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To cite this Article / Käytä viittauksessa alkuperäistä lähdettä:

Kunttu, I., Camarda, C. & Perttula, A. (2020) Editorial: Rapid Product Development and R&D. Technology Innovation Management Review, 2020:3, s. 3 - 4.

URL: <http://doi.org/10.22215/timreview/1331>

Editorial: Rapid Product Development and R&D

Iivari Kunttu, Charles Camarda and Antti Perttula

Welcome to the March issue of the *Technology Innovation Management Review*. As guest editors, it is our pleasure to introduce this month's editorial theme covering a variety of topics on agile and rapid approaches in product development. As indicated by this collection of scholars in fields of management studies, R&D is a key source of competitive advantage for high-technology organizations. At the same time, investments in R&D and innovation can be risky and costly, since typically only a minority of industrial R&D projects yield a commercial product or service. For this reason, new agile, rapid, and flexible approaches for R&D are critical to enable shorter product development cycles, allow for unexpected changes, and facilitate parallel development alternatives. Moreover, in today's world with rapidly changing customer and consumer expectations, networked interaction with external stakeholders such as customers, suppliers, and research institutes is essential for R&D organizations.

This special issue contributes to the theme of rapid development of products and services with both practical and scientific importance. The issue consists nine papers all having their own viewpoint on this general theme. The rapid product development theme brings together product and service ideas and methodologies. Both technology and business development viewpoints are covered in the papers. In a similar manner, the special issue contains papers focusing on stakeholder interaction, including various forms of customer, user, and university collaboration in rapid R&D. Some of the papers originate from conference papers presented in previous ISPIM events in Ottawa, Canada (*ISPIM Connects*, April 2019), and Florence, Italy (*ISPIM Innovation*, June 2019).

The first set of three papers give a practical introduction to the theme of rapid development of products and services from the viewpoint of development methods and processes. The paper written by **Charles Camarda et al.**, "*Rapid Learning and Knowledge-Gap Closure During the Conceptual Design Phase – Rapid R&D*", focuses on rapid product development strategies. It follows the principles of set-based design as a way to provide improved ways of addressing knowledge gaps in alternate design concepts. The paper describes how this methodology may construct knowledge that can accelerate knowledge capture that is critical for developing solutions to extremely challenging R&D

problems. The methods are practically illustrated by case examples from NASA technology development.

The paper by **Tuomas Huikkola** and **Marko Kohtamäki**, "*Agile New Solution Development in Manufacturing Companies*", proposes a new agile solution development model for technology and manufacturing companies. The proposed model presents a way for manufacturing companies to consider ideas related to new product, service, process, and business model development. This in turn may help companies to strategically renew themselves faster for turbulent product-service markets.

Antti Perttula and **Joni Kukkamäki**'s paper, "*Enabling Rapid Product Development through Improved Verification and Validation Processes*" has a particular focus on verification and validation (V&V) processes in rapid product development that applies the principles of agile development. The paper shows how product development cycles can be made faster and more flexible by implementing the V&V in each phase of agile product development. This is placed in contrast with the traditional approach in which V&V takes place only at the end of the product development process.

The next four papers concentrate on collaboration practices in industrial R&D by showing how internal and external relationships may facilitate innovation and R&D processes. The paper authored by **Johan Simonsson et al.**, "*Organizing the Development of Digital Product-Service Platforms*", focuses on the role of digital product-service platforms in manufacturing companies. The paper identifies challenges that these companies may face when they develop digital service platforms as part of a servitization process. The empirical part of the paper presents interesting outcomes from the Swedish industrial manufacturer Husqvarna Group.

The paper by **Jari Jussila et al.**, "*Rapid Product Development in University-Industry Collaboration: Case Study of a Smart Design Project*", contributes to the area of rapid product development by presenting a case study of developing prototypes in university-industry collaboration. It is facilitated by a Design Factory concept. The paper highlights key design principles involving stakeholders such as teachers, business representatives, and students working together in collaborative project design.

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The paper written by **Leena Kunttu** and **Yrjö Neuvo**, *“The Role of academics, Users, and Customers in Industrial Product Development”* also considers university-industry collaboration with special emphasis on the involvement of users and customers in networked collaboration between academia and industry. Based on a case study comprising five long-term university-industry relationships in Finland, the paper demonstrates collaborative practices through which the academic actors, users, and industrial customers may actively take part in industrial innovation and R&D processes.

Janne Kuivalainen et al.'s paper, *“Agile Product Development Practices for Coping with a Learning Paradox in R&D offshore Units”*, focuses on the recent trend of R&D offshoring. The paper presents a case study revealing how agile product development approaches greatly help the managers of globally dispersed R&D offshore units in coping with tensions that involve conflicts related to project performance and innovation.

The paper authored by **Mikko Mäntyneva**, *“Company Offers to Meet the Needs of Business-to-Business Customers: Strategies and Orientation”*, presents a qualitative analysis of customer-driven R&D. The paper investigates whether companies' offers to meet customer needs can be supported by customer strategy and orientation. In this task, the paper provides guidelines on how firms can align their R&D activities to consider the company's existing customers, with both their current and potential needs and requirements.

Finally, **Daniel Viberg** and **Mohammad H. Eslami's** paper, *“The Effect of Machine Learning on Knowledge-Intensive R&D in the Technology Industry”*, concentrates on the integration of tacit and explicit knowledge in an industrial R&D context. The paper shows how machine learning can be applied to knowledge integration in organizational contexts, and in particular for knowledge-intensive high-technology organizations.

The contributions included in this special issue of the TIM Review provide a covering insight into the actual viewpoints of agile and rapid product development, not only from the perspective of industrial R&D methodologies and concepts, but also from the viewpoint of service development, collaboration networks, stakeholder involvement, strategy work, and learning. For this reason, we hope that the content of

this issue will be of the interest to the TIM Review's regular audience, as well as for scholars and practitioners contributing to the area of agile and rapid product development.

Guest Editors

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The TIM Review currently has two Calls for Papers on the website. See the Upcoming Themes on the website for further information for prospective authors. For future issues, we invite general submissions of articles on technology entrepreneurship, innovation management, and other topics relevant to launching and scaling technology companies, and solving practical problems in emerging domains. Please contact us with potential article ideas and submissions, or proposals for future special issues.

Managing Editor

Gregory Sandstrom

Citation: Kunttu, I., Camarda, C., and Perttula, A. 2020. Editorial: Rapid Product Development and R&D. *Technology Innovation Management Review*, 10(3): 3–4. <http://doi.org/10.22215/timreview/1331>

Keywords: Rapid product development, R&D, knowledge gaps, set-based design, agile development, innovation practices, solution development, new service development (NSD), solution business, servitization, digital servitization, open innovation, verification, validation, requirements, set-based design, agile, business model innovation, digital platforms, corporate entrepreneurship, co-creation, co-creation pedagogy, design thinking, university-industry collaboration, rapid product development, stakeholder involvement, user involvement, customer involvement, commercialization, learning paradox, agile R&D, R&D offshoring, market offer, value proposition, research and development, customer strategy, customer orientation, B2B, knowledge integration, machine learning, artificial intelligence, technological firm, tacit knowledge, explicit knowledge

