Agile and Lean Organizations: Management, Metrics and Products

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In this mini-track, research papers and experience reports examine how agile development and lean product management interact with organizations, their structures, cultures and products.

Agile software development and lean product management claim to dramatically improve the efficiency and value produced by organizations, over plan-based waterfall management.

Agile development methods promote iterative product releases and drive risk-reduction earlier in product development. Lean product management methods test hypotheses and rapidly adapt to discoveries.

The participants in this mini-track hail from both academic and industrial sources. We have found that mixing the two helps motivate more industry-needed research, which benefits researchers with higher relevance, citations and collaboration opportunities, and benefits industry by offloading otherwise impossible research to academia.

Troy Magennis leads us off with a comprehensive paper, “The Economic Impact of Software Development Process Choice,” comparing software methodologies with product cycle time. Using Monte Carlo simulation, Magennis shows how the Weibull distribution in cycle time emerges from unexpected team delays. He hypothesizes that process approaches are correlated to the Weibull distributions shape parameter, and shows how $\lambda = 2.0$ for waterfall, 1.5 for agile and 1.0 for lean correlate with evidence. Magennis then shows how a company used these models to motivate process change, accelerating delivery by 1 month and reducing cost by $1.4M.

In “Success Factors of Agile Information Systems Development,” Markus Hummel and Alexander Epp provide what may be the first qualitative empirical study on the conditions and practices experienced agile practitioners think lead to success. This paper neatly classifies practitioner assertions into 4 major categories and 13 subcategories, inspiring further research.

In “Adaptive Finance & Control,” Rami Sirkiä and Maarit Laanti, finance and engineering experts respectively, provide a case study for the Beyond Budgeting approach to finance. Operating from the premise that no organizational structure, and no finance or planning process should add overhead to how software is actually made, they take us on a journey for changes in culture, planning horizons, delivery dates and cost center management.

In “Agile Enterprise Metrics,” Dan Greening describes a collection of useful enterprise metrics that correlate with agility or help diagnose problem areas. These include True Sprint Length, Velocity and its deviation, Forecast Horizon, Lead Time and three downstream impact metrics. He describes how these metrics drove coaching practice in a large software company.

In “Using a Large Whiteboard Wall to Support Software Development Teams,” David Socha, Troy Frever and Chunchao Zhang examine a team’s unorchestrated use of a whiteboard for information radiation, through analysis of video and photographs over a 17 month period. The board included sections focusing on working agreements, bookkeeping, scheduling, commitments, continuous improvement, technical design, information from other teams, FYI, teambuilding, and art.

In “A Theory of Software Development: What Really Distinguishes Agile from Plan-Driven Methods?” Adarsh Kakar examines software development methods from the perspective of Job and Work Design. He classifies waterfall development as Taylorist and agile as non-Taylorist. Kakar argues that agile methods have much higher skill variety, task identity, task significance, autonomy and feedback, thus improving employee work outcomes Hackman and Oldham’s Job Characteristic Model (similar to Pink’s autonomy, mastery and purpose model of productivity).

Join us for an inspiring assembly of research and speakers.
In “The influence of organizational factors…,” Vivienne Almeida dos Santos et al examine influencing factors, such as organizational strategy, and communication flow and channels, regarding inter-team knowledge sharing effectiveness in agile environments.

In “Teams that Finish Early Accelerate Faster …”, Jeff Sutherland et al propose nine patterns that lead to over 400% improvement in team productivity, based on the experience of several agile leaders.

In “Theme-based Product Release Planning …”, Nishant Agarwal et al describe a technique for identifying thematic connections implied by a dependency graph, to automatically suggest features to include in releases.

In “Toward an Understanding of Preference …”, David Bishop et al investigate the personality factors that lead to preference (and presumed success) in agile methods.

In “State-of-the-Art”, Markus Hummel reviews the quantitative research results in agile information systems and software engineering. He highlights several areas where more research is needed.

Last year’s Agile and Lean Organizations mini-track had lively interaction that inspired new ideas and approaches. This year’s iteration promises to meet or beat it.