Industry 4.0 Technologies as Enablers of Lean and Agile Supply Chain Strategies: an Exploratory investigation


Aim:
The study investigates the degree to which Industry 4.0 technologies (I4T) enable and improve the implementation of lean and agile practices and assesses the performance implications of integrating the technologies with Supply Chain (SC) operations.

Research Questions:
1. Which Industry 4.0 technologies impact lean SC practices?
2. Which Industry 4.0 technologies impact agile SC practices?
3. What implications does the integration of the technologies with SC operations have on operational performance?
   a) The implications of integrating the technologies with lean practices on operational performance;
   b) The implications of integrating the technologies with agile practices on operational performance;
   c) The implications of integrating the technologies with integrated lean and agile practices on operational performance.
Methodology & KPIs
Fig: Model depicting the impact of Industry 4.0 technologies on lean and agile SC
Key contributions:

- First attempt to empirically address the connection between Industry 4.0 technologies and the integrated lean and agile strategies despite literature backing of the complementary nature of the two SCM strategies.

- Cross-case study analysis on how Industry 4.0 technologies impact the LEAN and AGILE SC practices and the impact on Estonian manufacturing and digital solution providing companies.

- Performance implications of integrating digital technologies with SC operation on cost, customer satisfaction, quality and workplace safety measures is explored.

- Critical managerial guidance for organisations aiming to choose a suitable technology to support the management practices of lean and agile to improve their operations;

- Guides for the digital solution providing companies towards understanding the SCM practices that can be improved upon by various digital technologies.

- Insights for the consulting companies on which 4IR tools impact performance of SC KPIs and recommendations to SMEs towards digitizing their operations.