Organisational Model Editor

- comprehensive model for mapping complex organisational structures
- adding of arbitrary attributes to organisational entity-types (e.g. enterprise-specific data)
- vendor independent implementation of storage layer enables the use of any database

Worklist Client

- advanced worklist management
- balanced workload distribution
- manual and automatic prioritisation of work items
- delegation and escalation
- personalised worklist representation

Process Editor

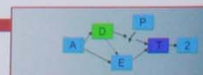
- graphical editor for modelling templates
- performing ad-hoc deviations of process
- fully syntactically correct
- decision predicate wizard

Process Test Environment

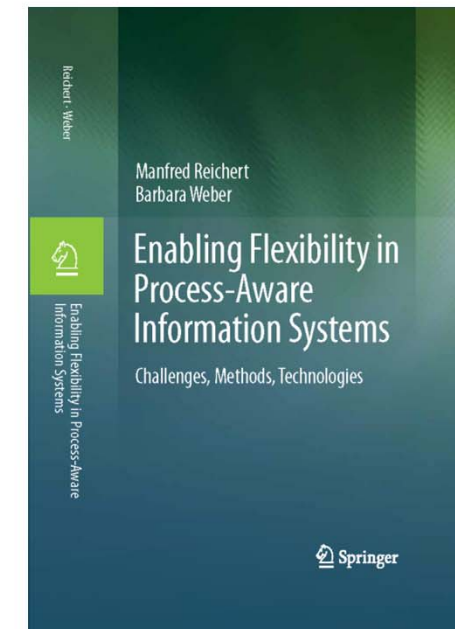
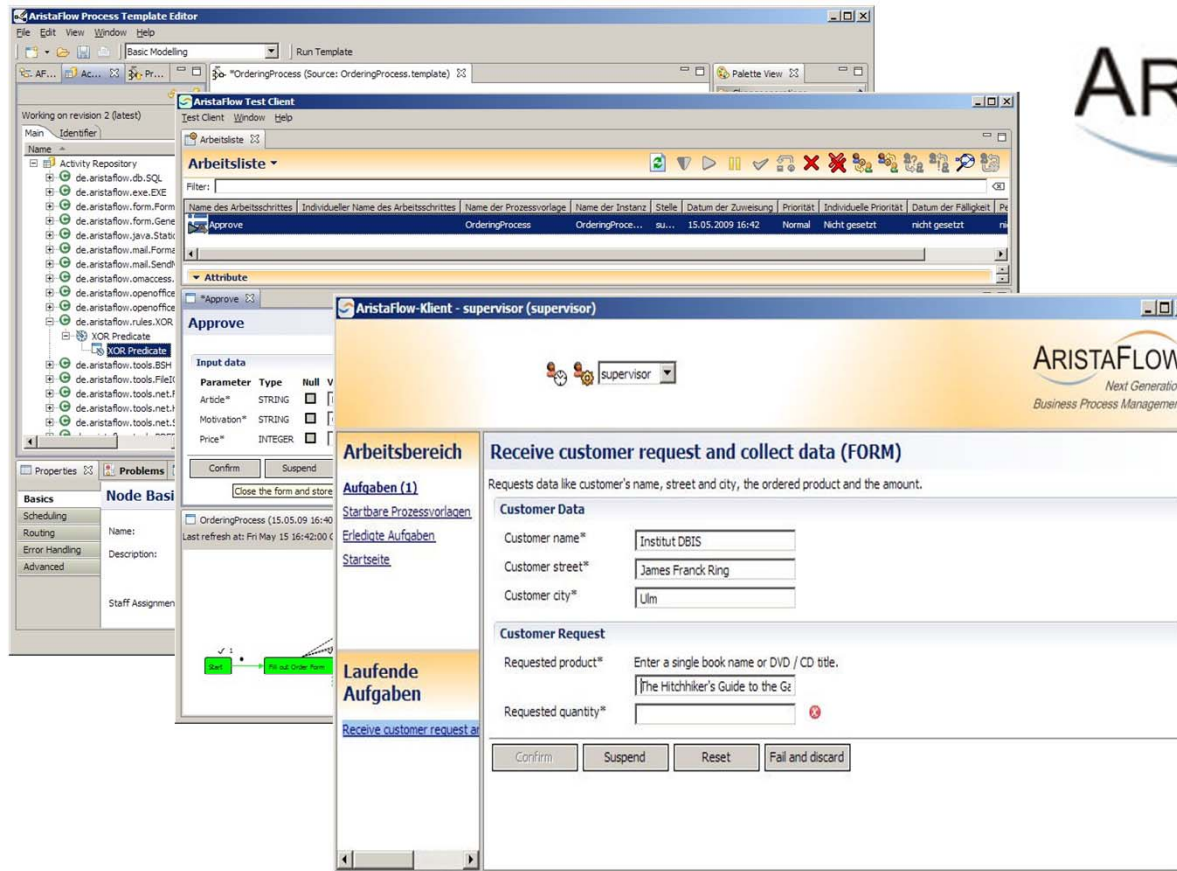
- fully-fledged test environment for process execution
- various execution modes ranging from pure simulation to production mode
- calls to arbitrary components including WebServices, JAVA, OpenOffice
- handling of manual and automatic process activities
- integration of software components with graphical user interfaces

Contact Us

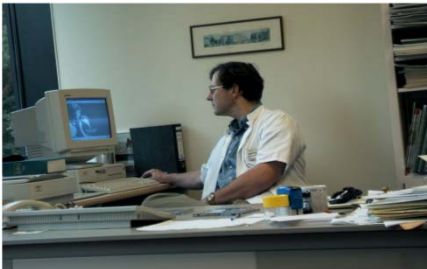
Prof. Dr. Peter Dadam, Prof. Dr. Manfred Reichert
Institute of Databases and Information Systems, James-Frank-Ring, 89081 Ulm
Email: {Peter.Dadam, Manfred.Reichert}@uni-ulm.de



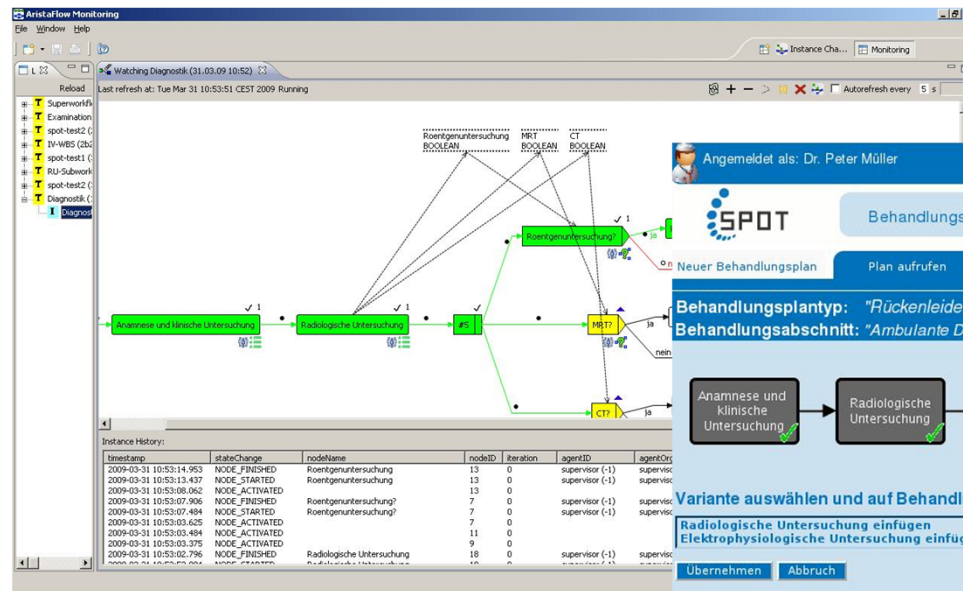
ADEPT: Technology Transfer



AristaFlow: Technology Application

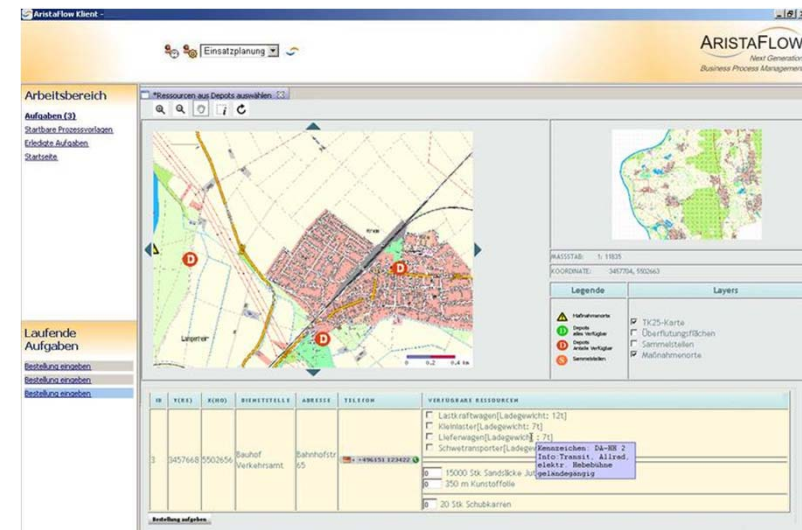
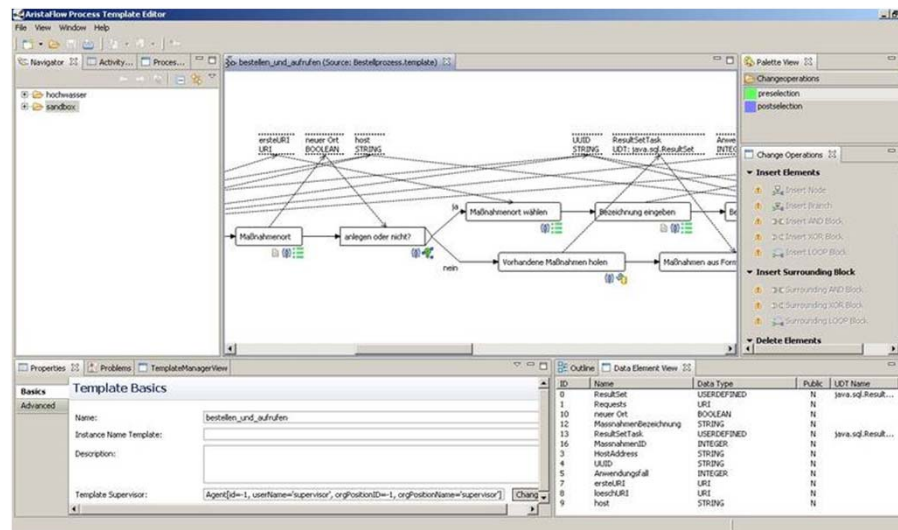


Flexible Support of Clinical Pathways



AristaFlow: Technology Application

Flexible Disaster Management



MARPLE: BPM Goes Mobile



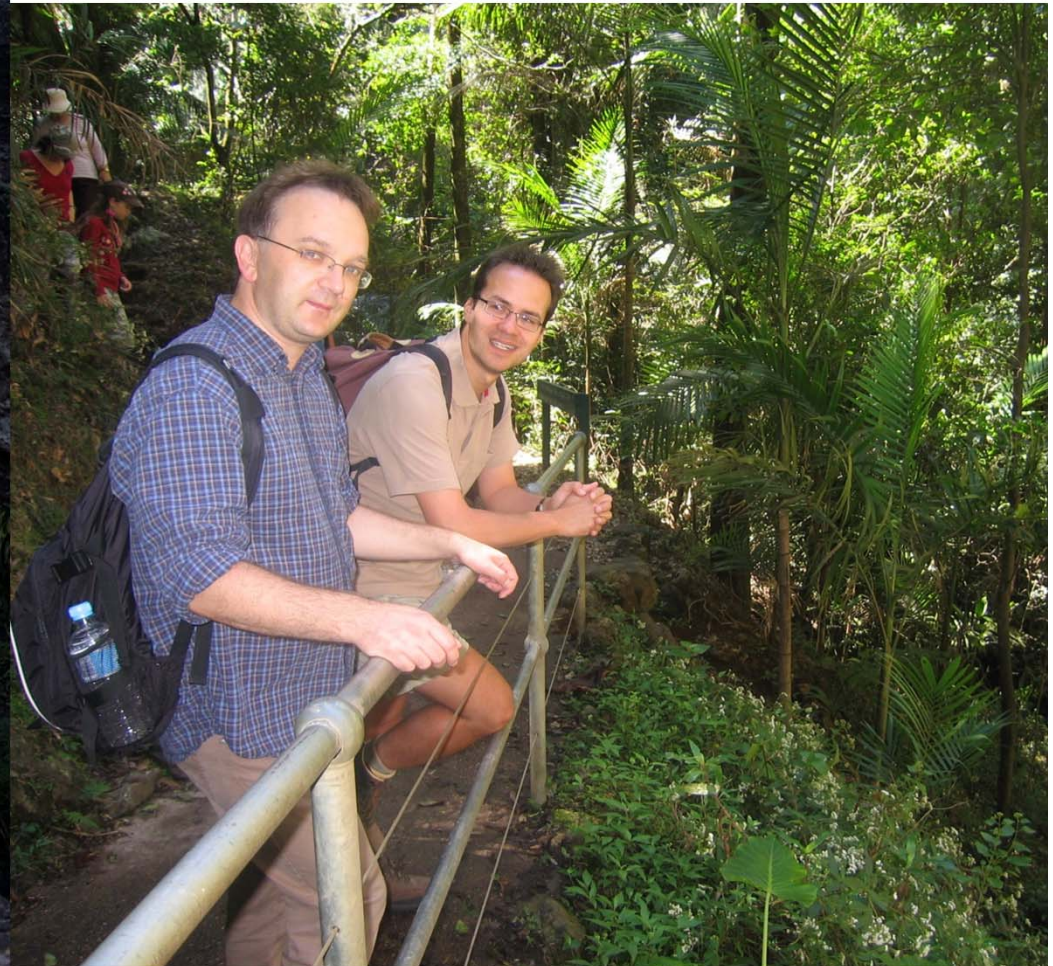
My BPM Life with Hajo



My BPM Life with Hajo



My BPM Life with Hajo



My BPM Life with Hajo



My BPM Life with Hajo



My BPM Life with Hajo



My BPM Life with Hajo



My BPM Life with Hajo



Our first joint paper ☺

Computers in Industry 62 (2011) 467–486



Contents lists available at ScienceDirect

Computers in Industry

journal homepage: www.elsevier.com/locate/compind



Survey paper

Refactoring large process model repositories

Barbara Weber^{a,*}, Manfred Reichert^b, Jan Mendling^c, Hajo A. Reijers^d

^a Department of Computer Science, University of Innsbruck, Technikerstraße 21a, 6020 Innsbruck, Austria

^b Institute of Databases and Information Systems, University of Ulm, Germany

^c Humboldt-Universität zu Berlin, Germany

^d School of Industrial Engineering, Eindhoven University of Technology, The Netherlands

ARTICLE INFO

Article history:

Received 24 July 2010

Received in revised form 18 November 2010

Accepted 17 December 2010

Available online 5 February 2011

Keywords:

Process-aware information system

Process model quality

Process model smell

Process model refactoring

Abstract: With the increasing adoption of process-aware information systems, large process model repositories have emerged. Typically, the models in such repositories are re-aligned to real-world events and demands through adaptation on a day-to-day basis. This bears the risk of introducing model redundancies and of unnecessarily increasing model complexity. If no continuous investment is made in keeping process models simple, changes will become more difficult and error-prone over time. Although refactoring techniques are widely used in software engineering to address similar problems, so far, no comparable state-of-the-art has evolved in the business process management domain. Process designers either have to refactor process models by hand or are simply unable to apply respective techniques at all. This paper proposes a catalogue of process model “smells” for identifying refactoring opportunities. In addition, it introduces a set of behavior-preserving techniques for refactoring large process repositories. The proposed refactorings enable process designers to effectively deal with model complexity by making process models better understandable and easier to maintain. The refactorings have been evaluated using large process repositories from the healthcare and automotive domain. To demonstrate the feasibility of the refactoring techniques, a proof-of-concept prototype has been implemented.

© 2010 Elsevier B.V. All rights reserved.

... and Hajo celebrating its acceptance.

