
Workshop Requirements Engineering

**Classification of Requirements,
Integration of Requirements and Models,
Requirements Engineering Process**

Munich, 17. April 2002
Großer Senatssaal
Technical University of Munich



TELELOGIC AB GERMANY



TECHNICAL UNIVERSITY OF MUNICH
DEPARTMENT OF COMPUTER SCIENCE
SOFTWARE & SYSTEMS ENGINEERING

Preface

Software and systems development within the embedded area is dominated by model based design techniques. These techniques are commonly aligned to standard modelling languages such as UML, SDL or UML/RT. Along with software and systems design techniques the concern of requirements management methodologies has continuously been increased in the last years, aiming at an improvement of the overall development process. As a merger of both, model based design techniques and requirements management methodologies, a new kind of requirements engineering methodology has been established. However, due to the complexity of this methodology and the high degree of informal aspects a unique and integrated methodology for requirements engineering is still missing.

The workshop focuses on the integration of formal, model based design techniques and informal, requirements management methodologies to assess different requirements classifications. Requirements classifications are regarded as a mean to couple formal and informal specification techniques. Furthermore new solutions for a tool based support are discussed. The overall goal is to stimulate a fruitful and continuing dialog between industry and academia.

The presentations deal with various methodological aspects as they are currently elaborated in research projects such as Drive-by-Wire, Empress, FORSOFT II - AUTOMOTIVE, Quasar and Step-X. Following topics are discussed in detail:

- Integration of Models and Requirements
- Classification of Requirements
- Linking of Requirements
- Contents of different Documents (Requirements Specification, Functional Specification ...)
- Reflection of these concepts into the Requirements Engineering Process

Lecturers: Dr. Michael von der Beeck (BMW Group, Munich), Dr. Keith Collyer (Telelogic UK, Brecknell), Prof. Dr. Ursula Goltz (TU Braunschweig, Braunschweig), Colin Hood (HOOD, Munich/London), Dr. habil. Barbara Paech (Fraunhofer IESE, Kaiserslautern), Arno von Querfurth (DaimlerChrysler, Stuttgart), Martin Rappl (TU Munich, Munich), Dr. Oscar Slotosch (Validas AG, Munich), Dr. Joachim Weisbrod (DaimlerChrysler, Stuttgart)

Workshop Organization: Sieglinde Berner, Peter Braun, Jianjun Deng, Ursula Eschbach, Martin Rappl, Dr. Christian Schröder

Manfred Broy and Christian Schröder

Agenda

Requirements Engineering Workshop

Program for Wednesday, 2002-04-17

Session Chair: *Dr. Christian Schröder (Telelogic)*

- 10:00 – 10:15** **Introduction**
Prof. Dr. Manfred Broy (TU Munich)
- 10:15 – 10:45** **Using Models for Requirements Validation**
Dr. Oscar Slotosch (Validas)
- 10:45 – 11:15** **Requirements Recycling**
Dr. Joachim Weisbrod (DaimlerChrysler)
- 11:15 – 11:45** **Requirements Management Process Improvement - Change without Risk**
Colin Hood (HOOD)
- 11:45 – 13:00** **Lunch**
- 13:00 – 13:45** **Putting Requirements First**
Dr. Keith Collyer (Telelogic AB)
- 13:45 – 14:15** **Model Based Requirements Classification**
Martin Rappl (TU Munich)
- 14:15 – 14:45** **QUASAR Requirements Documentation**
Dr. habil. Barbara Paech (Fraunhofer IESE)
- 14:45 – 15:00** **Coffee break**
- 15:00 – 15:30** **A Structured Development Process for Automotive Systems**
Prof. Dr. Ursula Goltz (TU Braunschweig)
- 15:30 – 16:00** **Requirements Engineering for Complex Functional Networks in the Automotive Area**
Dr. Michael von der Beeck (BMW Group)
- 16:00 – 16:30** **Specification Without Limitations**
Arno von Querfurth (DaimlerChrysler)
- 16:30-17:00** **Discussion**

Abstracts

Using Models for Requirements Validation

Dr. Oscar Slotosch (Validas)

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Models are used in many activities during system development. Different modelling concepts and languages are available and it is difficult to select useful modelling languages for requirements modeling. Some criterias are: simplicity, hierarchy, the right mixture of precision and abstraction, process integration, and support for validation techniques like simulation or testing. In the talk we shortly present AutoFocus, a graphical and formal modeling tool for requirements and show the achieved validation results by means of an example.

Requirements Recycling

Dr. Joachim Weisbrod (DaimlerChrysler)

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Requirements Management Process Improvement - Change without Risk

Colin Hood (HOOD)

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Leading organisational cultural change programs must be done with care and planning. Introducing new working practices to an organisation can be successful if the difficulties are understood and prepared for. Changing the Requirements Management Process will almost certainly involve a change to culture and practice. This paper summarises the need for change and then moves to discuss a successful process for changing an organisation's requirements Management process and the supporting methodologies. The paper shows that in order to facilitate change, the organisation must be able to learn. Any process improvement must include learning to be successful. The specific example of a requirements management process improvement is used to illustrate a general point.

Putting Requirements First

Dr. Keith Collyer (Telelogic AB)

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Model Based Requirements Classification

Martin Rappl (TU Munich)

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This presentation gives a survey on existing requirements classifications and motivates the use of a model based requirements classification. Within a running example the transition of informal requirements to first models is illustrated. Different aspects of the requirements engineering process and the change management process are accounted. The presented work stems from the research project AUTOMOTIVE which is a joint project between the TU Munich, tool vendors, car vendors and suppliers.

QUASAR Requirements Documentation

Dr. habil. Barbara Paech (Fraunhofer IESE)

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In this talk I present the QUASAR requirements documentation. For functional requirements it distinguishes explicitly system requirements (use cases from the user point of view), system specification (function nets and high-level statecharts which capture the full system behaviour but abstract from implementation details like several actuators for one controlled variable), software requirements (take the hardware decisions regarding sensors and actuators into account) and software specification (low-level, object-oriented state charts) In particular the transition between these different documentation levels will be discussed.

A Structured Development Process for Automotive Systems

Prof. Dr. Ursula Goltz (TU Braunschweig)

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The project STEP-X is a joint enterprise with Volkswagen and the institutes of Prof. Schnieder and Prof. Varchmin of the TU Braunschweig. Topic is to develop a structured development process for automotive systems. We are considering the comfort system door. We suggest a toolbased structured development process, leading from informal structured requirements to an architecture design, from which it is possible to generate code. Features for diagnosis and for testing are considered throughout the whole development process. Our focus in the project are the definition of the development process and its documentation, the adjustment of object-oriented methods to domain specific requirements, evaluation and selection of tools and the application of these results to the comfort system.

Requirements Engineering for Complex Functional Networks in the Automotive Area

Dr. Michael von der Beeck (BMW Group)

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This talk presents ongoing work from the Drive-by-Wire Project at BMW. One major aim of this project is given by the development of a distributed, seamless process for the construction of functional networks in the application domain of chassis management. This process shall encompass requirements engineering, hierarchical modeling of functional networks, integration of data bases, systematic and early testing, as well as version and configuration management. However, the focus of this talk is given by the integration between requirements engineering and modeling of functional networks.

Specification Without Limitations

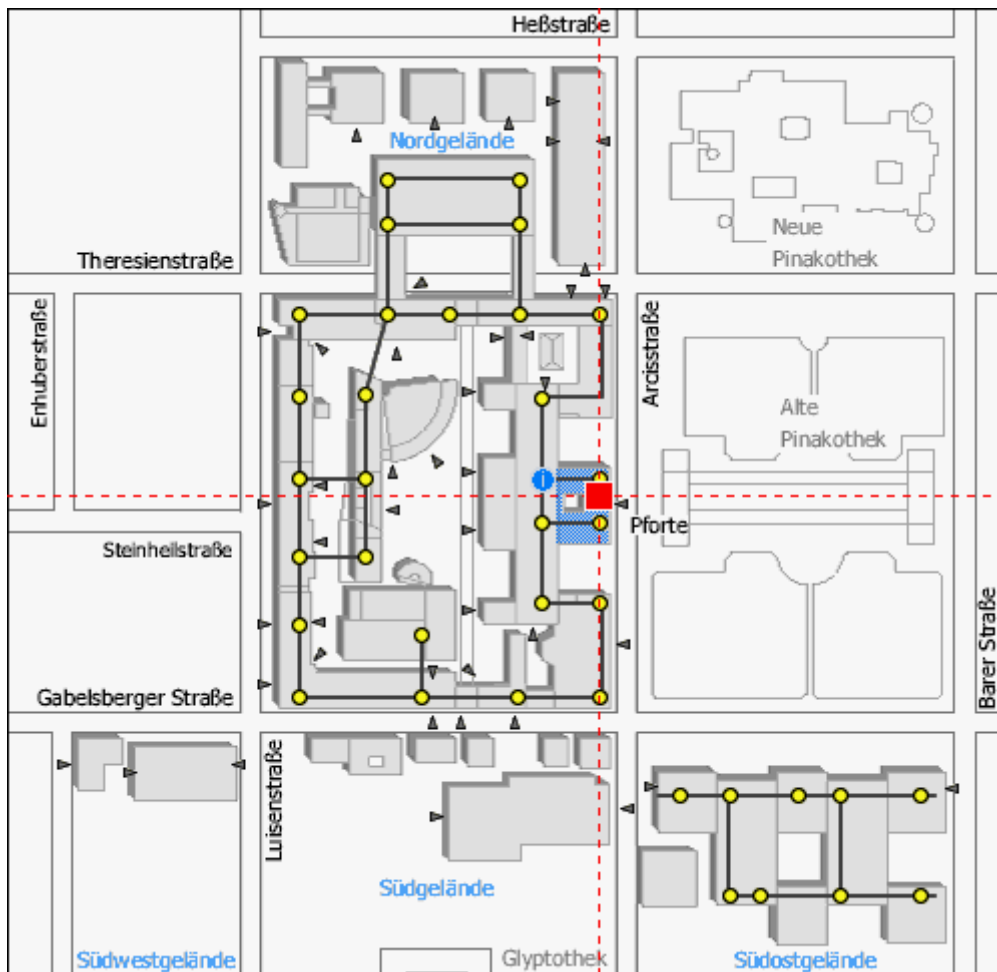
Arno von Querfurth (DaimlerChrysler)

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In diesem Vortrag wird anhand von Beispielen aufgezeigt, wie Grenzen in Entwicklungsprojekten durch neue Wege und werkzeugunterstütztes Requirements Management (RM) überschritten werden können.

Venue

Venue is the Technical University of Munich, Großer Senatssaal. The lecture hall can easily be reached by entering the university at the main entrance (Pforte). The “Große Senatssaal” is located on the first floor.



Technical University of Munich

Enter the central building of the main station. Follow the signs to subway line U1/U2. Take the escalator to platform “U1 Rotkreuzplatz/U2 Feldmoching” and go with the U2 line. Exit at “Königsplatz”. Leave the station at gate “Glyptothek”. Cross the Road and go ahead to the “TU Mensa” which can easily be identified by the big, green windows. Go along the Technical University to the main entrance.

