Sustainability of supply chains in the wake of the coronavirus (COVID-19/SARS-CoV-2) pandemic: lessons and trends

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Abstract

Purpose – The purpose of this article is to address the prioritisation and focus of supply chain managers subsequent to coronavirus disease 2019 (COVID-19)/severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the great lockdown of 2020.
Design/methodology/approach – In this article, concepts and trends on resilient and sustainable supply chains are systematized. Main trends in sustainability of supply chains in the wake of COVID-19 are presented.
Findings – Guidelines on building smarter and more resilient supply chains are provided and future tendencies, which includes the increase of a sustainable consumption perspective, are highlighted.
Originality/value – This is a conceptual article blended with a practical approach aiming to propose guidelines for managers and scholars on how to address supply chain management challenges after the coronavirus pandemic.

Keywords Coronavirus, COVID-19, Resilience, Supply chain management, Sustainable consumption
Paper type Viewpoint

1. Introduction

Coronavirus disease 2019 (COVID-19) has brought to light the fact that supply chains function as the veins of our economy and society (Ivanov, 2020). Societies and businesses across the world have faced unprecedented challenges due to the disruptions that the coronavirus outbreak, and the consequent great lockdown, have caused. Individuals, for instance, have dealt with a range of changes in their lives, from self-isolation to difficulties stocking up on essentials. Some businesses, mainly from the hospitality sector, have failed to survive because of the slowdown in trade, while other businesses have had to fight hard to supply the population's needs, including farms, retailers, third-party logistics and the members of healthcare sector supply chains.

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According the Regional Risks for Doing Business report from 2019, cybersecurity was identified as the greatest threat to businesses (World Economic Forum, 2020). However, pandemics, such as the coronavirus, are a significant source of external risk to the smooth operation of supply chains. Moreover, this source of risk can destabilise supply chains, leaving them unable to meet demand and satisfy customers' requirements and needs. Therefore, it is important to learn lessons from the disruptions caused by COVID-19 to build smarter and more resilient supply chains. This article addresses what managers may consider keeping supply chain alive due to COVID-19. This is a conceptual article blended with a practical approach aiming to propose guidelines for managers and scholars on how to address supply chain management challenges after the coronavirus pandemic.

2. Background

2.1 Principles for building resilience in supply chains

The design of a resilient supply chain requires the development of four principles (Christopher and Peck, 2004; Kamalahmadi and Parast, 2016) called ECAC: Engineering, Collaboration, Agility and Culture.

(1) Supply chain engineering

Mapping the structure of a supply chain, covering all of its members, including first and second tier suppliers, channels of distribution and final consumers, is important in order to identify likely bottlenecks that may restrict the flow, capacity and visibility of production. Processes or suppliers that may compromise the delivery of products and services to customers constitute potential bottlenecks; accordingly, the use of critical path and risk register tools can help managers to perform the required map assessment of a supply chain.

Procurement strategies play a critical role in building a resilient organisation because decisions related to multiple or single sourcing and local or global sourcing are important to ensure that a company can cope with internal and external variability and implement contingency plans. Therefore, procurement managers must assess the risk management of their suppliers in order to select and evaluate their current and future supply base.

Trade-offs between efficiency and redundancy do exist, and some slack in terms of resources may be necessary to adapt supply chains for unpredictable changes. A decoupling point is a compatible strategy to avoid keeping additional points of inventory throughout a supply chain. In this context, the inclusion of merge-in-transit practices could increase the flexibility of supply chains, without falling into excessive inventory costs.

(2) Supply chain collaboration

Working together is a central aspect of a resilient supply chain that aims to be adaptable and flexible. Sharing information is the best way to increase visibility and reduce risks in a supply chain. The purpose of collaboration in a supply chain is to create a common understanding of the strategy of the supply chain, because when there is clear understanding, relations can become meaningful. Therefore, sharing outputs from political, economic, social and technological analysis (PEST forces) and risk assessment of demand, supply and processes between members of a supply chain creates a community perspective.

Creating common targets between some members of a supply chain and organising video calls and workshops to check progress and share projections are initiatives which can help manage collaboration in supply chains.

(3) Supply chain agility

This principle is divided into two sections: visibility and velocity.

Visibility is related to monitoring the flow of materials and information across a supply chain in order to ensure that procurement, production, delivery schedules and orders will be met. Collaborative planning and forecasting are also important to provide a clear shared view of the processes within a supply chain. The use of portal software is useful for analysing real-time data and sharing information with suppliers, distributors and retailers to enable collaboration, monitor processes, identify issues and adjust planning.

Velocity concerns reducing the "end-to-end" time taken for producing and delivering products and services. Thus, value-stream mapping can help to identify activities or processes that may be reduced or eliminated in order to improve the flow of materials. Reduction of batch sizes, cellular layouts, platform-based products, versatile workforces and equipment support flexibility and enable quick shifts in production if disruptions happen. In addition, trace and track procurement, production, delivery orders by means of real-time sharing of information concerning order flow help to develop contingency plans, calculate inventory needs, change production orders and keep the upstream supply chain informed.

Digital technologies, such as cyber-physical systems, sensors, barcodes, Internet of things, collaboration portals and cloud computing can enable both the visibility and the velocity of supply chains.

(4) Supply chain risk management culture

Risk assessment management should be developed as part of the routine of a company and its supply chain in order to build an ability to anticipate and respond to disruptions. Leadership towards the creation of risk assessment teams would help firms to pursue this culture. Collection and storage of data and information regarding past events would help to systematize the lessons learnt over time and, in particular, after overcoming COVID-19. Big data analytics and blockchain are means of gathering and recording information to be analysed.

The journey towards building up resilience in supply chains requires a disciplined attitude towards risk assessment, joint and common purposes between members and the pursuit of flexible and efficient flows of materials and information.

3. Discussion

3.1 How to recover from COVID-19

Recovering and learning are capabilities that should be prioritised by companies that are under pressure due to COVID-19. Recovering refers to the ability to restore activities to the point they were before the disruption, while learning means the ability to improve activities based on the results of a disruption (Ali *et al.*, 2017).

The recovery process would require a reassessment of the structure of a supply chain in terms of location, production capacity and management of the flow of materials and information amongst the current members of the supply chain in order to identify pros and cons and eventually to reconfigure the supply chain structure (Govindan *et al.*, 2020). Provision of resources would be necessary to implement actionable contingency plans. Unquestionably, integration and collaboration between key members of a supply chain would be crucial in order to establish a common target and to share both losses and future gains to restore the foundations of the businesses.

Knowledge management is an important ability to develop in order to overcome disruption. Gathering data by means of both formal group discussion and brainstorming with key members of a supply chain to identify errors, bottlenecks, opportunities to innovate and solutions that work is critical to managing continuity. Such a data gathering process may benefit from the use of action review and retrospective review tools (Leask *et al.*, 2008), as well as project management documentation templates (Terzieva, 2014).

Other strategies are also important to the knowledge management process, such as education and formal training regarding the weaknesses identified during the group discussion and brainstorming sessions and the use of project management software for sharing information both within a company and across the supply chain (Terzieva, 2014).

After dealing with disruptions in supply chain, it is fundamental to ensure that the three Ts for successful management of supply chains have been used. The 3Ts are time, transparency and trust. Time means focussing only on adding value processes that costumers are willing to pay for; transparency relates to the necessary levels of inventory and costs of production which are reliable and fair for the joint planning of production and sales; and trust is the consequence of collaborative working practices that enable the sharing of gains and losses (Wilding, 2003).

4. Guidelines for managers and scholars on how to address supply chain management challenges after the coronavirus pandemic

Taking into account the above factors, supply chain and logistics managers, as well as policymakers and businesses in general, should pay attention to the following tendencies in the aftermath of COVID-19.

Some supply chains should be given the spotlight as they are critical for society and require specific attention from government, for example, pharmaceutical supply chains, in particular those dependent on biodiversity, grocery retailers, logistics and transportation, and the healthcare and safety sectors.

Society may reassess its decision-making processes regarding consumption patterns due to isolation and changes in habits (resulting from the increased use of social media and chat apps used to share items). According to EY Future Consumer Index, consumers behaviours tend to change after COVID-19 crisis. A survey conducted by Ernst and Young shows that 34% of respondents would be willing for paying more for local products, 25% for trusted brands and 23% for ethical products (Ernst and Young, 2020). Thus, a more sustainable consumption model may arise (Sarkis *et al.*, 2020), moving towards a sharing economy logic, with implications for supply chains which deal with consumer goods. The use of services provided by apps would be reinforced.

The notion of crowdsourcing has been highlighted; therefore, last mile logistics should be developed further to meet the potential rise in demand.

The discussion of offshore production should be on the agenda of supply chain managers with regard to the length and location of supply chains. Re-shoring is likely to be a hot topic for governments, policymakers and supply chains managers around the world.

Logistics decisions involving modes of transport, warehousing, handling of materials and packaging should be reassessed in order to seek even more efficient and agile solutions (Choi, 2020). Digital (e.g. use of sensors, cyber-physical systems) and virtual (e.g. virtual reality glasses) technologies would be vital to meeting the new requirements.

Procurement activity and in particular the importance of ensuring *Right Quality* should not be lost in the race to provide goods and services in the *Right Time* at the *Right Place* (Lysons and Farrington, 2016). Technical specifications and due diligence measures still remain vital elements in the procurement process, ensuring that potential suppliers have the necessary qualities to become a partner of government in its role as buyer.

Each sector faces a particular challenge. For example, the hospitality sector should invest more in delivering life experiences, online services and connectivity to customers after the isolation that people have faced, in order to provide high-value services. The hospitality sector may shift the provision of services towards the virtualization business model.

E-commerce may grow even further due to an increase in the number of users; thus, investing in efficient logistics, order fulfilment management and customer service management may be a trend.

More information systems and technologies, as well as automation systems, may be required by the manufacturing and service sectors, thus, there may be an increase in demand for such systems, as suggested by Govindan *et al.* (2020).

5. Conclusion

The world is likely to see a more imbricated relation between geopolitics and supply chain decision-making processes. For example, governments are likely to invest and regulate "key supply chains", such as pharmaceutical, personnel protective equipment and agri-food chains in order to ensure national food security. This goes against long-term trends of governments' policies of light touch, and simply putting their trust in key corporate supply chains to "do the right thing"; and therefore, relying on big retailers' and suppliers' strong customer orientation to keep supply chains moving. We may be entering a new age of localised/ regionalised supply chains and government intervention once again to determine.

The role of intermediaries might also be reassessed as it is through them that the smallest producers (micro- and small farmers) may coordinate their actions to produce deeper impact in the provision, and end-consumers can shorten the supply chain by actively involved in production/distribution systems (online delivery and/or community-supported agriculture).

Society, businesses and governments will all be transformed in the aftermath of the coronavirus outbreak, and we hope, towards a more sustainable society (Sarkis *et al.*, 2020); thus, scholars and managers should attempt to consider this transformation through a positive lens in order to improve supply chains and logistics management in order to provide high value and even more outstanding services to society, since it has now been made abundantly clear that supply chains are the veins of an economy.

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