

## Agile and Lean: Organizations, Products, and Development

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### Abstract

*Over the past two decades, research in the area of agile and lean software development has mirrored the strong growth of the use of agile and lean methodologies. Agile and lean management practices (which we define broadly to include Scrum, XP, Lean Startup and other related approaches) roughly triple the success rate of software projects over traditional management approaches. Because software projects contribute so broadly to economic and social improvement, research on agile methods may produce significant productivity gains. However, much work remains to enable all the benefits of agile and lean concepts to be realized.*

### 1. Introduction

Agile product development rapidly iterates short product development, testing, customer feedback, and pivoting cycles to improve cost, quality, timing and customer satisfaction outcomes over traditional project management approaches [1]. This lean approach increases profits, not only by improving revenues for released products from improved market fit, but also by continually reducing waste, including waste due to producing unprofitable products (recently popularized as “Lean Startup” or “Lean Entrepreneurship”). Characteristics include: set-based design, A-B testing, unmoderated user-experience testing, direct market experimentation, customer validation and pivoting. Advocates claim lean product management produces greater customer engagement, earlier discovery of hidden market opportunities, higher revenues and more efficient use of development staff.

Agile and lean approaches challenge organizations large and small. These approaches claim superiority in new product development over traditional approaches (such as “waterfall management”) that fail to test development and market assumptions in long-range plans. People typically conflate small failures (learning) with large failures (organizational threats), assume that

innovation means taking long-range untested risk, and establish and protect budgets and timelines with many baked-in production and market assumptions. These cultural realities interfere with agility and real innovation.

As a result, organizations often invest enormous amounts of money in incomplete or abandoned agile transformations. What can organizations do to improve agile uptake? How do we know that the organization is improving? How can organizations diagnose problems without motivating gaming? What types of people are more likely to thrive in agile and lean organizations, and what roles should they take? What hiring practices result in better candidates? What training programs produce better results? What coaching structures work? How do we measure these activities?

The Agile/Lean mini-track explores these questions by improving our understanding of agile methods as well as their effects on quality, speed and communication. We solicited research papers and case studies that explore agile development, lean product management and agile/lean organizations to improve the relevance and rigor of the agile community’s insights into best practices [2].

### 2. Sessions

At this year’s conference, we divide the papers into three related sessions. The first session sets the stage with some broad topics of discussion (literature retrospectives and metrics/efficiency). The second session is focused on teams. Finally, the third session is focused on matching organizations to align with agile methods.

#### 2.1. Setting the Stage

In this session, we start with “Journey Towards Agility—A Retro- and Prospective Review,” in which Dressen et al. investigate the existing body of knowledge on agile software development by applying a structured literature review and computer aided analysis that leverages text mining techniques. Next, Dahlberg & Lagstedt condense the extant knowledge base of research on information systems development

methods (ISDM) into nine recommendations in their paper “The Usefulness of the Recommendations Regarding the Information System Development Method Selection during the Era of Digitalization.” This is followed by “An Analysis of Measurement and Metrics Tools: A Systematic Literature Review,” in which Dias et al. propose a list of metrics used by tools that calculate and store metrics related to estimates regarding deadlines, cost, and quality. Finally, Verbruggen et al. discuss the adaptation of the velocity performance measure to the agile environment in their paper “Process Efficiency—Adapting Flow to the Agile Improvement Effort.”

## 2.2. Thinking about Teams

In this session, Marshburn first discusses the design and observed play of a game-based Scrum retrospective in “Don’t Break the Build: Developing a Scrum Retrospective Game.” Then, in “Team Autonomy in Large-Scale Agile.” Moe et al. report on a multiple case study of three large-scale projects that investigates barriers to team autonomy in large-scale agile projects. Stray et al. then explore coordination mechanisms in agile DevOps teams in their paper “Dependency Management in Large-Scale Agile: A Case Study of DevOps Teams.” Finally, using a grounded theory approach, Wiedemann et al. explore how continuous innovation mechanisms are correlated with the planning of customer requirements in their paper “Implementing

the Planning Process within DevOps Teams to Achieve Continuous Innovation.”

## 2.3. Matching Organizations and Agile

The final session starts with Fuchs explaining the interplay of agile methods and organizational features as well as their respective adaptations in “Adapting (to) Agile Methods: Exploring the Interplay of Agile Methods and Organizational Features.” Next, in “Splicing Community and Software Architecture Smells in Agile Teams: An industrial Study” Tamburri et al. explore agile architecture from an industrial context. Finally, Huck-Fries et al. draw on the job demands-resources theory to propose a theoretical model of work engagement in agile software development teams in their paper “The Role of Work Engagement in Agile Software Development: Investigating Job Demands and Job Resources.”

## 3. References

- [1] Hirschheim, R., Klein, H., and Lyytinen, K. *Information systems development and data modeling: conceptual and philosophical foundations*. Cambridge Univ Pr, 1995.
- [2] Tripp, J., Saltz, J., & Turk, D. (2018). Thoughts on Current and Future Research on Agile and Lean: Ensuring Relevance and Rigor, in *Hawaii International Conference on System Sciences (HICSS)*, 2018.