

2nd International Workshop on Creativity in Requirements Engineering – CreaRE 2012

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ABSTRACT

Requirements Engineering (RE) is a socially constructed activity and as such it includes the creation, development, assessment and communication of innovative ideas. An idea can take the form of a thought related either to the analysis of a problem, or to the search of a solution to this problem, and it can be concrete or abstract. Creative thinking is what RE professionals tacitly or explicitly use in their RE processes to conceptualize smart solutions to problems. RE demands the stakeholders to create visions of a future software system and to imagine all its implications. Creativity techniques that have been practiced in other fields can support this creative part of RE.

The CreaE series of workshops brings together RE practitioners and researches who are interested in discussing the role of creativity in RE and the ways in which creativity techniques from other disciplines can be leveraged in RE. CreaRE 2010 aimed at creating awareness of the importance of research on creativity in RE and initiated the conversation on experiences of applying creativity techniques in support of RE activities. CreaRE 2012 builds upon this foundation and extends the discussion on creativity in RE by actively fostering the exchange of ideas among members of diverse communities that are engaged in RE research and practice. CreaRE 2012 united an audience reaching out to areas such as design, theatre improvisation, stakeholder interactions, studies on cultural heritage and multimedia systems. This report describes the results of the workshop.

Keywords

Requirements Engineering, Creativity, Innovative Ideas, Design

1. INTRODUCTION

Requirements Engineering (RE) not only demands a systematic approach to eliciting, operationalizing, and documenting requirements and for solving their conflicts, but it also calls for a creative approach for it [1]. RE demands the stakeholders to create visions of future software systems and to imagine all their implications [2]. Creativity enhancing techniques, which have been developed and used in other disciplines and areas of problem-solving, have the potential to be adapted and adopted in today's RE, and thus become the foundation for innovative RE processes, addressing both problem analysis and solution design.

The CreaRE 2012 workshop brought together RE professionals from industry and researchers who are interested in discussing the role of creativity in RE, the array of creativity techniques that can be applied to RE, and the specific ways to do so. The workshop served as a forum for the exchange of experiences and research results. It also aimed at raising awareness in the RE community for the importance of creativity and creativity techniques. Last, the workshop reached out and made a decisive step towards linking the RE community to other communities to which creativity is essential.

CreaRE's long term vision is to bring together practitioners and researchers from both the RE community and other related communities, for example, creative design, psychology, design thinking, to debate on how to leverage creativity approaches for the

purpose of better RE. The workshop organizers are committed to provide opportunities for practitioners to learn about pragmatic ways for incorporating creativity techniques into RE processes. To researchers, the workshop provides a forum to discuss relevant and under-researched RE phenomena where creativity is of central importance.

2. WORKSHOP THEMES

The CreaRE 2012 topics include, but are not restricted to: (i) the interplay of requirements and creativity, (ii) creativity techniques and their application in requirements activities, (iii) tool support for creativity-enhancement, (iv) context-dependency of creativity and creativity techniques, (v) experiences with creativity techniques in industry, (vi) relation of creativity to innovation, (vii) RE techniques that enable or support creativity, (viii) skill-sets for creativity in RE, (ix) creativity via reuse: trading off innovation and efficient production.

3. WORKSHOP PROGRAM

The CreaRE 2012 workshop took place as a half-day workshop on the 19th March 2012 at REFSQ, the International Conference on Requirements Engineering – Foundation for Software Quality, Essen, Germany. The workshop program included four paper presentations, a keynote talk and an improvisation theatre session:

- *Daniel Berry* (keynote): Are Creativity, Human-Computer Interaction, and Emotions Parts of RE? — Are Requirements Invented or Discovered?
- *Alessia Knauss (Olesia Brill), Eric Knauss, Daniela Damian*: Towards Supporting End-User Creativity with Social Media and Multimedia
- *Li Zhu, Thomas Herrmann*: Design Now! — Elaborating Requirements in Situated Action
- *Deepti Savio, P.C. Anitha*: 'Pictionades': Enhancing Stakeholders' Awareness about Issues in Requirements Communication
- *Sylviane Levy, Fernando Gamboa*: Requirements Analysis for Multimedia Interactive Informative Systems: a Metamodelling Approach
- *Anne Hoffmann, Martin Mahaux*: Research Preview: Using Improvisational Theatre to Invent and Represent Scenarios for Designing Innovative Systems

We invite readers to review the CreaRE 2012 web site for further information <http://www.se.uni-hannover.de/events/creare-2012/> and to read the full text of the workshop contributions in the Workshop Proceedings of the REFSQ 2012 Conference.

3.1 Is Creativity Part of RE at All?

Dan Berry's keynote presentation brought a variety of perspectives on this question. The talk suggested that creativity is indeed part of RE, if requirements are something that is to be invented. Berry defined creativity as the generation of innovative, unexpected solutions to complex, non-trivial problems, or to ill-formed, wicked problems. Dan Berry — and many RE researchers who consider RE as a socially constructed activity [3] — think that creativity is an integral part of RE. Examples from Berry's own research were presented in support of this

viewpoint. Berry also shared personal evidence suggesting that there are different opinions on whether the topics of inventing requirements, reasoning about emotional requirements [4], or using personas in RE is part of RE and whether papers on these topics should be published in RE outlets or elsewhere. Because whether creativity is a part of RE is debated in the RE community, Berry invited the RE community to work towards increasing the awareness of the role that creativity and creativity techniques can play in RE. He emphasized that workshops on creativity should become part of any RE event. Furthermore, Berry offered his reflections on the history of research about creativity in RE. One of the reasons why RE needs creativity is that RE is a wicked problem for any non-trivial software-intensive system. Any wicked problem demands abandoning old ideas and finding innovative ways to solve problems. Creativity can even happen when someone fails to follow conventions. Errors can lead to new ideas. Creativity not only produces large numbers of requirement ideas but also provides the methods to cope with this avalanche of ideas. Therefore, creativity must be fostered instead of being controlled or even banned. Berry concluded that requirements are both invented as well as discovered.

3.2 Discussion on the Presentations

Knauss, Knauss and Damian in their contribution “Towards Supporting End-User Creativity with Social Media and Multimedia” describe their vision on how to support end-users by leveraging novel modes of interaction such as social media and multimedia. They propose a number of research questions grounded in related work in the areas of creativity, social media and multimedia. These research questions are:

1. How can social media be leveraged effectively to stimulate creativity in requirements engineering? A wiki could be such a medium. However, it still is open whether social media has a positive influence on creativity, especially when such social media tools would bring together people with conflicting or without common interests and how to add support for end-user creativity (e.g. seeding of content, for example multimedia).
2. How can multimedia be leveraged effectively to stimulate creativity in requirements engineering? This could be done by simulation or capturing usage context.
3. How can creativity in requirements engineering be stimulated by seeding of initial content in social media? Eliciting tacit knowledge here is one important objective.

Li Zhu and Thomas Herrmann in “Design Now! – Elaborating Requirements in Situated Action” present MikiWiki, the first tool for supporting meta-design and the results of their empirical evaluation of this tool. Meta-design implies design-in-use: it helps to continuously adapt design environments. Their findings indicate that a meta-design approach not only enables requirements engineering at use time but also enhances different levels of creativity: 1) opportunistic programming as bricolage at the meta-design level, in that meta-designers constantly evolved the MikiWiki design environment opportunistically to cope with emergent socio-technical issues without needing to change server-side code; and 2) creativity-in-use at the design and use level, in that designers and users invent their own ways to use MikiWiki which are not envisioned by meta-designers. A key discussion point is how to connect the outcome of design-in-use workshops to requirements documentation activities that lead to software development.

Deepthi Savio and Anitha P.C. in “‘Pictionades’: Enhancing Stakeholders’ Awareness about Issues in Requirements Communication” present a requirements engineering game. They used

this successfully in real-life projects in global software development contexts to convey to stakeholders who have no RE background the realities that underlie the communication of requirements across multiple contact points.

Sylviane Levy and Fernando Gamboa in “Requirements Analysis for Multimedia Interactive Informative Systems: A Metamodelling Approach” discuss a requirements engineering approach which they used in a case study to elicit requirements on Multimedia Interactive Informative Systems (MIIS). This approach is based on scriptwriting and transforming a script into requirements that can be used by a software development team. In this paper, they propose a meta-model to be used as a domain specific language when designing a MIIS and define new communicative quality attributes to complete ISO/IEC 25010 quality in use model. An open question discussed by the audience was the operationalization of the quality attributes ‘interestingness’ and ‘attractiveness’ of mobile learning systems that adjust to the learning style of the user.

3.3 Improvisation Theater

Martin Mahaux and Anne Hoffmann both are experienced improvisation actors and requirements engineers. In this workshop, they showcased one possible form of supporting requirements engineering by improvisational theatre – applied on a car sharing application – and discussed it with the audience. Improvisational theatre was experienced as an effective means to invent user experiences in a collaborative way, to generate requirements and to communicate them. The video extracted during this presentation is available online from the first author’s blog at <http://info.fundp.ac.be/~mma/wordpress/>. In their paper “Research Preview: Using Improvisational Theatre to Invent and Represent Scenarios for Designing Innovative Systems” they give a literature overview and an outlook for the planned further work.

4. WORKSHOP PROGRAM COMMITTEE

- D. Berry, University of Waterloo, Canada
- D. Callele, University of Saskatoon, Canada
- M. Daneva, University of Twente, Netherlands
- Joerg Doerr, Fraunhofer Institut IESE, Germany
- Andrea Herrmann, Infoman, Germany
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- Inge van der Weer, University of Utrecht, Netherlands
- Roel Wieringa, University of Twente, Netherlands
- Konstantinos Zachos, City University London, UK

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