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# Requireonautics Quarterly

The Newsletter of the Requirements Engineering  
Specialist Group of the British Computer Society

Issue 2 (January 1995)

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## RE-Soundings

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### Editorial

Hello, and welcome to the second newsletter. We intend to produce these newsletters four times per year, to be sent out to members. A number of people have asked why we don't distribute the newsletter electronically. One reason is that a small number of members do not have regular internet access. Another reason is that we'd like it to be read! Despite the fact that the internet seems to be everywhere these days, a printed newsletter is still more convenient to read for many of us.

For future issues, we'd like to print more articles of general interest to the membership. There is a gap between the academic journals and the general computing press, for articles of an informal nature, but which help us all keep up to date with the field. We'd especially like to encourage articles which describe recent experience, practical advice, new tools and techniques, or overviews of work going on at various laboratories.

Finally, if you haven't already done so, please send in your completed membership subscription form to ensure you get all future issues of the newsletter, free entry to SG meetings and discounts on many other RE events. You'll find the form at the end of this issue. If you've already joined up, pass the form onto your colleagues!

The next issue will be in April. Copy deadline is Friday 14th April.

Steve Easterbrook,  
Sussex University

### Chairman's Message

After the successful launch of the RE Specialist Group in October, we have had a busy few months organising a programme of activities for 1995. This newsletter will be (was!) distributed at the first meeting of the year in Manchester on "Enterprise Modelling in Requirements Engineering". Our next meeting will be held in London on 10th May 1995 and will address the question "What do designers want from a requirements specification?". In between these two meetings the IEEE 2nd International Symposium on Requirements Engineering will be held in York (27-29 March 1995). This is one of the major international meetings on RE, and if you have an interest in almost any aspect of RE then I strongly recommend that you to attend. For more details, read on!

Once again, Steve Easterbrook has done a great job in putting the newsletter together, and I'd like to thank him and the rest of the committee for all their effort. The group will hold its first (short) AGM on 10th May 1995 (just before the technical meeting), where you will have the opportunity to vote for your executive committee. Nominations for all posts on the committee are welcome: we are particularly in need of a publicity officer to ensure that YOUR group and its activities get the exposure they deserve! The contact details of all members of the committee appear at the back of this newsletter, and I urge you to contact any of us with any comments, feedback or questions that you may have.

Bashar Nuseibeh,  
Imperial College

## RE-Treats

*Forthcoming events organised by the group:*

### Wednesday, 25th January 1995, 2pm

Second meeting of the BCS Requirements Engineering Specialist Group

Theme: Enterprise Modelling

Place: Room D7, Renold Building, UMIST, Sackville Street, Manchester

*Details of speakers and their talks are given later in this issue.*

### Wednesday 10th May 1995, 2pm

Third meeting of the BCS Requirements Engineering Specialist Group

Venue: Dept. of Computing, Imperial College London, 2-5pm.

Theme: "What do designers want from a requirements specification?"

Speakers will include Michael Jackson, Jeff Kramer, and Paul Jeremaes.

Watch your email for further details.

## RE-News

### Requirements Engineering Journal

Springer-Verlag will be launching a new quarterly journal on requirements engineering in the first quarter of 1996. It will be edited by Professors Pericles Loucopoulos (UMIST, UK) and Colin Potts (Georgia Institute of Technology, USA) and will focus on the following topics:

- requirements elicitation and analysis techniques
- requirements definition languages and refinement techniques
- formalisation of and reasoning about requirements
- conceptual modelling and domain analysis
- collaboration and negotiation of requirements among stakeholders
- socio-technical systems design and organisational constraints
- participatory and work-oriented design

The journal will emphasise the multi-disciplinary nature of successful research about these topics and will seek to bring together communities of researchers and practitioners that normally would not interact under a single topic heading. The contributing fields include software engineering, information systems, occupational sociology, cognitive and organisational psychology, HCI, CSCW, linguistics and philosophy.

The editors welcome comments and suggestions from members of the BCS RE SG.

For more information, please contact Beverley Ford, Associate Computing Editor, Springer-Verlag London Ltd., Sweetapple House, Catteshall Road, Godalming, Surrey GU7 1NH, email: Bev@svl.co.uk and 100407.545@compuserve.com, Tel: 0483 414106, Fax: 0483 415144.

### ICRE 96 details announced

The IEEE 2nd International Conference on Requirements Engineering (ICRE 96) will be held in Colorado Springs, USA in April 1996. For more information contact Dr. Jawed Siddiqi (email: J.I.Siddiqi@SHU.AC.UK, Tel: +44 742 533141, fax: +44 742 533161)

### RE'95 needs you!

Student volunteers needed to work at the IEEE Requirements Engineering Conference from 26 March-30 March at the University of York, UK. Typical duties include helping delegate to find the various sessions, helping speakers operate slide projectors etc. In return we will provide rail travel from a station within the mainland UK, accommodation during the conference, registration for conference events when not required to help out with the organisation and a couple of brightly coloured t-shirts!

If you are interested then send your email address and snail mail location to Chris Johnson (johnson@dcs.glasgow.ac.uk). Space is limited: first come first served.

### Call for Student Volunteers, ICSE 17

International Conference on Software Engineering (ICSE 17), April 24-28, 1995, Seattle, Washington

The top people in software engineering organise and attend ICSE. The ICSE student volunteers program is an opportunity for students to associate with these world experts.

In return for fifteen hours of their time, students receive:

- a complimentary conference registration
- a copy of the proceedings
- access to tutorials you work and a copy of the tutorial notes for the tutorials you work
- access to receptions
- breakfast
- access to student volunteer's lounge

Job assignments will likely include helping with registration, traffic flow management, assisting with tutorials and panels, and general go-for assistance to keep the conference running smoothly. 25 student volunteers are needed. Interested graduate and undergraduate students should contact Gail Murphy (gmurphy@cs.washington.edu) no later than 1 March 1995. Electronic mail is greatly preferred for all correspondence.

## Albert on WWW

Since 1992, mainly under the framework of the Esprit II ICARUS project, the RE team in Namur (B) has been involved in the development of the ALBERT language (an acronym for "Agent-oriented Language for Building and Eliciting Requirements for real-Time systems"), a language that has been designed for the purpose of modelling Functional requirements related to real-time distributed and co-operative systems.

Information on the RE activities around Albert can be accessed through WWW. The URL is:

<http://www.info.fundp.ac.be/~pdu/albert.html>

## Conflict Management in Concurrent Engineering

Announcing a special issue of the journal CERA (Concurrent Engineering Research and Applications), Volume 2, Number 3 of CERA journal, which became available December 5, 1994. CERA is an international journal published quarterly by Academic Press

*A central aspect of concurrent engineering is the management of conflicts among multiple engineering disciplines throughout the product life cycle. If such conflicts are not addressed in a timely fashion, the result can be huge unnecessary waste, delay and reduced product quality. This special issue focuses on how computer technology can support more effective avoidance, detection and resolution of conflicts in such settings. The papers address a wide range of issues in diverse domains including architecture, software and complex physical systems. The papers may thus be of interest to researchers in distributed artificial intelligence, organisational science, computer-supported co-operative work, group decision support systems, software engineering and other related fields.*

### Contents

- Introduction to the Special Issue on Conflict Management in Concurrent Engineering. M. Klein.
- Automated Configuration Management in CE Projects. S. Tiwari and H.A. Franklin.
- Avoiding Conflicts in Architectural Subsystem Layout. M. Gross.
- Cosmos: A System for Supporting Engineering Negotiation. W. Mark, and J. Dukes-Schlossberg.
- The Interplay of Context, Process and Conflict in Concurrent Engineering. S. Kannapan, and D.L. Taylor.
- Mediating Conflicts in Concurrent Engineering with a Protocol Based on Utility. D. Bahler, C. Dupont., and J. Bowen.
- Coordinating Distributed ViewPoints: the Anatomy of a Consistency Check. S. Easterbrook, A. Finkelstein, J. Kramer, and B. Nuseibeh.
- Managing Cognitive and Mixed-Motive Conflicts in Concurrent Engineering. B. Ramesh, and K. Sengupta.
- Interactive Decision Support for Requirements Negotiation. W.N. Robinson.

## Calendar

### February 1995

The 9th Knowledge Acquisition for Knowledge-Based Systems Workshop (KAW'95), Banff, Canada, February 26 - March 3, 1995. Includes a track on Knowledge Acquisition and Requirements Engineering. Details: <http://ksi.cpsc.ucalgary.ca/KAW/KAW95.html>

### March 1995

Groupware '95, Boston, March 5-8, 1995. Contact: David Coleman, [davidc121@aol.com](mailto:davidc121@aol.com)

Second IEEE International Symposium on Requirements Engineering (RE95), York, England, 27-29 March 1995. Details: <http://www.cs.uoregon.edu/~fickas/re95.html>

International Working Conference on Information System Concepts: Towards A Consolidation Of Views (ISCO3), Marburg/Germany, 28-30 March. Details: <http://WWW.mathematik.uni-marburg.de/~isco3>

### April 1995

17th International Conference on Software Engineering (ICSE-95), Seattle, Washington USA, April 24-28, 1995. Contact: [icse17@cs.washington.edu](mailto:icse17@cs.washington.edu)

### June 1995

Second International Workshop on Requirements Engineering: Foundation for Software Quality (REFSQ'95), Jyväskylä, Finland, June 12-13 1995 (preceding the CAiSE conference)

The 7th Conference on Advanced Information Systems Engineering (CAiSE\*95), Jyväskylä, Finland, 12-16 June 1995. Details: <http://www.jyu.fi/~mor/>

Seventh International Conference on Software Engineering and Knowledge Engineering (SEKE'95), Rockville, Maryland, USA, June 22-24, 1995. Details: <http://www.cs.pitt.edu/seke/seke.html>

### July 1995

Seventh International Workshop On Computer-Aided Software Engineering (CASE '95), Toronto, Ontario, Canada, July 9-14, 1995

Fifth International Symposium of The National Council on Systems Engineering (NCOSE), Saint Louis, Missouri, July 24-26, 1995. Contact: Bill Schoening, [schoening@mdafltsim.mdc.co](mailto:schoening@mdafltsim.mdc.co)

### August 1995

Conference on Organisational Computing Systems (COOCS '95), Sheraton Silicon Valley, Milpitas (near San Jose), California, August 13-16, 1995 (Immediately after the Workflow '95 conference). info: Clarence A. Ellis, [skip@cs.colorado.edu](mailto:skip@cs.colorado.edu)

IFIP WG8.1 Working Conference On Information System Development For Decentralised Organisations, Trondheim, Norway, 21-23 August, 1995. Details: <http://www.idt.unit.no/~johnkrog/ifip.html>

Symposium on Designing Interactive Systems: Processes, Practices, Methods, and Techniques (DIS'95) University of Michigan, Ann Arbor USA, August 23-25, 1995. Contact: Sue Schuon, [sues@umich.edu](mailto:sues@umich.edu)

Second International Conference on Concurrent Engineering: Research and Applications (CE95), Washington DC, August 28-30, 1995. Details: <http://ce-toolkit.crd.ge.com/~sobol/CE95.html>

**September 1995**

9th International Conference of Z Users (ZUM'95), University of Limerick, Ireland, 7-8th September 1995. Contact: [Jonathan.Bowen@comlab.ox.ac.uk](mailto:Jonathan.Bowen@comlab.ox.ac.uk)

The Fourth European Conference on Computer Supported Co-operative Work (ECSCW95) Stockholm, Sweden, Sept 11-15. Details: <http://www.nada.kth.se/ecscw95/>

Fifth European Software Engineering Conference (ESEC'95), Sitges, Barcelona, Spain, September 25-28, 1995. <http://amoto.upc.es/Congressos/ESEC95.html>

**October 1995**

The Third Symposium on the Foundations of Software Engineering (FSE3), Washington, DC, 10-13 October 1995. Contact: [John Gannon, gannon@cs.umd.edu](mailto:John Gannon, gannon@cs.umd.edu)

First IFIP WG8.6 Working Conference on Diffusion and Adoption of Information Technology, Oslo, Norway, October 14-17, 1995. Details: <http://www.ifi.uio.no/~pa>

**November 1995**

Eighth Annual Symposium on User Interface Software and Technology (UIST'95) Pittsburgh, PA, November 15-17. <http://www.cc.gatech.edu/gvu/UIST95/unist95top.html>

**April 1996**

The IEEE 2nd International Conference on Requirements Engineering (ICRE 96) will be held in Colorado Springs, USA in April 1996. For more information contact Dr. Jawed Siddiqi (email: [J.I.Siddiqi@SHU.AC.UK](mailto:J.I.Siddiqi@SHU.AC.UK), tel: +44 742 533141, fax: +44 742 533161)

**RE-Calls**

*A summary of recent conference announcements and calls for papers. These are provided merely as reminders: please refer to the full calls for details about topics covered, types of submission, and how to submit.*

**The Fourth European Conference on Computer Supported Co-operative Work (ECSCW95)** Stockholm, Sweden, Sept 11-15 1995.

Submission Deadline: February 1, 1995  
 Web page: <http://www.nada.kth.se/ecscw95/>  
 Email: [ecscw95@kth.se](mailto:ecscw95@kth.se)

**Symposium on Designing Interactive Systems: Processes, Practices, Methods, and Techniques (DIS'95)** University of Michigan, Ann Arbor USA, August 23-25, 1995

Submission Deadline: February 10, 1995  
 Enquiries: Sue Schuon, Collaboratory for Research on Electronic Work, University of Michigan, [sues@umich.edu](mailto:sues@umich.edu)

**IFIP WG8.1 Working Conference On Information System Development For Decentralised Organisations,** Trondheim, Norway, 21-23 August, 1995

Deadline for Papers: 10 February, 1995  
 Enquiries: [johnkrog@idt.unit.no](mailto:johnkrog@idt.unit.no)  
<http://www.idt.unit.no/~johnkrog/ifip.html>

**The Third Symposium on the Foundations of Software Engineering (FSE3),** Washington, DC, 10-13 October 1995.

abstract due: 21 February 1995  
 Papers due: 7 March 1995  
 Programme Chair: Gail Kaiser, Department of Computer Science, Columbia University  
 Contact: [fse@cs.columbia.edu](mailto:fse@cs.columbia.edu)

**Second International Workshop on Requirements Engineering: Foundation for Software Quality (REFSQ'95),** Jyvaskyla, Finland, June 12-13 1995 (preceeding the CAiSE conference)

Deadline for papers: March 1st 1995  
 Organisers: Klaus Pohl, Peter Peters, Richard Wang  
 E-mail: [{pohl,peters}@informatik.rwth-aachen.de](mailto:{pohl,peters}@informatik.rwth-aachen.de)

**2nd Doctoral Consortium on Advanced Information Systems Engineering (A workshop at CAiSE\*95),** Jyvaskyla, Finland, 12-13 June 1995.

Organisers : Said ASSAR, Veronique PLIHON  
 Deadline for abstracts: March 1st 1995  
 E-mail : [assar@galaxie.int-evry.fr](mailto:assar@galaxie.int-evry.fr)

**First IFIP WG8.6 Working Conference on Diffusion and Adoption of Information Technology,** Oslo, Norway, October 14-17, 1995

General Chair: Priscilla Fowler, Software Engineering Institute, USA  
 Submission deadline: March 24, 1995  
 Info: Karlheinz Kautz, Norwegian Computing Center <[Karl.Kautz@nr.no](mailto:Karl.Kautz@nr.no)>  
<http://www.ifi.uio.no/~paalso/wg8.6/>

**Eighth Annual Symposium on User Interface Software and Technology (UIST'95)** Pittsburgh, PA, November 15-17, 1995.

Program Chair: George Robertson, Xerox PARC, [robertson@parc.xerox.com](mailto:robertson@parc.xerox.com)  
<http://www.cc.gatech.edu/gvu/UIST95/>  
 Papers due: April 28, 1995

**The 10th Knowledge-Based Software Engineering Conference (KBSE-95),** Boston, Massachusetts, USA, Fall, 1995

Papers due: May 1, 1995  
 General Chair: Howard Reubenstein, [hbr@mitre.org](mailto:hbr@mitre.org)  
<http://sigart.acm.org/Conferences/kbse>

## RE-Programmes

### Advanced Programme for RE'95

**The Second IEEE International Symposium on Requirements Engineering**, 27-29 March 1995, University of York.

The second international symposium on Requirements Engineering is to be held in York, England in 1995. After a very successful meeting in San Diego in 1993, the symposium moves across the Atlantic Ocean for 1995.

#### Conference overview

The conference consists of five types of session designed to optimise interaction between participants preceded by a doctoral consortium. Invited speakers begin each day in plenary session, intended to generate a theme that may be a useful 'benchmark' against which to measure the content of the other sessions during the conference. This session will contain plenty of discussion, often facilitated by a discussant.

Paper sessions will follow, in parallel with three other kinds of session:

- mini-tutorials are designed to introduce participants to a subject area that is highly relevant to requirements engineering;
- panel sessions provide a discussion session in which a forum of 'experts' address a hot topic in the area;
- working groups are special interest groups in which interested participants can meet to discuss and develop relevant new themes within requirements engineering.

#### Doctoral Consortium

The doctoral consortium will give selected students an opportunity to present ideas and work-in-progress which may not be ready for full presentation at the symposium but which they wish to expose to critical analysis and discussion. It gives these students a means to attend the symposium and get a feel for research progress in requirements engineering. In the doctoral consortium, students will present their work-in-progress to a panel of senior members of the requirements engineering community, for the purposes of feedback and discussion. The consortium will be run as a one-day closed workshop within the symposium programme.

#### Demonstrations

An important feature of RE'95 will be the exhibitions and demonstrations area. This will provide the opportunity to browse book stalls, talk to publishers, and see a range of requirements engineering tools and methods presented by both companies and researchers, with plenty of time for in depth discussion.

#### Invited speakers

Janis A. Bubenko Jr, Professor in Computer and Systems Sciences at the Royal Institute of Technology and University of Stockholm .

Michael Jackson, independent consultant and a part-time researcher at Bell Telephone Laboratories, Murray Hill New Jersey.

#### Day 1 - Monday 27 March 1995

9:15-10:30 Registration

10:30-11:00 Coffee

11:00-12:30 General chair's welcome

Invited speaker: "Problems and Requirements", Michael Jackson

12:30- 14:00 Lunch

14:00- 15:30 Papers 1: Elicitation and Investigation

"Scenarios--An Industrial Case Study and Hypermedia Enhancements", P. A. Gough, F. T. Fodemski, S. A. Higgins, S. J. Ray

"A Task Centered Approach to Analysing Human Error Tolerance Requirements", R. Fields, P. C. Wright, M. D. Harrison

"Presenting Ethnography in the Requirements Process", J. Hughes, J. O'Brien, T. Rodden, M. Rouncefield, I. Sommerville

Panel 1: "The Next 25 Years: New Customers, New Environments, New Requirements" Moderator: S. Greenspan

15:30- 16:00 Coffee

16:00- 17:30 Papers 2: Views and Consistency

"Improving the Use Case Driven Approach to Requirements Engineering", B. Regnell, K. Kimbler, A. Wesslen

"Managing Inconsistencies in an Evolving Specification", S. Easterbrook, B. Nuseibeh

"Consistency Checks for SCR-Style Requirements Specifications", C. Heitmeyer, B. Labaw, D. Kiskis

Panel 2: "How Can We Do Real Experiments in Requirements Engineering?" Moderator: K. Ryan

#### Day 2 - Tuesday 28 March 1995

9:15-10:30 Invited speaker: D. Thewlis

10:30-11:00 Coffee

11:00-12:30 Papers 3: Reports on the State of Practice

"Requirements Engineering Practices in Information Systems Development: A Multiple Case Study", K. El Emam, N. Madhavji

"Specification of Customer and User Requirements in Industrial Control System Procurement Projects", P. Forsgren, T. Rahkonen

"Implementing Requirements Traceability--A Case Study", B. Ramesh, T. Powers, C. Stubbs, M. Edwards

Mini-tutorial 1: "Applications of Normative Reasoning"  
M. Sergot

12:30- 14:00 Lunch

14:00- 15:30 Papers 4: Traceability

"Contribution Structures", O. Gotel, A. Finkelstein

"A Client Oriented Baseline for Requirements Traceability", J. Leite, A. Oliveria

"Requirements Traceability in an Integrated Development Environment", I. Macfarlane, I. Reilly

Working group 1: "Education in Requirements Engineering" Moderator: J. Mylopoulos

Working group 2: "Invented Requirements and Imagined Customers: Requirements Engineering for Off-the-Shelf Software" Moderator: C. Potts

15:30- 16:00 Coffee

16:00- 17:30 Papers 5: Evolution and Reuse

"Using Non-Functional Requirements to Systematically Support Change", L. Chung, B. Nixon, E. Yu

"Requirements Monitoring in Dynamic Environments", S. Fickas, M. Feather

"How People Categorise Requirements for Reuse: A Natural, Approach", N. A. M. Maiden, P. Mistry, A. G. Sutcliffe

Panel 3: "Integrated Requirements Analysis and Safety Analysis" Moderators: J. Atlee and J. McDermid

**Day 3 - Wednesday 29 March 1995**

9:15-10:30 Invited speaker: 'Challenges in Requirements Engineering', Professor J. Bubenko

10:30-11:00 Coffee

11:00-12:30 Papers 6: Formal Modeling

"Enhancing Soft Systems Analysis with Formal Modelling", D. W. Bustard, P. J. Lundy

"An Evaluation of Inquiry-Based Requirements Analysis for an Internet Service", C. Potts, K. Takahashi, J. Smith, K. Ota

"Improving Legibility in Specification Languages: The Parsing Problem", J.-P. Jacquot, A. Valdenaire

Mini-tutorial 2: "Ethnography by Video for Requirements Capture", M. Jirotko, C. Heath

12:30- 14:00 Lunch

14:00- 15:00 Papers 7: Overviews

"Goal-Directed Elaboration of Requirements for a Meeting Scheduler: Problems and Lessons Learnt", A. van Lamsweerde, R. Darimont, P. Massonet

"Measuring the Success of Requirements Engineering Processes", K. El Emam, N. Madhavji

Working group 3: "What Is Missing in Requirements-Engineering Research?" Moderator: P. Zave

15:00- 15:30 Program Chair's summary of the programme and announcement of future events

15:30-16:00 Coffee

**Social Programme**

Sunday 26 March - Welcome reception. Sherry reception to be held at 18:30 in the University's main building, Heslington Hall.

Monday 27 March - Conference dinner. The conference dinner will be held at the National Railway Museum in York.

Tuesday 28 March - Brewery visit

**Booking terms and conditions**

The cost of registration includes: the conference welcome reception, coffee/tea and lunch for each day of the conference plus the final night conference dinner.

The campus accommodation is available for the nights of the 26th, 27th and 28th March, in one of the University's on-site colleges providing bed and breakfast and evening meal.

Attendees can pay a supplement for en-suite bathroom facilities and those with accompanying partners may also book a twin room.

**Charging rates:**

The advance booking rate is open to all bookings postmarked before 13 February 1995. Late bookings must be received by Monday 20 March 1995, although as places are limited please try to ensure your booking reaches us as early as possible.

The member rate is open to members of the IEEE, ACM SIGSOFT or IFIP Working Group 2.9. To claim the discounted rate, you must specify your society and membership number on the booking form.

The discounted rate is available to full-time students. In order to claim this discount, copy of proof of status must be included with the booking.

A refund (less £25 administrative charge) will be made on cancellation of any booking provided it is received by the organisers by 20 February 1995. Thereafter the full amount paid will be forfeited. Substitutions may be made any time up to the beginning of the conference.

**Other bookings:**

For details of alternative accommodation, please see the RE'95 World Wide Web page (which can be found at <http://www.cs.uoregon.edu/~fickas/re95.html>) or contact:

Maggie Burton  
Department of Computer Science  
University of York.  
tel: +44 1904 432721  
fax: +44 1904 432767  
email: re95@minster.york.ac.uk

## RE-Issues

### Enterprise Modelling for Requirements Engineering

The second meeting of the Group takes place in Manchester on 25th January. The meeting will include presentations by four distinguished guests, followed by a panel session during which attendees will be encouraged to question the panellists about their positions and work.

#### Modelling Dynamic Organisations

Peter Houghton, Defence Research Agency, Malvern  
<P.Houghton@green.dra.hmg.gb>

This paper will explain some of the difficulties of using enterprise modelling techniques to assist the requirements process for information systems in organisations which experience rapid change.

There are many claimed benefits for the use of enterprise modelling in the development of information systems. However it should be understood that most models provide a static picture of an organisation. If organisational change is a gradual process then the use of such models for information systems development is beneficial. However if the organisation experiences rapid change the models can very quickly become unrepresentative of the current situation. The danger is that information systems are built on the basis of these static organisational models. The more detailed these models become the more specific the information systems developed from them. With this specificity comes a loss of flexibility. For organisations that need to respond rapidly to unforeseen events, such as military command organisations this lack of flexibility is not acceptable. The paper will put forward some ideas on how enterprise modelling techniques might be altered to deal with these difficulties and how they might fit into a development process that does not lead to the production of inflexible systems.

The research work has also developed a simple modelling tool which, while not solving all the above problems, does support requirements elicitation and the use of enterprise modelling techniques. The paper will briefly describe what the tool is designed for and what its properties are.

#### Enterprise Modelling - A Real Benefit?

Anne H. Waywell, British Aerospace Defence Limited, Military Aircraft Division Warton.  
<A.H.Waywell@bae.eurokom.ie>

A major concern during the development of a software application is gathering the requirements from the customer. Indeed this is of concern not just for software application development. It is vitally important to try to gather accurate requirements in the early stages of development, as the costs to rectify problems caused by incomplete, inconsistent requirements increase 10 fold and 100 fold dependent on the development stage in which they are found.

Since 1977, the panellist has been involved in a huge variety of software development projects and, more

recently, in an ESPRIT Project entitled From Fuzzy To Formal (F<sup>3</sup>), whose aim is to improve the communication between the customer and application developer in order to obtain an agreed and validated specification of the future application system. The project's aim is to develop an integrated requirements engineering method, which addresses all requirements engineering activities supported by an integrated set of tools. Validation is being performed by application developers via industrial case studies.

One of the techniques being defined and refined as part of this project is Enterprise Modelling. The presentation will attempt to show the realistic view of Enterprise Modelling from British Aerospace's perspective.

#### Translating Enterprise Goals Into Specifications For Software System Behaviour

Pericles Loucopoulos, Department of Computation UMIST <pl@co.umist.ac.uk>

A critical factor in successful requirements analysis appears to be the understanding not only 'what' the system under consideration should do, but also 'why'. To capture the reason of a system, one needs a mechanism to describe the behaviour of the organisation in which the software system is going to operate. This approach suggests further understanding and modelling of the organisational goals and the way that these goals become operationalised.

In software systems development we often make the distinction between the enterprise world and the system world. The former describes the domain about which the proposed software system is to provide some service, while the second is concerned with specifications on what the system does and include descriptions of the systems requirements, conceptual designs and implementations. This talk will describe an approach to linking the two worlds, thus bridging enterprise modelling activities with the software system specification. This integrated view can be used to approach system components from an organisational perspective. It gives the ability to move between enterprise goals and relevant information, infusing meaning into the systems output.

#### What Should An Enterprise Model Be Able To Do?

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The purpose of an enterprise model is to represent and reason about organisations, but what are the range of things that need to be represented and what sort of reasoning must be supported? There are many different contexts for the articulation and the use of models which place a wide range of demands on the representation, denotation, compositional capabilities of any approach. Common to all of them is the requirement to support the processes of generation, analysis and evaluation of policy makers, problem owners and the architects of systems and organisations.

## RE-Readings

### Requirements Traceability

#### A Summary of the BCS RE SIG's Inaugural Meeting

The group's inaugural meeting, a panel session on requirements traceability (RT), was attended by over 50 practitioners and academics. Although one of the panellists began with a quote from a Van Halen track - "...that which is understood need not be discussed..." - the topic instigated much discussion, from which it became clear that the issues involved were far from understood!

The first panellist, Prof. Anthony Finkelstein of City University, suggested there were 3 schools of thought on RT: (1) *Fantasy Engineering* (i.e., that which advocates transformational approaches to achieve RT, based on the use of formal methods); (2) *Band-Aid Engineering* (i.e., that which advocates repository-centred approaches to achieve RT, based on maintaining specified relationships between requirements information); and (3) *The Half-Way House* (i.e., that which advocates using the second approach to patch up problems with the first, based on adaptive requirements documentation). He discussed issues pertinent to each of these and outlined a research agenda for the area.

The second panellist, Prof. David Budgen of Keele University, focused on the relationships between requirements and design models. In particular, on the use of scenarios to bridge and explore these 2 models, and on the potential role of RT in assisting the systematic generation of these scenarios. He further identified the types of attribute which can be cross referenced and traced across such models (i.e., behavioural and functional properties of a system) and those types that cannot (i.e., structural and data properties of a system).

The third panellist, Dr. Laurence James of Marconi Systems Technology, highlighted the various levels of RT typically achieved in industrial practice, before explaining how RTM fits into the picture. These levels are based on the kinds of uncertainty present in the systems lifecycle: (1) *Inconclusive RT* (i.e., vague requirements trace to a vague product); (2) *Polymorphic RT* (i.e., vague requirements trace to a precise product); (3) *Fuzzy RT* (i.e., precise requirements trace to a vague product); and

(4) *Cascade RT* (i.e., precise requirements trace to a precise product). He provided colourful examples of each of these and discussed their implications.

The final panellist, Dr. Richard Stevens of QSS Oxford, examined some of the requirements for RT. He illustrated how the particular tasks that requirements are used for inform the kinds of information and interlinkages that are required for RT. He further explained the centrality of standards for any RT scheme, the importance of following a defined process for RT, and many of the issues relating to information management. The role of DOORS was introduced in this context.

In the subsequent discussion, the questions and issues raised included:

- The costs and benefits of RT.
- Identification of the amounts, types, and granularity of information and interlinkages that need to be gathered and maintained for RT purposes (i.e., the need for a suitable theory).
- Incentives, and possibly contractual obligations, that need to be introduced to collect meta-information about requirements (e.g., rationale).
- The capture and subsequent availability of sensitive information (e.g., that which exposes the network of political and social interactions underlying a system, so uncovering aspects such as responsibility).
- Re-anchoring information, and to what, to deal with changing requirements and moving targets.
- Support for more sophisticated forms of analysis (e.g., impact analysis which can cost change and visually assess knock-ons).
- Better visualisation of requirements (e.g., the use of virtual reality to physically make and traverse RT links, so providing physical metaphors to navigate the requirements space).
- How the issues of traceability, version control, and configuration management fit together to manage RT where there are multiple interacting versions and variants of a system.
- How disparate tools, and the information therein, can be integrated for RT purposes.
- The management of RT in distributed settings (be this physical or conceptual distribution).

## RE-Mission

### Mission statement of the Requirements Engineering Specialist Group of the BCS

Requirements engineering is the elicitation, definition, modelling, analysis, specification and validation of the needs of a computer system. It is multi-disciplinary and draws on techniques from software engineering, knowledge acquisition, cognitive science and the social sciences to improve software engineering practice. The Requirements Engineering Specialist Group (RESG) welcomes members from, and undertakes events for, both practitioners and academics in requirements engineering.

RESG offers the opportunity to requirements engineering practitioners and researchers to exchange experiences and new technologies through workshops, seminars and tutorials on all aspects of requirements engineering. These include, but are not restricted to:

- case studies and experiences;
- standards;
- methods and environments;
- formal representation schemes and specification languages;
- descriptions of the requirements engineering process;



- validation, elicitation, traceability, metrics, reuse, prototyping, animation, and execution of requirements;
- multiple viewpoints;
- non-functional requirements
- acquisition of requirements through reverse engineering and re-engineering;
- domain modelling and analysis;
- artificial intelligence techniques;
- cognitive science and human-computer interaction;
- requirements for the human-computer interface of computer systems;
- group and co-operative work, including ways to overcome barriers to communication;
- organisation modelling, including identification of stakeholders;
- political and cultural issues;
- philosophical and social underpinnings.

A regular newsletter is distributed to all members of RESG. Books on various aspects of requirements engineering are also planned. Proceedings of seminars, workshops and conferences organised by RESG will be published. Members of RESG can expect to get substantial discounts on conferences, workshops and tutorials.

To join the group please contact: Sara Jones, School of Information Sciences, University of Hertfordshire, Hatfield AL10 9AB, UK, S.Jones@Herts.ac.uk

## Corporate Membership now available!

The instructions for taking out a corporate membership, or a membership for an academic institution are as follows:

- 1) Nominate an institution contact to whom all copies of the newsletter, and any other publicity for general use within the institution will be sent. Up to 10 such copies may be sent - please specify how many your institution will require.
- 2) Name the individuals within your institution - up to 10 in the case of an academic membership, 15 for a corporate membership - who should be covered by the institutional membership. Personal copies of newsletters etc. will be sent to these individuals, in addition to the institutional copies described in 1. Note that institutions need not specify all 10 or 15 members in the first instance: other names can be added to the membership at a later date.
- 3) All the nominated individuals should fill in a membership form with their names, addresses, interests etc.; filling in **THE NAME OF THEIR INSTITUTION** against 'Corporate membership' or 'Academic institution:' in section 1 of the form.
- 4) The institution contact should also fill in a membership form with his / her details (as above) and clearly label the form **CONTACT** in top right hand corner.
- 5) Send us the completed membership forms, together with a cheque for the appropriate amount (£100 for corporate membership, or £30 for academic institutions) made payable to "BCS Requirements Engineering Specialist Group".

## RE-Sources

### Mailing lists

#### Requirements Engineering Newsletter

Prof. Anthony Finkelstein, at City University, publishes a regular electronic newsletter containing items of interest to the entire Requirements Engineering community. Subscription or Removal requests should be sent to: [re-request@doc.ic.ac.uk](mailto:re-request@doc.ic.ac.uk). If you wish to contribute send your material to: [re-list@doc.ic.ac.uk](mailto:re-list@doc.ic.ac.uk) (will be moderated).

Back issues can be obtained via anonymous FTP from <ftp://dse.doc.ic.ac.uk> (IP number: 146.169.2.20). Directory: requirements. Files are called ren1, ren2, etc.

Requirements Engineering Newsletter is published solely as an educational service.

#### Systems Engineering Email List

There is a systems-engineering email list at [systems-engineering@think.net](mailto:systems-engineering@think.net). To join send the message SUB SYSTEMS-ENGINEERING to [listserv@think.net](mailto:listserv@think.net)

### Web Pages

#### Experimental Home Page for RE SIG

<http://www.cogs.susx.ac.uk/users/steveea/re/>

#### Archives of the Requirements Engineering Newsletter

<http://web.doc.ic.ac.uk/req-eng/index.html>

#### For more information on RE'95

<http://www.cs.uoregon.edu/~fickas/re95.html>

#### For more information on ICSE 17:

<http://www.cs.washington.edu/research/se/icse17/>

**Software Process Automation** at the Software Engineering Institute

[http://www.sei.cmu.edu/SEI/topics/process\\_auto/](http://www.sei.cmu.edu/SEI/topics/process_auto/)

#### A Software Engineering Bibliography

<http://rbse.jsc.nasa.gov/eichmann/bibsearch.html>

## **RE-Actors**

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*The committee of RESG are:*

**Chair:** Dr Bashar Nuseibeh, Department of Computing, Imperial College London. ban@doc.ic.ac.uk, Tel: 0171-594 8286

**Treasurer:** Dr Neil Maiden, Centre for Human-Computer Interface Design, City University, London. N.A.M.Maiden@city.ac.uk, Tel: 0171-477 8412

**Secretary:** Paul Gough, Philips Research Labs. gough@prl.philips.co.uk, Tel: 01293 815000

**Membership Secretary:** Dr. Sara Jones, School of Information Sciences, University of Hertfordshire. S.Jones@herts.ac.uk, Tel: 01707-284000 Fax: 01707 284303

**Newsletter Editor:** Dr Steve Easterbrook, School of Computing and Cognitive Sciences, University of Sussex. steveea@cogs.susx.ac.uk Tel: 01273 678484

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**Meetings Officer:** Bernice Bright, School of Informtics, City University. B.P.Bright@city.ac.uk, Tel: 0171-477 8000

## Membership Form

### 1. Membership Class

Membership of the RESG normally runs for one year from January 1st. Members joining between October and December will receive the first 1 - 3 months of their membership free. Members joining between January and September will be required to pay the full annual fee for the current year.

BCS / IEE member (£10):

Student (free):

Non-BCS / IEE member (£20):

(Students should provide a copy of a current NUS card as evidence of their status)

Corporate membership (£100):

Academic institution (£30):

Corporate membership or membership of an academic institution entitles the organisation to membership for up to ten nominated individuals, and to free copies of the RESG newsletter. Contact the Membership Secretary (address below) for further information.

Payment may be made by cash or cheque only. Cheques should be in pounds sterling, and made payable to "BCS Requirements Engineering Specialist Group" and should either be accompanied by a bankers card or show the senders card number, name and address on the reverse.

### 2. Personal Details

Name:

Email:

Address:

Phone:

Fax:

### 3. Interests

Please identify any areas of particular interest to you by ticking against the bullets given over the page.

### 4. Group Activities

Please indicate whether you would be willing to help the Group with:

Publicity:

Newsletter contributions:

Organisation of meetings:

Do you have any other comments and / or suggestions regarding activities for the Group?

I understand that the information supplied on this form will be held in a database and used for the purpose of distributing information relevant to the activities of the RESG.

**Signature:**

**Date:**

Please tick here if you require a receipt :

Please return this form, together with your payment, to: Sara Jones  
(S.Jones@herts.ac.uk), RESG Membership Secretary, School of Information Sciences,  
University of Hertfordshire, Hatfield, Herts AL10 9AB, UK.