Supply chain strategies in a global context: a customer value-based perspective

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Abstract

Customer value is influenced by several factors, which impose major challenges to global Supply Chains (SCs) and their management. This study aims to understand how companies tackle these challenges by focusing their global SC management on major strategies and supporting practices. Based on customer value theory, and recognising major trends affecting what end consumers value, we identify four global SC strategies: customer-driven, service-driven, resource-efficient, and closed-loop. A multiple case study carried out in eleven companies in the consumer goods industry explores the practices adopted per each SC strategy in managing global sourcing, production, and distribution networks. Results show the key requirement of selecting tailored practices for SC management that align with the context and the value expected by customers. Operational SC practices entail managing collaborative actions both up and downstream and competing with other SCs and can benefit from the implementation of appropriate digital technologies for customer value creation and delivery, as well as for continuous learning about customer needs.

Keywords

Global logistics; Supply chain strategy; Supply chain processes; Customer perception

1. Introduction

Changes in global trade and customer perceptions impose major challenges to global Supply Chains (SC)s and their management (Zinn and Goldsby, 2020). Today's globalised SCs are facing unprecedented levels of complexity in the socioeconomic, geopolitical, and technological spheres that call for innovative strategic analysis to tackle the associated uncertainties and issues (Chang et al., 2020; Najar, 2022). Global SCs are increasingly challenged in defining more robust strategies that are grounded in balancing trade-offs and incentives in global sourcing, manufacturing, and distribution networks (Cohen et al., 2018; Richey Jr. and Davis-Sramek, 2020). In addition, disruptions such as COVID-19 and the war in Ukraine have forced the restructuring of SC structures and operations (Pujawan and Bah, 2022), including adopting outsourcing to reduce risk of business disruption and become resilient, while also limiting potential harm to customers (Kazancoglu et al., 2023).

Different factors affect organisational decision-making (Sharma et al., 2022): responsiveness, agility, transparency, sustainability and the pace of the market. SC decision-makers should efficiently combine and integrate activities and actors based in multiple countries to properly address these factors in delivering superior customer value (Mukhtar and Azhar, 2020). Thus, they continuously seek new ways to manage their SCs to responsively meet demands of customers and consumers, and their value perceptions, extending across national boundaries (Zinn and Goldsby, 2020). Agile and lean SC strategies have been mostly investigated to define SCs as successful in reducing costs and improving innovation and resilience, but only few works attempted to identify SC strategies that effectively work under volatile demand (Pujawan and Bah, 2022) and consider the perspective of customer value (Ibrahim et al., 2015; Najar, 2022), towards a proactive and seamless connection of SC processes to customers and end consumers to better align with their needs (Marty and Ageron, 2024). It is becoming imperative for companies to find possible strategies to integrate customers' and end consumers' views into SC management processes (Marty, 2022). Critical antecedents and outcomes of customers' and consumers' value perceptions are especially relevant for firms and SCs within certain industrial sectors, such as consumer goods, where companies face issues with having consumer inputs and predictive insights during the SC stages (Mariani and Wamba, 2020).

Literature shows that companies should select tailored practices for SC management that align the context and the value delivered to customers with their business (Barros et al., 2013). More recently, technologies and related capabilities also play a major role in overcoming global SC management and cross-border trade challenges (Chang et al., 2020), providing reliable information exchange for all SC actors (Jraisat et al., 2022). Nevertheless, still few contributions explored how tailored practices and technologies are addressed and exploited across SC tiers and processes for appropriately generating value for downstream actors, i.e. customers and end consumers, in SC that are globally spread (Marty, 2022; Pessot et al., 2024). More studies on global SC strategies are needed to rethink the strategic setting that guides the implementation of specific practices and adjustment of the global supply and customer networks (Ibrahim et al., 2015; Niu and Jiang, 2023; Xu et al., 2023).

This study aims to understand how businesses - especially in the consumer goods industry - focus their global SC management on major strategies and supporting practices to deliver superior value to customers. It attempts to contribute to the research on global SC by proposing a taxonomy of strategies driven by what customers value, and how these affect the practices adopted in managing sourcing, production, and distribution networks with a global scope. The research question was formulated as follows: *How can companies build, through tailored practices, global SC strategies that consider a customer value-based perspective?*

The rest of the paper is structured as follows. Section 2 presents a review of the literature on global SC strategies and related classifications, and introduces the strategies considering customer value. Section 3 outlines the multiple case study design, followed by results on the cases' practices supporting their global SC strategies in Section 4. Section 5 discusses the practices in terms of global sourcing, production and distribution networks, and the paper ends in Section 6 with theoretical and managerial implications and limitations of the study, opening to further research.

2. Theoretical background

2.1 Taxonomies of global SC strategies

Extant literature adopts different criteria to identify taxonomies for selecting and implementing global SC strategies. The taxonomies suggested focus on:

(1) strategic decisions, i.e. selection of SC strategies (Christopher et al., 2006; Hong and Hwang, 2011) and practices (Barros et al., 2013, Cohen et al., 2018; Kharlamov et al., 2020),

(2) tactical decisions, i.e. selection of inventory and warehouse strategies (Baker (2007), logistics network configurations (Creazza et al., 2010), and SC communication (Nguyen et al., 2021).

(3) technological decisions, i.e. ICT tools (Cragg and McNamara, 2018) and integration processes (Schubert and Legner, 2011). Appendix 1 provides an overview of the various taxonomies of SC strategies in the literature.

The Table in Appendix 1 shows that the extant literature defining global SC strategies has not considered what customers and end consumers actually value, nor the trends affecting the value created and delivered by all SC partners to align with customers and end consumers' needs. This paper aims at addressing this gap in the literature.

2.2 Identification of global SC strategies based on customer value theory

The customer value theory provides a perspective of the value that includes the functional benefits and individual perception of the customer, together with the costs of acquiring and disposing of a product or service (Woodside et al., 2008). Thus, customer value is defined as a multidimensional concept involving a trade-off between the benefits (i.e. what the customers actually get) and the costs paid within the relationship with the supplier (Blocker and Flint, 2007).

End consumers and in general customers' perceptions are influenced by changes in their environments, including technological, regulatory, and economic conditions (Blocker and Flint, 2007). Nowadays, trends affecting customer orientation include: the level of customisation of products and services (Yu et al., 2019); the opportunity to combine them into product-service offerings, towards the so-called servitisation (Cenamor et al., 2017); the use of resources in an efficient and effective, and thus sustainable manner (Ranta et al., 2020). Thus, we contend that a taxonomy of SC strategies aimed at delivering superior customer value in a global environment should consider these trends in the definition.

Firstly, the increasing requirements for personalised products call for global SC processes to change at several levels: at the design level, since consumers are willing to participate in configuration and production of customised products across multiple sectors (Pallant et al., 2022); at the production level, because the alignment of the SC from downstream to upstream is based on leveraging inter- and intra-organisational interactive relationships (Martinelli and Tunisini, 2019); and at management level, due to customer's needs driving SC choices and new tools and digital platforms supporting decisions such as demand and production alignment, multi-decoupling strategies, and personalised delivery of products into multiple countries with heterogeneous cultural values (Lyons et al., 2013). Thus, a SC strategy that is aimed at customer value in terms of customisation of delivered products and general offerings can be defined as a *customer-driven SC* strategy.

Secondly, the boundaries between physical goods and services delivered become increasingly blurred, with higher levels of servitisation that require global SCs need to evaluate the complexities of interactions with multiple stakeholders and the necessary change of mindset in power relationships and risk-sharing approaches with SC partners (Niu and Jiang, 2023). Digital technologies can help transform the SC structure and the value delivered to customers along with both downstream and upstream networks, due to reductions in production and transport costs, and the identification of different ways of engaging with customers (Vendrell-Herrero et al., 2016). In this sense, a global SC should pursue a *service-driven SC* strategy.

Thirdly, resource scarcity has become an important concern for companies as most of the traditional business models and production systems have proved to be unsustainable when it comes to the use of resources (Balatsky et al., 2015). European Green Deal and other governmental programmes, as well as customer pressure, are forcing companies to implement a resource-efficient SC strategy for an eco-efficient cost-saving approach and creating value from waste at a global level. While addressing all the dimensions of the triple-bottom line and mutually reinforcing elements of sustainability, resource efficiency envisages the configuration of SC processes: product and process design should take into consideration paradigms, such as design for environment, design for disassembly, design for recycling (Zheng et al., 2019), and material sourcing/selection should be based on environmental impact parameters along with the SC. Thus, a *resource-efficient SC* strategy should comprise four mutually inclusive elements (Matopoulos et al., 2015): resource-aware; resource-sparing; resource-sensitive and, resource-responsive.

Finally, it becomes apparent that consumers also influence the application of circular thinking in SC functions, with a superior value to be delivered thanks to forward and reverse SC operations starting from product design up to operational processes (Wang et al., 2022). A so-called global *closed-loop SC* needs to include traditional forward SC activities as well as the additional activities of the reverse SC, product return and reintroduction to the market (Shaharudin et al., 2017). Different practices can be implemented for the management of resource and information loops as proposed in Bocken et al. (2016): (i) design of long-life goods and product-life extension; and (ii) recycling, with a loop between post-use and production that is closed, resulting in a circular flow of resources. Also, the location of production sites in global networks is a key challenge for a circular approach (Amin and Baki, 2017).

Appendix 2 summarises the taxonomy with the main characteristics of the SC strategies identified in the light of customer value theory (i.e. customer-driven, service-driven, resource-efficient, and closed-loop).

3. Methodology

This study aims to elaborate on global SCs from a customer value theory perspective, based on the identified strategies that - to our knowledge - have not been studied for this purpose in literature: customer-driven SC, service-driven SC, resource-efficient SC and closed-loop SC. Hence, this study employs a critical realism perspective into case research, considering its aim to provide synthesis of causal reasoning and contextual complexity (Bille and Hendriksen, 2023). While positivism focuses on quantitative data for empirical observations, and interpretivism emphasises the social meanings, critical realism looks to provide insightful explanations bounded by case context. Taking into account the context of this study - global SCs - and the specific perspective applied, that is, the customer value theory, critical realist case research can aid in the development of contextualised theoretical developments drawn from empirical observations (Bille and Hendriksen, 2023). Thus, a qualitative approach was considered suitable to investigate the underlying mechanisms of managing global supplier, production, and distribution networks along with the SC in these strategies, given the complex nature of their adoption and the current uncertainty affecting global SC contexts. Considering the research objective theoretical framework and empirical approach of this study, we opted for a multiple case study approach (Yin, 2014) supported by customer value theory and the critical realism research philosophy.

3.1 Case studies selection

The multi-case study is composed of 11 consumer goods companies from different sectors. The selection of cases followed the criteria of (Yin, 2014): (i) companies are in the consumer goods industry; (ii) companies have an established global SC; (iii) companies have proven of being competitive in their sector, and well-known by consumers; and (iv) at least two cases from the same consumer goods sector are selected. Moreover, we focused on companies with similar origins in European countries as they face comparable economic and regulatory environments for their headquarters while having heterogeneity in their globally-spread supply, production or distribution networks to obtain multifaceted insights and thus enhance the validity and reliability of collected data. Both manufacturers and distributors, together with multiple SC stages, were identified to have complementary perspectives from different types of actors (Olhager et al., 2015). The profiles of the selected companies are summarised in Appendix 3.

3.2 Data collection

Data were collected from both primary and secondary sources. Primary sources were open-ended interviews with informants from each company. To assure coherence and consistency, a standard interview protocol was developed to understand the strategies and practices of the companies for achieving and maintaining global SCs. It consisted of questions for investigating the main aspects and the various functional areas of SC management according to the SC strategies identified. Informants included at least two among middle or senior managers of the single areas for strategic and SC management, according to their expertise and roles identified in each selected company (role and years of experience of each interviewee in the respective company are reported in the last column of Appendix 3). Interviews were conducted by teams of two researchers and lasted approximately 90 minutes each. Data collected from interviews was further triangulated with publicly available data from press reviews, company websites, business publications and materials provided by informants.

3.3 Data analysis

The case analysis was performed in two different stages: (i) within-case analysis, which looked to identify the patterns of practices employed by companies that emerged adopting the four SC strategies; and (ii) cross-case analysis, aiming toward establishing cross-case patterns (Eisenhardt, 1989). The coding methodology was a mixture of open coding and thematic coding (Saldaña, 2021; Nowell et al., 2017), performed through the NVivo Software. Open coding was used during the initial analysis aimed to identify important concepts and categories from the raw data collected, thus aiding in uncovering emerging themes and patterns (Saldaña, 2021). Afterwards, thematic coding was applied, leveraged by the customer value-based perspective, where significant themes were captured and further categorised within the theoretical framework, leading to better understanding the interactions between key aspects in terms of supplier relationships, logistics, risk management, and related SC management themes, as well as their impact in SC performance (Nowell et al., 2017). Findings were summarised in a report for each company with the identification of the applied practices considering their sector, main pursued SC strategy and SC capabilities. The report (together with the interview transcription) was sent to each informant to verify its accuracy, and follow-up questions were asked by email when needed. The outcome is the set of practices along with the 4SC strategies across the three main operational processes of international SCs (Caniato et al., 2013; Olhager et al., 2015): (i) global sourcing; (ii) global production; and (iii) global distribution.

3.4 Quality assessment

We adopted a case study protocol following the guidelines established by Yin (2014), adapted to the objectives of this research, and aimed to provide reliability. The unit of analysis for this multiple case study is companies operating in the global SC of the consumer goods industry. An interview protocol was developed and applied accordingly through structured interviews, triangulated with secondary data sources. Construct validity was achieved by establishing a chain of evidence following the structured interviews, while the pattern recognition regarding strategies employed by the different companies, combined with explanation building for the development of common strategies and practices, were employed as internal validity. The different sectors covered by the multiple case study and the company's well-established position and successful approach were considered external validity criteria.

4. Results

This section describes the results from the analysis of cases, with evidence of the practices adopted by companies per each global SC strategy (as in the Table of Appendix 3). Specifically, our analysis shows that cases E, F, G and J mainly use a customer-driven SC strategy; cases C and D a service-driven approach; Cases I and K a resource-efficient SC strategy; and Cases A, B and H a closed-loop SC.

4.1 Practices of a customer-driven SC strategy

The case analysis shows the implementation of a customer-driven strategy in different sectors, aiming to guarantee personalised products and deliveries. To this end, Case E combines in its upstream SC multiple suppliers located in cost-effective Asian countries (mainly Taiwan, Cambodia and China due to the cost of labour), together with local suppliers that provide raw materials for its fashion products, thus enabling a fast response to end consumer demand in terms of personalisation and delivery times. On the downstream SC, case E employs a direct SC network, focusing on Italy and Germany, and an indirect market with 102 distribution companies worldwide. The multiple distribution network practice allows for post-sales services, such as the guarantee of replacement and repair of products in use by end consumers, while ensuring rigid quality control and continuous monitoring of lead times (OEM and suppliers) for on-time delivery of finished goods. Given the nature of case E as a designer and manufacturer of sportswear, many of its products go through multiple levels of customisation, and the company engages professional athletes to develop and test new products for each season, supported by 3D computer-aided design systems and 3D printers during the prototyping stage.

A similar approach to the SC strategy is seen within Case F, which manufactures cosmetics related to beauty products, laundry and home care, and adhesive technologies. With global suppliers and contextualised, geographic-dependent activities, Case F company pursues the satisfaction of both customer and end consumer requirements through continuous data sharing and real-time monitoring of SC flows. This is achieved through increased levels of investments in technological developments, also thanks to digital transformation programs across SC tiers and processes. A reliable Information Technologies' system capable of tracing and tracking finished goods to the customers (i.e. sales points) functions as the centralised hub for information flows and SC management throughout the global distribution centres, regions, and business units. The SC strategy is adapted thanks to the collection of data on end consumers and local competitor behaviours through different means, with changes to target marketing and a better planning and forecasting for optimising services to local markets.

Case G offers products on personal hygiene and healthcare, as well as high-value chemical products. Its global chemical supplier network includes more than 50,000 suppliers of multiple industries and services. Strategic sourcing is at the forefront of the company's manufacturing planning process, which is supported by the total cost of ownership approach and sourcing-process optimisation technologies. The multiple sourcing practice combined with different relationships with suppliers enables the development of market-specific products tailored to customer and end consumer requirements and high added-value chemical products. The global deliveries are customised thanks to an intermodality approach and continuous replenishment based on product category, market preference and customer feedback. Furthermore, the production process is supported by lean manufacturing and just-in-time strategies in globally-spread plants that allow fast product delivery tailored to local needs.

Finally, the food industry Case J adopts long-term partnerships and information-sharing practices with its global suppliers through a digital platform enabling transparency on costs and prices, as well as optimal scheduling. On the downstream SC, the company also uses a digital platform for continuous monitoring of customer purchases and delivery scheduling requirements. For example, the main product - i.e. natural and frozen dairy - requires demand forecasting, make-to-order approaches, and demand-driven models. To ensure customised deliveries to local customers and end consumers, the company scans trends and customer behaviours in each customer's location, combined with continuous investments in product and process research and development. In the production network, Case J employs full automation of production lines to enable customisation of production units for various product categories. Given the constant shifts in customer demands, the company has its production plants close to customers and relies heavily on last-mile delivery strategies with optimisation techniques for route definition.

4.2 Practices of a service-driven SC strategy

Both Cases C and D operate in the fashion industry and follow a service-driven SC strategy. Still, the integration of services in their value offer differs significantly: Case C is focused on a traditional eyewear production model with the manufacturing plant and operational managers, whereas Case D is a marketplace platform for high-luxury fashion retailing, thus acting as an intermediary between fashion designers, producers, and end customers. Both companies integrate broad services portfolios, customised solutions and multiple interactions to engage end consumers at a global level, and investments in training and technologies for operational excellence.

On the one hand, Case C focuses on balancing efficiency and flexibility in its production lines and outbound logistics, mostly considering the adoption of optimisation practices for inventory management and transportation loading. To achieve this, the company employs long-term contracts with suppliers to ensure reliable service deliveries globally and targeted tactics for the different markets in which it has established production plants. The shift in approach from simple transactions to complex relationships with suppliers and customers enables the company to offer additional services, such as integrated logistics, direct distribution of shops worldwide and the launch of a joint platform with customers allowing for forecasting and planning of future seasonal products.

On the other hand, Case D targets a prominent use of information systems technology development for their online Fourth party logistics SC platform, and invests heavily in the integration of processes between warehouse management and distribution, also with incentive/penalty strategies to ensure demand fulfilment. This integration streams down through the SC to achieve full information flow, resulting in seamless information sharing to the customers. Moreover, it focuses on the customer experience to the point of developing customer journey history and investing heavily in digital marketing as part of the value delivered.

4.3 Practices of a resource-efficient SC strategy

Cases I and K show major features of pursuing a resource-efficient SC strategy across their production, supply, and distribution processes in the respective furniture and food and beverage markets. Both cases display a highly integrated SC, ensuring traceability and quality control until the end consumers. Case K ensures visibility and traceability of its food products using a cloud-based platform to share information between production food plants also related to energy consumption. In addition, it incorporates collaborative practices for warehouse management to gain visibility of operations, especially for last-mile distribution. The company is implementing Internet of Things (IoT) technology to guarantee real-time data exchange between machines and better control of the production process, and a partial automation of the warehouses. The automation level has a pivotal importance also in Case I, with the production processes that are fully automated to produce high volumes of furniture components globally, also thanks to the co-development of production technologies with providers. Moreover, practices carried out by Case I to increase sustainability include reducing the use of resources by recycled wood (50 % of the products), and recycling and reuse of packaging.

In the upstream SC, Case K is collaborating with suppliers of raw materials in the design of products that adequately address the changes in pet food demand patterns (e.g. more "humanised" products that are gluten-free or without cereals), but also to mitigate out-of-stock risks in case of disruptions in the delivery. The global suppliers are strategically located according to the raw materials: mainly local for the cereals, local or European for meat and flours to balance cost and freshness of the product, and European suppliers for the packaging. Resource efficiency is also reached thanks to an optimised distribution network, with the redesign of the routes to and from the ten common warehouses and the fifteen third-party suppliers across Europe to reach customers and end consumers in a both efficient and flexible way.

4.4 Practices of a closed-loop SC strategy

Cases A, B and H disclose practices of a closed-loop SC strategy. Case A is a main supplier of the automotive sector and invests in the tracking of sold car tyres globally, towards the collection and treatment of used tyres. Its pursuit of a superior value for both customers and end consumers includes the management of the reuse, recovery, and recycling of discarded and end-of-life tyres collected worldwide into new products. The setup of collaborative mechanisms with the upstream and downstream SC, also promoting and incentivising environmental awareness, allows the company to coordinate effectively with customers and suppliers and involve them in implementing the closed-loop approach.

The company for Case B is a main producer in the furniture sector and promotes transparency on energy consumption rates and the raw material employed in its products within the upstream SC.

With a focus on climate-neutrality, Case B considers investments into blockchain for better cooperation with global suppliers. This can support the traceability of energy emissions for the production of parts and components, as well as their transportation, to better enhance value also for end consumers. Moreover, the company is considering investing in future product design to further modularise the products to facilitate reuse and recycling of material.

Similar to the developments in the automotive industry, the furniture sector has undergone significant changes in the last decade, entailing important trends such as eco-design to reduce energy consumption. Case H designs its furniture products considering the entire product's life cycle, including their modular design, production and transportation. The company leverages trust and transparency in logistic processes and at an informative and organisational level with upstream and downstream SC partners. Several changes had been initiated to co-design new products, processes, and dedicated production technologies with customers and also end consumers to allow for traceability of the products along with the logistics flows, including the packaging.

5. Discussion

Results from the case studies confirm the key requirement of selecting tailored practices for SC management (Barros et al., 2013) that align with the context and the value expected by customers and end consumers to properly connect their perspective across SC processes and tiers (Marty, 2022; Marty and Ageron, 2024). Considering that we are investigating global SCs, tailored practices are discussed in this section in terms of management of the three main operational processes of international SCs (Caniato et al., 2013; Olhager et al., 2015), i.e. global sourcing, global production and global distribution, per each of the four strategies identified, i.e. customer-driven, service-driven, resource-efficient and closed-loop SC.

The Figure 1 represents the interconnection between the different dimensions we study in this paper, namely:

- the four global SC strategies driven by a specific customer value emerging from the market (as derived from literature in Section 2.2 and summarised in Appendix 1);
- the collected case studies from the consumer goods industry representing different sectors (as described in Appendix 3);
- the practices derived from the case studies and classified along the processes of the global network structure of each SC strategy (as described in Appendix 4).

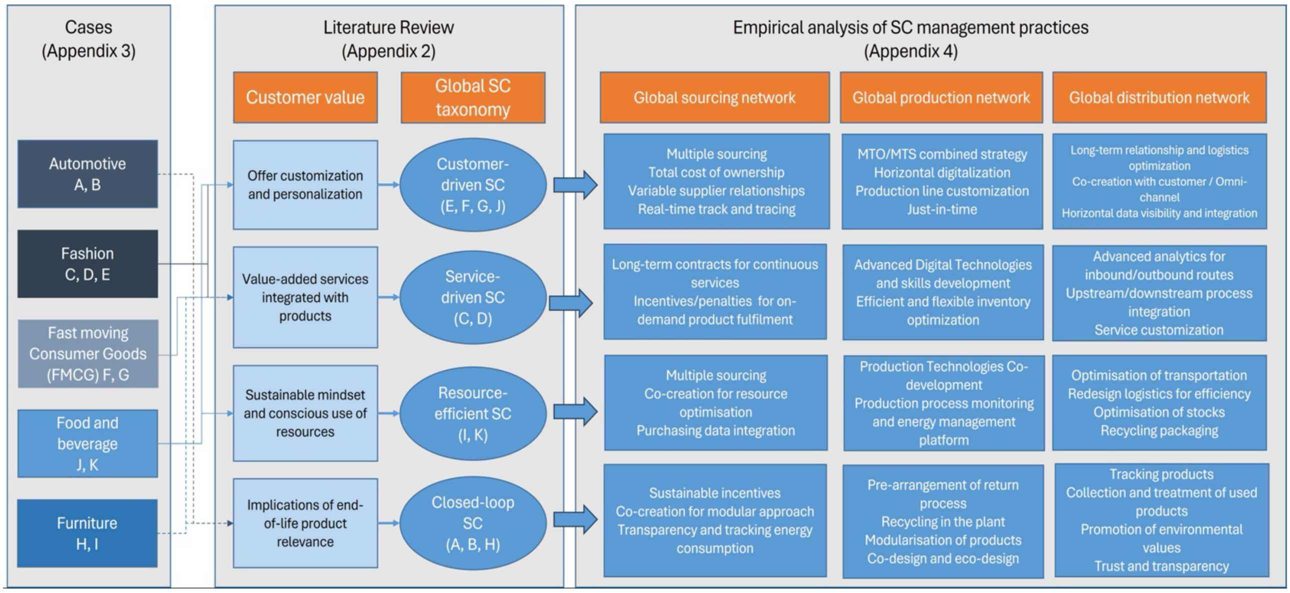

Figure 1 – Resulting framework of tailored practices in global SC strategies of cases considering a customer value-based perspective

The tailored practices considered in the management of global sourcing, production and distribution networks are below described.

5.1 Management of global sourcing networks with a customer value-based perspective

Managing global sourcing networks can be based on different practices related to processing goods and information with suppliers to ensure the specific expected customer value of each SC strategy. In this sense, companies are experiencing collaboration with global suppliers to ensure product and process traceability both in resource-efficient and in closed-loop SCs (Zaid et al., 2018).

Collaboration mechanisms and their intensity at supplier level are confirmed to have an impact on sustainability performance (Jraisat et al., 2021). In the service-driven SC, global suppliers are engaged with long-term contracts mainly to provide specific services to customers at the local level. One of the main concerns of the analysed fashion industry companies is providing value through an enhanced customer experience when buying products. One of the analysed companies in the fashion sector has grown as a service provider for large well-known brands and takes care of all these processes towards the customer, designing appropriate strategies according to customer location. Other global suppliers, like logistic providers, are also involved in providing personalised delivery with the support of targeted platforms, showing an improved capability in dealing with local specific needs and engaging customers while reducing transportation costs (Vendrell-Herrero et al. 2016), and environmental effect (Navarro et al., 2018). The choice of global or local suppliers in the definition of the outsourcing strategy implemented by the focal company of the SC can be set in terms of multiple sourcing, partnering with backup facilities, level of inventory, capacity advancement, supplier selection across more than one SC strategy (Kazancoglu et al., 2023). In the case of resource-efficient SC, companies show that in global SCs the selection of suppliers is based on a trade-off among several key performance indicators like efficiency versus sustainability. Multiple source strategies can be adapted according to the typology of the product, and suppliers can take part in the design to minimise an unsustainable use of resources (Balatsky et al. 2015).

In global sourcing, it is emerging that collaboration can be enhanced thanks to the use of track and tracing technologies to facilitate management of orders along the network as well to optimise processes (case B, F, J), and real time information sharing to help purchasing (F, J, I).

5.2 Management of global production networks with a customer value-based perspective

Global production networks contribute to creating customer value from a process perspective. Customer-driven SC and resource-efficient SC present some similarities in the type of action for the analysed cases even though they aim for a different value. For instance, a common practice is the automation of production lines as a way to facilitate the creation of value in terms of personalised products, or efficient systems. Sustainability is seen as both a requirement and a value in resource-efficient strategy, and thanks to a lean manufacturing approach, practices related to waste management and renewable energy use are implemented to have aligned production processes in a global production network. With the same aim to implement circular economy values, closed-loop SCs analysed cases make a step further, and plan return processes during the design and production phase, together with implementing practices for direct recycling at all production plants – thus overcoming the global market barriers (Jraisat et al., 2022; Wang et al. 2022).

Digitalisation plays an important role in data exchange and collection in global production networks. Here customer value is generated through technological links between people, machines, channels, and organisations (Attaran, 2020). Cases analysed in service-driven SC show a continuous investment in developing advanced technologies, along with training personnel in production processes towards continuously improving operations. Meanwhile, digitalisation in resource-efficient SC cases is focused on real-time data exchange to monitor the shop floors and plants for optimal balance between full capacity utilisation versus production flexibility, and for optimal energy consumption.

In the case of customer-driven SC, the interviewed companies fully customise production lines for product categories, to provide value to customers with personalised products with convenient production costs (Macchion and Fornasiero, 2021). Meanwhile, cases analysed in resource-efficient SC and closed-loop SC integrate technology providers to develop customised production technologies, as well as to prepare the products to integrate customised services.

5.3 Management of global distribution networks with a customer value-based perspective

The interviewed companies emphasise different aspects of global distribution along with the four SC strategies. The service-driven SC relies on highly integrated processes between service providers and consumers for the overall SC distributional design. This SC is characterised by investment in digital marketing and customer experience improvement that includes data gathering for after-sales services and analysis for target-marketing strategies and optimal planning/forecasting capabilities in each served market. The analysed cases in the fashion sector helped to identify different ways of engaging with customers providing new insights compared to what proposed in other papers (e.g. Vendrell-Herrero et al., 2016) where services related to flexibility in logistics of the delivery, optimise transportation for a timing delivery, after-sales services are used in provision of products in the eyewear sector.

Likewise, global distribution plays a relevant role in the customer-driven SC, which can be further enhanced with the adoption of digital technologies supporting adaptation and efficiency of related operations (Samadhiya et al., 2023). Major investments in digital marketing support the creation of value through a new customer's experience and data collection and analysis provides targeted marketing and forecasting, with an improved continuous replenishment to avoid stock-outs in any of the global distribution centres. In addition, a well-set-up downstream integration for information sharing and integration of processes with customers distinguishes the customer-driven SC from the other strategies.

While the long-term relationship with wholesalers and transportation companies in the customer-driven SC rests upon the customer experience, the resource-efficient SC aims at coordinating resources with distribution partners and requires trust from both parties. In general, the resource-efficient SC is characterised by continuously redesigning its global logistics network and processes to maintain efficiency, especially in a global environment (Ivanov et al., 2021). This includes optimisation and reduction of stocks through buffering strategies and optimisation of transportation (e.g. truck loading, last-mile delivery).

From the collected case studies, it is confirmed that recycling plays a major part in the closed-loop SC (Bocken et al., 2016). Companies declare practices related to global distribution focusing on tracking sold products and collection and treatment of used products where reverse logistics can be enhanced with technologies such as blockchain (Jraisat et al., 2022; Wang et al., 2022).

The required effort for recycling depends strongly on the product design, hence, companies with a closed-loop SC have a distinguished approach to product-life-cycle management (Bocken et al., 2016) as a way to deliver what customers value. This makes it necessary to leverage trust and transparency in the end-to-end SC, especially in a global context where cultural differences may represent a barrier.

6. Conclusions

The main objectives of this study were to identify and analyse how forward-looking firms are framing global SC strategies and operations to enhance value for customers and end consumers, thus focusing their global SC management on targeted practices. Based on customer value theory, and the implications of pursuing a proactive and seamless connection of SC processes to customers and end consumers (Marty and Ageron, 2024), we ground our study on four SC strategies that address multifaceted customer value orientations. In particular, we focus on customer-driven SC, service-driven SC, resources-efficient SC and closed-loop SC extrapolating how they are implemented at a global level. The multiple case study in 11 companies in the consumer goods industry allowed us to identify practices supporting the four strategies in managing global sourcing, production and distribution networks.

The research findings have important implications for researchers and practitioners in SC management, which are called to identify and develop more robust strategies to tackle the current challenges and opportunities of a global environment (Richey Jr. and Davis-Sramek, 2020).

From a theoretical viewpoint, the paper contributes to the research on global SC by proposing a taxonomy of strategies driven by what customers value. Moreover, results contribute to customer value theory by extending it with a novel perspective. Previous contributions to this theory originated as part of the marketing studies (Blocker and Flint, 2007), mainly focused on the value asked by the customer and how it can influence SC capabilities and competences. This study explores the implications in terms of SC strategies, analysing how customers' value can affect operations of global SCs. We show that SCs address the evolutions in customers value and demand by implementing specific SC strategies and managing collaborative actions both in the up and downstream processes, and adopting digital technologies. The four SC strategies have been described in previous literature mainly from the point of view of some specific processes, or application of technologies while this paper provides an encompassing description with the global perspective on sourcing, production and distribution.

From a managerial viewpoint, this study offers valuable insights for SC managers and strategists in identifying specific SC strategies, and supporting practices, in a global context. For each of the four strategies, a set of practices was analysed along the dimensions of the global SC (global suppliers, global production, and global distribution) to figure out how companies deploy knowledge of the value demanded by the customer and thus reach a competitive advantage. Customer-driven SC is applied in cases from sectors like fashion, food and beverage, and fast moving, where most practices focus on the value perceived by the customer thanks to product customisation implemented in different ways. In particular, collaboration with suppliers (like designers and material suppliers) help to configure, design and manufacture the product according to the customer requirements and digital technologies are used to support this collaboration along the global networks. Digital platforms to track and trace orders (in global supplying networks), 3D-based design and 3D printing machines (in global production networks) facilitate the creation of value through personalised components, functions and products; forecasting of market trends and configuration tools can help in the global distribution networks to interact with customers for custom orders.

Service-driven SC strategy is emerging in the fashion sector, where services are used to enhance the value of the products allowing companies to reach customers globally with service segmentation to satisfy specific needs in the company's markets. Digital technologies can support the service-driven SC with application of advanced analytics to render optimal inbound/outbound routes and other logistics services.

Resource-efficient SC strategy is applied in cases from the furniture sector and in food and beverage. This strategy is driven by the value perceived by both customers and end consumers in terms of sustainability and different practices can be put in place by SCs to reach it. The global dimension of these two strategies is based on implementing digitalisation practices (like tracking systems, optimisation modules for resource efficiency, real-time data acquisition) supporting decentralised processes like distributed process monitoring and control, assessment of energy consumption, and assessment of environmental impact. Closed-loop SC strategy is emerging in automotive and furniture sectors with the management of the global dimension of reverse flows, collection and treatment of products and materials for reuse and recycling, to pursue value for customers and end consumers. Digital technologies and especially blockchain are used for the collection of information on end-of-life products, and conveniently manage reverse logistics to treat, recycle and reuse the end-of-life products, for customer value creation and delivery.

Moreover, it emerges from the study that these strategies can be complementary to each other and some practices are applied in different strategies especially for what concerns collaboration in the global sourcing network, e.g. with long-term partnership and multiple sourcing. These can be implemented considering the possibility of merging practices for a multiplier effect, e.g. personalisation of products in customer-driven SC shall be supported by dedicated services for customers like personalised transportation, after-sales support. Managers and strategists should take into account that the main feature of these strategies is adaptability to create value for customers and end consumers in different sectors. In this sense, companies should focus on a strategy but taking account possible synergies, while enhancing continuous learning about evolving needs of customers and end consumers – and related trends – along the different SC processes.

This study is exploratory and adopts a qualitative approach, and presents some limitations related to the number of companies involved and the methodology applied that provide the opportunity for further research. Specifically, mechanisms entailing the relationships between the four strategies could be further explored in more extended studies. Moreover, a survey including other sectors in the consumer goods, like pharmaceutical, and other industries beyond consumer goods, could investigate the prevalence of the four strategies in specific contexts, and related factors at the global and country level. The results of the qualitative models can be used to define the variables and the relationship between them to be used in a quantitative modelling like simulation or system dynamics. With data from specific SCs, it can be possible to study how implementing certain practices can help improve the capability to create, deliver and understand what customer value is based on a set of indicators to be monitored along with the global SC.

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Appendix 1 - Overview of SC taxonomies in literature

Reference	**Focus of the paper**	**SC strategies / configurations**	**Criteria / Dimensions**
Christopher et al. (2006)	Supply chain strategies	• Lean • Agile • Leagile	- Predictability - Replenishment lead-times
Baker (2007)	Inventory and warehouse strategies	• Inventory reduction strategies • Supply chain risk strategies	- Business Model Considerations - Supplier Lead Times vs. Customer Lead Times - Demand Variability - Supply Chain Risk Factors
Creazza et al. (2010)	Logistics network configurations	• Direct shipment with full container load (FCL) • Direct shipment with groupage container • One echelon logistics network with consolidation hub (CH) • One echelon logistics network with central warehouse (CW) • Two echelons logistics network with both CH and CW	- Overall annual demand - Annual average demand between a supplier and a RW - Suppliers' dispersion (average distance between CH and suppliers) - Product value density - Differential labour cost
Hong and Hwang (2011)	Supply chain strategies	• Efficient • Responsive • Resilient • Green	- Strategic focus - cost/quality and delivery/innovation - Market position - market qualifier and market winner
Schubert and Legner (2011)	B2B integration in global supply chains	• Parallel use of different information systems with manual system access • Parallel use of different information systems with data interchange and direct connection • Parallel use of different information systems with data interchange provided by an intermediary • Joint use of a self-operated, central ERP system • Joint use of a central system operated by an intermediary	- Industry sector - Position in the supply chain - Direction of integration
Barros et al. (2013)	Supply chain practices	List of tailored practices to mitigate the seven detrimental phenomena	- Waste (3 practices) - Uncertainty (2) - Vulnerability (6) - Congestion (3) - Bullwhip (3) - Diseconomies of scale (4) - Self-interest (9)

Reference	Focus of the paper	SC strategies / configurations	Criteria / Dimensions
Cohen et al. (2018)	Global manufacturing sourcing	• Supply chain restructuring • Offshoring vs. reshoring • Reloading vs. rebalancing • Natural hedging	- Labor cost differences - Technological advances - Global sourcing economics and risks - Government policies and constraints
Cragg and McNamara (2018)	Barriers to supply chain integration	List of ICT tools for addressing the barriers to SC integration	- Asymmetries - Contractual design - Supplier dependence - Product specifications - Supply chain complexity - Performance monitoring
Kharlamov et al. (2020)	Supply chain segmentation	• Cluster 1: Products with the shortest delivery time window and high delivery frequency (high demand volume and the lowest demand variability) • Cluster 2: Products with the fewest order corrections as well as low demand volume per product • Cluster 3: Products delivered rarely (low delivery frequency) and low average monthly demand volume with the highest order correction • Cluster 4: Products with the longest average delivery time window and the highest demand variability	- Demand volume - Demand variability - Order corrections - Delivery time window - Delivery frequency
Nguyen et al. (2021)	Supply chain communication and cultural compatibility	• Proactive • Initiative • Reactive	- Cultural compatibility - Supply chain communication

Appendix 2 - Taxonomy of global SC strategies based on customer value theory

Trends in customer value and market orientation	Global SC strategy	SC strategy definition	References
Demand of customised and personalised offerings	Customer-driven SC	Capabilities and resources for the design, production and customer relationship management along the SC are configured around customer-specific needs to deliver customised and tailored products and services.	Pallant et al., 2022; Yu et al., 2019
Increasing importance of services integrated with physical products	Service-driven SC	Increase of service flows and collaborative relationship structures throughout the SC – towards the so-called servitisation – aimed at offering value-added (digital) services integrated into product-service solutions on a worldwide basis	Cenamor et al., 2017; Niu and Jiang, 2023; Vendrell-Herrero et al., 2016
Attention towards sustainable behaviours and use of resources	Resource-efficient SC	The overall SC is configured and engaged into accessing and using specific resources efficiently, assessing their usage and fostering sustainable consumption to minimise dependency from scarce natural resources as a source of competitive advantage at global level	Balatsky et al., 2015; Matopoulos et al., 2015; Zheng et al., 2019
Awareness of circular economy paradigm and environmental impacts of globally-distributed SC	Closed-loop SC	Coordinated handling of forward and reverse flows and services (e.g. end-of-life product management, reverse logistics, remanufacturing, recycling and refurbishing) among SC actors, moving the overall global SC to a circular economy	Bocken et al., 2016; Shaharudin et al., 2017; Wang et al., 2022

Appendix 3 - Overview of case studies

Case	Sector	Main activity	Headquarter country	Turnover (2020)	Global SC features	Interviewees (years of experience)
A	Automotive	First tier supplier of OEMs	Italy	€4.3 billion	Regional and global supply base; 19 production plants in 12 countries; 15,900 points of sales in over 160 countries	Head of suppliers' quality (<10); Manufacturing R&D manager (10-20)
B	Automotive	First tier supplier of OEMs	Germany	€501 M	150 suppliers worldwide; 30 customers (global car manufacturers)	Head of logistics (10-20); Product manager (<10)
C	Fashion	Manufacturer and distributor of eyewear	Italy	€53 M	40 suppliers worldwide; 600 wholesalers and stores worldwide	Strategic manager (10-20); SC manager (<10)
D	Fashion	Luxury fashion distributor and retailer	UK	€7.7 billion	Supply base: 614 luxury retailers and 375 brands; deliveries in more than 190 countries	Senior product manager (10-20); Digital operations lead (<10)
E	Fashion	Designer and manufacturer of sportswear	Italy	€35 M	20 local and global suppliers; 102 distribution companies worldwide	General manager (10-20); Product owner (10-20)
F	Fast Moving Consumer Goods	Manufacturer, distributor and retailer of beauty, homecare and adhesive products	Germany	€20 M	Suppliers in 120 countries; more than 180 production plants worldwide; global distribution	Logistic and planning manager EMEA (10-20); Digital factory lead (<10)
G	Fast Moving Consumer Goods	Manufacturer and distributor in several product segments	UK	€61 billion	More than 100 suppliers worldwide; operations and commercial presence in over 180 countries	Senior product innovation manager (<10); International customers senior manager (>20)
H	Furniture	Manufacturer of home furniture	Netherlands	€39.6 billion	1,500 suppliers worldwide; more than 440 stores in 50 markets	SC development manager (>20); Purchasing and logistics area manager (10-20)
I	Furniture	First tier supplier of furniture components and kits	Italy	€605 M	230 suppliers worldwide; customers over 30 international large-scale retail chains	SC manager (<10); Operations manager (>20); Purchasing manager (<10)

J	Food and Beverage	First tier supplier of food preparations	Portugal	€115 M	Almost 500 suppliers, 9 production plants and almost 100 clients in more than 40 countries worldwide	SC manager (10-20); Procurement executive director (10-20)
K	Food and Beverage	Manufacturer of animal food products	Spain	€570 M	7 production plants; 20,000 customers worldwide	SC director (10-20); Corporate procurement director (<10)

Appendix 4 - Practices adopted in sourcing, production and distribution networks in global SC strategies

Global SC strategies and management practices	**Customer-driven (E, F, G, J) (fashion, fast moving, food)**	**Service-driven (C, D) (fashion)**	**Resource-efficient (I, K) (furniture, food)**	**Closed-loop (A, B, H) (automotive, furniture)**
Global sourcing network	• Multiple sourcing with a combination of global and local sourcing (E, G) • Total cost of ownership (G) • Long-term partnerships / established contracts with suppliers (E, J) • Real-time data sharing, monitoring and tracking for supporting integration in purchasing (F, J)	• Long-term contracts with suppliers to assure continuous service delivery (C, D) • Incentives/penalty strategy for on-demand product fulfilment as a requirement for contract renewal with suppliers (D)	• Multiple sourcing with a combination of global and local sourcing (K) • Co-creation of parts and/ or products with suppliers (K) • Integration in purchasing by real-time data sharing, monitoring and tracking (I)	• Promotion and incentivisation of environmental awareness (A) • Set-up of collaborative mechanisms to promote environmental, social, and economic pillars of sustainability (A, H) • Transparency on energy consumption of parts through blockchain (B) • N-tier transparency and collaboration with suppliers to track energy emissions for production and transportation of parts (B) • Co-design of new processes with modular approach (B)
Global production network	• Combination of make-to-stock with make-to-order (J) • Digital transformation across multiple business units (F) • Full customization of production lines for product category (J) • Automation of production lines (J) • Lean manufacturing / just-in-time (G)	• Investment on development of advanced digital technologies and continuous training for operational excellence (C, D) • Optimisation of inventory and loading management to balance efficiency and flexibility (C)	• Co-development of production technologies with providers (I) • Automation of production lines (I, K) • Real-time data exchange between machines and information systems to monitor the shop floor (K) • Platform to monitor the production process and energy consumptions (K).	• Prearrangement of return processes during production (A) • Implementation of strategies for direct recycling at plant (A) • Modularisation of products to facilitate a re-use and recycling of material at production site (H) • Co-design of new products (H) • Eco-design to reduce energy consumption (B)

Global SC strategies and management practices	Customer-driven (E, F, G, J) (fashion, fast moving, food)	Service-driven (C, D) (fashion)	Resource-efficient (I, K) (furniture, food)	Closed-loop (A, B, H) (automotive, furniture)
			• Balance between flexibility and full capacity utilisation with control and visibility (I)	
Global distribution network	• Long-term relationships with wholesalers and / or transportation companies (G) • Long-term customer relationships (J) • Optimization of transportation (G) • Continuous replenishment based on product category (E) • Co-creation of products/ services/ solutions with customers (E) • Collaboration in design and production of technological and logistics processes and systems with customers (E) • Downstream integration for information sharing / integration of processes with customers (F, J) • Data collection and analysis through different means to target marketing and better planning and forecasting (J) • Multi- / Omni-channel selling and marketing strategy (E)	• Long term relationship with customers to offer additional services (C) • Application of advanced analytics to render optimal inbound/outbound routes (C) • Integration of processes (warehouse management and distribution) upstream and downstream (D) • Investment in digital marketing and customer experience improvement (C) • Data gathering and analysis for target-marketing strategies and optimal planning/forecasting capabilities (C)	• Optimization of transportation (e.g. trucks loading, last mile delivery) • Continuously redesign its logistics network to gain efficiency (K) • Optimization and reduction of stocks, considering buffers (K) • Long-term customer relationships (I, K) • Recycling and reuse of packaging (K)	• Tracking of sold products, and collection and treatment of used products (A, H) • Reuse, recovery and recycle of discarded and end of life products (A) • Promotion of environmental awareness (A) • Leveraging on trust and transparency in logistic processes (H)