POLICY RECOMMENDATIONS FOR NEXT GENERATION SUPPLY CHAINS

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The COVID-19 pandemic has highlighted the importance of supply chains and has taught us much about their management. This article presents strategies that companies may use to prepare for future challenges, and recommendations for decision-makers towards the competitiveness and resilience of upcoming European supply chains.

For the past year, the COVID-19 pandemic has taught us much about supply chain management. On the one hand, it taught us how to design a supply chain, from product development (in this case, the vaccine) to distribution to the final customer. On the other hand, it showed us how to re-design and manage companies' supply chains, in order to deal with the frequent disruption of the flow of materials. This is the latest example of a global phenomenon that led society to rethink our way of life, with a significant impact on economy and, in particular, on supply chains. At the same time, global warming is becoming an increasingly urgent issue, and we must face it to ensure future generations' quality of life. Critical issues related to social, sanitary, humanitarian and economic aspects have arisen with increasing frequency and scope, challenging us to find effective and innovative solutions. Furthermore, globalisation and new consumption habits have drastically increased the complexity of supply chains, requiring new ways to address a constantly changing market supply. The fast evolution of digital technologies also influences the way companies do business.

These and other present-day challenges have had a significant impact on companies, regarding business management approaches and, in particular, their supply chains.

The rate of change has been so intense that the task of predicting what happens in the future becomes quite difficult. Obviously, a common method to deal with all obstacles and trends does not exist; therefore, it is necessary to keep thinking about the future, in order to be prepared to act and face the challenges that may arise. In this sense, INESC TEC has worked closely with many European entities during the last three years, in a project financed by the European Commission, focusing on reflecting upon the future of European supply chains (results are available in the book "Next Generation Supply Chains: A Roadmap for Research and Innovation" [1]). Considering the main political, economic, social, technological, legal and environmental trends, we have developed six different scenarios for the supply chains of the next decade, mapped and analysed the technologies that will be a part of future solutions, and proposed a set of strategies applicable to different contexts. Results show that the consideration of which strategy to adopt dictated the companies' own characterisation of supply chains, according to eight dimensions: Products and Services, Supply Chain Paradigm, Sourcing and Distribution, Technology Level, Supply Chain Configuration, Manufacturing Systems, Sales Channel and Sustainability. By analysing their specific context regarding these dimensions, companies may adopt several strategies for supply chains, like establishing global chains, urban chains, resource-efficient chains, closed loop chains, disaster-relief chains, customer-driven chains, service-driven chains, human-centred chains, hyper-connected chains or biointelligent chains. Finally, we ask ourselves the following question: what are the main actions that public/private actors should develop in order to help European supply chains prepare for future challenges? With the support of a significant number of experts – academics and professionals in the

area of supply chain management — we identified a set of transversal topics that affect all supply chain dimensions and strategies, applicable to all industrial sectors (Key Horizontal Issues). These topics include issues related to: standardisation, regulatory framework, training and education, international agreements, funding and incentives, reference bodies and infrastructure. Supported by these topics, and considering the European Commission's guidelines for technological innovation, research and development (Horizon Europe), we developed a set of recommendations. The main target-audience is the European Commission, including institutions that regularly support this body in the decision-making process, such as research centres, technological centres, public-private partnerships and industrial associations.

The recommendations are presented in three different forms: (1) a policy, understood as a set of ideas or plans to be used as a basis for decision-making, and representing a long-term commitment; (2) a project, which is a temporary effort to create a specific solution; or (3) a programme, which can be defined as a set of related projects, managed in a coordinated way in order to obtain broader benefits. The twelve recommendations are:

-› Fostering the harmonisation of legislation and standards on European supply chains;

-› Disseminating standards among European supply chain stakeholders;

-› Facilitating and boosting multimodal transportation;

-› Developing the workforce for the supply chains of the future;

-› Promoting bi-lateral and multi-lateral agreements that consider a holistic supply chain perspective;

-› Supporting the establishment of R&D networks for the advancement and dissemination of supply chain-related topics;

-› Enhancing collaboration based on the results of European Projects: creation of a platform to serve as a data repository;

-› Establishing a prize to support and spread best practices in European supply chains;

-› Creating synergies between public and private sectors in funding actions;

-› Creating a European supply chain knowledge hub for sustainable, resilient and inclusive supply chains;

-› Upgrading infrastructures towards low-emission supply chains;

-› Promoting the usage of 5G networks and autonomous vehicles (AVs) to improve urban supply chains.

Each recommendation resulted in a policy brief [2], presented and delivered to potential decision-makers related to the domain. This set of recommendations will potentially contribute to the competitiveness of forthcoming European supply chains, but also to the development of a fairer, more collaborative and sustainable society for future generations.

[1] Fornasiero, R., Sardesai, S., Barros, A. C., & Matopoulos, A. (2021). Next Generation Supply Chains: A Roadmap for Research and Innovation, https://www.springer.com/gp/book/9783030635046

[2] Next Horizons for European Supply Chains - Strategic Research and Innovation Agenda (2019), https://nextnetproject.eu/wp-content/uploads/2019/12/DosierParaImprenta_mailing.pdf

SUPPLY CHAIN STRATEGIC DIMENSIONS

Product & Service
Mainstream Products, Customized Products, Frugal Products, Servitization

Supply Chain Configuration
Hyperconnected Factories, Modular Systems, Urban Manufacturing, Simple Systems

Supply Chain Paradigm
Efficient, Agile, Leagile, Risk-hedging

Manufacturing Systems
Digital Lean Manufacturing, Digital Mass Customization, Agile Manufacturing, Flexible Manufacturing, Efficient and Reconfigurable Manufacturing

Sourcing & Distribution
Global, Local, Glocal

Sales Channel
Omnichannel, Consumer to Consumer (C2C), Traditional Sales Channels

Technology Level
Digital Masters, Tech Fashionistas, Tech Beginners, Tech Conservatives

Sustainability
Closed-loop, Green, Resource Efficient, Social Responsible, Humanitarian SC