BCS™

Requirements Quarterly

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Requirements Engineering Specialist Group
of the British Computer Society

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Contents

RE-soundings

From the Editor

In this issue, RQ happily reports on RE'06 (to my mind, the best RE'xx ever, at least for people from industry, but then I'm biased) from Minneapolis. There were remarkable innovations – software cinema, emotional requirements, and discovering NFRs from speech or unstructured text, to name just three. It was wonderful to see so much open dialogue between people from all sides of requirements work, not to mention finding academics listening with interest to industry speakers. It was also a bit of an eye-opener discovering how much preparation goes on every year to set these events up, but that's another story.

Next year, RE'07 will be held in Delhi, a beautiful and delightful city combining vibrant modernity, faded colonial grandeur (think of the white hotels in Brighton or Margate and you'll get the idea) and oriental bustle. India is rapidly becoming the IT capital of the world. And, yes, the great monuments like the Friday Mosque (the Jama Masjid) and the Red Fort are splendid too. So if your boss needs a reason to let you go, get writing that paper now!

One of the things RQ is most pleased about is the growing spirit of collaboration among all the organisations that help to spread requirements knowledge – including the IEEE (host of the RE'xx conferences), INCOSE, ourselves here at the BCS RESG, and the IET (formerly the IEE). This very issue contains both an invitation to INCOSE and details of our joint IET/RESG event here in London. Let's have more joint ventures.

We also have an unusual number of new RE websites, including one from India, to tell you about, so take a careful look at the RE-Sources section in this issue.

Ian Alexander,
Scenario Plus

Chairman´s Message

Welcome to the post-RE'06 edition of RQ. As you'll see from the contents list, the RESG was well represented at the annual RE bash. Even if you weren't lucky enough to make it to the charmingly folksy city of Minneapolis, this RQ will make sure you're up to speed with the important things that went on.

One of the most significant things about RE'06 was the attention that had been paid to making it as interesting to practitioners as to researchers. That's not to say that there were just parallel practitioner tracks, ghettoising the two communities. Industrial speakers were built in to the main programme at all the important points, making sure that we all benefited from exchanging different perspectives. All this was due in no small part to the efforts of the RQ editor – Ian Alexander. With Frank Houdek, Ian was the practitioner track co-chair. Between them, they worked immensely hard to make it work.

So that's RE'xx over for another year. But don't forget that RE'07 will be in New Delhi, an irresistible location. Before that REFSQ will be in Trondheim, Norway and the deadline for papers is MUCH earlier this time: 20th December. As always, there's no time to relax, so start planning your RE or REFSQ paper/workshop/tutorial or send us ideas for RESG events that you'd like to see.

Pete Sawyer,
Computing Department, Lancaster University

RE-treats

For further details of all events, see www.resg.org.uk Forthcoming events organised by the RESG:

IET/RESG Requirements Events For Systems Engineers

Introduction to Requirements

2nd October 2006, IET (formerly the IEE), Savoy Place, London: 1-day training course (Ian Alexander)

http://conferences.theiet.org/itr/course.htm

Answering the Six Questions about Requirements

3rd October 2006, IET, Savoy Place, London: 1-day Seminar of 8 talks covering all the essentials of requirements work:

- Who: Stakeholder Analysis (Ian Alexander)
- What: Goal Modelling (Nadia Amin)
- Where: Scenario Modelling (Neil Maiden and Alistair Mavin)
- Why: Rationale Analysis (Simon Buckingham Shum)
- How: Making Requirements Verifiable (Suzanne Robertson)
- When: Triage and Prioritisation (Andrew Farncombe)
- With What? Requirements Tools (Kathleen Maitland)

http://conferences.theiet.org/itr/seminar.htm

Members' discount for RESG members at both events

Early Aspects

2 November 2006, Lancaster University

PhD Day

6th December 2006, Lancaster University

A whole day specially for PhD Students researching any aspect of Requirements.

The RESG Student representative writes:

Following on from the success of our previous PhD day the RESG are pleased to announce a successor event to be held at Lancaster University on the 6th of December 2006.

This is a unique opportunity for requirements engineering researchers from all over the UK to meet and share advice, stories from the trenches and the results of their research to date. The event is divided into three sections :

1) Current research - an opportunity for students to showcase their work to date. For students early on in their research this session will provide ideas for issues such as how to scope your work, where to find ideas and supporting evidence and how to present these ideas concisely.

2) Mechanisms of PhD assessment - invited speakers will present an overview of the assessment process, advice about writing up and the main attraction : a mock PhD viva. This is an ideal chance to see what really goes on in the assessment room and the hidden mechanisms that examiners use.

3) Share the pain - Attendees state something that has been a real problem for them during their research. Common themes are explored and discussed. To end on a positive note everyone provides one piece of advice to put into the communal knowledge-share.

Registration for this event will open shortly.

- Andrew Stone, RESG Student Team

Contact Andrew Stone a.stone1 @ lancaster.ac.uk
or Pete Sawyer sawyer @ lancaster.ac.uk

Requirements and Large-Scale Procurements

December 2006 [Date and Place TBD]

RE-calls

Recent Calls for Papers and Participation

RefsQ'07

The 13th International Working Conference on Requirements Engineering: Foundation for Software Quality

NEW : For 2007, RefsQ evolves into a working CONFERENCE!

http://www.refsq.org

OVERVIEW

Requirements engineering is as integral to the assurance of software quality now as it was when the first RefsQ took place in 1994.

Compared to 1994, our understanding of RE has improved, while newer and better methods and tools are available to practitioners. At the same time, however, new challenges have emerged. These include increased economic pressures on developers and customers and the pace of change caused by new technologies and new application domains. Meanwhile, many old problems stubbornly resist attempts to solve them. We still make poor trade-offs between incompatible requirements; we still struggle to derive appropriate software architectures from requirements; and too many ambitious development projects still end in recriminations instead of useful software.

Against this background, RefsQ'07 seeks reports of innovative work in RE that enhances the quality of software and systems, particularly where challenged by new development paradigms or technologies. We encourage researchers and practitioners from the RE, software engineering, information systems, and embedded systems fields to present original work. Contributions from cognate areas such as formal methods, systems engineering, economics and management and social sciences are very welcome for the insights they provide in RE.

THEME: RE AND INNOVATION

IN SOFTWARE ENGINEERING

We encourage submissions on any aspect of RE but we particularly welcome submissions that address how RE is affected by or affects innovations such as:

- Service-oriented computing
- Model-driven development
- Software product lines
- Aspect-oriented software development
- Adaptive and autonomic systems
- Situational and domain-specific RE

Case studies, experience reports and industrial problem statements are particularly encouraged.

WORKING CONFERENCE FORMAT

RefsQ has the tradition of being a highly structured and interactive forum and this remains as we make the transition to a working conference. What has changed is that attendance of RefsQ is no longer restricted to paper authors, although we will restrict numbers to encourage the active participation of all attendees. The working language is English.

SUBMISSIONS

Three types of papers are solicited:

- full papers (15 pages max, 12 recommended),

- position papers (6 pages max),

- industrial problem statements (6 pages max).

See http://www.refsq.org for format and evaluation criteria. Submission is handled electronically through the RefsQ web site.

PUBLICATION

SPRINGER has provisionally approved publication of the RefsQ'07 proceedings as a special volume of Lecture Notes in Computer Science (LNCS).

Conflict Research

Call for Companies to Participate in a Research Project

Do we really understand the nature of conflict among stakeholders in requirements negotiation?

Nan Ma and Tracy Hall
University of Hertfordshire

Conflict is an inevitable part of requirements engineering (RE) process. This is because RE is a social and technical process involving extensive interactions among different stakeholders from different backgrounds and with different individual and organizational goals. Recent findings in the software engineering literature indicate that conflict results in poor working relationships and poor communication between developers and testers, and negatively impacts software testing process [1]; conflict between users and developers results in substantive dissension and emotional hostility [2]; conflict between users and developers consistently and negatively affects project outcomes [3]. In RE literature, much of the work focuses on studies presenting technical methods or tools for modeling conflict (e.g. KAOS and I*). Such theoretical work consistently argues that conflict may lead to disagreement, and such disagreement may lead to inconsistency in the requirement specification. However, little empirical evidence could be found to support this point. Moreover little attention is given to the causes and characteristics of conflict. We still lack

a clear understanding of its impact on the quality of requirements specification. Completeness, consistency, and ambiguity are three most important factors that determine the quality of requirements specification. Furthermore, this research also aims to formulate some good practical guidelines to improve requirement negotiation practice based on the empirical findings.

Participation in this project will encompass 30-45 minute interviews with requirements practitioners. Participation would also involve the observation of discussions and meetings between requirements practitioners and users. In return, you will be offered a full analysis of our findings at your organization together with an overall analysis of the findings of the whole project. If you are interested in participating in this project and should you have any queries, please do not hesitate to contact Mr. Nan Ma (N.ma@herts.ac.uk) or the project leader Dr Tracy Hall (t.hall@herts.ac.uk). We would be happy to visit you to discuss the project in more detail. Alternatively, you are more than welcome to visit our website: http://homepages.feis.herts.ac.uk/~ssrg/.

[1]. Cohen, C., Garfield, M., Webb, H. and Birkin, S, *Managing conflict in software testing*, Communications of the ACM, 47, 1, 76 – 81, 2004

[2]. Yeh Quey-Jen and Tsai Chih-Ling, (2001) *Two conflict potentials during IS development*, Information and Management, 39, 2, 135-149, December 2001

[3]. Birkin, S., Cohen, C., Garfield, M., and Webb, H. *Causes and consequences of conflict in software testing*. Global Business and Technology Association 2002 International Conference, Rome, Italy, 2002

Mastering the Requirements Process

25-27 September 2006 and 26-28 February 2007, London, presented by Suzanne Robertson, Atlantic Systems Guild

This 3 day seminar & workshop presents a complete process for eliciting the users' requirements, testing for correctness and recording them clearly, comprehensibly and unambiguously. Delegates will learn to:

- Determine their client's needs, and know they are correct
- Write requirements that are complete, traceable and testable
- Precisely define the scope of the project
- Identify the appropriate stakeholders and keep them involved
- Get the requirements quickly and incrementally
- Use up-to-date techniques such as storyboarding and e-collaboration

Visit www.irmuk.co.uk/1/ for full seminar details or contact IRM UK on +44 (0)20 8866 8366 or e-mail customerservice@irmuk.co.uk

RE-readings

Reviews of recent Requirements Engineering events.

RE'06

The 14th IEEE International Requirements Engineering Conference, Minneapolis/St Paul, Minnesota, USA, 11-15 September 2006

RE'06: Highlights of the Conference

In any multi-track conference, it is naturally impossible for anyone to see and hear all the good things that are going on. This conference was specially hard to cover, as there were always three good things running at once! So here are some highlights, followed by some other points of view.

Multimedia in RE

Oliver Creighton chaired the MeRE workshop which looked at using video and other media in RE. Videos could be highly polished marketing visions of future products and services, like Apple's imaginary "Knowledge Navigator" product.

"We're trying to abolish text-based requirements", said Creighton provocatively. Certainly, changing the look and feel of requirements, eg providing a view tailored to each stakeholder, could be highly desirable.

Workshop speakers presented a mobile PDA scenario walkthrough tool; a tool to extract possibly unstated NFRs from spoken text (but some speakers are "goats", bleating unintelligibly); Software Cinema (sysiphus.in.tum.de); the idea of attaching short (30 second) recordings of stakeholders explaining their requirements; indexing of video for traceability to original statements; and the transformations needed between knowledge represented as film, text, use cases, and diagrams, with all the problems that that might bring.

The lively discussion spanned the purpose of multimedia in RE, whether text was the only target of "requirements compilation", and whether we needed to teach "software cinema" to software engineering students. Jeremy Dick and Ian Alexander constructed an information architecture to handle requirements, rationales/justifications, goals, and assumptions – all supported as needed by multimedia.

The audience took notes on 3 laptops, a digital camera, and several pads of paper, using text and mindmaps, so perhaps there's a lesson in there somewhere.

Prioritisation

Al Davis argued for the use of just enough requirements management, which he said was just plain common sense (though he admitted that wasn't very common). Key things were for the RE to avoid convincing the customer that the RE was smart, but to do simple things like keeping a glossary of terms; and to keep requirements lists (ok, hierarchies) with recorded priorities. Stakeholders can set (input) priorities, and then a panel (a good old-fashioned Change Control Board) must sieve the requirements in a process Davis calls Triage to create a baseline. The input requirements needed another name, perhaps "candidate requirements"; Dan Berry in the audience suggested "wishes" to distinguish them from things a product was required to do. Davis didn't explain the threeness of "triage", however.

How much is just enough RM? Davis presented the graph from Dorfmann's 1996 book, showing that projects should spend 8% or more of their budget on requirements to cut cost overruns effectively. Dorfmann was in the audience to hear Davis argue that the curve starts to climb again if you heavily overspend on RM!

End User Programming

Mary Beth Rosson gave a keynote talk on End Users who Meet their own Requirements. She gave a rosy picture of "ad hoc, informal, situated solutions for everyday computing", and then suggested some of the many obstacles – design is hard, people are diverse, solutions made by users may be bad, training is rarely available. Perhaps worst of all, people focus on immediate ends rather than stopping to learn how to produce better results – like forever playing Chopsticks on the piano with one finger as your party piece, rather than trying to improve with effortful study.

Solutions could come, she hoped, from smarter tools, "learning by debugging", visual programming, templates and "stencils" to offer guidance on relevant software constructs, and online tools to support learning, such as WIKIs and discussion groups. Tools could for instance give immediate feedback on progress, eg a progress bar saying "30% tested" – an immediate visual reward to the novice programmer, and a gentle hint that more testing might be needed.

Detecting and Classifying NFRs

Jane Cleland-Huang described research on a tool able to detect and classify non-functional requirements, which were often overlooked in the scramble to assemble specifications. Existing NFR methods included looking manually for keywords, or trying to fill templates and checklists. But NFRs are often informally stated in emails and memos. The goal was to scan such text (which could also be created by speech analysis) for possible NFRs and then to try to classify them.

In this application, recall (% of existing NFRs retrieved) was more important than precision, as it is easier for a human to look through a few dozen candidate NFRs and to reject a few, than to search a whole project's documentation to try to locate the missed ones. The results so far are up to 88% recall for Availability requirements, but only 51% for Look'n'Feel. Precision ranged from 19% to 36%, so the requirements analyst must remain in the loop.

Emotional Requirements

David Callele described the challenge of capturing a game designer's intent. The key to a good game is the player's experience while playing, ie a planned sequence of target emotional states such as fear, tension, relief etc at each point of the game. Hence the specification has to represent intended emotional states with respect to time and space in the game. Callele argued that emotional requirements are much bigger than simple functions in games, as only 10% of the cost of a game is in the game engine – the rest of the work consists of setting up the data for the game (space and time, including 'emotional' components such as lighting and soundtrack).

Currently, game projects offer very poor return on investment: only 10% of them succeed, making software industry complaints like the Chaos report look like glowing praise. Most of the risk lies in trying to make a likeable, sellable game (not just one that works).

Colour coding proved to be insufficient, though the idea of drawing game space as a map is clearly helpful. Callele's answer is to draw a simple map of the game space, with smiley/fearful faces sketched on – or drawn eloquently, if a graphic artist is to hand, as is likely. For instance, a passageway that turns sharply before an open doorway may have a smiley halfway along, and a fearful face just inside the doorway, presumably indicating foreboding of an attack.

Alistair Sutcliffe wondered if all of a game's flow (its story) isn't functional in a sense. Callele agreed that many NFRs are really functions, if only we know how to translate them into specific actions.

Regulatory Compliance

Travis Breaux and Annie Antón described how to extract statements of rights and obligations – along with anti-rights and anti-obligations – from legal documents such as regulations. You could express these in restricted natural language statements, easier to write than formal logic. These reveal ambiguities, eg that "may" can confer a right or merely state a possibility.

The general scheme is that where a regulation confers a right on a rights bearer, it implicitly or explicitly confers an obligation on a counter-party ("obligated party") to meet that right. The analysis quickly discovers numerous gaps where obligations are implicit. The proposed approach looks completely

general and must surely have wide application, given that requirements usually form part of a contract, and that standards and regulations are almost always called up.

In the lively discussion that followed (so much better than the dreaded 'time for two quick questions'), the audience inquired whether it was safe to infer anything not actually written in a regulation? Breaux said he'd been concerned about that, but legal advice was that people always make such inferences, and it was helpful to know what the implications were.

Ivy Hooks: Meeting the Expert

Ivy Hooks (www.complianceautomation.com) works in a zone entirely free of set-theoretic notation and cultural hermeneutics. She spoke under the banner "Requirements Engineering: an Oxymoron?"

Her goal, she said, was to help her clients create quality products that meet customer needs at acceptable cost, and on schedule.

Often that meant doing only one small thing, making one small change: there was no need to change everything else, but you had to discover what the key things was.

How to do that? You could make mockups and watch the customer's reaction. Never ask stakeholders for requirements! They don't know how to state them. Instead, learn to play the game of is/could be; develop story-telling skills; show stakeholders early and often what they're getting, and put all the assumptions you can discover on the table.

You can't please everyone, but you can do a whole lot better by getting each signatory to sign off a "contract" on the cover of the specification saying for example "I promise not to change the requirementsl" (a different promise for each role). It concentrates minds wonderfully.

Ralph Young: Theory into Practice

Up to 45% of product features are never used, says the Standish corporation. If we can identify the Real requirements, we can therefore save substantial time, cost and risk. Conversely, failing to identify these before development, failing to control change, and failing to define the requirements process itself are major risks to any project. And, tools are meant to serve projects, not vice versa.

The requirements process owner has to advocate RE practices, facilitate with good relationships and by tailoring the corporate practices, and to involve everyone through teamwork in the requirements.

Good practices include initial briefing, creating a process web page with all needed resources, requirements workshops à la Ellen Gottesdiener, inspections (eg the Tom Gilb/Dorothy Graham (see below) book on Software Inspection), and peer reviews.

Success factors included teamwork as already mentioned, training, vision and scope, creating a proper Concept of Operations (scenarios), stakeholder analysis, and a suitable life-cycle (generally evolutionary, for a product).

Software Cinema

Oliver Creighton provided another of the delightful surprises of the conference with his beautiful and effective software cinema prototype developed with Siemens.

Creighton's goal is to make video a natural, widely-used specification method. Of course this may be easier said than done, despite the obvious advantages: stakeholders define their expectations; revolutionary changes can be explained easily; perceptions of reality can be shared; gaps between stakeholders can be bridged.

Basically, brief video clips focus on the essentials: film can condense a story into a few cut-together shots. The roots of software cinema lie in film theory, multimedia, modelling, and scenario-based approaches (anti-scenarios are useful). Even a video just of the as-is situation is of great benefit, Creighton claimed.

David Callele pointed out that there were large obstacles: a 20-minute video of broadcast quality costs $0.5M, out of most projects' reach.

Ian Alexander asked whether we could scale the approach down, eg just a Word doc with a few video clips embedded, or a database with a playable sequence of clips? Creighton said it was an interesting question but he didn't know: perhaps even an Agile project of 3 people (a client and 2 programmers!) could use some video.

An issue was to avoid misleading people, eg "there's snow in the scene – is this product only for winter use?". Creighton said that you could add (UML) model overlays, eg live sequence charts, to disambiguate the intentions. Similarly, superposed graphics could be used to make requirements changes: for instance, you could provide a shot of a telephone's screen, and place the on-screen text using graphics rather than actual film. This could help to control cost.

Testing to Improve Requirements

Dorothy Graham (www.grove.co.uk) gave a fine keynote address on testing, not a topic we often hear about in RE but one that is highly relevant. Indeed, Graham praised both Dan Berry's and Debra Aubrey's papers for their excellence on testing. The moral was to involve testers early.

One of Graham's favourite cartoons depicts the Waterfall Model. A requirements engineer is bathing in the limpid waters of the requirements pool. Down below, a designer is washing in some cleanish water. Further down, some coders are splashing about in some pretty muddy waters. Below them, the testers are coping with the filthy water that flows down to them.

And in case you thought that was the end, at the bottom, the maintenance programmers are working in a cesspit!

Of course it's all wrong, said Graham. Testing doesn't start at the end. You can test the "piece of paper" with requirements on it. The V-model gives a better picture: each level has different tests, "with a long uphill struggle on the right hand side of the V". When do you design these tests? Just before executing them? The answer, plainly, is "as early as possible", and the "Test" bubbles animated themselves across to the Requirements side of the V, where they belong.

Testers ask different questions from either designers or analysts: not "what is needed?", nor "how can we make it work?" but "what could go wrong?" and "how can I break it" (laughter).

The test life-cycle naturally mimics the software life-cycle as a whole. You identify candidate test conditions (not requirements, as only a sample can ever be tested); design test cases, build tests, run them, and check the results. Around this, you have a framework of test planning and control.

Requirements therefore create candidates for test, while test asks questions of the requirements. There is a strong but often overlooked interdependence.

Testers can take many approaches, eg condition/action tables, that are rarely used as specifications. This is helpful, as it means that testers can exercise parts of the system that users rarely visit. System testing is mainly white-box, examining the 80% of the code that covers only 20% of what users do – including a lot of exception-handling. Acceptance testing covers the 20% of the code that handles 80% of user activities: great for checking that normal situations work, but poor for discovering bugs. The folly of merging system and acceptance testing is apparent.

What should requirements people do about testing? Two things: invite testers to requirement and use case reviews; and thank testers (if only through gritted teeth) for their feedback.

An Astonishing Practitioner

Anette Prindahl of ATP (www.atp.dk) described how her company is going about procuring a unified IT system – it has had many separate systems for years now.

This simple goal has led ATP to adopt a model-based approach to define its requirements. Models include a service specification, driving a context model, use cases, a CRUD matrix and an information model for each domain (driven also by a concept model). These in turn drive a business process model, a business workflow (which of course impinges on the use cases) and a set of state charts. The information model especially has turned out to be very valuable, said Prindahl.

The new approach is rule-based, configurable, and service oriented: there is a lot to learn, she said. The services are specified both with use cases and a service catalogue. The use cases make it easy for the testers to derive test cases (now, how often do you hear of anyone doing anything so sensible?).

NFRs are identified through the principles of the enterprise architecture framework (a la Zachman), eg you consider issues of data, of usability etc and see what requirements come up in each box.

The models themselves are constructed in the QualiWare lifecycle management tool (www.qualiware.com), which Prindahl said is "really neat". The models are easy to customise, great for communication, and all the descriptions are in one place. Matching elements are hyperlinked together (at this point, the audience realised they were dealing with a really serious bit of system specification) forming a mesh of diagrams and objects. This enabled consistency to be checked and provided traceability, eg to justify choices made. There were challenges in this specification approach, not least that you really need to freeze every single model to get a proper baseline, and ownership needs to be identified carefully for each item.

Future RE

Bashar Nuseibeh hosted a panel discussion on the future of RE, looking forward to a somewhat dark set of four possible pictures or "worlds" in 2020. The panellists (Ian Alexander, Daniel Berry, Don Gause and Colin Potts) tried gamely to envision a world dominated by Big Business, Big Brother, Big Image, or Big Choice. None really seemed quite believable, perhaps partly because the most likely underlying cause of such rapid change from the present situation – military ambition, whether played out in cold wars or hot – was not discussed. But the ensuing discussion from the floor was interesting, drawing out themes such as technology push vs pull, automation, increasing plug-and-play for software, self-evolving (genetic) software, and the chilling possibility of David Callele's Emotional Requirements being used to control the proles (to echo Orwell's 1984).

Requirements by Collaboration

Ellen Gottesdiener gave a lively tutorial on the use of facilitated workshops – a whole lot more than "meetings", a word she clearly abhors, emphasizing serious play, face to face interaction, and continuing customer involvement.

RE'06: A View from the USA

Valuable Sharing of Requirements Experiences

Ralph Young, Northrop Grumman Inc

More than 300 participants from 28 countries at the IEEE Conference on Requirements Engineering (RE'06) benefited from a valuable opportunity to share

experiences and knowledge. The Conference theme, "Understanding the Stakeholders' Desires and Needs", was supported by research and practitioner tracks, tutorials, workshops, a doctoral symposium, and a Birds-of-a-Feather session. Social events included a welcome reception, breaks, luncheons, and s conference banquet that provided valuable opportunities for the participants to meet and learn from one another.

Conference General Chair Robyn Lutz of Iowa State University and the Jet Propulsion Lab (USA) noted in her welcoming comments that valuable "serendipitous collisions" occur at IEEE's requirements engineering conferences. That insight proved to be very true!

Program Chair Martin Glinz of Universitat Zurich, Switzerland, shared concerning the tremendous effort that went into creating the Conference—sincere thanks from all participants go to the members of the RE'06 Organizing Committee, Steering Committee, Program Board, Program Committee, reviewers, and student volunteers.

While the attendees included prominent requirements authors, consultants, educators, trainers, and practitioners, almost half of the participants were emerging requirements scholars who brought their vast intelligence and expertise to the emerging and increasing requirements body of knowledge. This was a healthy insertion of vitality!

Keynote presentations were provided by Mary Beth Rosson ("End Users Who Meet Their Own Requirements"), Dorothy Graham ("Testing to Improve Requirements – Mission Impossible?"), and John Mylopoulos ("Goal-Oriented Requirements Engineering, Part II").

Rosson emphasized that end users are already meeting their own requirements with whatever resources they can find; we should work to maximize the upsides of this trend.

Dorothy Graham noted that 80% of what the users usually do is done by 20% of the code—an interesting insight for users who are willing to objectively evaluate and prioritize their requirements! Mylopoulos indicated that goal-oriented requirements engineering was coming of age, and was now a capable, general-purpose approach.

Two awards were presented: to Annie Anton, for the best paper of 1996, and to Jane Cleland-Huang, for the best paper of 2006.

Several tutorials were provided, including presentations by Ian Alexander, Christopher Armstrong, Erik Simmons, Don Gause, the team of Andreas Birk and Gerald Heller of Hewlett-Packard in Germany, another team of Fabio Massacci, John Mylopoulos, and Nicola Zannone from Italy, and a team of Awais Rashid, Ruzanna Chitchyan, Ana Moreira, and Joao Araujo who presented a tutorial concerning Aspect-Oriented Requirements Engineering.

Workshops included the International Automotive Requirements Engineering Workshop, the First International Workshop on Requirements Engineering Visualization, the Fourth International Workshop on Comparative Evaluation in Requirements Engineering, the First International Workshop on Multimedia Requirements Engineering, an International Workshop on Software Product Management, and a workshop titled "Service-Oriented Computing: Consequences for Engineering Requirements".

Alan Davis presented a mini-tutorial concerning the topic of his most recent book, Just Enough Requirements Management. He noted that it's not critical that projects be completed on time and budget; that we should let the schedule drive inclusion of requirements; and that customers have a right to change their minds.

Other events included a set of a dozen posters, research papers, practice papers, research demonstrations, invited experience talks, invited practice talks, vision papers, panels (on the topics of Product Management, Traceability, and The Future of RE), and a presentation by Ivy Hooks, "Requirements Engineering, an Oxymoron?"

A highlight of the Conference for me was Jeremy Dick's presentation concerning an INCOSE initiative to develop A Requirements Guide for All (REGAL). The goal of this initiative is to collect good practices from requirements practitioners. Jeremy is serving as the Chair of INCOSE's Requirements Working Group, and welcomes your contributions to this initiative—contact him at jeremy.dick@integrate.biz.

RE'06: From the Industry Track

As Industry Track Co-Chair (with Frank Houdek of DaimlerChrysler), I was very happy with the strength of the Industry Track this year. The conference felt busy and practical, with a lot of good things to do – tutorials, workshops specially for industry; talks, keynotes, meet-the-expert all practical and relevant. Crucially there was something to do every day (almost every minute) for Industry Track people old and new. I was not embarrassed to meet colleagues and clients and to discuss what we'd heard with them. This feeling is I believe a crucial test – if we wouldn't invite our clients, then the conference is too academic for industry.

The conference was highly relevant locally. We had about 50 people from Minnesota! We'd need 52 conferences just to cover the USA (gulp). But it was noticeable that we had people from major firms from across the continent: locally probably means different things to different kinds of people.

The conference was attractive to beginners (again, probably most of the Minnesota people among others).

There was a really nice distribution of people with all amounts of experience, and of course that means there is a large emphasis on the early years. So, a conference is a place where all can learn.

The Industry Track content was strongly weighted to invited speakers, who were of the highest quality. We were specially happy to have Jeremy Dick's talk on INCOSE's REGAL website. This was a sign of the growing degree of friendship and collaboration between the IEEE, INCOSE, the BCS RESG and the IET. For me, this is very welcome – these organisations really aren't competitors, but have everything to gain from supporting each other.

A successful Industry Track is a lively mix of Tutorials, Workshops, Debates, Keynotes, Invited Talks, Master Classes, whatever, so that industry folks can come along, listen, learn, argue, look, read, and enjoy all at once. Industry wants things it can grasp, take away, and use on the next project (if not this one).

Martin Glinz (the program chair)'s determination to have at least 10-15 minutes of discussion and questions in every session was wonderful, and it had the most remarkable effect on everything I attended (including academic paper sessions). Suddenly everyone seemed to be part of the conference. Surely this should be an essential element of every future conference.

RE-writings

Why the "Shall" Statement is Obsolete

Or, Seven Stakes through Shall's Coffin

Some creatures never seem to die, no matter how many stakes the horror-movie actors try to hammer through the vampire's heart.

Requirement engineers occasionally feel that the "shall" statement has joined the ranks of the undead – not something they ever want to write, yet strangely always at the back of everybody's mind.

Here therefore are seven reasons why the unlovely shall-statement is well past its bury-by date.

1) ***It's Clunky***. It's an obsolete piece of grammatical clunkiness. "The system shall be able to do x" (or worse, "The system shall enable the user performing such and such a role to do x"). Why not say simply "The system does x", "The <role> does x"?

   The shall=mandatory, should=desirable, may=optional style for requirements was introduced in the 1960s (apparently by the US DoD) when word-processed tables were unavailable (let alone requirements databases). The original justification for the approach has long since collapsed, but the fossilised style persists. Since contractors routinely ignore anything that isn't mandatory, you might wonder what the point of it all was anyway.

2) ***It's Unintelligible.*** *Shall should may might can could will would must ought.* It's a scrap-heap of slippery auxiliary verbs, used to construct a dauntingly complex set of tenses.

   How often do you use the conditional future perfect? "She should have arrived here next Tuesday, but…" The meaning seems to be that a planned action is now known to be counterfactual, but that it is still (wistfully) being imagined as ***possibly going to be completed after all.***

3) ***It's Confusing.*** Even if you're a native English speaker, the auxiliaries are tricky to interpret. To engineers who are using English for specification as a second or third language, it must be a nightmare.

   In careful English, we can distinguish, just, between "you do not have to do x" and "you have not to do x" – the former meaning that x is not mandatory, the latter that x is forbidden. Just how dangerous all this is in natural language is brought home by the German equivalent: "*muss nicht*" means not "must not" (forbidden) as an over-literal translation would suggest, but "need not" (not mandatory). And what about "shall"?

   > "We shall not sheathe the sword, which we have not lightly drawn…"
   >
   > *(Asquith, 1914)*

   It positively shudders with noble feeling and determination to face up to the hideous enemy at the start of the Great War. "Shall" here implies personal and collective intention of the strongest kind: not exactly a calm unemotional construct suitable for system requirements, you might think. So important was the unbending force of the "shall", that Asquith chose to endure a sequence of three alliterative sibilants which could have tripped a lesser orator.

Herbert Henry Asquith, 1852-1928

All this is a linguistic minefield for native speakers; the English language has shifted markedly in the last generation, let alone the last century. RQ was taught at the age of ten, like all good little journalists, to report speech by inflecting it. If the speaker said

"I *shall* go to Athens this summer",

the reporter had to write

"She said that she *should*…"

Similarly, *will* turned to *would*, *can* to *could*, *may* to *might*, *is* to *was*, and *must* to, ahem, *had to*.

Even the BBC and the quality press have quietly dropped this nonsense. They now cheerfully announce

"The prime minister said that he *may*…"

ignoring the unheard "*might*" jangling on the nerves of all the good little journalists of an older generation. (You didn't even know that "might" was the reported form of "may"? Exactly. The world has moved on.)

A respected colleague pointed out that it is misleading to say "was" in meeting minutes, as people nowadays tend to assume that "was" implies the past tense, ie that the statement is no longer valid.

4) ***Useless for Phasing.*** It's no good for phasing or staging your project. If a requirement is Desirable in version 1, Highly Desirable in version 2, and Mandatory in version 3, which word should you have in the written requirement: may, should, or shall? Any of them would be confusing, clearly. Far better to put the Priority in adjacent columns and make your meaning explicit with a table or database record. Of course the same applies to many other aspects of requirements engineering.

Reqt	V1	V2	V3
The system *?shall?* do x.	Desirable	Highly Desirable	Mandatory

5) ***Unusable in Use Cases.*** The modern convention for use cases is to use the plain indicative in the present tense. "<Role r> does x." Sanity intervenes.

6) ***Inapplicable in Models.*** If you're modelling goals, creating specification tables for table-driven software, specifying behaviour with state models (a la Statemate or Matlab), or even drawing flowcharts/activity diagrams, you'll hardly be writing shall-statements either.

7) ***Anaesthetic.*** An endless list of "The system shall enable the user to …" statements is desperately boring to read. Indeed, the mantra-like repetition of the phrase affects the brain of the reviewer: errors and omissions become hard to detect.

Shall? An idea whose time has gone. It may be fine for bellicose oratory, but it's terrible for engineering. Let's give it a decent burial. Bring on the wooden stake, the garlic, the crossed piece of silver, the exorcism spell, anything.

RE-verberations

This section is for items of news that have a bearing on requirements work. RQ would like to hear of such things from its readers.

Fed Up With the CHAOS Report?

AugustDiva's remarkable personal website (http://www.geocities.com/augustdiva/Artifacts/projectsuccess.html) contains a questionnaire form that calculates your "Project Success Potential". AugustDiva explains as follows:

"The CHAOS Report from 1994 surveyed over 352 companies reporting on over 8,000 software projects and determined that:

+ 9% of projects are on time and on budget at large companies (compared to 16% at small companies)
+ 53% of projects will cost 189% of estimates
+ 31% of all software projects are canceled before completed ($81 billion waste)

The Standish Group subsequently released Unfinished Voyages: A Follow-Up to The CHAOS Report. A very useful report -- although you can grow tired of trying to answer the questions *and* add up the results in your head at the same time. Which brings us to the self-calculating questionnaire below...

So, the next time you have a hunch that the project you're working on is not going well (i.e. the Chaos is Back), fill out this questionnaire. You'll end up with your Project Success Potential, plus some areas identified for extra focus."

The website also contains an interesting set of "ideas for the practitioner" on requirements analysis, mainly about use cases.

RE-flections

Language

1. What does a submarine commander say to the officers on the conning tower when he's about to dive? "Initiate closing of conning tower main hatch?" or something pompous like that? Not a bit of it. He says "shut the lid", presses the klaxon three times, and dives.
2. A friend's father, an expert yachtsman, tells his son "go up to the pointy end and bring me the loose rope": nothing about "Avast ye landlubber, go for'ard on the lee side and catch me the jib sheet, splice the mainbrace*, ya harrr" or any of that stuff.
3. On holiday in France this summer, we went riding *en famille*. I took care to learn the key terms: étriers (stirrups), selle (saddle), licol (bridle), rênes (reins) and so on. I was told to "reprenez vos rênes, monsieur" more than once. But as I got to know my horse, and as the riding-master got to know me, his instructions grew less and less verbal. Eventually "close up" became a small gesture of the left hand, held out low, palm forwards. He used the same quietness to direct his horse, a splendid mare. "Trot" was a barely visible squeeze, the smallest of heel-movements.
4. It seems to be possible to give any order, specify any requirement, in a few very plain words.
5. The more familiar people are with each other, and with their domain, the fewer words they seem to need: right down to zero, in fact.
6. A generation ago, with insecure radios, I saw a tank regiment giving a demonstration of night firing. The radio traffic to control the whole deadly hail of shells and bullets: a pre-planned sequence of clicks and answering clicks, of old-fashioned pressel-switches on handheld microphones. Not a word was spoken; no voice-signatures were broadcast to an enemy's signal intelligence service.
7. Language is designed for a low-bandwidth medium: speech, a single easily-jammed voice channel. Its symbols are compact, but its pattern highly redundant: a lot can be said in a small space; it's OK if parts of it are missed, as the sense is usually reconstructable, even without asking for parts to be repeated.
8. All of this fails if pushed to the limit – atomic shall-sentences with no redundancy, written (not spoken with a chance to question back), across a cultural divide to people without domain knowledge, and not known personally to the speaker(s). These things are hard and dull to read. Normally we expect to skim over repetitive stuff, or nod off during pep-talks by the boss or village headman.
9. Richer, higher-bandwidth languages, using artefacts like photos, mock-ups, videos, drawings, rich pictures, stories, goal models, process diagrams, flowcharts… give us the chance to communicate needs better when the parameters of spoken language are not appropriate. Diagrammatic models can be checked against each other (useful redundancy). Sense can be gathered from context, just as it can when practitioners in any domain speak in natural language – yachtsmen sailing a boat, riders out pony-trekking, controllers handling air traffic, whatever.
10. Requirements work is itself a domain, whose context is communication. The richnesses of our domain, our riding-master's gestures, are models, prototypes, sketches, diagrams: not words.

* to give a tot of rum to all the crew.

RE-partee

The Consultant

Once upon a time a Requirements Manager was riding in a helicopter when a heavy fog descended. Visibility fell almost to zero, and the pilot lost his bearings. They flew slowly and cautiously through the fog while the fuel level fell lower and lower.

Suddenly a rectangular grey shape came into view. With relief, the pilot brought the aircraft close up to it: a skyscraper. Opening the door, everyone shouted

"WHERE ARE WE?"

A window shot up in the building, and a smartly-suited man leaned out.

"YOU'RE IN A SI-KOR-SKY S-76 HELLY-COP-TER!"

he shouted.

"Why doesn't he just tell us where we are",

muttered the pilot angrily.

"It's fine",

said the Requirements Manager.

"His answer was completely correct and perfectly useless, and he was wearing a suit,

so this must be the *** Corp. headquarters in Reading. Turn east and fly down the river. We'll be at the heliport in a few minutes."

Proverbs

We need something to do with navigation to follow that old chestnut (ahem). Perhaps this dialogue between Alice and the Cheshire Cat will suit. It is no accident that Carroll was a mathematician, well used to writing precise specifications.

Would you tell me please, which way I ought to go from here?

That depends a good deal on where you want to get to, said the cat.

I don't much care where –, said Alice.

Then it doesn't matter which way you go, said the cat.

Lewis Carroll, Alice in Wonderland, Chapter 6.

RE-Creations

To contribute to RQ please send contributions to Ian Alexander (ian @ scenarioplus.org .uk).
Submissions must be in electronic form, preferably as plain ASCII text or rtf.
Deadline for next issue: 15th December 2006

RE-Publications

Software Requirements Memory Jogger

A Pocket Guide to Help Software and Business Team Develop and Manage Requirements

Author: Ellen Gottesdiener, Goal/QPC, 2005

Anyone who knows Ellen Gottesdiener's *Requirements by Collaboration* will immediately guess that this will be a fine introduction to the field. They won't be disappointed either. The diminutive format of the book, or 'booklet' as the publishers have it, looks unpromising from the outside, suggesting a sketchy industrial 'Spreadsheets for Dimwits' sort of approach. But the book's content is anything but that.

Gottesdiener has written a textbook covering the whole requirements process, including at the largest scale the kind of life-cycle to choose for your project, and at smaller scales how to gather, write, and review requirements. Somehow she has packed in a wealth of materials, suggestions, checklists and modelling techniques. The knowledge is encyclopaedic, the space small: like Dr Who's Tardis time-machine, it is much bigger on the inside than on the outside. It's extremely practical, too.

Most of the material is applicable to projects of all kinds, not only software. The book should appeal to a wide audience, with or without requirements experience. It is clearly aimed at people in the software industry but may well be useful to students of software engineering as well.

RE-sponses

RQ welcomes comments and reactions to articles and reports published in its pages.

RE-sources

Books, Papers

See also the RQ archive at the RESG website:
http://www.resg.org.uk

Al Davis' bibliography of requirements papers:
http://www.uccs.edu/~adavis/reqbib.htm

Ian Alexander's archive of requirements book reviews:
http://easyweb.easynet.co.uk/~iany/reviews/reviews.htm

Scenario Plus – free tools and templates:
http://www.scenarioplus.org.uk

CREWS web site:
http://sunsite.informatik.rwth-aachen.de/CREWS/

Requirements Engineering, Student Newsletter:
www.cc.gatech.edu/computing/SW_Eng/resnews.html

IFIP Working Group 2.9 (Software RE):
http://www.cis.gsu.edu/~wrobinso/ifip2_9/

Requirements Engineering Journal (REJ):
http://rej.co.umist.ac.uk/

RE resource centre at UTS (Australia):
http://research.it.uts.edu.au/re/

Volere template:
http://www.volere.co.uk

DACS Gold Practices "Manage Requirements":

http://www.goldpractices.com/practices/mr/index.php

New Resources

This quarter has seen a remarkable burst of new Requirements Engineering resources on the Internet. Here are those that RQ has heard about. RQ wishes them all well as they set out in the world.

http://www.requirements.in

This is an interesting new website with an attractively minimalist design, independent articles licensed under the Creative Commons scheme, and an invitation to contribute. RQ readers take note!

RQNG

The Requirements Networking Group

The Requirements Networking Group (RQNG) plans on establishing itself as the preeminent resource for information and networking opportunities for information technology requirements professionals in the World. RQNG aims to be the leading source of information and services geared toward requirements gathering and management in the information technology industry.

RQNG's products and services include:

- Articles written by industry leaders about timely and compelling issues
- Archives designed for researching best practices, policies and procedures
- Forums to share ideas and knowledge with other community members
- "Blogs" to express thoughts relevant and important to you
- My Networking Group search the database and invite other individuals to join your network
- Vendor Links search vendors offering various related services
- Job Posting Selected job postings for requirements professionals

The Purpose of RQNG — In Brief

Chaos

Billions of dollars wasted each year, thousands of projects cancelled, many more failing to deliver a large percentage of the requested features, over 50% of projects costing almost twice as much as originally estimated, a great many projects well over their estimated implementation date. Worst case, the project is well over budget, well past its estimated implementation date and then it's cancelled!

The software development world is indeed in chaos, and the single most common reason is incorrect or missing requirements! It is time to do something about it, time for all the expert requirements gatherers and managers to help educate the others to get the job done right and force success in an industry with a pitiful record.

Requirements Network

We have built the first site dedicated solely to requirements professionals in the world to share "blogs", forums, educate themselves through articles written by requirements Subject Matter Experts and share ideas, thoughts and opinions around requirements practices.

In July 2006 www.requirementsnetwork.com goes live giving the first online professional network exclusively for the requirements experts in information technology.

About the RQNG Community

As a pioneer in the space, RQNG reaches a diverse audience of requirements professionals who work in the field of information technology.

This diverse group includes representatives from any industry. RQNG's focus on requirements gathering practices and improvement make it a top destination for forward-looking requirements professionals who are passionate about becoming leaders in the field and stemming the chaos.

Richard Matthews, 75 Sherbourne St. Suite 112, Toronto ON M5A 2P9, cell (647) 402- 7641

richard@requirementsnetwork.com

RE Yahoo Group

Our purpose is to provide environment for sharing knowledge and experience in the scope of Software Development Processes. Our subjects are:

1. Requirements Eng. Process
2. Importance of Requirements and Elicitation Techniques
3. Requirements Analysis Patterns
4. Types and Attributes of Requirements
5. Requirements Managements
6. Requirements in the scope of CMMI
7. Developing the requirements

To join us:

http://groups.yahoo.com/group/Requirements-Engineering/

Post message:

Requirements-Engineering@yahoogroups.com

Subscribe:

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Unsubscribe:

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Kasim Sen (Moderator)

Mailing lists

RESG Mailing List:

The RESG provides an email forwarding service to the requirements engineering community in the UK and worldwide. Calls for papers for RE-related conferences, workshops and special events are forwarded to the mailing list. Mailings also include reminders of coming RESG or related events and position openings for professionals in the RE field.

This mailing service is moderated to ensure that all messages are RE-related and conform to the aims of the service indicated above.

RESG members become part of the RESG mail forwarding service soon after they register.

If you are not an RESG member, but wish to benefit from to the RESG mail forwarding service, you can join by following the instructions below.

To register your email address on the RESG mail forwarding list send a message to admin-mail-list@resg.org.uk including the text "subscribe" anywhere in the subject line.

To update your email address on the RESG mailing list send a message to admin-mail-list@resg.org.uk including the text "change address" anywhere in the subject line. Please indicate in the body of the message the old email address that is to be replaced. The originating email will be replacing the old one on the list. Addresses to which messages cannot be successfully delivered are removed from the list.

To remove your email address from the RESG mailing list send a message to admin-mail-list@resg.org.uk including the text "unsubscribe" anywhere in the subject line.

If you wish to forward a relevant message - a call for papers or participation - to the RESG mailing list, send it to admin-mail-list@resg.org.uk with the text "forward to list" anywhere in the subject line.

RE-online (formerly SRE)

http://www-staff.it.uts.edu.au/~didar/RE-online.html

The RE-online mailing list acts as a forum for requirements engineering researchers and practitioners. To subscribe to RE-online mailing list, send e-mail to majordomo@it.uts.edu.au with the following as the first and only line in the body of the message:

subscribe RE-online <your email address>

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The Requirements Engineering Specialist Group of the British Computer Society

Individual Membership Form for 2006

1. Membership Type

Please indicate type of membership:

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Corporate Membership also available – details at www.resg.org.uk or ask the Membership Secretary

Payment by cheque only. Please make it payable to "The BCS Requirements Engineering Specialist Group"

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As an RESG member your e-mail address will be added to the RESG mailing list

Optionally, indicate:

Your organisation's name:_____

Its type of business/domain:_____

3. Your Specific Interests

Areas of interest for the RESG given at *http://www.resg.org.uk/about_us.html*. Is there another area would you like us to add?

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4. Your Participation Preferences

Please indicate what timings/duration for RESG events would suit you:

Whole day [ ] Half day [ ] Evening [ ] Other (please specify) [ ]_____

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

Publicity [ ] Newsletter contributions [ ] Organisation of meetings [ ]

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The RQ quarterly newsletter is sent to all RESG member as a PDF e-mail attachment unless you prefer a hard-copy of RQ delivered by post. For hardcopy delivery, please tick here [ ]

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.

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