Preface

This textbook comprises the proceedings of the 24th Systems, Software and Services Process Improvement (EuroSPI) Conference, held during September 6–8, 2017, in Ostrava, Czech Republic.

Since EuroSPI 2010, we have extended the scope of the conference from software process improvement to systems, software, and service-based process improvement. EMIRAcle is the institution for research in manufacturing and innovation, which arose a result of the largest network of excellence for innovation in manufacturing in Europe. EMIRAcle key representatives joined the EuroSPI community, and papers as well as case studies for process improvement on systems and product level will be included in future.

Since 2008, EuroSPI partners have packaged SPI knowledge in job role training and established a European certification association (www.ecqa.org) to transport this knowledge Europe-wide using standardized certification and exam processes.

Conferences were held in Dublin (Ireland) in 1994, in Vienna (Austria) in 1995, in Budapest (Hungary) in 1997, in Gothenburg (Sweden) in 1998, in Pori (Finland) in 1999, in Copenhagen (Denmark) in 2000, in Limerick (Ireland) in 2001, in Nuremberg (Germany) in 2002, in Graz (Austria) in 2003, in Trondheim (Norway) in 2004, in Budapest (Hungary) in 2005, in Joensuu (Finland) in 2006, in Potsdam (Germany) in 2007, in Dublin (Ireland) in 2008, in Alcala (Spain) in 2009, in Grenoble (France) in 2010, in Roskilde (Denmark) in 2011, in Vienna (Austria) in 2012, Dundalk (Ireland) in 2013, in Luxembourg in 2014, in Ankara (Turkey) 2015, and in Graz (Austria) 2016.

EuroSPI is an initiative with the following major action lines http://www.eurospi.net:

- Establishing an annual EuroSPI conference supported by software process improvement networks from different EU countries.
- Establishing a social media strategy with groups in LinkedIn, Facebook, Twitter, and online statements, speeches, and keynotes on YouTube, and a set of proceedings and recommended books.
- Establishing an effective team of national representatives (from each EU- country) growing step by step into more countries of Europe.
- Establishing a European Qualification Framework for a pool of professions related to SPI and management. This is supported by European certificates and examination systems.

EuroSPI has established a joint newsletter with the European Certification and Qualification Association (www.eurospi.net, in the menu "About EuroAsiaSPI"), the SPI Manifesto (SPI = Systems, Software and Services Process Improvement), a set of social media groups including a selection of presentations and keynotes freely available on YouTube, and access to job-role-based qualification through the European Certification and Qualification Association (www.ecqa.org).

A typical characterization of EuroSPI is reflected in a statement made by a company: "… the biggest value of EuroSPI lies in its function as a European knowledge and experience exchange mechanism for SPI and innovation."

Since its beginning in 1994 in Dublin, the EuroSPI initiative has outlined that there is not a single silver bullet with which to solve SPI issues, but that you need to understand a combination of different SPI methods and approaches to achieve concrete benefits. Therefore, each proceedings volume covers a variety of different topics, and at the conference we discuss potential synergies and the combined use of such methods and approaches. These proceedings contain selected research papers under six headings:

- Section I: SPI and VSEs
- Section II: SPI and Process Models
- Section III: SPI and Safety
- Section IV: SPI and Project Management
- Section V: SPI and Implementation
- Section VI: SPI Issues
- Section VII: SPI and Automotive
- Section VIII: Selected Key Notes and Workshop Papers

Section I presents two papers related to the new standard ISO/IEC 29110 for very small entities. In the first paper, Sanchez-Gordón et al. investigate adding security practices in the software implementation process of the standard. The second paper presents research incorporating innovation management into ISO/IEC 29110.

Section II explores the theme of "SPI and Process Models," with Clarke et al. discussing variation in process due to situational context. In the second paper in this series, Barafort et al. examine risk management aspects of process reference models.

Section III presents three papers dealing with issues surrounding the topic of safety. In the first paper, Ito examines human and machine issues in safety-critical systems, while in the paper by Doss et al., safety assurance principles from a Scrum perspective are discussed. In the final paper of this set, Varkoi et al. explore compliance in a product line context.

Section IV discusses issues surrounding "SPI and Project Management" with the first paper reporting how to improve project portfolio management practices. In the second paper, Calderón et al. present a project management game perspective.

Section V explores the theme of "SPI Implementation" with the first paper discussing results from an experiment in improving model inspection processes. In the second, paper Krisper et al. propose a metric for evaluating residual complexity, while the third paper discusses the potential of self-adaptive software in an industrial control context. Finally, in the fourth paper, Ardila and Gallina explore ways to increased efficiency and confidence in process compliance.

Section VI looks at two related areas of SPI issues with a systematic review of software process improvement by Ali Khan et al. and a mechanism to overcome speaking anxiety by Yilmaz et al.

Section VII presents the last of the EuroSPI 2017 research papers and focuses on the topic of automotive aspect of SPI. In the first paper, Macher et al. explore issues of dependability engineering and in the second paper Oliveira et al. present a study involving the Automotive SPICE and ISO 26262 standard.

Section VIII presents selected keynotes from EuroSPI workshops concerning the future of SPI. From 2010 onward EuroSPI has invited recognized key researchers to publish work on new future directions of SPI. These key messages are discussed in interactive workshops and help create SPI communities based on new topics.

The first set of papers relates to the GamifySPI workshop and explores "Gamification and Persuasive Games for Software Process Improvement," "Information Technology," and "Innovation Management." The second collection of papers relate to the topic of SPI in Industry 4.0 – "The Digitalization of Design and Manufacturing" – and elaborates a set of best practices and success factors for the implementation of Industry 4.0. The third collection of papers surround the topic of "Best Practices in Implementing Traceability" and examines the issues from an automotive SPICE, functional safety, and medical device industry perspective. The fourth collection discusses the topic of "Good and Bad Practices in Improvement" with key contributions from European initiatives, which developed best practices for SPI. The fifth collection of papers relate to the topic of "Functional Safety" and addresses best practices from automotive industry to cope with cyber security and functional safety. The sixth collection addresses experiences with "Agile and Lean" and examines a series of success factors and examples of being lean and agile. The seventh collection of papers addresses the topic of "Standards and Assessment Models" and examines different ISO standards and assessment models that are introduced, explained, and discussed. The final collection of papers addresses "Team Skills and Diversity Strategies" and examines a variety of organizational and human factors as they relate to SPI.

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