
Editorial

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Biographical notes: Greg Huet has been newly appointed Product Manager at PTC for their Manufacturing Process Management solution, MPM link. In the past, he has participated in various academic and industrial initiatives where the support of engineering design work was at stake. His main areas of expertise are Lean transformation, PLM solutions, and process modelling. His work in industry has essentially focused on solving issues in the aerospace sector. He holds a Mechanical Systems Engineering degree from the Université de Technologie de Compiègne (France), a PhD in Mechanical Engineering from the University of Bath (UK), and is a registered Professional Engineer in the province of Quebec (Canada).

Sergio Terzi is senior researcher at University of Bergamo, where he teaches Plant Design. He is also collaborating as Lecturer with Politecnico di Milano, where he teaches Product Lifecycle Management. He is used to collaborate in research activities and projects at international level, most of them funded at European level. During 2009–2013 he acted as Dissemination Manager of the LeanPPD project. He is author of two books and more than 100 papers in the fields of product lifecycle management and engineering. He is convenor and the IFIP Working Group 5.1 (Global Product Development along the whole product lifecycle).

Over the past 20 years, businesses of all sizes delivering products and services in a wide variety of markets have made attempts to integrate lean strategies and methods into their design processes. As many practitioners have noticed, the changes implied by lean are seldom straightforward and a number of organisational and even cultural barriers complicate these transformations. This special issue aims to provide readers from the engineering and management community with a collection of accounts and reflections that help portray the current implications of lean thinking during design and development activities. The objective was not to rewrite the fundamental principles of lean that have been established essentially through the study of the Japanese automotive industry, but rather to depict the struggles and new opportunities that have been encountered whilst

implementing them in a variety of settings. The Guest Editors invited both academics and industry professionals to submit original manuscripts that can shed some light on the question, “What makes a product development process lean?”

Suitable topics included but were not limited to the following:

- lean product development practices, methods and tools
- lean transformation observations and experiences
- product development process analysis and assessment
- formalisation of lean thinking in design and engineering
- set-based concurrent engineering methodologies
- information management for set-based engineering activities
- lean and knowledge management in the enterprise
- lean and sustainability in product design and development
- cultural barriers to lean transformation
- lean awareness and training methods.

The call for papers attracted numerous submissions, 22 in total, encompassing most of the topics mentioned above. After a thorough peer-reviewed process including major and minor revisions of several manuscripts, eight papers were accepted for publication. The accepted papers can be divided into two categories, i.e. (1) empirical/theoretical studies and (2) proposals of tools/methods/approaches and procedures.

1 Empirical and theoretical studies (literature review, case studies, and surveys)

Peter E. Harland and Zakir Uddin investigate the question of how product platform strategies affect and support the implementation and success of lean product development and production. Their paper entitled ‘Effects of product platform development: fostering lean product development and production’ presents an extensive literature review and content analysis, and suggests that 27 effects of corporate strategies on product platforms have been documented. They also define a consistent framework to describe their influence on product development projects and production. Moreover, using a theoretical case to illustrate their framework, they demonstrate how lean thinking applied to product platforms strategy helps companies to become more competitive.

‘Efficient front-loading through knowledge integration’ by Simge Tuna and Georg Windisch proposes an empirical analysis of the impacts of front-loading activities on new product development efficiency. This investigation is based on an analysis of 53 development projects carried out between 2007 and 2012, archival documents, and interviews of industry experts. Their results show that companies that systematically front-load their projects with knowledge obtained from previous projects and knowledge from downstream activities (e.g. testing) show significantly better schedule attainment and time efficiency than companies that are not practicing knowledge front-loading in their projects.

The paper proposed by Timothy Saunders, James Gao and Satya Shah 'A case study to evaluate lean product development practices in the global automotive industry' discusses the findings of an exploratory study that evaluates the challenges encountered in the transformation to achieve Lean Product Development (LPD) in a multi-national automotive manufacturing company. Areas such as organisational restructuring, growing/maintaining competences, in-house manufacturing and supplier integration are examined in detail. The paper also presents a compressive literature review and the evolution of LPD in industry in the last decades which provide contextual information and justifies the research.

2 *Proposal of tools, methods, approaches and procedures*

Ana T. Correia, Dragan Stokic and Stefan Faltus have proposed a new tool called CM-BOX (Communication Mechanisms Box) which can be used as a decision support tool to support companies applying the Set-Based Concurrent Engineering (SBCE) approach to optimise critical communication and knowledge-sharing processes. Their paper 'Mechanisms for communication and knowledge sharing for set based concurrent engineering' presents in detail the tool and demonstrates its application across companies in various sectors such as automotive, aerospace and home appliances. Moreover, they discuss the main benefits of the CM-Box in terms of efforts needed to select appropriate communication mechanisms, as well as in terms of reduction in lead time and costs.

Regarding SBCE, the paper 'Teaching set-based concurrent engineering to practitioners through gaming' by Endris Kerga, Monica Rossi, Sergio Terzi, Marco Taisch, Walter Bessega and Alberto Rosso proposes a learning game as a tool to educate and bring hands-on experience to industrial practitioners to learn SBCE's principles and practices. Moreover, an evaluation method of learning outcomes is proposed based on a questionnaire that assesses which players have learned most from the game. The paper discusses the lessons learned after a game was introduced to employees of an SME (Small and Medium Enterprise).

'Lean engineering performance analysis' by Yvan Beauregard, Nadia Bhuiyan, and Vincent Thomson discusses the need for a novel performance assessment model that supports companies to evaluate progress and plan improvement while adopting lean thinking in product development. A detailed industrial case study shows the results of the applied model and the influence of a number of criteria and management policies on product development performance. The analysis focuses on the improvements required and how to support the overarching goal of continuous improvement.

A paper that advances a traditional value stream analysis is 'Systematic waste elimination in lean product development using generic activities' by Guenther Schuh, Kai Korthals, Stefan Rudolf and Stefan Breunig. The authors propose a new approach and procedure to analyse the execution of product development activities and eliminate waste. Moreover, generic activity types within development processes are derived and their ideal execution for Lean objectives is defined.

'A3 reports for knowledge codification, transfer and creation in research and development organisations' by Dag Raudberget and Cecilia Bjursell presents a new way of using A3 type reports in a knowledge management approach for product development. They discuss that the current A3 literature does not explain how A3 can be used a knowledge management vector. They argue that the application of the concept of

boundary object to the A3 report could in fact become a powerful means of transferring knowledge from a tacit to an explicit form. The paper also discusses the application of this new use of A3 approach in an R&D department, and demonstrates how it is structured to support knowledge codification, transfer and creation.

Finally, we would like to thank all our peers and colleagues that participated in reviewing the manuscripts and also the editorial team of *IJPD* for their kind support throughout the publishing process.