

5th International DevOps Quality Management (DevOps-QM) Workshop 2024

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ABSTRACT

DevOps is a framework that integrates both the development and operation activities and bridges the gap between them. DevOps practices are getting significant research and industrial attention because of its attributes, i.e., continuous value delivery, faster time to market, frequent accommodation of changes, and superior quality. The 2017 software trends highlighted that DevOps would become a well-established and accepted approach across the software industry. However, quality management plays a significant role between the development and operation silos. In DevOps, quality assurance works as a bridge between all the disciplines from customers and business to development and operation. For instance, exploring the quality management issues in DevOps becomes an urgent need for software companies striving to adopt DevOps practices. This workshop aims to provide a venue for advances in state of the art in DevOps quality management approaches, practices, and tools. To this end, the workshop brings together experts from academia and industry, working in the diverse areas of quality assurance, testing, performance engineering, agile software engineering, and model-based development to identify, define, and disseminate novel quality-aware approaches to DevOps.

The 1st, 2nd, 3rd and 4th International DevOps Quality Management workshops were respectively collocated with EASE 2020, EASE 2021, EASE 2022 and EASE 2023.

<https://sites.google.com/view/devopsqmw/home>

1. PROPOSED LENGTH OF WORKSHOP

The length of the workshop is a one day, and the date is 21st June 2024 (tentative).

2. WORKSHOP THEME

In some cases, companies like Facebook, Netflix, and Amazon are able to deliver features to customers thousand times per day; on the other hand, some organizations need several months for product releases [1]. For software development organizations, it is important to deliver the product to customers considerably more frequently and with high quality. In this regard, the term continuous software engineering (CSE) has been introduced to speed up and make the software development process efficient [2]. The concept of CSE is associated with the term DevOps, which is considered a popular approach since 2014 [3]. DevOps (development and operations) is a set of practices that integrate software development silos and information technology operations [4, 5]. It is a concept in which the development team, customers, operations, and quality assurance stakeholders collaborate to deliver a software product continuously, grab market opportunities and reduce the time to consider the customer feedback [6]. The main factor that accelerates the use of the DevOps concept is automation. The achievement of automation is assisted by techniques for software

continuous integration, continuous delivery, infrastructure-as-code,

and more. The quality management of the software system and processes are mature in a conventional software development environment [6]. Roche [7] highlighted that focusing on various metrics and processes under the DevOps principles could significantly improve product quality, development, and ownership. However, the deployment of DevOps quality assurance techniques and approaches remains largely unknown. The automated steps in DevOps make quality management a challenging phase that cannot be achieved using traditional approaches. Therefore, DevOps-oriented quality management techniques are far from being mature and are often limited to expensive trial-and-error exercises.

3. WORKSHOP GOALS

The term DevOps attracts significant attention from both academia and the software industry. However, it is emergent for the community to discuss the experience reports and highlight the new trends and practices of DevOps. We welcome the research articles which report studies to address the DevOps quality management challenges. More specifically, the goal of the workshop is to attract quality academic and industrial submissions and to stimulate discussions around the themes (but are not limited to) as listed below:

- Empirical studies using quantitative, qualitative, and mixed methods
- Empirical evaluation of quality management techniques
- Social aspects of DevOps
- DevOps quality management tools and methods
- Machine learning for quality assurance
- Scaling DevOps in the domain of global software engineering
- Quality improvement standards and models
- Knowledge management in DevOps
- DevSecOps (thinking about application and infrastructure security from the start)
- Automated documentation in DevOps
- Risk management
- Human factors in DevOps
- DevOps education
- Testing, verification, and validation
- DevOps challenges
- DevOps for Cyber-Physical Systems

4. WORKSHOP EXECUTIVE COMMITTEE

The DevOps quality management workshop proposal is based on the

collaboration project of DevOps between the University of Oulu, Finland, Lappeenranta–Lahti University of Technology, Finland, and the Penn State University, PA, USA. Thus, the organizing committee of the workshop consists of three researchers from the respective universities:

- **Arif Ali Khan**, M3S Research Unit, University of Oulu, Finland, arif.khan@oulu.fi
- **Muhammad Azeem Akbar**, LUT University, Finland azeem.akbar@lut.fi
- **Shahid Hussain**, Penn State University Behrend, Erie, PA, USA shussain@psu.edu

5. NUMBER OF EXPECTED PARTICIPANTS

The expected number of participants are 20 including the workshop organizers, with minimum 12 in order to develop with adequate commitment from researchers and practitioners in this area. Our core objective is to attract participants from academia and industry to provide a platform for both researchers and industrial practitioners. We will use different channels and social media networks to approach the software engineering community, such as ISERN, SEWORLD, LinkedIn, WeChat, ResearchGate, and Facebook.

6. PARTICIPATION AND SELECTION PROCESS

The workshop will accept both research and industry papers (between 6 and 12 papers), depending on the quality of the submissions. Papers must have a maximum length of 10 pages (i.e., maximum page number of the main conference papers). The selection process is based on each submitted paper reviewed by no less than two program committee members. The participants will be solicited through public calls for papers and open participation.

7. PROPOSED PROGRAM COMMITTEE

The program committee will consist of the workshop organizers and the reputed researchers working in the domain of both software engineering and DevOps. The list of the proposed program committee members includes (but are not limited to):

- Benoit Baudry, KTH Royal Institute of Technology, Sweden
- Florian Rosenberg, AIM Software GmbH, Austria
- Guoping Rong, Nanjing University, China
- Klaas-Jan Stol, University College Cork, Ireland
- Tony Clear, Auckland University of Technology, New Zealand
- Asif Qumer Gill, University of Technology, Sydney
- Brian Fitzgerald, Lero - The Irish Software Research Centre, Ireland
- Damian Andrew Tamburri, Eindhoven University of Technology, Netherland
- Dong Shao, Nanjing University, China
- Lucy Ellen Lwakatatare, Chalmers University of Technology, Sweden
- Jan Bosch, Chalmers University of Technology, Sweden
- Waqar Hussain, Monash University, Australia
- Lianping Chen, Huawei, Ireland
- Cheng Zhang, Anhui University, China
- Muhammad Azeem Akbar, Lappeenranta-Lahti University of Technology, Finland

We are contacting the abovementioned nominees and seeking the consent of a few more people to serve on the PC. We will confirm their commitments shortly.

8. IMPORTANT DATES

- 19th Jan. 2024 - Workshop Webpage and CfP
- 8th Mar. 2024 - Paper submission close (confirm)
- 12th Apr. 2024 - Authors notification (confirm)
- 26th Apr. 2024 - Camera-ready (confirm)
- 5th May 2024- Early registration (confirm)
- 21th June. 2024- Workshop takes place (tentative)

On the day of the workshop, it will be organized according to the following schedule:

- 8:30 - 9:00 Workshop registration and opening
- 9:00 - 10:30 Keynote (Session A1)
- 10:30 - 11:00 Coffee break
- 11:00 - 12:30 Presentations: theoretical foundations (Session A2)
- 12:30 - 13:30 Lunch
- 13:30 - 15:00 Presentations: empirical studies and experience report (Session P1)
- 15:00 - 15:30 Coffee break
- 15:30 - 17:00 Presentations: novel visions, methods, techniques, and tools (Session P2)
- 17:00 - 17:30 Final discussion and closing

9. BACKGROUND OF ORGANIZERS

9.1 Organizer-1

Arif Ali Khan, PhD

Assistant Professor

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Arif Ali Khan works as an Assistant Professor with the M3S Research Unit, University of Oulu, Finland. Previously he worked as a faculty member with the Faculty of Information Technology, University of Jyväskylä, Finland; and College of Computer Science and Technology, Nanjing University of Aeronautics and Astronautics, China. He obtained a PhD degree in software engineering from the Department of Computer Science, City University of Hong Kong. He has participated in and managed several empirical software engineering-related research projects. Khan has expertise in software process improvement, global software development, multi-criteria decision analysis, DevOps, quantum software architecture, microservices architecture, AI ethics, agile software development, requirements change management, soft computing, and evidence-based software engineering. He is professionally active in conducting publication-based research workshops, serving as guest editor in main-track software engineering journals, and editing software engineering research books. He has published over 80 articles in peer-reviewed software engineering conferences and journals.

9.2 Organizer-2

Muhammad Azeem Akbar, Ph.D.

Associate Professor
Department of Software Engineering,
Lappeenranta-Lahti University of Technology, Finland.
Email: azeem.akbar@lut.fi

Akbar obtained PhD Software Engineering at Chongqing University, China in January 2019. He has done a Post-Doctorate with Nanjing University of Aeronautics and Astronautics, Nanjing, China in January 2021. From, January 2021- August 2021, he worked with LERO-The Irish Software Research Centre, Ireland, as a senior researcher and work on Huawei's 'Software Trustworthy' project. Currently, he is working as a associate professor at Lappeenranta-Lahti University of Technology, Finland. Dr. Akbar published more than 90 research papers in well-reputed journals and conferences. He has an outstanding academic carrier. His research interests include software process improvements, requirements engineering, internet of things, DevSecOps, microservices architecture, and quantum software process improvements. Akbar managing special issues in Journal of *Information-MDPI* and *axioms-MDPI*. He also serves as a reviewer for the Information and Software Technology Journal, Journal of System and Software, Information Technology and Management Journal, Applied Soft Computing, Soft Computing, Journal of Software: Evolution and Process, IET Software, and Journal of Multimedia Tools and Applications. He has organized a workshop on global software development process improvements with ENASE 2019. He was a member of the technical committee for EASE conference 2020 and 2021.

9.3 Organizer-3

Shahid Hussain, PhD

Assistant Professor
Penn State University Behrend, Erie, PA, USA
Email: shussain@psu.edu

Dr Shahid Hussain is currently working as an Assistant Professor at the Computer Science and Software Engineering Department, School of Penn State University Behrend, Erie, PA, USA. Before joining PSU, Shahid worked as a Pro temp (NTTF) at the Computer and Information Science Department, University of Oregon, Eugene, Oregon, USA. He also worked as an Assistant Professor at COMSATS University, Islamabad, Pakistan, Namal College, Mianwali an affiliated College of University of Bradford, UK, as a faculty member of the University of Peshawar, Center of Applied Epistemics, and CECOS University.

Dr Shahid current research focus is to explore the software engineering practices for High-Performance Computing (HPC) software packages and applications to improve their process and benchmark their quality levels, automate the document generation for open-source software, and to explore the implications of Machine learning, Software fairness analysis, Artificial Intelligence (AI), Big data analysis and soft computing technique in analysis and design of the software.

10. Call for Papers

5th International DevOps Quality Management (DevOps-QM) Workshop - 2024

Co-located with 28th International Conference on Evaluation and Assessment in Software Engineering (EASE2024)- Tue 18 - Fri 21 June 2024 Salerno, Italy

The workshop focuses on the integration of quality management in DevOps, a key practice merging software development and operations for continuous delivery and rapid market presence. As DevOps garners more research and industry interest, addressing quality issues is vital for companies adopting these practices. This

event invites academia and industry experts in fields like quality assurance and agile engineering to explore state-of-the-art quality-aware approaches to DevOps.

Suggested Topics

Potential topics include but are not limited to the following:

- Empirical studies using quantitative, qualitative, and mixed methods
- Empirical evaluation of quality management techniques
- Social aspects of DevOps
- DevOps quality management tools and methods
- Machine learning for quality assurance
- Scaling DevOps in the domain of global software engineering
- Quality improvement standards and models
- Knowledge management in DevOps
- DevSecOps (thinking about application and infrastructure security from the start)
- Automated documentation in DevOps
- Risk management
- Human factors in DevOps
- DevOps education
- Testing, verification and validation
- DevOps challenges
- DevOps for Cyber-Physical Systems
- Ethics in DevOps Practices
- Managing crowdsourcing using soft computing approaches
- Systematic literature reviews

Important Dates

- 8th Mar. 2024 - Paper submission close (confirm)
- 12th Apr. 2024 - Authors notification (confirm)
- 26th Apr. 2024 - Camera-ready (confirm)
- 5th May 2024- Early registration (confirm)
- 21th June. 2024- Workshop takes place (tentative)

Submission Guidelines

The workshop will accept both academic and industrial papers, depending on the quality of the submissions. Submitted papers must be written in English, contain original unpublished work, and conform to the ACM Proceedings Format (<https://www.acm.org/publications/proceedings-template>). Submit pdf format manuscripts via the following easychair link: (<https://easychair.org/conferences/?conf=ease2024>). When submitting, please select the workshop type: "5th International DevOps Quality Management Workshop".

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11. REFERENCES

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practices and devops: beyond the buzz, what does it all mean? *In 43rd IEEE Euromicro Conference on Software Engineering and Advanced Applications (SEAA)*, Vienna, Austria, pp. 440–448. DOI: 10.1109/SEAA.2017.8114695

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