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Special Issue: Agile beyond software -
In search of flexibility in a wide range of innovation projects and industries

Guest Editors

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Theme

"*At its heart, an agile approach has little to do with software; it's all about recognizing and applying feedback*." These are the words of Andrew Hunt, one of 17 authors of the Agile manifesto, which in 2001 initiated revolutionary changes in the way new software is developed and delivered [1]. Yet, the large majority of empirical studies on the effective use of Agile principles and methods has exclusively focused on the IT industry. Little is known about the application of Agile in non-software innovation contexts [2], [3].

This is a significant missed opportunity from a theoretical and practical standpoint. Agile has brought major productivity gains and has consistently enhanced the time, cost and quality performance of software development projects [4]. It's a framework that helps innovators cope with the growing uncertainty and turbulence in technological and market environments [5]–[7]. Feedback and change are at the core of Agile for a dynamic, evolving, and organic, rather than static, predefined, and mechanistic development process[8]. To create timely, high-quality, and cost efficient innovations, Agile developers organized in small, co-located, autonomous teams, build and test software in rapid iterative cycles, actively involving users to gather feedback, updating the project scope and plan "on-the-fly", using face-to-face communication as opposed to documentation [9].

Shortly after its introduction, Boehm and Turner [10] introduced the concept of Agile's home ground, referring to the project conditions that are most favorable for this framework: small, non-critical, in-house projects with changing requirements but stable architecture [11]. Recent studies however report a growing trend of applying Agile methods outside its narrow "sweetspot", to contexts that were the home turf of traditional, linear, plan-driven Stage-Gate/Watefall models [12], [13]. Mangalaraj et al. [14] suggest that developers increasingly perceive Agile as a viable approach across all innovation projects. Yet, this discussion is still mostly confined in the IT field.

What about projects that create new products which include no software or for which software is only a part? What about non-IT industries? Answers to these questions are few, and mostly based on anecdotal evidence. More research-based insights are needed. Transferring Agile concepts is not trivial due to the different nature of purely digital vis-à-vis physical products. Modern products are typically complex systems with many interacting components belonging to several technical domains. Unlike software, hardware development is more difficult to break into small chunks and so to organize in rapid iterations; it requires cross-functional teams that connect to departments that work very differently, are often geographically dispersed, and so harder to synchronize [15]. Tangible products have longer development cycles and cost more to prototype. The typical duration of Agile sprints is too fast for hardware developers to make meaningful progress and deliver a working prototype for user testing and the resultant collection of realistic feedback [3]. These and other attributes may indeed restrict and/or complicate the adoption of Agile methods outside software.

Scholars have tentatively explored recipes to overcome these obstacles: the adaptation of specific Agile practices to non-IT environments, e.g., modifying the definition of "done sprints" or introducing the concept of "protocepts" (the hardware version of a "shippable product" required at the end of sprints), while maintaining Agile values and principles unchanged [15]; the coexistence of flexible and traditional frameworks in the same organization, and so the adoption of Agile-Stage-Gate hybrids [16]; the evolution of Agile principles to account for all types of innovation projects, outputs and industries.

Most scholars believe that Agile will continue expanding its boundaries. Progress in prototyping and other technologies (e.g., 3D printing and virtual simulation) as well as in management thinking, through smarter ways to modularize and rapidly test complex systems

(e.g., smoke tests, pretendo-types and minimum viable products) [17] will promote the growing applicability of this still relatively young and malleable framework. The examples of long-lived manufacturing and service companies adopting Agile such SAAB, 3M, Bosch and ING Direct [18] preliminarily support of this prediction.

The aim of this special issue is thus to spur and develop high-quality research in the emerging field of Agile management beyond the software industry. The special issue intends to offer an holistic and rigorous assessment of the current state of the art in the application of Agile principles, methods and tools for the development of a wide range of new products and services; to identify opportunities for future research, and to contribute building a community of scholars from different fields, e.g., project management, innovation management, new product development, entrepreneurship, software engineering and design.

Both conceptual as well as empirical submissions are welcomed. While the focus is on Agile in non-software environments, adopting a comparative approach (software vs. non-software) is possible and valued. We are interested in studies using any of the full range of empirical methodologies, qualitative and quantitative, laboratory or field settings. We also value theoretical pluralism. All articles should offer a strong practical and theoretical contribution.

Some Relevant Topics

- Emerging and innovative concepts, methods, practices and tools for applying Agile to non-software innovation projects
- Application of Agile for the development of new products that require tight integration between hardware and software
- Agile for new service development and for innovations in the customer experience
- Enablers and pre-conditions for the effective adoption of Agile in non-software environments
- Risks and challenges in the application of Agile in non-software environments
- Environments that are <u>not</u> well suited to Agile and should not adopt flexible frameworks
- Definition of agility and development of scales to measure Agile adoption in non-software environments
- Replication vs. adaptation of existing Agile practices outside software
- Classification and investigation of hybrid frameworks, e.g., Agile-Stage-Gate and Industrial Scrum
- Relation between Agile and other flexible frameworks, e.g., Lean Start-up and Design Thinking, in non-IT industries
- Evolution of Agile theory to account for the characteristics of non-software environments
- Measuring performance of Agile application outside software

Notes for Prospective Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere.

Conference papers may only be submitted if the paper has been completely re-written and if appropriate written permissions have been obtained from any copyright holders of the original paper.

Manuscripts should be submitted through the publisher's online system. Submissions will be reviewed according to the journal's rigorous standards and procedures through double-blind peer review by at least two qualified reviewers.

The extend abstract should be no more than 2,000 words (references excluded) with brief literature review, research question and methodology.

Submission Process

Please prepare the manuscript according to IEEE-TEM's guidelines (http://ieee-tmc.org/tem-guidelines) and submit to the journal's Manuscript Central site (https://mc.manuscriptcentral.com/tem-ieee).
Please clearly state in the cover letter that the submission is for this special issue.

Schedule

- Interested authors send extended abstracts by September, 1st 2020
- Decisions on acceptance of abstracts by November, 1st 2020
- Papers submitted by May, 1st 2021

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Guest Editor Bios

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Marina Dabić is Professor of International Business at the University of Zagreb, Faculty of Economics and Business (Croatia) & Nottingham Trent University (UK). She is the author of more than 200 articles and case studies, and has edited five books; the latest of which is a co-authored book entitled Entrepreneurial Universities in Innovation Seeking Countries: Challenges and Opportunities which was published by Palgrave Macmillan in 2016. Her papers appear in wide variety of international journals, including JIBS, the JWB, JBR, JBE, IMR, EMJ, TBR, IJPDLM, and MIR, among many others.