




Future Trends in Agile at Scale: A Summary of the 7th International Workshop on Large-Scale Agile Development

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Abstract. This workshop explored the main research challenges in conducting agile software development in large-scale software development. We considered multi-site companies with projects that include a large number of teams which develop sophisticated systems by adopting and using agile methods. Such topics include inter-team coordination, knowledge sharing, agile transformations, and project management models that facilitate multiple cooperating self-organising teams. The keynote talk, by Darja Šmite, provided empirical results on communities of practice within the music streaming service Spotify. We accepted five full research papers which are included in this volume. These five papers report empirical research studies using surveys, observational and case studies. Workshop participants also worked together in groups to establish current research topics and priorities. This workshop summary contributes a current snapshot of research along with future research agendas in the field of large-scale agile development.

Keywords: Large-scale agile software development · Architecture · Portfolio management · Project management · Scaling · Inter-team coordination · Software engineering · Agile transformation · Business agility · Knowledge sharing

1 Introduction

The goal of this workshop was to explore the main research challenges in conducting large-scale software development programmes using agile methods. We conducted a half-day workshop during the XP conference in Montréal in May 2019. How to apply agile methods to large projects was identified as the “top burning research question” by practitioners at XP2010 and has since then attracted increasing interest among practitioners and researchers. The first of this workshop series was organized at XP2013.

Agile software development methods are conventionally applied in small, co-located development teams. There is growing interest, from researchers and practitioners, in agile methods applied to large-scale projects which comprise multiple self-organising teams cooperating to develop sophisticated software systems.

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This workshop addressed research challenges in large-scale agile development and identified topics such as inter-team coordination, large project organization, release planning and architecture and practices for scaling agile methods.

2 IEEE Software Special

The workshop followed a recent special issue on “Large-scale Agile” in IEEE Software [4]. The special issue, published in March/April 2019, comprised four papers. The first paper, explored the relationships between project size, agile practices, and successful software development [10]. Flexible scope, frequent deliveries to production, ability to tolerate a high degree of requirement changes and more competent providers appear to enable the success of agile approaches to development in large-scale projects.

The second paper, investigated implementing large-scale agile frameworks [3]. A fifteen year collaborative study led to the researchers identifying nine challenges to large-scale agile transformations. Among the main challenges are: top-down versus bottom-up implementation, overemphasis on 100% framework adherence over value and lack of evidence-based use.

The third paper, explored knowledge sharing in large-scale agile organizations [16]. Specifically, the guild model in the Spotify culture was examined. In Spotify, guilds are a recognised instantiation of the concept of communities of practice [19] implemented to promote collaboration among engineers across the company. This paper formed the basis of the keynote talk for the workshop reported here.

Finally, the fourth paper, investigated product owner behaviours [1]. Product owners, in Scrum terminology, identify and prioritise requirements as well as approving finished software for release. However, on large scale projects, the scope of activities required goes beyond the capacity of one person. The notions of “area product owners” [15] or product owner teams [2] have previously been explored. The current study found that face-to-face interactions are preferred, when dealing with geographical, temporal, and cultural distances [1]. On projects regarded by practitioners as successful, product owners use their influencing skills to keep a wide range of stakeholders focused on a specific set of goals. Experienced product owners use a minimum viable product to create the capacity for change. The study suggests that the process of building a product owner team should be explicit and well defined.

3 Workshop Contributions

The workshop comprised a keynote talk, speakers selected following submission of short papers, which were peer-reviewed by members of the program committee, and an interactive session to identify research topics and priorities.

3.1 Keynote

The keynote talk, by Prof. Darja Šmite from Blekinge Institute of Technology in Sweden [17], focused on Guild use within Spotify, the internet music streaming service, and was based on the recent article in IEEE Software [16]. Guilds are a social structure for stewarding knowledge or an explicit way to inculcate communities of practice within the organisation. The research found that engagement in guilds, at Spotify, is cultivated through annual un-conferences, “Slack” channels and electronically-mediated opinion elicitation (requests for comments).

3.2 Research Papers

For the 2019 workshop we had seven submissions, of which five were accepted as full research paper presentations. The first paper “SAFe Adoptions in Finland: A Survey Research” reported benefits in terms of transparency, co-operation and cadence [12]. However, organisations adopting SAFe reported challenges with legacy organisational structures, lack of tailoring to their context and implementation issues. The respondents reported that SAFe was being used in conjunction with other agile practices. The authors also observed evidence of incomplete adoption of SAFe practices.

The second paper, “Comparing Scaling Agile Frameworks Based on Underlying Practices” identifies several common practices among adopters of scaled agile frameworks [18]. The authors found that many scrum project and scaling practices underpin the frameworks observed in their study. The authors present an interesting “subway map” diagram to illustrate practices used in several frameworks as compared with more esoteric practices.

The third paper, “Finnish Large-Scale Agile Transformations: A Survey Study” is based on the same survey as the first paper [11]. In this third paper, the authors found that 44% of their survey respondents have completed an agile transformation at least one year prior to the survey. A further 30% of the respondents in the study are in the process of an agile transformation. The authors also discovered that 60% of the respondents in the study worked in organisations that made use of external consultants or subcontractors in order to assist the change process. The authors suggest that organisations use consultants and subcontractors to provide new competencies and additional resources to perform transformations.

The fourth paper, “Changes Over Time in a Planned Inter-Team Coordination Routine” investigates the Programme Increment (PI) Planning routine [9]. PI Planning is considered a fundamental practice within SAFe. The author conducted an observational study of PI Planning within three organisations and found differences in the approaches being taken. This study suggests that organisations are tailoring their SAFe PI Planning practices.

Finally, the fifth paper “Technical-, Social- and Process Debt in Large-Scale Agile: an exploratory case-study” explores how using short-term expedient technical or organisational constructs can make future change more difficult or expensive [13]. The research reveals that process debt is resolved by inter-team coordination, and that teams spend a lot of time discussing social debt in retrospectives.

3.3 Future Research Trends

The workshop attendees were asked to work in four groups, each group addressing one topic adapted from research priorities identified during the 2017 workshop [14]. Thus, the four groups were considering:

- Inter-team Communication,
- Agile Transformation, Business Agility,
- Knowledge Sharing, Knowledge Networks, and
- Scaling Agile.

Each of the four groups considered important issues in each of the topics. Each group was then asked to prioritise the topics. The results of each group is presented as a flip chart illustration, available online as follows:

- Inter-team Communication [5],
- Agile Transformation, Business Agility [6],
- Knowledge Sharing, Knowledge Networks [7], and
- Scaling Agile [8].

For inter-team coordination, the group emphasised the continuum of team alignment to strategy and autonomy along with new roles and new communication modes enabled by new tools. For agile transformation and business agility, the group emphasised issues around measurement, budgeting and success as well as customer collaboration and agile framework evaluation. For knowledge sharing and knowledge networks, the group emphasised on-boarding new team members, finding competencies in the organisation and balancing knowledge sharing with focused work. Finally, for scaling agile the group emphasised public sector agile along with “how is agile visible (in mindset and results) to senior executives?” as well as issues of trust and transparency.

4 Programme Committee

Many thanks to the members of the programme committee many of whom have also contributed to previous workshops, as follows:

- Steve Adolph, cPrime, Canada
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- Eric Knauss, Gothenburg University, Sweden
- Maarit Laanti, Nitor, Finland
- Carl Marnewick, University of Johannesburg, South Africa

- Nils Brede Moe, Sintef, Norway
- Helena Holmstrom Olsson, Malmö University, Sweden
- Maria Paasivaara, Aalto University, Finland
- Yvan Petit, ESG UQAM, Canada
- Alexander Poth, Volkswagen, Germany
- Ken Power, Cisco, Ireland
- Klaas-Jan Stol, Lero, Ireland

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5 Conclusions

This workshop successfully created an opportunity for researchers and practitioners to consider the latest trends in large-scale agile development. The papers in these proceedings, the keynote and interactive session contribute a snapshot of the start-of-the-art in this field. The authors presented evidence of frameworks being used to enable agile transformations in organisations, but also of incomplete adoption of frameworks and commonalities between practices being used in frameworks.

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