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## EDITORIAL

# 'Rethinking research methods in operations and supply chain management'

A few years ago, a group of Operations Management scholars (MacCarthy et al. 2013) authored a thought-provoking paper entitled 'The same old methodologies? Perspectives on OM research in the post-lean age'. Noting that the OM field is, by its very nature, close to practice and that the world is changing economically, technologically, politically and socially, they follow up with a pointed question (934): 'Are our OM research methods fit for purpose for the new age?' Amongst their many interesting views and opinions, they conclude that the OM profession *must not make assertions regarding the supremacy of qualitative empirical studies over quantitative ones, and vice versa* (our italics). Instead, they affirm that '... a rich diversity of methods is available and this diversity is beneficial and should persist' (951). It should be noted that past authors have previously commented on the merits and deficiencies of both quantitative and qualitative research approaches (e.g. Boyer and Swink 2008; Childe 2011).

As editors of this Special Issue, we come from different backgrounds and formal trainings (Operations Management, Business Analytics and Financial Management, Philosophy of Science, respectively). Nevertheless, one thing that unites us is our common interest in these types of profound debates and discussions. We broadly agree with MacCarthy et al. and other scholars about the need to have a rich diversity of both quantitative and qualitative research approaches at our disposal. We also think that debates about methodologies that can help us to understand more comprehensively, for example, 'what causes what' questions (Karlsson 2009, 19) are always welcome. Having said this, we also believe that such debates should be redirected towards identifying the type of hypothesis under investigation and other fundamental methodological issues. We believe that these discussions will improve the rigour and relevance of OM research. This is the background to our call for papers that are based on a considered rethinking of research methods in OM. The contributors to this Special Issue have responded to this challenge by presenting fresh ideas on a broad range of OM methodological approaches.

The first article presented in the Special Issue by Whelan, Sarmiento, and Sprenger is a discussion paper that aims to promote a debate on fundamental methodological topics in OM research. As indicated in its title – 'Universal-deterministic and probabilistic hypotheses in operations management research: a discussion paper' – this paper comments on the formulation and testing of hypotheses and sheds light on the potentially important role that case studies can play in

this process. It also highlights the importance of specifying the type of hypothesis proposed and the logical implications of this for using case studies for theory testing purposes. The paper suggests that these conceptual issues should be examined in the light of Popper's principles of critical rationalism. Since the findings from investigations into operational issues can be used as the basis for policy recommendations, it is noted that the process of theory formulation and testing is a topic of critical importance for the relevance and rigour of OM research.

Two of the other articles in this Special Issue adopt contrasting approaches to methodological topics relating to case study research.

The paper by Kelliher and McAdam provides insight into the design and execution of a longitudinal case study. Their investigation spanned over a 4 year period and their paper focused on methodological issues arising from the implementation of an Operations Management (OM) system in three micro-firms. Through a chronicle of both researchers' experiences over the 4 years, we gain a better understanding of issues such as negotiating access, and approaches to data collection and analysis. Advice from the paper that will benefit OM researchers interested in this approach to empirical investigations include highlighting the importance of specifying observation arrangements in advance of commencing the study and guidelines on when to start (and finish) a longitudinal case study in an OM context.

Examining the philosophical basis of this paper, it can be seen that the authors distinguish between an 'objective' and a 'subjective' stance with the latter perspective focusing on the unique particular and individual situation under investigation. This provided the justification for the application of an underlying philosophy of 'interpretivism' in the paper. However, it is interesting to note that the authors acknowledge the value of objective procedures such as establishing a data collection protocol and the chronological ordering of the data for reporting purposes.

Following on from Yin (2003), the paper by El-Akruti, Kiridena, and Dwight adopts a contrasting approach to case study design that sets out accurate measures of operational variables and methods of identifying the causal relationship between these variables. Nonetheless, it is accepted that the researchers' own perspectives will influence the presentation and subjective interpretations of the evidence arising from the case study investigations. The authors of this paper propose a 'contextualist-retroductive' approach in order to

achieve a reconciliation between objective and subjective aspects of case study design. This approach is illustrated in the context of a strategic asset management. The paper provides useful guidance for other OM researchers on how a case study design can be operationalised using specified protocols and procedures.

Three of the papers in this Special Issue suggest different approaches in order to address methodological issues arising from conducting research on organisations in the current dynamic and challenging OM environment.

The paper by Romero-Silva, Santos, and Hurtado deals with the question of how contextual factors affect the organisational structure of a business – and thus, indirectly, its performance. They review the literature in Organizational Management Practice Contingency Research (OM PCR) and note that it could benefit from a more holistic approach, where the structure and context of an organisation are seen as a single integrated entity: the organisational system. They spell out the definition of various organisation types and show which advantages researchers and practitioners could gain by adopting the notion of an organisational system – especially when it comes to designing studies and identifying helpful OM practices.

A systematic review of research articles on the management of manufacturing capabilities is presented in the paper by Ogbunike, Purvis, and Naim. The authors note that in the current highly competitive manufacturing environment, organisations need to move beyond possessing capabilities that focus on internal expertise in technical areas, process efficiency and individual organisational structure. The well established and rapidly increasing use of outsourcing strategies and the impact of global influences means that manufacturing capabilities must now transcend traditional confined organisational boundaries. Based on an insightful review of the philosophical foundations of over 100 papers, the authors conclude that conducting effective research in this area requires a range of methodological approaches that can address the complex and dynamic issues that arise in the arena of managing manufacturing capabilities.

The difficulties for research investigations arising from a number of complex factors in the current OM environment are also recognized in the contribution from Bai and Sarkis. In order to honour these complexities, research methodologies and decision models are required that can take into consideration a large number of stakeholder interests including those of customers, suppliers, shareholders and regulatory bodies. Rough Set Theory is proposed as a methodology that can assist in the investigation of these multiple stakeholder relationships and can also address other complex issues that arise when researching the management of sustainable supply chains. This approach is explained in great detail and can provide a theoretical framework that will benefit both OM researchers and practitioners.

In summary, this Special Issue presents a range of proposals that have resulted from a carefully considered reflection and rethinking of OM research methods. We hope that this will contribute to the evolution of an accepted and

foundationally sound methodology for OM. It is also intended that, in keeping with the main aims of *Production Planning & Control*, this Special Issue will be a useful resource of reference and the stimulus for further debate on ways to improve the rigour and relevance of OM research.

As a final note, we would like to give special thanks to Stephen J Childe, Editor-in-Chief of PPC, for the opportunity to lead this project. We also thank Heather Childe, for the invaluable assistance throughout the whole process. The contributions of each and every one of the authors are very much appreciated. We also acknowledge the diligent work of the reviewers that helped us with the essential task of refereeing the manuscripts.

## Notes on contributors

**Roberto Sarmiento** received his PhD in Manufacturing Engineering and Operations Management from the University of Nottingham, UK. He is currently an Associate Professor at the Autonomous University of San Luis Potosi, Mexico. Roberto is interested in a variety of topics, including operations management, green supply chain management, decision-making models, and the philosophy of science.



**Garvan Whelan** has extensive industrial experience including management of operations, sales and finance in the manufacturing and retail sectors. He has also worked as a business analyst in the financial services, technology and tourism industries. This industrial experience combined with a keen interest in research methodology formed the basis for his PhD with University College Dublin. The outcomes from this included an award-winning case study that addressed the trade-offs between product, market and financial considerations. His current action research project focuses on the application of business analytic techniques in order to provide insights into the financial implications of outsourcing and assessments of individual company systematic risk factors.



**Jan Sprenger** is Professor of Philosophy of Science at the University of Turin in Italy and currently Principal Investigator of an ERC Starting Grant on scientific objectivity. Prior to that, he worked at Tilburg University in the Netherlands (2008–2017), where he also directed the Tilburg Center for Logic, Ethics and Philosophy of Science (TiLPS) from 2014 onwards. His research focuses on epistemological questions in science, such as models of causal reasoning, statistical inference, and scientific objectivity. In spring 2019, his monograph 'Bayesian Philosophy of Science' (with Stephan Hartmann) will appear with Oxford University Press. website: [www.laeuferpaar.de](http://www.laeuferpaar.de)

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