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## Editorial

# Global Software Engineering: Challenges and solutions

## 1. Introduction

Today's software industry is more global than ever before. The idea of developing major software systems in one location or by one single team belongs to the past. Over the past decade, research on GSE has uncovered many challenges associated with operating over physical, temporal, cultural, and linguistic distances. Unfortunately, these challenges have become even more personal to many more in 2020 due to the disruption provoked by the COVID-19 pandemic.

Studies have shown how organizations have struggled to smoothly transition to virtual work, and while Global Software Engineering (GSE) is part of everyday life by now, succeeding in the global software industry remains challenging, with a considerable share of global projects still not meeting the expectations, especially regarding cost savings and time to market. Albeit known, distances are still causing severe breakdowns in cooperation within virtual teams and among distributed ones. As such, there is a considerable gap to fill in to establish how to manage such challenges effectively.

During its 14th edition held in Montreal, Canada, on 24–26 May 2019, co-located with ICSE, the International Conference on Global Software Engineering (ICGSE 2019)<sup>1</sup> opened a call for paper for the present JSS Special Issue with the goal of advancing research that focused on providing evidence of working solutions to the GSE challenges and needs.

Both extended papers from ICGSE 2019 and original manuscripts were eligible for submission. As a result of the call, 16 papers were submitted, highlighting the interest of the international GSE research community on the topics of the special issue. After an internal review performed by the Guest Editors and the Special Issue Editor, 11 papers were moved into review and assigned to three expert reviewers selected from academia and industry.

As a result of this careful review process, four high-quality papers have been accepted, resulting in a 25% acceptance rate. We take the opportunity to congratulate the authors of the accepted papers, thank all who submitted a contribution to this special issue, and all the reviewers for their precious hard work.

## 2. Selected papers

The papers in this Special Issue provide readers from both academia and industry with a broad view of the most recent research advancements in GSE. The contributions are equally divided in original contributions and extensions of ICGSE 2019 papers.

Ricardo Britto and co-authors in “*Evaluating and Strategizing the Onboarding of Newcomers in Large-Scale Distributed Software Projects*” describe how distance to mentors, training strategies, and team instability hinder performance. By extracting data through interviews, workshops, and archival research, they show that onboarding must be planned well ahead to avoid these issues. As a solution, they propose and validate a process to strategize and evaluate onboarding systematically.

Viktoria Stray and Nils Brede Moe in “*Understanding Coordination in Global Software Engineering: A Mixed-Methods Study on the Use of Meetings and Slack*” conducted a longitudinal case study analyzing data from surveys, observations, interviews, and chat logs. They found that the low availability of key people, the absence of organizational support for unscheduled meetings, and the unbalanced activity from team members were barriers for effective coordination across sites. Accordingly, they provide practical advice for conducting better meetings and more efficient use of collaboration tools in global projects.

Darja Smite and Nils Brede Moe in “*Vendor Switching: Factors that Matter When Engineers Onboard Own Replacement*” show that successful switch between outgoing and incoming vendors highly depends on their willingness to cooperate and transfer knowledge. By developing a theoretical model of the factors affecting such transitions, they provide practical recommendations to companies that want to switch vendors.

Sarah Beecham and co-authors in “*Do Scaling Agile Frameworks Address Global Software Development Risks? An Empirical Study*” develop a catalog of 63 items to assess the degree to which two scaling agile frameworks (DAD and SAFe) address software project risks in GSE. By examining data from two longitudinal case studies, they show that SAFe and DAD eliminate nearly half of GSD risks, and, while some cannot be eliminated, their impact can be mitigated.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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