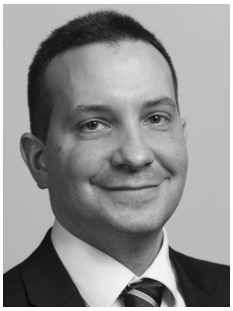
Editorial

New Times for International Production Networks



Thomas Friedli & Torbjørn Netland

When "Industry 4.0" was born as a term in 2011, it was good as well as challenging news for production and operations management. It was good because of the new-won appreciation for the importance of—and opportunities in—manufacturing. Manufacturing and supply chain management took center stage as top agenda issues in both boardrooms and parliamentary institutions. However, it was also challenging news because it questioned the established design of global production networks. For companies, thirty years of network "optimization" was in jeopardy.

Unfortunately, we have observed that rather than thinking strategically about global production networks, "Industry 4.0" made companies focus most efforts on building the factory of the future or "lighthouses." Many companies implemented a range of digitalization pilot projects—often poorly selected and with ill-understood consequences for the overall network. Pioneers in the research of international manufacturing networks, like Kasra Ferdows, Yongjiang Shi, Mike Gregory, Ann Vereecke, and John Miltenburg, to name only a few, might have rubbed their eyes observing the single plant focus once again dominate—not only in research but in practice too! COO after COO either launched plant digitalization projects by themselves or were pressured to do so by executive committees or boards afraid of missing the next big thing in manufacturing. For some time, digitalization became an end in itself and could be observed everywhere but in the performance reports.

Then COVID-19 raged, and the world of manufacturing had to change again. The vulnerability and the realities of today's global manufacturing networks re-surfaced. Politicians, practitioners, and researchers had to (re)consider networks from robustness and resilience perspectives. Once again, it was the *network* that was analyzed and not the single plant.

Considering this recent history, *now* is a good time for a special issue dedicated to international manufacturing networks. We are proud to present with this special issue a comprehensive overview of the state-of-the-art in management of global manufacturing networks.

Kasra Ferdows opens this issue with an invited contribution. He highlights a growing complexity due to the accelerated rate of globalization of manufacturing and that the literature has failed to keep up with it. In his expert opinion, the attempt to do justice

to this should, in particular, combine strategic and operative perspectives or consider them simultaneously right from the outset. He also raises attention to the importance of understanding the policy perspective, which is often less elaborated in research on global production networks. The policy perspective is critical in times of discussing global reference frames and standards (RAMI 4.0 vs. IIRA) for an effective "Industry 4.0" implementation, as well as trade barriers and the role of pandemics and cybersecurity. In this regard, Ferdows is not worried that manufacturing will leave the industrialized countries but instead will continue to be a matter of global activities. Despite the additional challenges posed by trade wars and the pandemic, companies will need to respond to the increasingly rising requirements for individualization in proximity to their global customer base.

This special issue contains six valuable contributions to the contemporary and important debate on global production networks. Besides Ferdows' conceptual paper, two literature reviews by Remling and Benfer et al. take stock of the current state of the art on essential aspects relating to global production networks: The role of performance management and the role of resiliency. The two following papers by Miedler and Schlosser et al. both build on deep case study insight to suggest practical concepts and techniques that help improve production network designs. Finally, Liao et al. use simulation to offer a way to overcome uncertainty in networks.

The six included papers are:

1. Kasra Ferdows: Perspectives on Global Manufacturing
2. Dominik Remling: Barriers and Success Factors of Performance Management in International Manufacturing Networks – A Literature Review
3. Martin Benfer, Bastian Verhaelen, Sina Peukert, Gisela Lanza: Resilience Measures in Global Production Networks: A Literature Review and Conceptual Framework
4. Philipp Miedler: Analyzing and optimizing international manufacturing networks – learnings from the field
5. Günther Schuh, Andreas Gützlaff, Julian Ays, Tino X. Schlosser: Framework for determining the degree of centralization in global production networks
6. Shuangqing Liao, Adrian Rüegg, Roman Hänggi: Deriving a global production network type in times of uncertainty – a simulation based approach

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