Software Engineering for Social Sustainability

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Abstract—Social sustainability is often deemed to create the basic framework for an operational society. Software too has now become one of the cornerstones of societal infrastructure. Yet, the question on how software engineering impacts social sustainability still remains largely unaddressed. The 1st workshop on Software Engineering for Social Sustainability aims to mobilise an inter-disciplinary community focusing on how software engineering principles and practices must change to ensure maximised positive contribution of an engineered system towards the social sustainability of the societies affected by it.

I. Workshop Description

Social sustainability is often defined as ability of a society to maintain its social capital which creates the basic framework for society, including cohesion of community for mutual benefit, connectedness between groups of people, standards of ethics, rules, laws, and information [1]. It lowers the cost of working together and facilitates cooperation, e.g., trust lowers transaction costs [1].

Software systems are prevalent in all walks of life today. It is hard to think of a business, educational programme, or even entertainment industry that does not rely on a software system either for its core activities (e.g., from full pant automation to online games), or payroll, communication, coordination, advertisement, and so on. Surprisingly, even now software systems engineering research and practice severely lacks the consideration of how the software systems (that software engineers develop) contribute to the “basic framework” – i.e., social sustainability – for the society for which these systems are intended. While some research is currently underway on “social software”, the core consideration for such research is how a particular type of software – that used for social networking – is developed and used. The broader question: how software engineering impacts social sustainability remains largely unaddressed.

The motivation for this 1st workshop on Software Engineering for Social Sustainability is to mobilise an inter-disciplinary community focusing on how software engineering principles and practices must change to ensure maximised positive contribution of an engineered system towards the social sustainability of the societies affected by it. Such societies can vary from business organisations using software, or localised communities where an organisation/software is located, to distributed online communities that use a given software system.

The Workshop objectives are:

- To bring together an inter-disciplinary community, including, for example, software engineers, sociologists, anthropologists, ethics researchers, legal scholars, environment scientists and others, in order to mobilise a community focusing on how software engineering can contribute to better social sustainability.
- Identify on-going research efforts pertaining to software engineering and social sustainability and foster inter-disciplinary collaborations amongst participants.
- Motivate and demonstrate the relevance of this topic to both research and practitioner communities and report on concrete examples of such relevant research and practice.

The workshop will result in:

- Initiating discussions/collaborations between those working on various aspects of social sustainability in/through software engineering;
- Creation of the first Report on State of Software Engineering for Social Sustainability to be published at the workshop web site as well as Computing Resources Archive, and
- Initiation of an online repository of example projects to illustrate, motivate, and educate research and development in Software Engineering for Social Sustainability.

All workshop materials will be published on the workshop web page at this URL: http://cazzola.di.unimi.it/se4ss.html

II. Workshop Attendance

This workshop is planned as a full-day event.

The workshop solicits submissions of full papers (up to 8 pages), extended abstracts (up to 2 pages), and case studies (2 pages + artefacts). All submissions will be reviewed by at least two program committee members. The main criteria for acceptance will be relevance to the workshop topic and quality of the submission.

Space permitting, any attendee is welcome, but priority will be given to those with submissions. Please sign up through the EnviroInfo & ICT4S registration system.

The workshop activities are briefly itemised below:

- Panel-centred paper presentations: Full paper submissions accepted for the workshop will be structured
• **Small Group work on Case Studies:** Case Study submissions accepted for the workshop will be structured into domain/problem areas. The workshop participants will split into small groups to work on detailing, clarifying, and aggregating problems and solutions posed by each domain/problem area. The case studies will be collected for the repository of example projects.

• **Plenary discussion on Case Studies and Guidelines:** The session of the workshop will be used for a plenary session. The results will be discussed and integrated into good practice guidelines, and open research questions to set the agenda for the research and practice on this topic.

### III. Workshop Organisers

**Dr. Ruzanna Chitchyan (contact organiser)** is a lecturer in Software Engineering at the University of Leicester, UK. Her research has mainly focused on topics of software engineering and sustainability, as well as advanced modularization techniques (such as product-line and aspect-oriented development). Currently Dr. Chitchyan is researching on topics of software engineering for sustainability (e.g., recent EPSRC All-in-One project) and software user behaviour modification towards sustainable living. She has a particular interest in effects of sustainability requirements on software design, and is one of the main contributors on work around manifesto on Sustainability Design, that aims to distill principles of sustainability design for/through software. Dr. Chitchyan has also worked on issues of technical sustainability within the requirements engineering domain (EU FP7 DiVA, EU FP6 AOSD-Europe and AMPLE projects).

Dr. Chitchyan has a substantial conference and workshop organization experience. She has served, for instance, as the organizing co-chair of ECOOP 2011, and (lead) (co-) organizer on a number of workshops on aspect-oriented development (e.g., at AOSD, ICSE, RE, ECOOP conferences) as well as workshops on Software Challenges and Climate Change (ECOOP 2011 and ICSE 2010). Dr. Chitchyan is currently a co-organiser of the workshop on Requirements Engineering for Sustainability, to be held at Requirements Engineering 2015 conference.

**Prof. Awais Rashid** is director of the inter-disciplinary Security Lancaster Research Centre at Lancaster University, UK. The centre involves approx. 100 researchers across computer science, engineering and social sciences. His research interests are in inter-disciplinary approaches at the boundary of software engineering, security, sociology, psychology and law. In particular, he is interested in developing sustainable software systems for sustainable living in the digital world – particularly systems that empower otherwise marginalised groups, e.g., young people, the elderly and those on the wrong side of the digital divide. He has led a number of inter-disciplinary research projects funded by the European Commission and UK Engineering and Physical Sciences Research Council in excess of 12M euros. Examples include his work on the UDesignIt platform that developed novel social media tools to enable communities to come together en-masse to design systems that affect them; work on studying group identities to understand how online groups move from rhetoric to (positive or negative) social actions in the physical world; novel techniques to protect vulnerable online users from frauds, cyber-bullying, etc.; and development of frameworks for tackling emergent ethics for software engineering in society. Prof. Rashid has extensive experience of serving on programme committees. He has served on program committees of major conferences such as International Conference on Software Engineering (Software Engineering in Society Track), International Conference on Requirements Engineering, International Conference on Foundations of Software Engineering, International Conference on Aspect-Oriented Software Development (AOSD) and European Conference on Object-Oriented Programming (ECOOP).

He was program co-chair of AOSD 2006 and Conference Chair for ECOOP 2011. He has also organised a number of workshops over the years at major conferences including ICSE, AOSD and ECOOP to name a few.

**Prof. Walter Cazzola** Prof. Walter Cazzola is currently an associate professor at the Department of Computer Science of the Università degli Studi di Milano, Italy and the chair of the ADAPT laboratory. His research interests include reflection, aspect-oriented programming, software evolution, programming methodologies and languages. He is the designer of the mChaRM framework, of the Java, [a]C#, Blueprint programming languages and he is currently involved in the designing and development of the Neverlang general purpose compiler generator. He has written more than 100 scientific papers and served in the program committees or editorial boards for the most important conferences and journals on his research topics.

With regards to past workshop organisation experience, Prof. Cazzola has (co-)organised, a number of these, such as workshop series on Reflection, AOP and Meta-Data for Software Evolution from 2004 to 2012; workshop series on Aspect-Oriented Modeling from 2006 to 2009; IFAC Workshop on Distributed Computer Control Systems, 1998; Workshop on Object-Oriented Reflection and Software Engineering held at OOPSLA 1999; Workshop on Reflection and Meta-Level Architectures held at ECOOP2000; Workshop on Experience with Reflective Systems held at WERS 2001; and others.

### REFERENCES