Essen, Germany, March 28-30, 2011

# REFSQ 2011

## 17th Intl. Working Conference on Requirements Engineering: Foundation for Software Quality


Organised by

PALUNO
The Ruhr Institute for Software Technology

UNIVERSITÄT DUISBURG ESSEN

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## Imprint


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### Organisational Chair

**Vanessa Stricker,** University of Duisburg-Essen, Germany

### Local Team

**Philipp Schmidt,** University of Duisburg-Essen, Germany

### Program Committees

Please check www.refsq.org for the full lists of the program commitee members.

# Introduction

## Message from the Chairs

We, the General Chair and the Program Committee Co-Chairs, are delighted to welcome you to the 17th Working Conference on Requirements Engineering: Foundation for Software Quality (REFSQ 2011) and its satellite events in Essen, March 28–31, 2011.


Dan Berry

Since the beginning of computing, long before 1994 when the first REFSQ took place, requirements engineering (RE) has always been a major factor determining the quality of software-intensive, computer-based systems and services. From REFSQ's beginnings as a workshop, the REFSQ working conference series has steadily established itself as a leading international forum in which to discuss RE in its many relations to computer-based system quality. REFSQ seeks reports of novel ideas and techniques that enhance RE processes and artifacts as well as reflections on current research and industrial practice about and in RE. Probably the most appreciated characteristic of a REFSQ working conference is its format in which, unlike most conferences and workshops, the discussion following a paper's presentation is as long as the presentation.

A total of 59 papers of all categories were submitted, 2 more than last year, despite the fact that in moving the working conference 4 months earlier, authors had less time to prepare this year. Each paper was subjected to reviews by three different members of the Program Committee. Whenever the reviews for a paper showed any divergence, the reviewers were asked to conduct a discussion electronically with the aim of reaching a consensus. Following the discussions, a few of which ended with the reviewers agreeing to differ, the Program Committee met in Essen to resolve these differences and to choose the final set of 19 accepted papers, yielding an overall acceptance rate of 32%. Of the 38 long papers submitted, 10 were accepted, yielding a long-paper acceptance rate of 26%, and of the 21 short papers submitted, 9 were accepted, yielding a short-paper acceptance rate of 43%. The long accepted papers included 7 research papers and 3 experience report papers. The short accepted papers included 7 research preview papers, and 2 problem statement papers.


Xavier Franch

Besides the main working conference, there are three workshops and a Doctoral Symposium to be held on the day after the working conference.

Special for REFSQ 2011 is the extended Industry Track to be held on the middle day of the working conference. The Industry Track features industry presentations and workshops on product-line engineering, lean development, domain-specific languages, quality attributes, requirements management tools, and other topics.

REFSQ 2011 also debuts two new events in a new Empirical Track. On the first day of the working conference, a selected empirical study will be conducted in a plenary session. In addition, a second study was broadcast prior to the working conference to REFSQ 2011 registrants in a search for participants. On the middle day of the working conference will be the Empirical Research Fair in which proposals for empirical research to be conducted in industrial settings will be presented. The aim of the Fair is to match researchers who want to conduct studies with companies that can provide an industrial setting and subjects in exchange for first access to the results.


Klaus Pohl

We would like to express our gratitude to Christof Ebert for proposing and organising the new format of the Industry Track; to Jörg Dörr, Nazim Madhavji, and Brian Berenbach for promoting and chairing the empirical events; to Barbara Paech and Vincenzo Gervasi for organising the Doctoral Symposium; and to Martin Glinz for serving as Workshop Chair.

We are also deeply thankful to the members of the Program Committee and to the additional referees for their careful and timely reviews. We particularly thank those who actively participated in the Program Committee meeting.

Special thanks go also to the local organising team, including Organisational Chair Vanessa Stricker, Philipp Schmidt, and all those who ensure that the conference is running smoothly.

Last but not least, we thank the sponsors for supporting us in organising this conference: Bosch, adesso, adn, Cassidian, evu.it, e-Spirit, logica and paluno - The Ruhr Institute for Software Technology.

We hope that you are as excited about this incarnation of REFSQ as we are and that you will find it to be informative, and indeed, the best REFSQ working conference ever.

**Klaus Pohl**, General Chair

**Daniel Berry** and **Xavier Franch**, Program Co-Chairs

# Sponsors

**We thank all our sponsors for supporting REFSQ 2011!**

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The paluno approach facilitates innovative, efficient and reliable software systems.

paluno - The Ruhr Institute for Software Technology – represents a holistic development approach for flexible software applications that couples components of classical information systems intelligently with real time information of physical objects and goods.

This development approach supports an agile integration of software-based services on the Internet of Services with features of physical goods within the Internet of Things, and is aligned with business processes in general. As a result, adaptive and customizable software systems based on flexible business models arise.

The development and operation of such new types of software applications require special approaches and agile adaptation in almost all activities of software development. This comprises changing requirements, changes in system utilization, runtime adaptation, and intensive monitoring of the behavior of the system and system context as well as changes of the architecture at runtime.

The paluno approach integrates these elements and thus makes them holistically applicable.

„The paluno approach facilitates the development of innovative, efficient and reliable software systems, overcoming the traditional development models and creating entirely new services."

Paluno is a research institute at the University of Duisburg-Essen, Germany, that is one of the ten largest German universities with about 30,000 enrolled students and 3,400 academic and non-academic staff. Five full professors and about 60 academic staff members join forces in the research institute. Consequently, its professional competence covers several areas of software and service engineering, including software and service architectures, mobile and ubiquitous software systems, pervasive computing, quality assurance, requirements engineering, software product line engineering, variability management, security and trust, and software development methods and tools.

adesso business. people. technology.

adesso is one of the leading IT service providers in the German-speaking area and focuses its consulting and software development activities on a company's core business processes. adesso's strategy is based on three pillars: the deep industry-specific know-how of its staff, the comprehensive expertise in technology and the application of reliable methods in software implementation projects. Following this approach, adesso develops superior IT solutions which enhance the competitive position of a company.

The adesso service portfolio is divided into four main units which are, depending on the customer's requirements, individual entry points for projects:

* Business Consulting, i.e. Strategy Development, Requirements Engineering, Tender Management, Process Management
* IT Consulting, i.e. Software Architecture, Software Processes, Technology Selection, Test Management
* Software Development, i.e. developing custom applications, integrating and migrating existing legacy systems, integrating and customizing standard software, designing, building and consolidating complex portal landscapes
* IT Management, i.e. consolidation of complex infrastructures, definition and introduction of services and products for IT organisations, support of complex sourcing projects, application management of complex application landscapes

## Key Figures

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* More than 750 employees in adesso Group
* 10 offices in Germany, Austria and Switzerland (headquarter: Dortmund)
* Sales revenues 2009: EUR 71.3 million (Expected sales revenues 2010: > EUR 79 million)
* Customers: i.e. Allianz, Hannover Rück, Westdeutsche Lotterie, Zurich Versicherung, DEVK, DAK
* Ranked 18 in the top 25 German consulting and systems integration companies (Lünendonk-Liste 2010)

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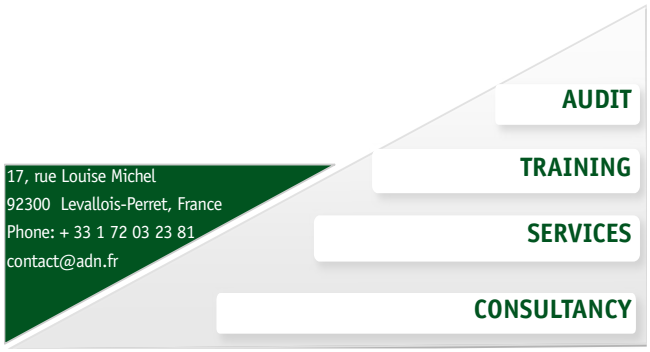
adn

## Risks - Requirements - Regulatory Management




## Center of Excellence: System Engineering

* Requirements Elicitation
* Requirements Definition and Derivation through Design, traceability
* Requirements Verification
* Risks Analysis
* System Modeling (SysML, SADT, Ontologies, ...)
* Products lines: Re-use of Generic Requirements and Variants Management
* Change and Configuration Management

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# Conference Program

## Monday, 28th of March 2011 - Atlantic Congress Hotel

| | | |
|---|---|---|
| 08.45 - 09.00 | Conference Opening | Room 1&2 |
| 09.00 - 10.30 | Keynote "Delivering Requirements Research into Practice"<br>Prof. Neil Maiden, City University London, UK | |
| 10.30 - 11.00 | Coffee Break | |
| 11.00 – 12.30 | Research Session 1 – Security and Sustainability<br>Session Chair: Norbert Seyff | Room 1&2 |
| 12.30 - 14.00 | Lunch | |
| 14.00 - 15.30 | Empirical Study<br>Session Chair: Andrea Herrmann | Room 1&2 |
| 15.30 - 16.00 | Coffee Break | |
| 16.00 - 18.00 | Research Session 2 – Process Improvement and Requirements in Context<br>Session Chair: Anne Persson | Room 1&2 |
| 18.00 - 18.30 | Plenary Discussion | Room 1&2 |
| 19.00 | Welcome Reception | Hotel Restaurant |

## Tuesday, 29.th of March 2011 - Atlantic Congress Hotel

| | | | |
|---|---|---|---|
| 09.00 - 10.30 | Industrial Talks Session 1 - Elicitation & Specification<br>Session Chair: Klaus Pohl | Room 1 | Industrial Talks Session 2 - Tools & Seizing<br>Session Chair: Christof Ebert | Room 2 |
| 10.30 - 11.00 | Coffee Break | | | |
| 11.00 - 12.30 | Industrial Talks Session 3 - Modeling & Quality<br>Session Chair: Klaus Pohl | Room 1 | Industrial Talks Session 4 - Integrated RE<br>Session Chair: Christof Ebert | Room 2 |
| 12.30 - 14.00 | Lunch | | | |
| 14.00 - 15.30 | Empirical Research Fair<br>Session Chairs: Nazim H. Madhavji<br>Brian Berenbach | Room 1 | Industry Workshop 1 - Effectiveness and Efficiency – Evolving towards Lean Development<br>Organiser: Steffen Grünwaldt | Room 2 |
| 15.30 - 16.00 | Coffee Break | | | |
| 16.00 - 17.30 | Industry Workshop 2 - Quality Assurance for Natural-Language Specifications<br>Organiser: Frank Houdek | Room 1 | Industry Workshop 3 - Software Product Management<br>Organiser: Samuel Fricker | Room 2 |
| 17.30 - 18.00 | Informal Talk by Nazim H. Madhavji "Why Ph.D. Students Should Not Write a Thesis" | | | Room 1 |
| 18.30 | Conference Dinner | | | Dampfe |

# Conference Program

## Wednesday 30th March 2011 - Atlantic Congress Hotel

| | | |
|---|---|---|
| 09.00 - 10.30 | Research Session 3 - Elicitation<br>Session Chair: Pete Sawyer Room 1 | Research Session 4 - Models<br>Session Chair: Kim Lauenroth Room 2 |
| 10.30 - 11.00 | Coffee Break | |
| 11.00 - 12.30 | Research Session 5 - Services<br>Session Chair: Roel Wieringa Room 1 | Research Session 6 - Embedded and Real-Time Systems<br>Session Chair: Samuel Fricker Room 2 |
| 12.30 - 14.00 | Lunch | |
| 14.00 - 15.30 | Research Session 7 - Prioritisation and Traceability<br>Session Chair: Bjorn Regnell Room 1 & 2 | |
| 15.30 - 16.00 | Plenary Discussion & Closing Room 1 & 2 | |

## Thursday 31th March 2011 - paluno Building

| | | | |
|---|---|---|---|
| 09.00 - 13.00 | Workshop 1 - Requirements Engineering Efficiency<br>Organisers: Samuel Fricker<br>Norbert Seyff | Workshop 2 - Requirements Prioritization for Customer-Oriented Software Development<br>Organisers: Benedikt Krams<br>Sixten Schockert | Doctoral Symposium<br>Co-Chairs: Barbara Paech<br>Vincenzo Gervasi |
| 13.00 - 14.00 | Lunch | | 12.20 - 13.15 Lunch |
| 14.00 - 18.00 | Workshop 3 - Workshop on Empirical Research in Requirements Engineering: Challenges and Solutions<br>Organisers: Andrea Herrmann<br>Maya Daneva | | Doctoral Symposium cont. |

# Keynote

## Delivering Requirements Research into Practice

### Prof. Neil Maiden - City University London, UK

Requirements research over the last 25 years has delivered numerous methods, techniques and tools. These methods, techniques and tools have been reported in requirements and software engineering journals and conferences, often with small-scale evaluations based on experiments and controlled studies. Few of these methods, techniques and tools have been applied to large-scale requirements problems or transferred to widespread requirements practice. This keynote will review the challenges that researchers face to apply research solutions to requirements practices. It will demonstrate how some of these challenges have been overcome with presentations of cases that show the application of requirements research on large-scale industrial projects, and reflect on how these successes were achieved. The keynote will end with proposals to deliver more requirements research into practice.

### Biography

Neil Maiden is Professor of Systems Engineering at City University London. He is and has been a principal and co-investigator on numerous UK EPSRC- and EU-funded research projects with a total value of €3 million. He has published over 150 peer-reviewed papers in academic journals, conferences and workshops proceedings, and heads the most successful requirements research group worldwide in terms of numbers of publications. He was Program Chair for the 12th IEEE International Conference on Requirements Engineering in Kyoto in 2004, and is both Associate Editor for Requirements and Editor of the IEEE Software's Requirements column. His details are available at http://www-hcid.soi.city.ac.uk/pNeilmaiden.html.


## Proceedings

REFSQ 2011 research papers are available in the conference proceedings published by Springer in the volume 6606 of the Lecture Notes in Computer Science Series.

***Requirements Engineering: Foundation for Software Quality***

*Proceedings of the 17th International Working Conference, REFSQ 2011*

**Editors:**

Dan Berry, Xavier Franch

**ISBN:** 978-3-642-19857-1

More information at http://www.springer.com/computer/swe/book/978-3-642-19857-1.

# Scientific Track

Since 1994, when the first REFSQ took place, Requirements Engineering (RE) continued to be a dominant factor influencing the quality of software, systems and services. The REFSQ working conference series has now established itself as one of the leading international forums to discuss RE in its many relations to quality.

REFSQ 2011 is organised along the following seven sessions featuring 19 high quality papers. Each session is organised in order to provoke discussion among the presenters of papers, pre-assigned discussants, and all the other participants.

### Research Session 1 - Security and Sustainability (Monday, 28th of March, 11.00 -12.30)
**Session Chair: Norbert Seyff**

| | |
|---|---|
| 11.00 - 11.40 | **Supporting Requirements Engineers in Recognising Security Issues** (Research Paper)<br>Eric Knauss, Siv Houmb, Kurt Schneider, Shareeful Islam and Jan Juerjens<br>**Discussant:** Martin Mahaux |
| 11.40 - 12.20 | **Discovering Sustainability Requirements: an Experience Report** (Experience Report)<br>Martin Mahaux, Patrick Heymans and Germain Saval<br>**Discussant:** Eric Knauss |
| 12.20 - 12.30 | **Session Discussion** |

### Research Session 2 - Process Improvement and Requirements in Context (Monday, 28th of March, 16.00 -18.00)
**Session Chair: Anne Persson**

| | |
|---|---|
| 16.00 - 16.40 | **Requirements Engineering Process Improvement: An industrial Case Study** (Experience Report)<br>Georgi Markov, Oliver Creighton and Anne Hoffmann<br>**Discussant:** Thorsten Merten |
| 16.40 - 17.00 | **Requirements for a Nutrition Education Demonstrator** (Research Preview)<br>Ing Widya, Richard Bults, Rene de Wijk, Ben Loke, Nicole Koenderink, Ricardo MendesBatista, Val Jones and Hermie Hermens<br>**Discussant:** Georgi Markov |
| 17.00 - 17.20 | **Scaling Up Requirements Engineering – Exploring the Challenges of Increasing Size and Complexity in Market-Driven Software Development** (Problem Statement)<br>Krzysztof Wnuk, Björn Regnell and Brian Berenbach – Problem Statement<br>**Discussant:** Ing Widya |
| 17.20 - 17.40 | **Towards a New Understanding of Small and Medium Sized Enterprises in Requirements Engineering Research** (Problem Statement)<br>Thorsten Merten, Kim Lauenroth and Simone Bürsner<br>**Discussant:** Krzysztof Wnuk |
| 17.40 - 18.00 | **Session Discussion** |

### Research Session 3 - Elicitation (Wednesday, 30th of March, 9.00 -10.30)
**Session Chair: Pete Sawyer**

| | |
|---|---|
| 09.00 - 09.20 | **Research Preview: Supporting End-User Requirements Elicitation Using Product Line Variability Models** (Research Preview)<br>Deepak Dhungana, Norbert Seyff and Florian Graf<br>**Discussant:** Klaus Schmid |
| 09.20 - 09.40 | **Interview Patterns for Requirements Elicitation** (Research Preview)<br>Georgi Markov, Oliver Creighton and Anne Hoffmann<br>**Discussant:** Norbert Seyff |
| 09.40 - 10.20 | **A Heuristic Approach for Supporting Product Innovation in Requirements Engineering: A Controlled Experiment** (Research Paper)<br>Sascha El-sharkawy and Klaus Schmid<br>**Discussant:** Lauri Scheinholtz |
| 10.20 - 10.30 | **Session Discussion** |

# Scientific Track

**Research Session 4 - Models (Wednesday, 30th of March, 09.00 -10.30)**
**Session Chair: Kim Lauenroth**

| | |
|---|---|
| 09.00 - 09.20 | **Satisfying User Needs at the Right Time and in the Right Place: A Research Preview** (Research Preview)<br>Nauman A. Qureshi, Norbert Seyff and Anna Perini<br>**Discussant:** Dustin Wueest |
| 09.20 - 09.40 | **Flexible Sketch-Based Requirements Modeling** (Research Preview)<br>Dustin Wueest and Martin Glinz<br>**Discussant:** Soren Lauesen |
| 09.40 - 10.20 | **Use Cases versus Task Descriptions**(Research Paper)<br>Soren Lauesen and Mohammad Kuhail<br>**Discussant:** Nauman A. Qureshi |
| 10.20 - 10.30 | **Session Discussion** |

**Research Session 5 - Services (Wednesday, 30th of March, 11.00 -12.30)**
**Session Chair: Roel Wieringa**

| | |
|---|---|
| 11.00 - 11.40 | **RE-Service Requirements from a Consumer-Process Perspective** (Research Paper)<br>Martin Henkel and Erik Perjons<br>**Discussant:** Sebastian Adam |
| 11.40 - 12.20 | **Is It Beneficial to Match Reusable Services Earlier?** (Research Paper)<br>Sebastian Adam, Oezguer Uenalan and Norman Riegel<br>**Discussant:** Martin Henkel |
| 12.20 - 12.30 | **Session Discussion** |

**Research Session 6 - Embedded and Real-Time Systems (Wednesday, 30th of March, 14.00 -15.30)**
**Session Chair: Samuel Fricker**

| | |
|---|---|
| 11.00 - 11.40 | **Requirements Engineering for Embedded Systems: An Investigation of Industry Needs** (Research Paper)<br>Ernst Sikora, Bastian Tenbergen, and Klaus Pohl<br>**Discussant:** Amalinda Post |
| 11.40 - 12.20 | **Applying Restricted English Grammar on Automotive Requirements — Does It Work? A Case Study** (Experience Report)<br>Amalinda Post, Igor Menzel, and Andreas Podelski<br>**Discussant:** Bastian Tenbergen |
| 12.20 - 12.30 | **Session Discussion** |

**Research Session 7 - Prioritisation and Traceability (Wednesday, 30th of March, 11.00 -12.30)**
**Session Chair: Bjorn Regnell**

| | |
|---|---|
| 14.00 - 14.40 | **Agile Requirements Prioritization: What Happens in Practice and What is Described in Literature** (Research Paper)<br>Zornitza Bakalova, Maya Daneva, Andrea Herrmann, and Roel Wieringa<br>**Discussant:** Varsha Veerappa |
| 14.40 - 15.00 | **Mining Requirements Links** (Research Preview)<br>Vincenzo Gervasi and Didar Zowghi<br>**Discussant:** Zornitza Bakalova |
| 15.00 - 15.20 | **Clustering Stakeholders for Requirements Decision Making** (Research Preview)<br>Varsha Veerappa and Emmanuel Letier<br>**Discussant:** Vincenzo Gervasi |
| 15.20 - 15.30 | **Session Discussion** |

# Empirical Track

This year's edition of REFSQ will feature a new Empirical Track. The discussions at REFSQ 2010 have revealed the strong need for increased empirical support in RE. Thus, REFSQ 2011 will focus on this empirical topic and include it in it's program by issuing two calls: one for an Empirical Research Fair that allows the lively discussion between academics and industrials to identify the right context for empirical studies and one for Empirical Studies that can be conducted during the REFSQ 2011 itself.

## Empirical Study

The discussion at recent REFSQs have confirmed the strong need for empirical validation of the effectiveness for our RE methods, but the literature to date, including that of REFSQ, could show more of this validation. This lack is assumed to be at least partly due to the difficulty of finding and persuading the participation of a sufficient number of suitable experimental subjects. Therefore, REFSQ 2011 issued a call that offers an opportunity to conduct an Empirical Study during the conference itself. The goals of this opportunity, besides that of permitting to conduct the experiment, are to raise awareness for the necessity and benefits of empirical studies and to show that participating in them is not dangerous to one's health. Furthermore, we want to bring together the community of researchers and practitioners who are interested in empirical studies.

### Live Experiment about Risk Estimation

**Monday, 28th of March, 14.00-15.30**

**Organised by Andrea Herrmann, Axivion GmbH**

The live experiment will be a controlled experiment about the estimation of IT-related risk. Such risk estimation is the basis for risk-based requirements prioritisation, for such requirements which contribute to the system value by reducing risk.

**Research questions:** The experiment investigates the influence of the following two factors on the quality of risk estimation:

1. **Fuzziness:** Are the estimates achieved for measurable risks better than those for fuzzy or abstract risks?
2. **Scales:** Are damage and probability of risks easier to estimate on a scale of points than in percent or Euro?

**Participants´ benefits:** The participants can make a practical experience with the estimation of requirements-related risk, what is more difficult than they probably expect.

**Profile of intended participants:** No special knowledge or experience is needed. Former experiments have indicated that more experience does not automatically mean better risk estimates.

**Agenda**

| | |
|---|---|
| 14.00-14.20 | Introductory Presentation |
| 14.20-14.50 | Risk Estimation on Questionnaires |
| 14.50-15.10 | Break |
| 15.10-15.30 | Discussion of Preliminary Results and Method |

## Empirical Research Fair

It is clearly understood in the requirements engineering (RE) community that case studies of industry projects are critical for our in-depth understanding of both: (a) the phenomena occurring in projects, processes, systems, and services and (b) the impact of the phenomena on the quality, cost, and deliverability of systems. For example: Are we doing too much or too little documentation of software and system requirements in projects? When eliciting requirements for a relatively new system or a legacy system, should we examine the existing system architecture and, if so, when, and why then? What is the impact of decisions made during RE on the quality, cost and delivery of software or services to the customer? How do we manage a very large number of requirements on large projects? How does one efficiently and effectively review the requirements for a large system? Such questions abound in industrial projects, but there is a dearth of research results in RE that actually helps solve them. Consequently, both the industrial and the academic RE communities are struggling to make significant progress in RE, so the purpose of the fair is to bring them together.

This situation is akin to paddling a bicycle with a malfunctioning sprocket. Let us fix the RE sprocket so that (i) industry can provide the right kind of questions and environment to the researchers to solve important RE problems and (ii) research in RE can yield relevant answers to help RE practice, thus creating a symbiotic relationship between industry and academia.

For what appears to be the first time ever and certainly for the first time at any REFSQ working conference, at REFSQ 2011, there will be a special Empirical Research Fair, the goal of which is to bring together practitioners and researchers together – very much like in a fair – so that: (1) practitioners can propose studies that organisations would like to have conducted and (2) researchers can propose studies they would like to conduct in industry. It is a meeting point to match the demand and supply of empirical studies among researchers and practitioners.

Practitioners are typically "turned off" or intimidated by the rigorous requirements and low acceptance rates of conference paper submissions. To encourage industry participation, the format of this session is short presentations of case study proposals by both practitioners and researchers. In

# Empirical Track

addition, there will be a "match-making" session to bring together specific industry personnel and specific researchers on specific proposals.

The Empirical Research Fair will bring together practitioners presenting studies they would like to have conducted in their organisations by researchers and, likewise, researchers presenting studies they would like to conduct in an industrial setting. Thirteen proposals have been selected to be presented on posters during the fair. The posters will also be displayed throughout Tuesday the 29th of March 2011 in the conference lobby.

### Empirical Research Fair Presentations

**Tuesday, 29th of March 2011, 14.00 - 15.30**

**Chaired by Nazim H. Madhavji and Brian Berenbach**

What do User Stories Tell Us About the Business Value?

Zornitza Bakalova, Maya Daneva

RBAC in Practice

Virginia N. L. Franqueira, Nelly Condori Fernandez

Why Do Homecare Providers Stories Tell Us About the Dynamicity

Alireza Zarghami, Mohammad Zarifi, Marten van Sinderen

Requirements Elicitation and Validation for Secure IT Enabling Supply Chain Networks

Elena Irina Neaga, Michael Henshaw

Scalability of Methods for Managing Requirements Information- an Interview Study

Krzysztof Wnuk, Bjorn Regnell

Intercultural Requirements Engineering for Software-Development: Culture and Its Impact on Requirements Negotiation

Dr. Georg Herzwurm, Benedikt Krams

Interested in Your Requirements Engineering Process? Try Requirement Patterns!

Xavier Franch, Cindy Guerlain, Cristina Palomares, Carme Quer, Samuel Renault

The Impact of Domain Knowledge on the Effectiveness of Requirements Engineering Activities

Ali Niknafs, Daniel Berry

Towards a Universal Syntax of Software Requirements

James Hulgan, Joy Beatt

Application of Tailored Requirements Process in the Context of Reuseoriented IS Development

Sebastian Adam

Identifying Value-based Criteria for Requirements Triage and Selection Decision Making

Mahvish Khurum, Tony Gorschek

Empirical Study of Modelling Behavior

Ilona Wilmont, Lauri Ann Scheinholtz

# Industry Track

## Industry Track

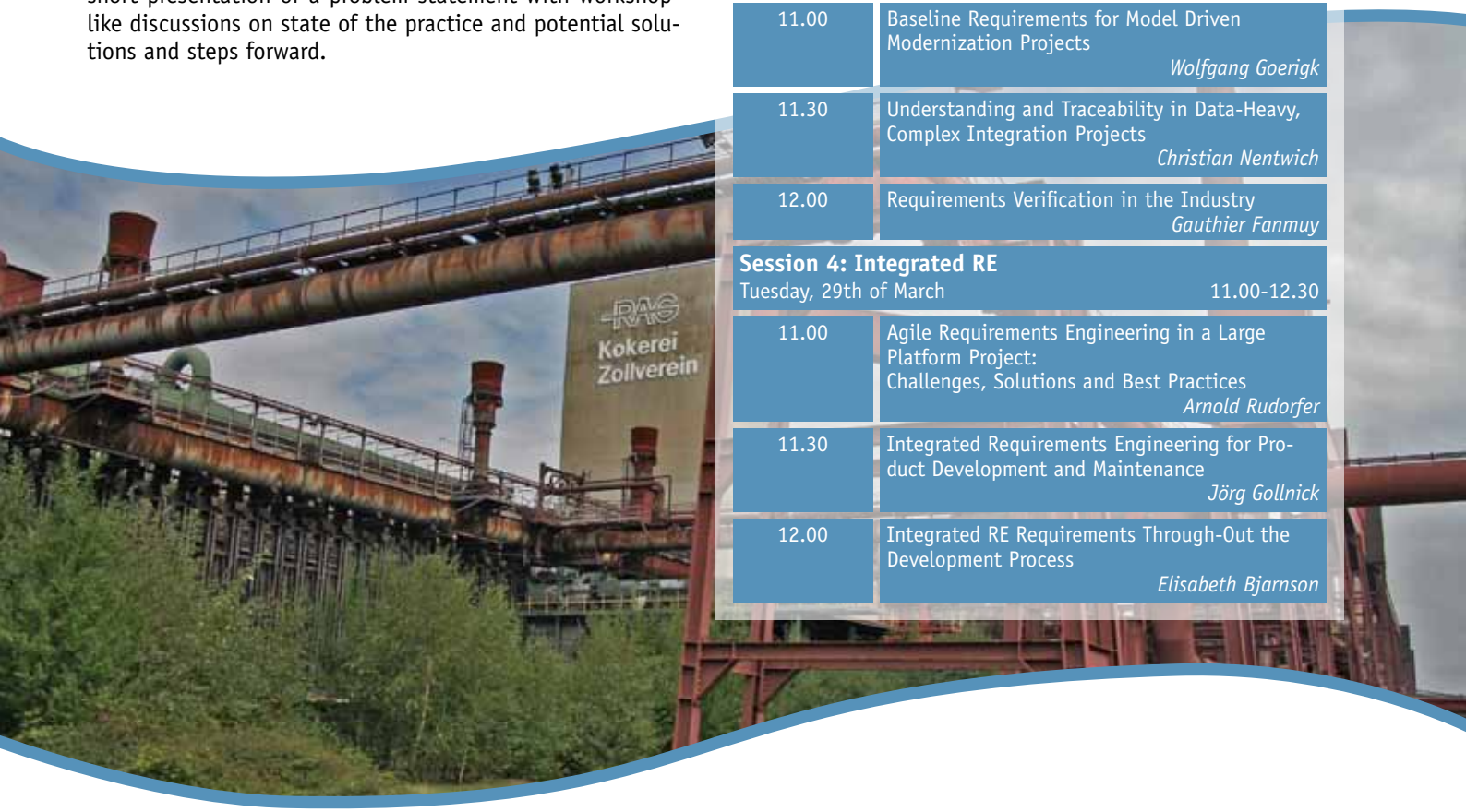
The REFSQ working conference series has since 1994 established itself as one of the leading international forums to discuss RE in its many relations to quality. Since 2010 REFSQ consolidates as a stand-alone conference and, in addition, offers a dedicated Industry Track. Requirements engineering is recognized in industry as one of the most critical parts of the life cycle. Challenges such as new business models, systems development with many stakeholders, service delivery, collaboration, or eco-systems provide an exciting context for this new Industry Track. It offers a unique opportunity for sharing best practices, innovations and ideas with peers and experts in the field.

## Industry Track Format

REFSQ has a long tradition of being a highly structured and interactive forum. The Industry Track is organised in order to provoke discussion and to understand problems and challenges on one hand, but also see how different approaches can help in implementing solutions. It is split in two parts, namely invited industry presentations in the morning and a workshop format in the afternoon. In the morning each speaker will get a 30 minutes slot; 20 minutes presentation and 10 minutes discussion. In the afternoon we will have a short presentation of a problem statement with workshop-like discussions on state of the practice and potential solutions and steps forward.

## Overview

| | |
|---|---|
| **Session 1: Elicitation & Specification** Tuesday, 29th of March | 09.00-10.30 |
| 09.00 | Eliciting Requirements: Experiences and Challenges *Alexander Fronk* |
| 09.30 | Domain-Specific Languages for Requirements *Markus Voelter* |
| 10.00 | Requirements Reuse and Product Lines *Daniel Lucas-Hirtz* |
| **Session 2: Tools & Seizing** Tuesday, 29th of March | 09.00-10.30 |
| 09.00 | Requirements Engineering in Germany's Research Center for Aeronautics and Space *Andreas Schreiber* |
| 09.30 | Survey on requirements engineering tools *Juan Manuel Carrillo de Gea* |
| 10.00 | Sizing requirements using COSMIC: Uses and Benefits *Charles Symons* |
| **Session 3: Modeling & Quality** Tuesday, 29th of March | 11.00-12.30 |
| 11.00 | Baseline Requirements for Model Driven Modernization Projects *Wolfgang Goerigk* |
| 11.30 | Understanding and Traceability in Data-Heavy, Complex Integration Projects *Christian Nentwich* |
| 12.00 | Requirements Verification in the Industry *Gauthier Fanmuy* |
| **Session 4: Integrated RE** Tuesday, 29th of March | 11.00-12.30 |
| 11.00 | Agile Requirements Engineering in a Large Platform Project: Challenges, Solutions and Best Practices *Arnold Rudorfer* |
| 11.30 | Integrated Requirements Engineering for Product Development and Maintenance *Jörg Gollnick* |
| 12.00 | Integrated RE Requirements Through-Out the Development Process *Elisabeth Bjarnson* |



# Industry Track

## Session 1: Elicitation & Specification

### Eliciting Requirements: Experiences and Challenges

*Alexander Fronk, adesso AG, Germany*

In industrial projects, techniques for requirement elicitation and management are often seriously affected by restrictions in time and budget. This results in gradation of both requirements quality and coverage. Thus the elicitation of requirements follows a refinement process and should be organised incrementally with respect to time and budget such that customers' expectations are satisfiable within any refinement step. Therefore, strategies and methods are needed that highly adapt to almost arbitrary project situations. We discuss such an incremental strategy based on a specific notation for requirement elicitation in heterogeneous groups and show its application within a tight time schedule.

**Dr. Alexander Fronk** started his career as a scientist in the Software Technology research group at Dortmund University. There he gave lectures on software engineering. He focused his research activities on requirements engineering, using both formal and semi-formal graphic-based methods, on formal specifications of software systems and workflows, as well as on code analysis of large legacy software systems. Since 2008, Dr. Alexander Fronk has been working as a Senior Consultant in the fields of requirements engineering and workflow analysis, providing profound knowledge on public administration processes. He joined adesso in 2010, were he also coaches consultants in applying requirements engineering methods.

### Domain-Specific Languages for Requirements

*Markus Voelter, Itemis, Germany*

An important part of Requirements Engineering is capturing precisely what a software system is supposed to do. The challenge is to express these requirements precisely, without predetermining the way the system is designed or implemented. The use of natural language or "picture drawing" modeling languages leads to ambiguity and inconsistencies. Domain Specific Languages offer a way to solve this dilemma: they are built specifically to precisely represent information for a given domain. In this talk we present a couple of examples of how we have used DSLs for RE. Examples are based on various tools, including Eclipse and JetBrains MPS.

**Markus Völter** works as an independent researcher, consultant and coach for itemis AG in Stuttgart, Germany. His focus is on software architecture, model-driven software development and domain specific languages as well as on product line engineering. Markus also regularly writes (articles, patterns, books) and speaks (trainings, conferences) on those subjects.

### Requirements Reuse and Product Lines

*Daniel Lucas-Hirtz, Exibri Consulting, France*

Reuse is the holy grail of software engineering. On many contexts, especially market driven product engineering, efficient reuse management has been shown to drastically decrease time to market and development cost, while improving overall system quality.

Requirement engineering, as a foundation for the rest of the engineering, has a major impact on overall reuse efficiency.

Unfortunately, efficiently reusing requirements is everything but easy to put in practice.

In this talk we show how we've seen software requirements reuse put in practice in some multimedia and telecommunication contexts, and we illustrate what real life problem we're faced with in this context.

**Daniel Lucas-Hirtz** is a Requirements Engineering Trainer and Consultant, co-founder of exibri consultancy company in Rennes, France. With more than 15 years in the multimedia and telecommunication industry, Daniel trains Requirements Engineering and coaches teams with a focus on market driven product definition, innovation, user experience and portfolio planning. Key topics lately have been software re-use and product line engineering. Daniel has been in charge of the specification teams and processes for the European mobile phones portfolio of both Motorola and Mitsubishi. As member of the IREB, he is playing a key role in the translation of the IREB certification material to French, and in the porting of the overall IREB certification scheme in French speaking regions. Daniel is co-founder of the SPECIEF association for the promotion of Requirements Engineering in French (www.specief.org). He is lecturer at several French Universities and engineering schools.

## Session 2: Tools & Seizing

### Requirements Engineering in Germany's Research Center for Aeronautics and Space

*Andreas Schreiber, DLR, Germany*

The development of software is a core activity at most German Aerospace Center's (DLR) institutes. About a quarter of DLR's manpower is assigned to it. Projects range from small software tools developed by students to large long-term cooperations with other research centers, academia, and industry. The kind of developed software is very also different. There are many small scripts with a limited lifetime (e.g., for prototyping) as well as large systems or critical real-time software. Furthermore, in most cases the software is developed by engineers or natural scientist who do not have any education in software engineering. The talk outlines the current status of software engineering at DLR with focus on requirements engineering.

With examples from very different development projects, some of the used tools and methodologies for requirements engineering will be described. Also, the efforts for DLR-internal standardization and some of the research topics related to requirements management will be presented.

**Andreas Schreiber** is scientist and head of the Department for Distributed Systems and Component Software of the DLR Simulation and Software Technology division. He received a degree in industrial mathematics from Technical University Clausthal. His research fields include distributed computing, Grid Computing, modern software architectures, user interfaces, and software engineering.

### Survey on requirements engineering tools

***Juan Manuel Carrillo de Gea, University of Murcia, Spain***

Requirements Engineering (RE) is known to be a key activity within the systems and software engineering lifecycle, to the point that if poor attention is paid to this activity, user needs and requirements might not be completely and correctly captured. This situation will lead to non-compliant products and, in consequence, higher costs and longer development times. The RE process must therefore be carried out carefully to ensure that a complete set of user needs and requirements is captured, transformed into a validated set of technical requirements and managed throughout the lifecycle using the RE process activities. To achieve this goal, software engineers usually rely on RE tools which provide support for many RE and lifecycle activities. It is therefore important to improve existing RE tools with the aim of facilitating stakeholders' work, thus reducing or, ideally, completely removing product errors, and ensuring software quality and conformity with user needs. Moreover, the market for RE tools is simultaneously widespread, sparse and changing. Empirical research has been carried out in order to gain insights into how the industry actually works. RE tools vendor representatives working at various software development companies around the world were thus invited to fill in an online questionnaire. We realise that the current issues, trends and challenges in RE tools is a key concern if the gap between academic and industrial practice is to be filled, thus leading to a real possibility of applying academic suggestions to software development organisations. The findings obtained from this survey will be presented in the workshop.

**Juan Manuel Carrillo de Gea** is a research assistant at the University of Murcia, Spain. He has a BSc in Nursing and a five-year BSc in Computer Science. He also has an MSc in Industrial Informatics from the University of Murcia. He has worked as a systems engineer for the AES Corporation and as a vocational training teacher in computer networks for a private school. His main research interests currently lie in requirements engineering, global software engineering and requirements management tools. He is also involved in other research lines such as computer-based learning and its application to health disciplines. He has had various peer-reviewed published papers in academic journals and conferences. He is a member of the Software Engineering Research Group led by Ambrosio Toval. This group has been working on RE since 1996.

### Sizing requirements using COSMIC: Uses and Benefits

***Charles Symons***

Estimating the effort for a new software development project usually means that the size of the requirements must be measured or estimated. But sizing requirements using the COSMIC method brings many other uses and benefits, including being able to:

* track the size of requirements as they grow and are refined, and thus control the project scope
* help control the quality of requirements (if they cannot be measured, they are certainly not clear enough to be developed)
* plan testing
* and, for real-time embedded software, estimate the required physical memory size

This talk will briefly introduce the topic of functional size measurement in general and the COSMIC method in particular. The latter is an internationally standardised method. Its design is based on fundamental software engineering principles and hence it applicable for sizing business, real-time and infrastructure software. I will explain the distinction of functional and non-functional requirements and the sizing of software at different levels of software decomposition and from various user viewpoints and how all this relates to the problems of estimating. This will help understand why this method is superior to older sizing methods.

Examples of the uses and benefits of applying the COSMIC method in real industrial cases will be presented, including

* use in the auto industry for estimating development effort and physical memory requirements
* use for demonstrating software development productivity improvement which had not been revealed when using older sizing methods
* controlling agile software development projects
* a process to integrate sizing with estimating to help control the scope and to deliver software projects to time and budget.

**Charles Symons** is semi-retired after 50 years in computing. After graduating in physics, he joined the UK Atomic Energy Authority where he first used a computer for experimental data analysis. He then worked at CERN, the European Centre for Nuclear Research in Geneva, as a

scientific programmer and then became Operations Manager of the main data centre. Later he worked for Philips in the UK and Eindhoven, Netherlands, where he was responsible for Corporate IS standards and data administration. After a similar responsibility at Xerox, he moved into consulting, joining Nolan, Norton & Co, which became part of KPMG Management Consulting. In these roles he has led consulting studies on IS Strategy and improving the performance of the IS function in many parts of the world.

He became interested in the measurement of software for the purposes of measuring project performance and estimating when working for Xerox in the 1980's. This led to his interest in improving methods for software size measurement. He developed the MkII FP method, which is still used to help control price/performance in outsourced UK Government IT contracts and represented the UK on the ISO Working group on Functional Size Measurement. He helped establish the Common Software Measurement International Consortium in 1988 and is the current President.

## Session 3: Modeling & Quality

### Baseline Requirements for Model Driven Modernization Projects

***Wolfgang Goerigk, B+M Informatik, Germany***

As with any software development, legacy modernization requires some degree of requirements management and requirements engineering. An important initial decision is the extent to which enhancements or new requirements should be part of the modernization project. On the one hand, the legacy application definitely defines a kind of requirements baseline, which renders legacy modernization special compared to classical software development. On the other hand, however, there would not be any need for talking about and spending money on modernization at all, if every requirement were satisfied by the legacy software as it is. Refactoring on its own is hardly enforceable in a business context, but even if, there are still requirements not yet met by the existing legacy software.

It seems generally a good advice to strictly limit the number of enhancements and new functional requirements, or to schedule them for a follow-on project, and to assume that the major goal of the modernization project is to transform existing functionality towards a modern target architecture and/or platform, i.e. to mainly focus on refactoring or architectural reorganisation. But the legacy software very often provides the sound baseline for future development. The model based approach fits very well both for a model driven further development and for a formal support of identifying, eliciting, documenting, analyzing, tracing and agreeing on requirements.

The talk will discuss on a meta model, i.e. a set of notions and their relations, useful in order to capture requirements, and its specialization in the context of model driven modernization (MDM). The so called horse shoe metaphor for MDM is a priori based on the extraction and semantical enrichment of architectural models of the legacy and on MDSD for further development. But it seems to serve as an appropriate procedural model also to capture requirements actually raised by stake holders.

**Wolfgang Goerigk** joins the b+m Informatik AG, initiator and founder of the openArchitectureWare (oAW) open source initiative, as a senior software expert, senior architect and senior consultant since 2006. For many years he worked as a senior researcher and associate professor in computer science at the Christian-Albrechts-University of Kiel, teaching computer science also at the Justus-Liebig-University of Gießen, and, as has been a Visiting Scientist at Computational Logic Inc. and at the University of Texas at Austin, Texas. His major research topics are programming and modeling languages, semantics and verification, compiler construction, compiler verification, object orientation, software engineering, software verification, and software quality. He is the author of many scientific articles and book contributions, and he is speaker on many scientific and IT conferences.

### Understanding and Traceability in Data-Heavy, Complex Integration Projects

***Christian Nentwich, Model TwoZero, UK***

Model Two Zero, in collaboration with customers, has been pioneering the use of the open Natural Rule Language for formally specifying semantic constraints, transformations and data enrichments required in system integration architectures. This language, essentially a DSL specialised for common integration requirements, can act as an "executable specification" from which entire systems are generated.

In this talk, I will outline some of the challenges we have faced when attempted to deploy such an approach globally, and the difficulty of putting it into the hands of people with a large variety of technical skills and educational backgrounds.

**Christian Nentwich** is the founder of Model Two Zero Limited, a software company based in London that produces components for high-complexity enterprise IT architectures. He has a long record of advising some of the world's largest financial instutitions on standards and complex data architectures, and has been served on standards bodies including the Financial Products Markup Language (FpML) and the Object Management Group (OMG). Christian has been a speaker on several academic and industry conferences, as well as serving as acting as a reviewer for the IEEE Transactions on Software Engineering. He holds a PhD and BSc in Computer Science from University College London.

**Requirements Verification in the Industry**

***Gauthier Fanmuy, ADN Consulting, France***

Requirements Engineering is a discipline that has been promoted, implemented, deployed for more than 20 years through the impulsion of standardization agencies (IEEE, ISO, ECSS, BNAé) and national / international organisations such as AFIS, GfSE, INCOSE.

Since, despite an increasing maturity in Requirements Engineering, this discipline remains unequally understood and implemented, even in a same organisation. Industry is now facing a diversity of challenges:

* "How to explain and make understandable the fundamentals of Requirements Engineering",
* "How to be more effective in Requirements authoring",
* "How to reach a Lean Requirements Engineering, in particular with improved knowledge management and the extensive use of modeling techniques".

The presentation is about requirements verification during the specification and design phases (descending branch of a V-Model).

In a first part are presented the results of an AFIS study made end 2010 about Industrial Requirements Engineering practices, where 22 companies worldwide were involved through interviews and surveys.

In a second part are presented some innovative techniques and tools that are starting to be used in the industry for Requirements authoring and verification. In particular, the presentation will address:

* The use of Lexical analysis for correctness verification (in the form, not the substance)
* The use of Requirements boilerplates with Natural Language Processing (NLP) for writing assistance and checking
* The use of Ontologies with Natural Language Processing (NLP) to verify requirements consistency.

**Gauthier Fanmuy** is the Technical Director at ADN, a Systems Engineering consulting company specialized in Requirements Engineering, Model Based Systems Engineering and Products Lines for complex and critical Systems. He has worked in the past years in the Automotive Industry at PSA Peugeot Citroen where he has deployed Requirements Engineering and DOORS in an engineering department.

He previously worked in the Aeronautic Industry at Dassault Aviation where he managed several projects such as integration of electro-optics sensors on military aircrafts, development of complex system functions and re-engineering of MMI in object oriented approaches.

He is also involved in AFIS (French Association on Systems Engineering) as Global Processes Technical Committee. He was the chair for about 10 years of the Requirements Engineering Working Group. He is involved in INCOSE as Chair an international WG: Systems Engineering for Very Small and Small Entities and small project (VSMEs), and as an active member of Requirements WG, Bio-Medical WG.

As member of the IREB, he is playing a key role in the translation of the IREB certification material to French, and in the porting of the overall IREB certification scheme in French speaking regions. He is co-founder of the SPECIEF association for the promotion of Requirements Engineering in French.

## Session 4: Integrated RE

**Agile Requirements Engineering in a Large Platform Project: Challenges, Solutions and Best Practices**

***Arnold Rudorfer, Siemens Healthcare, Germany***

Medical device development is increasingly under market pressure to reduce deployment in critical care facilities. Further, budget cuts in critical care facilities drive process innovation mostly realized through a holistic integration of IT systems (hospital information systems, PACS and modalities). One important leverage to reduce development cycle time is to introduce learn/ agile requirements engineering approaches. Traditional V-model basded development processes cannot cope with the pressure from the market. Given that the content of software in medical device has risen bigger than 60% (compared to 30% by end of the '90s), lean/agile RE is becoming a paramount discipline for a development organisation to remain competitive. Our own experience and an underlying business case show concrete cost savings in the project planning, testing and complexity reduction of the imaging platform architecture. A comparison of traditional to learn/agile requirements engineering rounds up the picture incuding key take aways.

**Arnold Rudorfer** is Director Software Initiative and Process Improvement in the Siemens Healthcare Imaging and Therapy Division. He is responsible for introducing new software engineering technologies with the goal to optimize engineering cost and development efficiency. Prior to joining Healthcare, he was the Head of the User Interface Design Center for Corporate Technology in the US. Later, he took over as the Global Technology Field Leader Requirements Engineering at Siemens Corporate Research (in Princeton, NJ, USA) with worldwide Centers of Competence (Munich, Erlangen and Beijing). He is co-author of the previously published book "Software Systems Requirements Engineering" (McGraw Hill, April 2009). Also, he is an organiser of Siemens Best Practice Sharing Events and speaker at Siemens-internal and international conferences on Software Engineering topics.

# Industry Track

**Integrated Requirements Engineering for Product Development and Maintenance**

***Jörg Gollnick, Lufthansa Systems Berlin GmbH, Germany***

This presentation shows how requirements engineering is integrated into the software production processes on the example of a nearly 19 year old software product for Airline Operations Control. It gives you an short overview about the software production processes in our team. The processes are described on high level (Incident, Problem, RfC, Release Management and Software development).

You get to know some key features of these processes and how they help us to produce and maintain a high quality software. Requirements are integrated in these processes and gave us the possibility to understand which requirement leads to which change in the code and which change in the code belongs to which requirement.

**Jörg Gollnick** works as Application Manager at Lufthansa Systems Berlin. He is responsible for the whole maintenance of an Airline Operations Control Software. Product. Prior to that he worked in different roles for this product and has now a over 15 years experience with everyday processes for product maintenance and development. His special interests are on integrated, robust, customer orientated processes. He has graduated as engineer for transport automation at Hochschule für Verkehrswesen „Friedrich List" Dresden in 1992.

**Integrated RE – Requirements Through-Out the Development Process**

***Elisabeth Bjarnson, Sony Ericsson, Sweden***

The main purpose of requirements engineering is to support and guide development of successful products, which will appeal to the customers and result in profits for the company. This entails both capturing the 'right' requirements, both from a business and an engineering perspective, as well as, communicating them all the way throughout the project life-cycle, and not just in the initial requirements and design steps. In order to do this in a successful and efficient way, requirements engineering has to interact and co-operate with a number of other software engineering disciplines, like architecture, verification and validation, configuration management etc, ideally by integrating the requirements engineering with the more implementation-near work. Requirements then become a natural and obvious part of development, and not an activity performed in isolation, either in time or in roles, with the risk of becoming out of synch with the actual development. There is a major challenge involved in this, namely cross-disciplinary competence. For example, there have been many attempts to enable traceability between requirements and test cases, but few success stories. Merely setting up a tool that allows connecting requirements and test cases is not sufficient. A true integration of the two disciplines, including integrated processes and tool support, requires a cross-pollination of competences. A good understanding of both domains is needed to identify a well integrated solution that meets the needs to both disciplines. Integrating requirements into the more development-near disciplines is a way to enable the requirements to be 'alive' all the way through the project life cycle and support the projects in synchronizing the large amount of requirements and people involved in developing large-scale software. There are also potential gains in efficiency to found by researching and developing methods and techniques for Integrated Requirements Engineering.

**Elizabeth Bjarnason** is Process Engineer at Sony Ericsson Mobile Communications. She is part of the process team that is responsible for the processes for developing software for mobile phones, and the main responsible for the requirements aspects of those processes. She has a long and wide experience within the company's software development organisation and has worked with software design, programming, project management, standardization, as well as, requirements for the software of mobile phones. Prior to joining Sony Ericsson (then Ericsson), she worked with developing educational software and smaller database applications, as well as, doing research into tool support for domain-specific languages. Through her experience of working with requirements as an integrated part of large-scale software development she has become interested in the area of Requirements Engineering and is currently working part time with the Software Engineering Research Group (SERG) at Lund University. Her main research interests are integrated and agile requirements engineering, including alignment between requirements and verification & validation.

## Interactive Industry Workshops

In the afternoon of 29th of March, the Industry Track at REFSQ 2011 will present three Workshops with relevant topics from industry. Experienced practitioners will present problems or challenges encountered in practice, innovations in industrial practice, or success or failure stories. They will be discussed in a workshop format with an audience from industry and research.

| **Interactive Industry Workshops**<br>Tuesday, 29th of March | |
|---|---|
| 14.00-15.30 | Effectiveness and Efficiency – Evolving towards Lean Development<br>*chaired by Steffen Grünwaldt* |
| 16.00-17.30 | Quaility Assurance for Natural-language Specifications<br>*chaired by Frank Houdek* |
| 16.00-17.30 | Software Product Management<br>*chaired by Samuel Fricker* |

### Industry Workshop 1: Effectiveness and Efficiency – Evolving towards Lean Development

***chaired by Steffen Grünwaldt, Siemens, Germany***

Lean Thinking has long been recognized as an important approach to sustainable and comprehensive improvement of products and business processes. In the area of complex systems in particular, the Lean approach is particularly attractive because of its joint improvement of effectiveness and efficiency. Yet, to date no comprehensive framework has been put forth for how to manage the transition to lean thinking in a product development organisation engaged in day-to-day business.

This workshop discuss the approach for managing the transition to Lean Product Development, with special focus on aspects such as business objectives to meet and its particularities of lean in product development as well as generating lean awareness and the active participation of employees within the transition phase in order to ensure top-to-bottom buy-in.

Significant opportunities for further work remain, in particular in the areas of further application of the framework, correlation of current and future state scenarios, associated transition strategies with standard case scenarios as well as further development of lean training exercises for methods as applied to product development.

**Steffen Grünwaldt** is a Program Manger on managing product development processes with Enterprise Processes Consulting at Siemens Corporate Technology in Munich. His inhouse-consulting work is focused on enabling Innovation, Sustainability, and Flexibility by Enterprise Transformation and Lean Product Development.

He is executing the Siemens co-operation with the Lean Advancement Initiative (LAI) at the Massachuetts Institute of Technology.

For the last years he has been responsible for several improvement projects for Siemens business units in Industry, Energy as well as Healthcare Sectors. Prior to joining Siemens in January 2004, Steffen Gruenwaldt was working in Strategic Marketing for Corning Inc. and as a Manager at various levels in an operational responsibility at Infineon AG.

Since 2009 he has been a lecturer in Systems Engineering at the University of Applied Sciences in Munich focusing on Project Management. He holds a Diploma degree in Physics from Technische Universitaet in Munich (1995).

### Industry Workshop 2: Quaility Assurance for Natural-Language Specifications

***chaired by Frank Houdek, Daimler AG, Germany***

Despite many formal or semi-formal specification formats, natural language is still the most popular format in writing specifications. There are numerous reasons for this. One is its suitability for communication among stakeholders with heterogeneous backgrounds and skills. However, ensuring quality properties like clearness, consistency, or completeness is difficult in natural-language specifications. The workshop focuses on (semi-) automatic approaches for quality assurance in natural-language specifications and their practical relevance in the specification process. The workshops starts with practical experiences in this field gained at Daimler passenger car development followed by invited short presentations. In a group session experience from the audience along with candidates for improved (semi-)automatic quality assurance techniques will be compiled together.

**Dr. Frank Houdek** graduated in Computer Science at the University of Ulm in 1995 and finished his Ph.D. thesis in 1999. Since 1995 he works at Daimler Research and Development. There, he worked in and headed various research and transfer projects on requirements engineering and management with internal customers in the passenger car and commercial vehicles business units. Since 2004, he heads the research group "Requirements Management" inside the Daimler AG.

He is a member of the GI (German Interest Group on Computer Science) and a IEEE CS member; he is active in the steering board of the GI professional group 2.1.6 Requirements Engineering and we is involved in various program and organising committees of events related to requirements engineering. Within the distance learning course „Software Engineering for Embedded Systems" at the TU Kaiserslautern he is responsible for the module „Requirements Engineering". He is a founding member of IREB (International Requirements Engineering Board) where he is heading the exam working group.

# Industry Track

**Industry Workshop 3: Software Product Management**

***chaired by Samuel Fricker, Blekinge Institute of Technology, Sweden***

The success of any software product depends on the skills and competence of the product manager, especially in agile development. The product manager plays a key role to ensure that the product supports company strategy and satisfies market needs beyond a single development project. This workshop introduces software product management and discusses practicable and pragmatic techniques for planning and controlling the development of software products. The participants will understand the benefits of software product management and how to develop this key role in their company.

**Dr. Samuel A. Fricker** is assistant professor in the Software Engineering Research Group (SERL) at Blekinge Institute of Technology (BTH) and scientific advisor of Fuchs-Informatik AG, a leading Switzerland-based company in requirements engineering consultancy. His career is devoted to requirements engineering and software product management. He has worked as senior consultant, global process responsible, lecturer, and senior research associate with companies at any scale, from startups to Fortune500. Samuel Fricker is a member and spokesperson of the International Software Product Management Board, which leads standardization in the software product management field.

On tuesday evening Nazim H. Madhavji will give an informal talk on the **controversial topic:**

## Why Ph.D. Students Should Not Write a Thesis

This statement may come as a surprise to many when, in fact, there are an increasing number of students in various doctoral programs including Requirements Engineering. Ridiculous as it may sound, let us stop and question whether one should ever bother to write a doctoral thesis.

**Don't miss this event and a unique opportunity for a lively dicsussion!**

# Workshops & Doctoral Symposium

## Requirements Engineering Efficiency Workshop

**Thursday, 31st of March 2011, 09.00-13.00**

Most requirements engineering research so far has focused on specification quality, while ignoring practitioners that look for efficiency and pragmatism. The International Requirements Engineering Efficiency Workshop (REEW 2011) aims at initiating, facilitating, and nurturing the discussion on efficient approaches to engineer just good-enough requirements. Requirements engineering is here seen as a means that can be simplified, automated, or combined with other practices to achieve successful systems in an economically efficient manner. REEW 2011 will provide a platform for the community of practitioners and research experts that are interested in efficient and pragmatic approaches to requirements engineering.

**Organisers**

Samuel Fricker, Blekinge Institute of Technology, Sweden
Norbert Seyff, University of Zurich, Switzerland

## Requirements Prioritization for Customer Oriented Software Development

**Thursday, 31st of March 2011, 09.00-13.00**

The workshop serves as a platform for the presentation and discussion of new and innovative approaches to prioritization issues for requirements engineering. Topics can either carry out new research approaches with a fundamental theoretical background or best practices from practitioners with a focus on customer orientation.

A high rate of active participation and intense exchange of ideas and experiences shall encourage researchers as well as software developers, requirements engineers or consultants to absorb new ideas and to carry them out into their daily work and research projects.

**Organisers**

Benedikt Krams, University of Stuttgart, Germany
Sixten Schockert, University of Stuttgart, Germany

## Workshop on Empirical Research in Requirements Engineering: Challenges and Solutions

**Thursday, 31st of March 2011, 14.00-18.00**

The primary goal of this workshop is to create a forum and a community to debate the need for, the value of, and the challenges in using empirical approaches to researching aspects of RE processes and products. The targeted outcomes are (1) a preliminary agenda for conducting empirical research in RE, and (2) a plan for setting up an online forum for exchange of ideas, research designs and research results within the RE community. EPICAL brings together practitioners and researchers to debate on the research methods suitable in RE, the criteria for judging RE research outcomes, and the implications of choosing particular research designs for the validity of the obtained results. We invite submissions about one of these four central themes:

1. How to do RE research of good quality: action research, explorative case studies, experiments, replication studies, validation studies? To what extents is empirical research in RE different? Is it more qualitative? How do we make sure it is aligned to stakeholders' objectives?
2. How to judge good RE practice? Where do good RE practices come from? What criteria a RE practice should meet so that it obtains the 'good practice' status?
3. What is the role of anecdotal evidence in creating RE knowledge about effectiveness of RE approaches in context: needs for, value of, and challenges in evaluating lessons learnt and practitioners' experiences.
4. What is the role of empirical evidence in creating RE knowledge? How do we judge what we know and what we do not know in RE? How do we aggregate empirical results?

**Organisers**

Andrea Herrmann, Axivion GmbH, Germany
Maya Daneva, University of Twente, The Netherlands

## Doctoral Symposium

**Thursday, 31st of March 2011, 09.00-16.00**

The Symposium is intended to bring together PhD students, facilitate the establishment of links among them and with senior researchers, and give students the opportunity to present and discuss their research among colleagues in a constructively critical atmosphere. A number of senior researchers will attend the event.

**Co-Chairs**

Barbara Paech, University of Heidelberg, Germany
Vincenzo Gervasi, University of Pisa, Italy

| | |
|---|---|
| 09.00-09.15 | Welcome and Introduction |
| 09.15-10.05 | The Impact of Domain Knowledge on the Effectiveness of Requirements Engineering Activities, Ali Niknafs |
| 10.05-10.55 | Jigsaw Puzzle Metaphor to Handle Imperfection in Requirements, Maria Pinto-Albuquerque |
| 10.55-11.30 | Coffee Break |
| 11.30-12.20 | Process Improvement in Software Product Management: the Online Method Engine, Kevin Vlaanderen |
| 12.20-13.15 | Lunch |
| 13.15-14.05 | A Model-Based Requirements Engineering Framework in an Automotive Certification Purpose, Morayo Adedjouma |
| 14.05-14.30 | Coffee Break |
| 14.30-15.20 | Towards an Integrated Tool Supported Use Case Engineering Approach – Research Abstract, Veit Hoffmann |
| 15.20-16.00 | Final Discussion |

# Social Events

A conference is more than formal discussions about Requirements Engineering. Lots of talks will be made between the sessions, most contacts will be met in coffee breaks and many ideas will be spread at lunch and dinner. REFSQ 2011 knows about that and supports you to exchange your thoughts among your colleagues. Your REFSQ 2011 main conference registration includes a ticket to the Welcome Reception and the Conference Dinner where you will meet each other and learn a lot about the German art of brewing.

## Welcome Reception

**Monday, 28th of March 2011 19.00**

On Monday, March 28th 2011 19:00 REFSQ 2011 welcomes you with a reception in the Atlantic Congress Hotel. It offers a great opportunity to meet colleagues and to share ideas.

## Social Dinner

**Tuesday, 29th of March 2011 18.30**

On Tuesday March 29th 2011, participants from the REFSQ'11 conference will be able to attend a dinner at the „Dampfe", a historical German brewery in Essen. The dinner will start with a champagne receiption at half past 6pm. In such a scope there will be the possibility to compare notes with the other conference participants in a comfortable and historical atmosphere. After this the buffet will be opened at 7pm and will take place in tastefully furnished rooms which reflect the long history of the brewery.

Besides the buffet there will be two grandiose highlights this evening. A live band called "Lounge Band" will cater for musical entertainment. This band can resort to a large song repertoire in the fields of Bar Jazz, Soul, Pop and Saxophon. Furthermore all participants from the REFSQ'11 conference will be able to view the brewery in the form of a guided tour.

**How to Get There**

REFSQ 2011 wants you to have a pleasant stay and easy ways to the different locations, so we organise a bus shuttle that takes you to and from the brewery. After the last session busses will pick you up at the Atlantic Congress Hotel and directly go to the social dinner location. After the event busses will pick you up again and take you back to the Atlantic Congress Hotel with an additional stop at Essen Main Station from where you have best access to the public transport system. The underground, trams, busses or from have past 23.00 on night busses will take you to nearly every part of Essen.

**Shuttle Busses will head from the Atlantic Congress Hotel at 18.30 and back at 23.00, 00.00 and 01.00**

If you cannot or do not want to take the bus to the brewery you can either use the public transport system or come by car.

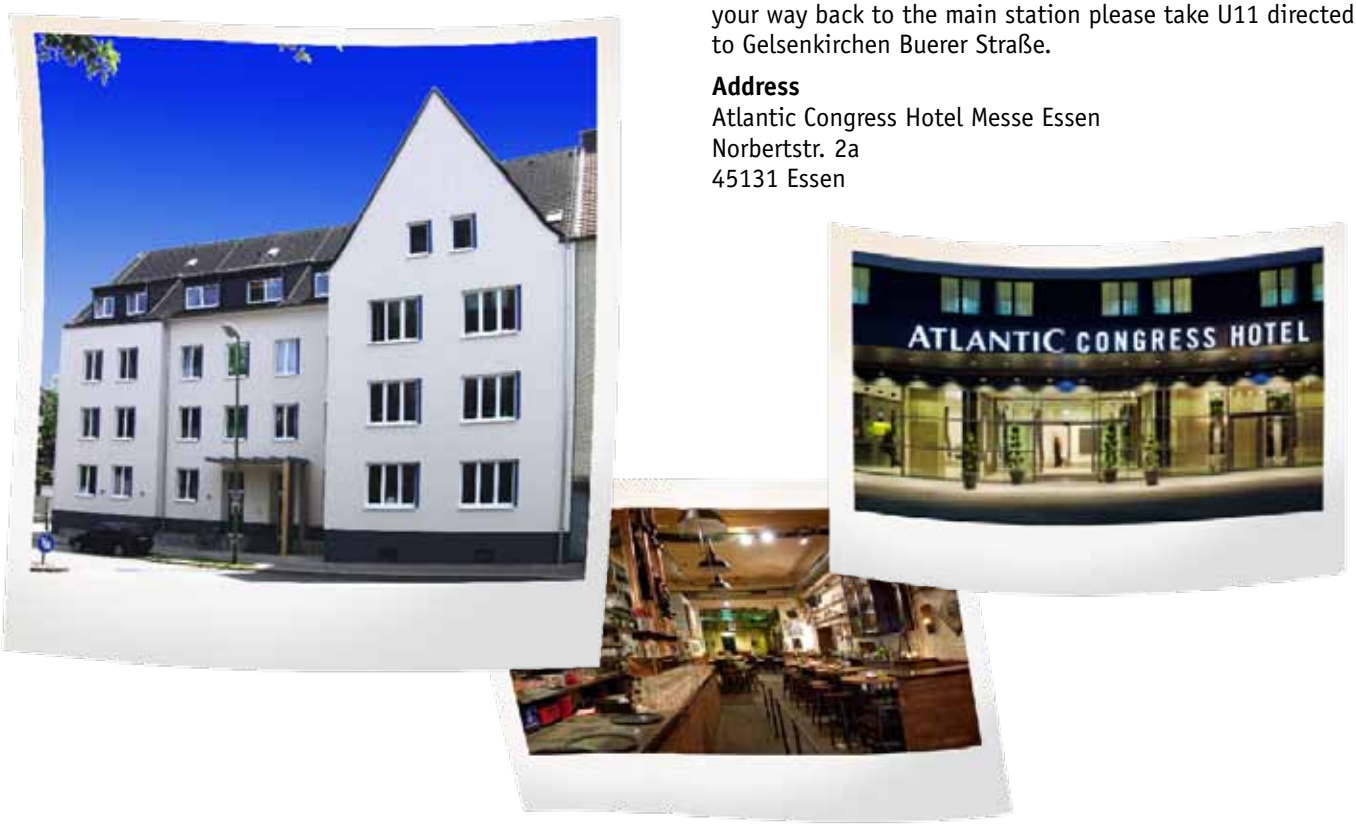
**More Possibilities...**

Public transport system is a good alternative to go to and from the brewery. From the Atlantic Congress Hotel to the main station just take the underground U11 directed to Gelsenkirchen Buerer Straße. From Essen Main Station take the S9 (direction: Bottrop Hbf or Haltern am See) and exit after about 7 minutes at Borbeck Bf. It´s just about 1 minute of walk to reach the DAMPFE – Das Borbecker Brauhaus.


# Directions & Addresses

## Directions in Essen

The conference will take place in Atlantic Congress Hotel Messe Essen directly to the trade fair, the event hall Gruga Halle and the public recreation areal Grugapark. The social dinner will be located at the DAMPFE – Das Borbecker Brauhaus a traditional German brewery in Essen Borbeck. The workshop location will be at paluno – The Ruhr Institute for Software Technology that is part of the University of Duisburg-Essen and located near to the city center of Essen.




## paluno
## The Ruhr Institute for Software Technology (Workshop & Doctoral Symposium Venue)

### How to Get There

From main station take the Tram 106 (direction: Altenessen Bhf) or the Tram 107 (direction: Gelsenkirchen Hbf). Depart at the second stop "Viehofer Platz". Take the exit to the left (Gerlingstraße), ride up the stairs and walk left down the pedestrian bridge. Walk along Gerlingstraße past the bus stop. You find the paluno building on your right.

**Address**
paluno – The Ruhr Institute for Software Technology
Gerlingstr. 16
45127 Essen

## Atlantic Congress Hotel Messe Essen (Main Conference Venue)

### How to Get tThere

From Essen Main Station take the underground U11 (direction: Essen Messe West-Süd/Gruga) from platform 2. It will only take about 5 minutes to the station Essen Messe Ost/Gruga-Halle where you have to leave the train and stay right to exit B, Messe/Gruga Grugahalle. The Atlantic Conference Hotel is directly in front of you (about 150m to walk). On your way back to the main station please take U11 directed to Gelsenkirchen Buerer Straße.

**Address**
Atlantic Congress Hotel Messe Essen
Norbertstr. 2a
45131 Essen

## Dampfe – Das Borbecker Brauhaus (Social Dinner Venue)

There will be a shuttle bus for the social dinner. You find more information about it on the social dinner page. Those who cannot or do not want to use this service can indivually plan their directions with the following informations.

### How to Get There

From Essen Main Station take the S9 (direction: Bottrop Hbf or Haltern am See) and exit after about 7min at Borbeck Bf. It´s just about 1 minute of walk to reach the DAMPFE – Das Borbecker Brauhaus. Please check out the city map in your conference bag.

**Address**
DAMPFE – Das Borbecker Brauhaus
Heinrich-Brauns-Straße 9-15
45355 Essen

**REFSQ 2012 will take place from 19th till 22nd of March 2012 in Essen, Germany. The Paper Submission Deadline is 21st of October 2011!**

**Looking forward to see you again next year!**