The Eurasia Proceedings of Science, Technology, Engineering & Mathematics (EPSTEM)
ISSN: 2602-3199

The Eurasia Proceedings of Science, Technology, Engineering & Mathematics (EPSTEM), 2023

Volume 23, Pages 471-484

ICRETS 2023: International Conference on Research in Engineering, Technology and Science

Improving the Supply Chain - Marketing Interface, Translating the Voice of the Customer into Processes

Simone Franceschetto
Polytechnic University of Milan

Roberto Cigolini
Polytechnic University of Milan

Lucio Lamberti
Polytechnic University of Milan

Abstract: The aim of this paper is to develop and test a framework for leveraging the supply chain-marketing interface to deliver customer value through a standardized closed-loop customer feedback strategy. The manuscript begins with a literature review in the fields of both marketing and supply chain, resulting in a framework that defines a systematic process to deliver customer value by creating synergy between the two fields. This framework is then validated through empirical activities at Company Beta. Regarding the findings, it appears that the application of the conceptual framework, endorsing the importance of closed-loop customer feedback, highlights the role that a supply chain-marketing interface plays in delivering customer value. Nonetheless, there are some necessary prerequisites and contextual variables that must be taken into consideration to ensure a successful implementation of the framework. Since the framework validation is based on a single case study, results cannot be generalized. The preliminary results suggest that a contingent approach is necessary to adapt the framework to different company contexts, paving the way for future research. Existing studies address ways in which companies should restructure to support the integration of marketing and supply chains, and researchers are in harmony that the integration can contribute to company success. As of yet, there is no comprehensive guide for the inter-functional activities needed to leverage the supply chain-marketing interface towards customer-centricity and customer value creation.

Keywords: Supply chain-marketing interface, Voice of the customer, Customer centricity, Marketing automation, Customer journey

Introduction

Following a rise in globalisation, consumer preferences have strongly changed, favouring deeper customisation, higher quality, and shorter delivery times (Lamberti, 2013). This has made it necessary for companies to adopt customer-centric business strategies. Companies must revolutionise customer interactions and explore new marketing possibilities to remain competitive and offer a customer experience that matches its' time (López-Cabarcos et al., 2020). In this context, the effectiveness of delivering superior customer value is fundamental and, to achieve this, full coordination between marketing and supply chain functions is crucial.

As customers demand more personalised service offerings, companies can exploit advanced technologies, including Big Data and intelligent algorithms, to extract new insights from customers and identify business opportunities or areas of improvement in their supply chains (Noci, 2019). By integrating marketing and supply chain processes, a company can successfully deliver superior customer value through the development of customer-based product specifications and individualised customer journeys (De Haan et al., 2015).

The objective of this manuscript is to define a process-driven methodology to leverage the synergy between marketing and supply chain activities to collect and translate new customer insights into operational processes, leading to the delivery of customer value.

This paper explores the possibility of integrating marketing and supply chain activities to achieve customer-centricity and leverages empirical activities in Company Beta, a company that delivers intelligent products and tailored solutions to its customers. In order to become more customer-centric, the company must define a systematic process to collect insightful feedback from customers at various critical touchpoints at the front end to drive operational improvements in the back end.

The most relevant touchpoints are highlighted by reviewing the company's vast range of customer journeys. A strategy is then deployed to collect the right information from customers at each critical touchpoint, evaluate the given feedback, and channel new insight to the right stakeholders in order to improve supply chains accordingly. The objective of empirical activities is to provide base material when developing a standardised strategy to enhance customer value by linking customer experience to operational improvements.

The paper is structured as follows: section 2 is devoted to the description of the research background to define the SC of the construction industry and the related risks as well as the main characteristics of blockchain technology. Section 3 describes the methodology adopted while section 4 illustrates the model. Section 5 shows the main findings. Finally, section 6 draws some conclusions and suggests future research paths.

Background

Customers are becoming more sophisticated and empowered to demand exactly what they want from companies, which accelerates the importance of understanding exact customer needs, and using those insights to drive supply chains and deliver superior customer value (Piercy, 2007).

Several factors contribute to today's modern marketing environment: globalisation, customer sophistication, shifting organizational structures, and increased dependence on information technology (Day, 2011). On the one hand, digital technologies and social networks are the reason behind customers' increasing expectations of personalised services, adding pressure on companies to adapt their offerings (Pero & Lamberti, 2013). However, those technologies may also help companies become more in touch with customers to identify their exact volatile needs and adopt responsive operational processes to deliver the appropriate offerings (Ardito et al., 2018).

As customers now interact with firms through a vast range of touchpoints in online and offline channels, customer journeys are becoming increasingly complex (Lemon & Verhoef, 2016). One way to keep up with the evolving consumer behaviour is to leverage the power of technology to collect both solicited and unsolicited feedback to listen to the voice of the customer (VoC) (Stegemyr & Thell, 2021). This way, customer needs, wants, and pain points can be captured in order to refine and develop an optimal product or service offering (Lee et al., 2014).

Digital marketing operations involve the application of technologies to scale and effectively enhance customer interactivity (Juttner et al., 2010). By incorporating digital technologies in the marketing process, companies can become more in touch with customers at different touchpoints throughout the customer lifecycle. This allows a company to build a complete picture of the experience they are delivering to every customer that they have at each step of the journey (Giménez &Ventura, 2003). Once this complete picture is formed, information can be extracted and fed back into the organisation.

As firms begin to focus their marketing processes on revealing exact customer needs, they must ensure that those insights drive productive and efficient actions in supply chains to achieve excellent business results (López Cabarcos et al., 2020). This highlights the need to create a common interface between a company's marketing and operational activities to achieve synergy (Zokaei & Hines, 2007).

If a company's marketing department is strongly focused on customer interactions and feedback, without directly communicating its results with the rest of the organisation, the company may fail to achieve efficiency in operational activities, leading to unfulfilled demand (Ardito et al., 2018). On the other hand, a company that

exclusively focuses on delivering optimal products from a cost-optimisation point of view would then struggle to deliver customer value (Jüttner et al., 2010). It is therefore important to create interdepartmental relationships between organisational units to introduce a joint decision-making process between front-end marketing and supply chains. The following research questions and scheme presented in Figure 1 will be addressed in this paper to gain the required knowledge and reach the final objective:

RQ1: what are the necessary conditions for a company to shift towards a customer-centric organisational structure?

RQ2: how can the marketing-supply chain interface contribute to the overall delivery of customer value?

RQ3: how do contextual factors influence the adoption of the supply chain-marketing interface?

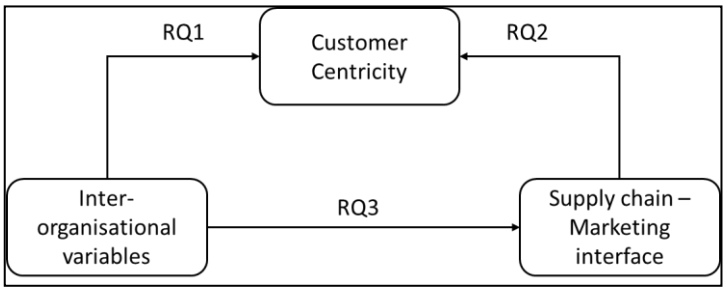


Figure 1. The research scheme used to steer the research paper

Literature Review

The literature review aims to explore literature addressing the ways in which an organisation can become more customer-centric by adopting strategic marketing activities and creating an interface between marketing and supply chain to remain competitive in dynamic markets. There are five pillars an organisation should consider in order to effectively bridge the gap between what customers expect and what they get (Todor, 2016). These attributes will serve as a guide to the structure of this literature review as depicted in Figure 2.

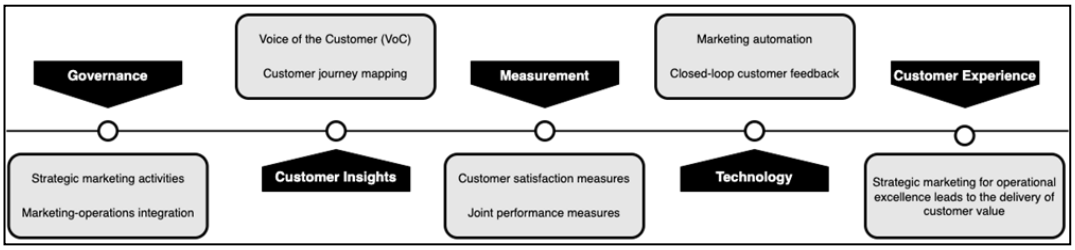


Figure 2. The five attributes of marketing operations required to keep up with evolving consumer behaviour

Strategic Marketing

Technology has turned some customer journeys fully digital, which allows companies to serve a global customer base (Ardito et al., 2018). However, to ensure that the customer experience delivers superior value, Tang (2009) highlights that people, processes, and governance must be structured to deliver efficient marketing activities. In line with this, literature has begun to acknowledge that marketing needs to be strategic rather than tactical to drive efficient changes in a company's strategy (Amico et al., 2022a). To do so, organisations must reform organisational structures and establish new guidelines in order to allow marketing to gain more relevance in an organisation (Zokaei & Hines, 2007).

According to Muralidharan and Raval (2018) while companies are adopting structured process improvement methods such as Lean Manufacturing and Six Sigma in their supply chains, the marketing field remains characterised by its unstructured work environment. Furthermore, although marketers are undertaking a wide

range of digital transformations to keep up with dynamic market demands, they are unable to deliver aspirations due to the non-scientific decision-making processes (De Haan et al., 2015).

As more firms attempt to increase their customer centricity and thereby improve their operational performance, Lee et al. (2014) examine the impact of an organisation's structural design on its marketing outcomes. They highlight how logical, standardised marketing processes serve to effectively link employees to customers, creating an organisational structure that prioritises being customer-focused rather than product-focused, which in turn maximises customers' overall experience (Day, 2011).

Supply Chain - Marketing Interface

The evolution of marketing and its integration with other organisational functional areas is a topic widely discussed in the literature (Giménez, & Ventura, 2003). Specifically, there is increasing focus on ways in which marketing should cooperate with supply chain to develop successful innovation and enhance competitiveness (Franceschetto et al., 2022). Several functions are critical to the customer journey, including marketing, sales, customer service, and technical support. However, back-end functions are usually overlooked by marketers although they are critical to the creation and delivery of customer value (Amico et al., 2022b). This is why the joint role of supply chain and marketing is imperative to success (Mollenkopf et al., 2010).

Several studies highlight the importance of the integration of a company's marketing and supply chain to achieve superior performance for the firm. Those studies provide a range model to interface between marketing and back-end organisational units. There are several integration archetypes, each having different goals and contingent factors that impact their adoption (Tang, 2009). According to Pero and Lamberti (2013), the integration can vary from mutual isolation, characterized by an absence of information exchange and an avoidance of considering the counterpart's objectives, to full collaboration; when two organisational functions come together to work towards a common objective.

In practice, marketing and supply chain often experience conflicts due to their respective roles and responsibilities (Mollenkopf et al., 2010). Marketing is an externally focused unit whose main responsibility is meeting customer expectations quickly, while the supply chain is a functional area that focuses on developing an operational plan in order to meet the demand imposed by the marketers in a cost and time-efficient manner (Tang, 2009).

Customer Centricity

A customer journey is the series of actions and experiences that customers go through when interacting with a company and its brand (Sawhney & Piper, 2002). Prior research has conceptualised a customer journey in three overall stages: pre-purchase, purchase, and post-purchase (Lemon & Verhoef, 2016). It is important to note that customer experience does not only occur within the sales and marketing units of an organisation; many of the activities that occur along the customer journey concern other functional units within an organisation (Franceschetto et al., 2023).

A customer journey map (CJM) is a diagram that presents every stage of the customer experience by outlining the steps a customer takes to engage with a brand (Moon et al., 2016). The diagram, usually presented in the form of a timeline, gives an overall view of the entire customer journey, from initial awareness to post-purchase. Previous research has defined several methodologies to design a CJM that depicts all the different interactions that a customer has with a company (Moon et al., 2016; Cigolini et al., 2022). However, in order to really understand the customer experience, it is important to take a close look into what happens within each stage of the customer journey, since the journey is often not linear (Payaro and Papa, 2014).

During each stage, customers interact with the company at various points of customer contact, known as customer touch points. As the number of touchpoints increases, journey mapping becomes increasingly important to better deliver customer value (Zokaei & Hines, 2007). According to Found and Harrison (2012), in order to understand exact customer value and therefore tackle the first element of measuring the VoC, the first step is to map the different touch points in order to identify the gap between customer experience and expectation at each point. Identifying customer touchpoints starts with making a list of all the instances and

channels that a customer is in contact with the organisation before, during, and after a transaction is made (Amico & Cigolini, 2023).

Customer input is crucial in this process as it is important to understand the customer journey from the customer's perspective. These insights can be collected through qualitative customer research and allow a company to understand which touchpoints are critical to customer experience (Rosenbaum et al., 2017). Once an organisation can understand the VoC throughout the various touch points, it may begin improving value creation at each step, resulting in an enhancement of the customer journey and overall customer experience.

Marketing Automation

Marketing has a strong responsibility to lead with innovation and deliver superior customer value. To do so, it must leverage the application of technologies to improve customer knowledge and match their needs with operational activities (Sawhney & Piper, 2002). This way, customer insights captured by marketing can be used to drive operational changes and achieve growth by meeting exact customer expectations.

The previous sections outline the importance of structuring marketing activities in order to effectively capture the VoC and quantify customer satisfaction through relevant metrics. In line with this, marketing automation involves adopting technologies to help marketers manage their activities in a structured way (Xu et al., 2002). It leverages real-time data from multiple data sources to understand customer behaviour and respond accordingly to deliver customer value (Heimbach et al., 2015; Cigolini et al., 2021).

In addition, marketing automation is often associated with Customer Relationship Management (CRM), whose primary purpose is to use software to track customer behaviour and manage customer relationships in an organised manner (Xu et al., 2022). As the number of customer touch points increases in response to the continuous increase in supply and demand, it becomes more complex to collect insights from a wide range of customers (Lemon & Verhoef, 2016), This introduces the need for automation and CRM to facilitate feedback collection and efficiently process relevant insights.

Marketing automation also facilitates the integration of marketing and supply chain, as the actionable insights and metrics processed by the front-end can then be centralised on a common platform and shared across the organisation. This creates an efficient supply chain-marketing interface that continuously feeds new customer insights into back-end units and drives behind the scenes supply chains to improve customer experience (Todor, 2016).

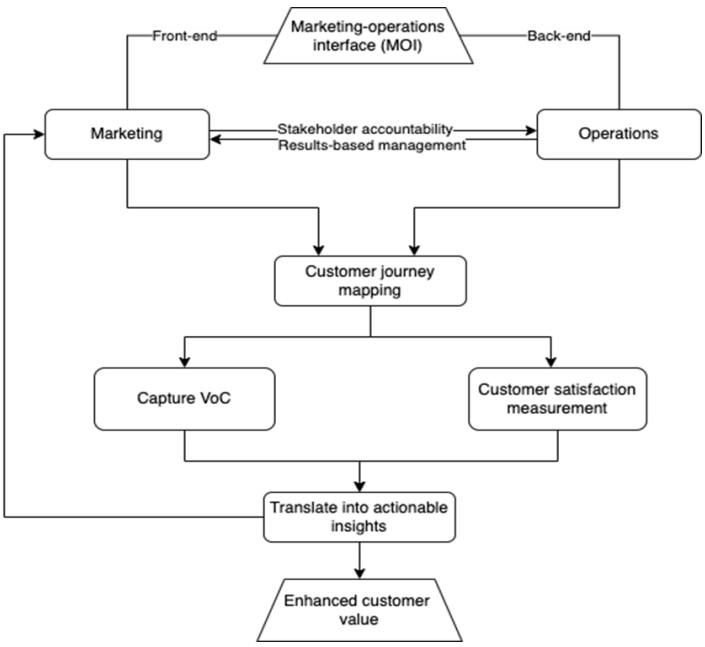


Figure 3. Marketing-supply chain integration framework for customer value creation

Conceptual Framework

This section supports the notion that a common supply chain-marketing interface contributes to the effectiveness of customer value creation. A conceptual framework is proposed, that defines a systematic process to deliver customer value by creating synergy through the integration of marketing and supply chain activities. The development of the conceptual framework involved two main phases. The first phase began by developing an initial framework using insights from existing literature. The second phase then involved testing and progressively refining it as a result of insights uncovered during the empirical activities conducted at Company Beta.

The conceptual framework aims to provide managers with guidelines for a joint marketing and supply chain planning process when they are struggling to deliver optimal customer value. However, before this interface can be implemented, a manager must first ensure that the organisation has a customer-centric organisational structure, meaning that its strategy and culture focus on fostering a positive customer experience at every stage of the customer journey (Lamberti & Pero, 2019). If this is not the case, structural changes must first be made to the organisation to accommodate the supply chain-marketing interface (Figure 3).

Methodology

The purpose of the empirical activities conducted in this research project is to test the conceptual framework developed as a result of a literature review on the integration of marketing and supply chain to deliver optimal customer value. This research is crucial since academia still lacks a definitive framework for the full integration of marketing and supply chain for customer-centricity and has not particularly investigated the organisational issues and dynamics required for this interface. An empirical investigation has been pursued because inter-organisational dynamics and emotional variables such as customer value measurement are hardly observable through explanatory studies. The research project is centred on capturing the VoC and delivering customer value by leveraging a supply chain-marketing interface. Two major sub-parts of the new VoC strategy have been launched.

The first part of the VoC strategy is deployed on a small scale, solely focusing on delivering value to Company Beta users, i.e., the developers. Currently, Company Beta has over 130.000 software downloads each month, which in turn has a strong impact on customer value. This has driven the division to completely transform their product development approach from a ‘product-out’ strategy, to directly working with developers to provide exactly what their customers need. In order to do so, they must put the developers at the centre of their activity, which is in line with the VoC strategy to be deployed.

The second part of the VoC strategy captures the VoC on a wider scale throughout Company Beta’s entire online ecosystem. Due to the competitive nature of the industry, Company Beta needs a good online presence in order to remain a key player. Currently, the Company beta’s online ecosystem offers a variety of online customer journeys and touchpoints. The VoC strategy involves highlighting Company Beta’s most relevant online touchpoints and collecting insights from users at different stages throughout the various customer journeys. This allows us to calculate customer satisfaction metrics across Company Beta’s offerings, which can then be compared in order to identify areas which require improvements, driving actionable insights to supply chains, who can then work to deliver customer value.

Table 1. The two main steps required to deploy the VoC strategy

Step 1: feedback collection	a. Customer journey mapping andcritical touch point identification
	b. Developing a feedback collection strategy for each touch point
	c. Feedback collection at the derived touch points
Step 2: feedback handling	a. Feedback processing:calculation of metrics and translation into actionable insights
	b. Feedback reporting: channelling insights to the right stakeholders
	c. Closing the customer feedback loop

This way, information can be easily and quickly exchanged between marketing and technical experts, creating a strategic supply chain-marketing interface. Once this is achieved, we may begin to deploy the VoC strategy, which is divided into two main sub-parts, as described in Table 1.

VoC – Company Beta Software Users

Before the wide-scale launch of the VoC strategy across Company Beta's range of customer journeys, it was first deployed for the customer journey of one of Company Beta's most popular online offerings; embedded and development software. When exploring the stages, a developer goes through for a new embedded product design (see Figure 4), 50% of the total time spent occurs during the 'detailed design' and 'testing & debugging' stages, according to surveys conducted by Company Beta with lead developers. In those two time-consuming stages, software is a crucial tool required to successfully create a scalable prototype. This justifies the importance of prioritising Company Beta software for the VoC project, as it is a strong contributor to customer value.

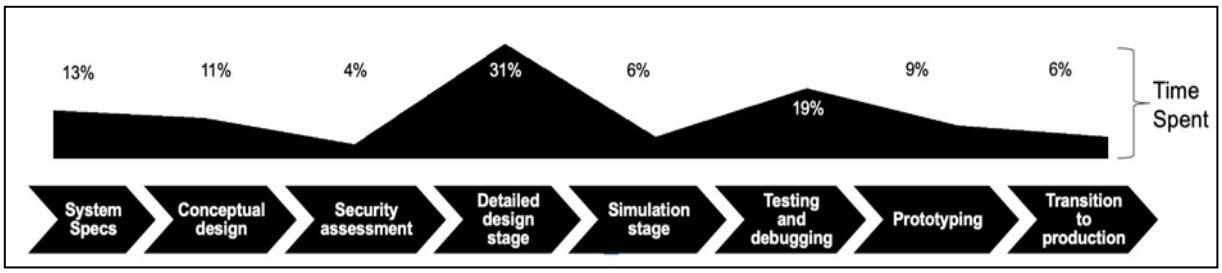


Figure 4. Stages of a new embedded product design process

In order to gain a holistic understanding of the software users' experiences and identify areas that require improvement, it is important to understand users' cumulative experience across the entire customer journey, considering both online and offline touch points. We first begin by mapping the users' broad customer journey; from the moment the need for a specific software is realised, until the developed prototype is ready for production. This was then followed by an in-depth analysis of each stage of the customer journey in a detailed customer journey map (CJM), which was divided into three macro-phases; search, download, and use of the software.

There is a range of interaction points throughout the journey where the VoC can be captured. To identify those critical touch points from which customer feedback would be most constructive, they have been prioritised through an analysis of existing feedback from software users to identify touch points with a strong impact on customer value, along with analytics data to identify high-traffic touch points. Finally, the following touch points have been prioritised:

1. Software pages: the various pages on Company Beta's online ecosystem where developers can access software information and download the software
2. Emails: feedback surveys sent by email to users after they have used the software for a period of time

For each of those touch points, a customer journey map is constructed to identify pain points a customer may face during the journey, along with possible strategic actions to overcome the barriers. Finally, specific metrics are assigned to each touch point to monitor the performance of the corrective actions taken and ensure they have had a positive impact on customer value delivery. Later, once feedback is collected from users through surveys, it's possible to understand individual experiences and gather more in-depth insight into the different barriers they may face.

In order to begin the customer feedback collection process, a collaborative plan must be constructed involving all stakeholders who have an impact on customer experience throughout the software users' customer journey. This plan is to be implemented across all critical touch points along the journey in order to ensure successful closed-loop customer feedback collection. The collaborative plan is presented in Table 2. Once the VoC plan has been defined, the two main steps of the VoC strategy must be adapted and deployed (Table 1). The next two sections will outline the activities required for step 1, adapted to each of the two explored touch points. Once this is done, the following section will introduce step 2 of the VoC strategy, which has been generalised for the entire software customer journey.

Table 2. The defined collaborative plan for the feedback collection strategy on Company Beta's software

Stakeholder responsibilities	Digital marketers: CJM + feedback collection & reporting Technical marketers: software presentation on Company Beta's website Software developers: software package quality & availability Web developers: technical implications on Company Beta's website Technical support: provide technical assistance to software users
Joint performance measures	Customer satisfaction score (CSAT) Customer effort score (CES) Net promoter score (NPS) % of users encountering issues
Cross-functional team	Front-end: digital and technical marketers, and technical support Back-end: web and software developers
Periodic review reporting	Bi-weekly review sessions between involved stakeholders Monthly reporting sessions involving external stakeholders

Model

Touch Point: Online Software Pages

Currently, the Company beta's online ecosystem offers a variety of online customer journeys and touchpoints. Software pages are a considerably high traffic touch point, with around half a million page visits and over 130 thousand software downloads each month. Users access software pages to get information about the software, and if it meets their needs, they download the software directly from the page. Therefore, it is crucial to optimise software pages, as it's one of the most important touch points that can drive higher conversion rates.

Step 1: Customer Journey Mapping

Considering the entire customer journey map, the software 'download' phase corresponds to the stage in which a 'visitor' converts into a 'customer', making Company Beta's software pages a critical final touch point where visitors make a decision to become users of Company Beta's software. Going more in depth, the customer journey in Figure 4 outlines the steps a visitor undertakes on Company Beta's website up to the point of 'conversion', once the software download begins.

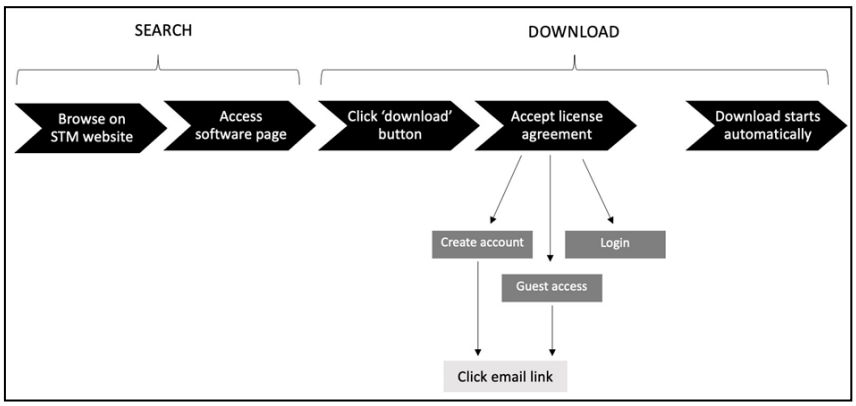


Figure 5. The journey an online visitor undergoes up to the point of conversion.

In order to collect real-time active feedback from users, the survey will appear in the form of a pop-up on the users' screen once the software download begins. This interceptive survey method allows to capture the users' attention and collects a large number of immediate responses while the users are waiting for their software to

finish downloading. In addition, since Company Beta has over 100 thousand software downloads each month, a sample size of 25% has been set, for which the survey will appear to a random selection of people, irrespective of the software they downloaded. This randomisation is done to ensure the results are representative of all software download journeys on Company Beta's online ecosystem.

Finally, to ensure that the survey is not intrusive, specifically for users who download multiple Company Beta software, quarantine rules are applied. If a user has been exposed to the survey in the past X (predefined) days, they do not see the survey again until that time has elapsed.

Step 2: Develop a Feedback Collection Strategy

Once the survey has been defined, the following feedback collection strategy is developed, where decisions on the type of survey and the target segment exposed to the survey are made.

Table 3. Survey information

Survey type	Pop-up survey on Company Beta website
Survey trigger	Start of software download
Survey sampling	25% of all users downloading Company Beta software
Quarantine periods	Declined survey: 7 days Submitted feedback: 21 days

In order to collect real-time active feedback from users, the survey will appear in the form of a pop-up on the users' screen once the software download begins.

Step 3: Feedback Collection

Once the survey and feedback collection strategy has been defined, the technical implementation required to launch the survey begins with collecting feedback. For this interceptive pop-up survey, the software's automation rules can automatically trigger the survey upon the users' software download.

Results

The conceptual framework defined as a result of the literature review has served as a guide throughout the entire VoC strategy deployment (see Figure 3). In turn, the results of the empirical activities reflect many benefits of the marketing-supply chain interface in customer value creation for Company Beta.

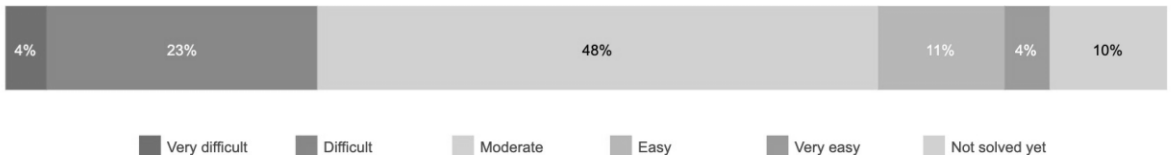
Following the deployment of both parts of the VoC strategy outlined in the Methodology and Model section, it's possible to generate comparable customer satisfaction metrics for the explored touch point. In doing so, customer journeys which require corrective actions were identified, and the supply chain-marketing interface was leveraged to create a closed-loop customer feedback cycle, delivering enhanced customer value.

Overall, through joint performance measures comparable across touch points, along with full visibility between the stakeholders involved in the supply chain-marketing interface, accountable divisions were incentivised to reach and surpass their set targets. This has led to an overall improvement in customer satisfaction metrics across Company Beta's entire online ecosystem. To provide an example of customer value improvement through the supply chain-marketing framework, the process to improve the customer effort score (CES) metric for Company Beta software is presented below.

Firstly, proactive customer feedback was collected from software users through email surveys as outlined in the Methodology section. One insight captured through these surveys is the level of ease of resolving issues encountered with the software. Users who have indicated that they encountered an issue with the software are asked to rate how easy it was for them to solve their issues, through the question displayed in Figure 6.

Figure 6. Customer effort score (CES) questions

Once the responses were collected, the corresponding CES metric is calculated, at a considerably low value of 2,9 out of 5. Initially, 27% of users found it difficult (or very difficult) to solve their issues, only 15% of the users found it easy, and 10% have not yet managed to solve their issue (see Figure 7). This indicates that Company Beta needs to improve the software support services provided to increase the CES score.



(a) CES: distribution of user responses

(b) CES score

Figure 7. Initial customer effort score (CES): ease of resolving software issues

Company Beta provides a range of software support services to its users, meaning that in order to improve the CES score, there are many possible stakeholders to involve in a vast range of improvement activities. It is therefore important to identify and prioritise the services requiring immediate attention. To do so, the survey includes a question which asks users to select the support channels they have used (see Figure 8).

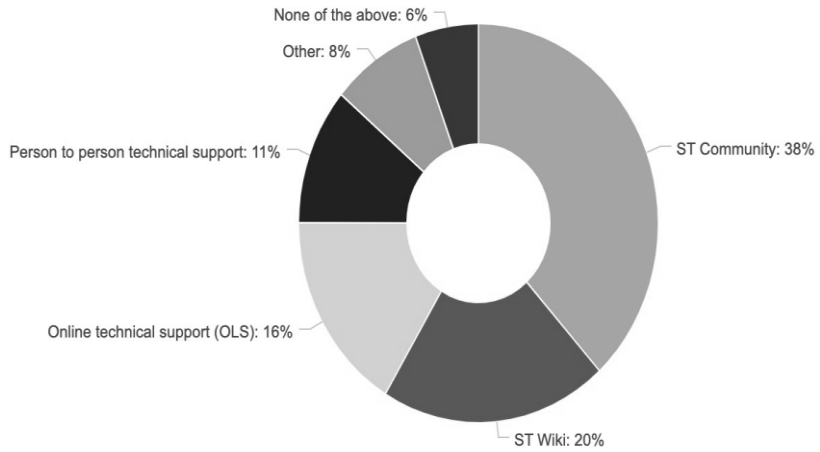


Figure 8. Distribution of Company Beta support channels used by software users

During the feedback processing step, the responses to the CES question were filtered by each support channel in order to rank the channels by performance and prioritise corrective actions for the support channels with lower CES values.

This aggregation of customer feedback by type of support channel allowed for actionable insights to be shared along the supply chain-marketing interface and routed to the divisions directly responsible for the three

aforementioned channels with a low CES score. The divisions must then dig further into the responses in order to allocate responsibilities to the accountable stakeholders. For example, the division responsible for 'Online technical support' has filtered the negative feedback responses by region, which allowed them to identify that the stakeholders responsible for support in China and Germany required the most improvement activities.Next, corrective actions are taken by the various stakeholders to attempt to improve the CES score and then documented on the platform. This way, all back-end activities are logged in a common platform to trace back improvements and avoid duplicated actions.

Finally, to close the customer feedback loop, the performance of software support is reassessed post-changes to identify whether the improvement activities taken by various divisions have led to an overall improvement in the CES metric. Overall, the CES increased by an increment of 0,5 (16,7% improvement), and looking closely, the percentage of users finding it difficult to solve their issues, or who were not able to solve them has reduced by 4% and 3% respectively.

This indicates that the corrective actions taken have led to an overall improvement in customer value delivery. Fortunately, the resources were invested in the right direction thanks to the result-based management strategy, which drives strategic data-driven decisions to be made in the back-end based on the voice of the customer. Furthermore, the supply chain-marketing interface has also contributed to Company Beta's overall business performance, as resources were prioritised and allocated to the touch points with relatively lower customer satisfaction ratings.

Thanks to the results-based management strategy, stakeholders are able to identify exactly which areas needed improvement, leading to an optimisation of both cost and time resources. Through the adoption of a closed-loop customer feedback cycle in the supply chain-marketing interface, which follows the structure of the Six Sigma DMAIC cycle (see Table 4), the following lean wastes were reduced:

Table 4. The lean wastes reduced by supply chain-marketing interface for value creation

Lean waste	Description
Defects	Customer pain points and issues were captured in real-time, allowing quick fixes to be made accordingly
Over-processing	The VoC uncovers exact customer preferences, leading to reduction in unnecessary value creation activities, and prioritisation of operational activities
Waiting	The supply chain-marketing allows for integration between divisions, reducing waiting times due to slow communication
Motion	Using an online platform to manage the supply chain-marketing leads to the reduction of unnecessary movements or overlapping activities between divisions
Talent and creativity	The integration of stakeholders across different divisions creates synergy between knowledge and skills

Overall, the variation of the customer satisfaction metrics when parameters in the feedback collection strategy are changed has introduced a constraint in the VoC strategy, since the performance of the different touch points on Company Beta's online ecosystem can only be compared as long as the same feedback collection strategy is used. This is because changing parameters within the strategy, such as the survey type or the time at which feedback is collected, strongly influences the users' psychology, leading to a variation in responses. Another implication uncovered by the empirical activities is the requirement of different degrees of integration between stakeholders in the supply chain-marketing interface. Due to the various roles and responsibilities, along with the complex nature of some touch points, full integration and transparency have caused some conflicts and a lack of teamwork between stakeholders due to different backgrounds, expertise, and cultures. As a result, the level of integration within the supply chain and marketing should be determined by contextual factors, depending on contingent variables specific to each explored customer journey.

Conclusions and Future Research Paths

The purpose of this paper is to provide a contribution to existing research on the integration of front-end marketing and supply chain activities. Specifically, it aims to outline the ways in which a strategic interface

between marketing and supply chain has a crucial role in the delivery of customer value, leading to overall business performance. To do so, the manuscript begins with an extensive literature review to develop an overview of the existing knowledge in the fields related to strategic marketing-supply chain integration and customer-centricity. From this, we infer that for a company to adopt a customer centric business model, some organisational changes must be made. Along with structural requirements such as modularity and decentralisation of activities, the application of systematic methodologies such as lean and six sigma to marketing activities is necessary to adopt a methodological rather than unstructured approach to marketing, leading to the overall efficiency of front-end activities. Once this is done, an organisation may begin to integrate its marketing and supply chain activities to put a continuous closed customer feedback loop in place. Existing research also addresses the requirements for a successful marketing-supply chain interface, along with the set of activities required to successfully capture the voice of the customer and ensure insights are processed strategically to drive operational improvements that deliver enhanced customer value.

Considering the contextual complexities outlined above, the marketing-supply chain interface requires added coordination costs and planning time, which may influence overall business performance. However, this drawback appears to be outweighed by the added benefits accrued to greater customer value delivery as well as the reduction of lean waste. To validate this, the research scope can be extended beyond the delivery of customer value to examine the impact of the proposed supply chain-marketing interface framework and the application of Lean Six Sigma tools in marketing on overall business performance. As with most studies, this research has some limitations that should be acknowledged. Firstly, although the conceptual framework has been successfully applied in a business context to create value for customers, the conclusions are limited in their generalisability, since one company does not represent a broader population of companies across different industries. The results of the study can be strengthened by further examination of the impact of the Supply chain-Marketing interface framework in various companies from the same industry as well in different industries. However, the results of this study are based on a VoC strategy which was deployed across a range of Company Beta's online offerings. This tested the supply chain-marketing interface framework in multiple customer journeys, involving a wide range of stakeholders within different divisions. This means that the results can be predicted to have more generality than those from a study focused on a single customer journey with a limited number of stakeholders.

Overall, the results of this study can be used as the base material for customer-centric organisations looking to involve their marketing and supply chain divisions in the customer value delivery process. The results of the empirical research are aligned with the literature review outcomes, and substantially confirm that the conceptual framework, endorsing the importance of closed-loop customer feedback, provides a starting point for understanding the role that a marketing-supply chain interface plays in delivering customer value. Nonetheless, to become a powerful tool applied to companies in different contexts, the framework and general insights uncovered from existing literature must be adapted according to specific contingencies.

Scientific Ethics Declaration

The authors declare that the scientific ethical and legal responsibility of this article published in EPSTEM journal belongs to the authors.

Acknowledgements

This article was presented as an oral presentation at the International Conference on Research in Engineering, Technology and Science (www.icrets.net) held in Budapest/Hungary on July 06-09, 2023.

References

Amico, C., Cigolini, R., & Frances *XXVI Summer School Proceedings of the Summer School Francesco Turco Industrial Systems Engineering.*Bergamo, Italy.

Amico, C., Cigolini, R., & Franceschetto, S. (2022a). Using blockchain to mitigate supply chain risks in the construction industry. *XXVI Summer School Proceedings of the Summer School Francesco Turco Industrial Systems Engineering.Bergamo, Italy.*

Amico, C., Cigolini R., Franceschetto, S. (2022b). Supply chain resilience in the European football industry: the impact of Covid-19. *XXVI Summer School Proceedings of the Summer School Francesco Turco Industrial Systems Engineering.*Bergamo, Italy.

Amico, C., Cigolini, R. (2023). Improving port supply chain through blockchain-based bills of lading: a quantitative approach and a case study. *Maritime Economics and Logistics*, 1-31.

Ardito, L., Petruzzelli, A. M., Panniello, U., & Garavelli, A. C. (2018). Towards industry 4.0: Mapping digital technologies for supply chain management-marketing integration. *Business Process Management Journal*, *25*(2), 323–346.

Cigolini, R., Franceschetto S., & Sianesi A. (2021). Mitigating the bullwhip effect in the electric power industry: a simulation model and a case study. *Proceedings of the Summer School Francesco Turco Industrial Systems Engineering.*Bergamo, Italy.

Cigolini, R., Franceschetto, S., & Sianesi, A. (2022). Shop floor control in the VLSI circuit manufacturing: a simulation approach and a case study. *International Journal of Production Research, 60*(18), 5450–5467.

Day, G. S. (2011). Closing the marketing capabilities gap, *Journal of Marketing*, *75*(4), 183–195.

De Haan, E., Verhoef, P. C. and Wiesel, T. (2015). The predictive ability of different customer feedback metrics for retention, *International Journal of Research in Marketing*, *32*(2), 195–206.

Found, P., & Harrison, R. (2012). Understanding the lean voice of the customer, *International Journal of Lean Six Sigma*, *3*(3), 251–267.

Franceschetto, S., Amico C., Brambilla M., & Cigolini, R. (2023). Improving supply chain in the automotive industry with the right bill of material configuration. *IEEE Engineering Management Review*, *51*(1), 214-237.

Franceschetto S., Amico C., Cigolini R. (2022). The 'new normal' in the automotive supply chain after Covid. *XXVI Summer School Proceedings of the Summer School Francesco Turco Industrial Systems Engineering.*Bergamo, Italy.

Giménez, C., & Ventura, E. (2003). Logistics-production, logistics-marketing and external integration: Their impact on performance.*International Journal of Opeations & Production Managment, 25*(1), 20-38.

Heimbach, I., Kostyra, D. S., & Hinz, O. (2015). Marketing automation, *Business Informati-on Systems Engineering*, *57*(2), 129–133.

Jüttner, U., Christopher, M., & Godsell, J. (2010). A strategic framework for integrating marketing and supply chain strategies, *The International Journal of Logistics Management*, *21*(1), 104–126.

Lamberti, L. (2013). Customer centricity: the construct and the operational antecedents. *Journal of Strategic Marketing*, *21*(7), 588-612.

Lamberti, L., & Pero, M. (2019). Special issue editorial: Managing the supply chain management–marketing interface. *Business Process Management Journal*, *25*(2), 246-249.

Lee, J.-Y., Kozlenkova, I. V., & Palmatier, R. W. (2014). Structural marketing: Using organizational structure to achieve marketing objectives, *Journal of the Academy of Marketing Science*, *43*(1), 73–99.

Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey, *Journal of Marketing*, *80*(6), 69–96.

López Cabarcos, M. Á., Srinivasan, S., Vázquez-Rodríguez, P., (2020). The role of product innovation and customer centricity in transforming tacit and explicit knowledge into profitability. *Journal of Knowledge Management, 24*(5), 1037-1057.

Mollenkopf, D. A., Frankel, R. and Russo, I. (2010). Creating value through returns management: Exploring the marketing-operations interface. *Journal of Operations Management*, *29*(5), 391–403

Moon, H., Han, S. H., Chun, J., & Hong, S. W. (2016). A design process for a customer journey map: A case study on mobile services, *Human Factors and Ergonomics in Manufacturing and Service Industries*, *26*(4), 501–514.

Muralidharan, K., & Raval, N. (2018). Scientific outlook of lean in six sigma marketing, *Seventh International Conference on Lean Six Sigma*.Dubai.

Noci, G., (2019). The evolving nature of the marketing–supply chain management interface in contemporary markets. *Business Process Management Journal*, *25*(2), 379-383.

Payaro, A. & Papa, A. R. (2014). The wastes in lean marketing. a proposed taxonomy and an exploratory study on Italian smes, Management and Marketing, In *Proceedings of the 9th International Conference on Business Excellence*

Pero, M., Lamberti, L. (2013). The supply chain management-marketing interface in product development: An exploratory study. *Business Process Management Journal*, *19*(2), 217-244.

Piercy, N. (2007). Framing the problematic relationship between the marketing and operations functions, *Journal of Strategic Marketing*, *15*(2-3), 185–207.

Rosenbaum, M. S., Otalora, M. L., & Ramírez, G. C. (2017). How to create a realistic customer journey map. *Business Horizons*, *60*(1), 143–150.

Sawhney, R., & Piper, C. (2002). Value creation through enriched marketing-operations interfaces: An empirical study in the printed circuit board industry. *Journal of Operations Management, 20*(3), 259–272.

Stegemyr, J., Thell, L., (2021). Kano model deployment and its relation to customer centricity. *Chalmers University of Technology, 1*(1).

Tang, C. S. (2009). A review of marketing-operations interface models: From co-existence to coordination and collaboration. *SSRN Electronic Journal.* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1568947

Todor, R. D. (2016). Marketing automation. *Transilvania University of Brasov. Economic Sciences*, *Series V, 9(2),*87-94.

Xu, Y., Yen, D. C., Lin, B., & Chou, D. C. (2002). Adopting customer relationship management technology, *Industrial Management: Data Systems*, *102*(8), 442–452.

Zokaei, K. & Hines, P. (2007). Achieving consumer focus in supply chains, *International Journal of Physical Distribution; Logistics Management*. *37*(3), 223–247.

Author Information

Simone Franceschetto
Polytechnic University of Milan
Milano, Italy
Contact e-mail: *simone.franceschetto@polimi.it*

Roberto Cigolini
Polytechnic University of Milan
Milano , Italy

Lucio Lamberti
Polytechnic University of Milan
Milano, Italy

To cite this article:

Franceschetto, S., Cigolini, R., & Lamberti, L. (2023). Improving the supply chain - marketing interface, translating the voice of the customer into operational processes. *The Eurasia Proceedings of Science, Technology, Engineering & Mathematics (EPSTEM), 23,* 471-484