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# Systems, Software and Services Process Improvement

29th European Conference, EuroSPI 2022
Salzburg, Austria, August 31 – September 2, 2022
Proceedings

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# Preface

This book comprises the proceedings of the 29th European Systems, Software and Services Process Improvement and Innovation Conference (EuroSPI$^2$ 2022), held during August 31 – September 2, 2022, in Salzburg, Austria.

The EuroSPI conference (and book) series was formed in 1994 as a leading conference in the area of systems, software, and services process and product improvement, with contributions from leading industry figures and leading researchers. Following the first event in Dublin, Ireland, EuroSPI conferences have taken place annually at various locations around Europe.

From 2013 onwards new communities (e.g., cybersecurity, Internet of Things, and agile) have joined EuroSPI and the letter 'S' has been extended to include safety and security, whilst the letter 'I' also incorporates innovation and infrastructure (e.g., Internet of Things); hence, the conference acronym is now EuroSPI$^2$.

EuroSPI is an initiative with the following major goals:

- Organizing an annual EuroSPI$^2$ conference supported by software process improvement networks from different EU countries (https://conference.eurospi.net).
- Establishing a Europe-wide academy with online training for qualifications related to the content discussed in the EuroSPI conference series (https://academy.eurospi.net).
- Establishing an exam and certification system for all the training programs offered in the EuroSPI academy (https://www.iscn.com/projects/exam_portal/index_asa.php).
- Developing a strategic partnership with the Automotive Skills Alliance (ASA) in Brussels, which includes the association of car makers and suppliers in the automotive sector in Europe. EuroSPI certificates are now issued in cooperation with ASA and a special ASA representative is a conference board member (https://automotive-skills-alliance.eu/).
- Furthering EuroSPI through social media and its own YouTube channel (https://www.youtube.com/channel/UCIQfOm8-ycv8gY2BuuhKDMQ/videos).

SOQRATES, a EuroSPI working group comprised of leading German and Austrian companies, started in 2003 and contributes to the thematic workshops organized at EuroSPI$^2$ conferences to define the state of the art in system design, safety and cybersecurity, assessment, quality management, agile processes, standards, etc.

EuroSPI also established the SPI Manifesto, where SPI stands for systems, software, and services process improvement, at EuroSPI 2009 in Alcala, Spain, and this manifesto still provides a framework for improvement and innovation in organizations today.

In addition, the EuroSPI academy started in 2020 (based on the EU Blueprint project DRIVES concept of a learning compass for the European automotive industry) and within a year trained many hundreds of participants. There are currently more than 2000 MOOC trainees on the DRIVES learning portal.

The exam systems originally developed to support the European Certification and Qualification Association (ECQA) have now been adapted and integrated to support Europe-wide certification and exams under the European System, Software, Services Process Improvement EuroSPI Certificates & Services GesmbH. All activities are being brought under this one umbrella.

This year, EuroSPI began working in cooperation with ASA, and ASA is another result of the EU Blueprint for Automotive project DRIVES (2018–2021), where leading automotive organizations discussed and presented skills for the Europe 2030 strategy in the automotive sector.

EuroSPI also cooperates with the EU Blueprint for Battery Systems project ALBATTS (2020–2023), where leading industrial organizations discuss and present skills for the creation of battery production in Europe for cars, ships, planes, industrial plants, etc.

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, 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 annual conference we discuss potential synergies and the combined use of such methods and approaches.

These proceedings contain 57 research and industrial contributions under the nine core themes identified for EuroSPI$^2$ 2022:

I. Emerging and Multidisciplinary Approaches to Software Engineering (eight papers)
II. E-Mobility, Digitalization of Industry, and Infrastructure (ten papers)
III. Good Process Improvement Practices (four papers)
IV. Functional Safety, Cybersecurity, ADAS, and SOTIF (nine papers)
V. Agile and Lean (five papers)
VI. International Standards and Norms, Assessment Experiences, and Automotive SPICE (five papers)
VII. Team Skills, Accessibility, and Diversity (seven papers)
VIII. Innovations - Business Models for E-Mobility (five papers)
IX. Virtual Reality and Augmented Reality (four papers)

For the contributions, only the highest quality research submissions were accepted. All papers were reviewed by at least three members from the relevant Program Committee in a single-blind process.

To encourage synergy between best academic and industrial practices, the various core research and industrial contributions to EuroSPI$^2$ 2022 were presented side by side at the conference under the nine key themes.

In memory of our dear friend and long term EuroSPI Conference Series Editor, Prof. Rory O'Connor of Dublin City University and Lero – the Science Foundation Ireland Research Centre for Software, the committee, in collaboration with ISCN, ASQ and

Lero, established the Rory O'Connor Award for Research Excellence. On an annual basis, the individual presenting the highest quality work to the conference audience, especially in areas of major importance to our field, is awarded this honor.

We hope that you find the contributions interesting and insightful.

September 2022

Murat Yilmaz
Paul Clarke
Richard Messnarz
Bruno Wöran

# Recommended Further Reading

In [1] the proceedings of three EuroSPI conferences were integrated into a single book, which was edited by 30 experts in Europe. The proceedings of EuroSPI 2005 to 2021 inclusive were published by Springer in [2–18], respectively.

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