

Impact of Digital Marketing on Supply Chain Collaboration Through S &OP Framework: A Retail Industry Case Study

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Abstract

The paper proposes a collaborative S&OP framework to encapsulate the digital marketing and supply chain collaboration to optimise firm performance by identifying the gaps in the existing frameworks and performance metrics. We argue that the demand and supply side of a business remains pivotal towards how a business operates and achieves sustainability. Hence, creating the need of further observations of achieving collaboration between both spectrums and able to apply in accordance to the proposed objectives. The paper examines the retail industry, in order to identify marketing and supply chain collaboration through the S&OP framework. The research has identified several findings within applications towards retail, implying further focus towards product and distribution planning due to the product focused nature of the industry. We suggest further applications of the framework to be reviewed and adjusted in accordance to the proposed objectives so as to align all departments within the company.

Keywords

Marketing, Digital Marketing, Supply Chain Management, DCM, S&OP, Demand-Supply, Operations Planning

1. Background

The integration of Supply Chain Management and Marketing functions is vital in delivering high quality of services to customers. Without the integration of demand and supply functions, a firm may underperform. It is further elaborated on the importance of integrating both of these functions. Marketing is crucial in maintaining varying demands and consumer segments to identify suitable product offerings, while Supply Chain Management concerns the operational side of the business, such as inbound, outbound, holding stocks, and on-time deliveries. Thus, the importance of integrating both functions is evident. In achieving cooperation between both departments, there are specific challenges that arise. Although the importance of aligning both departments has been addressed previously, having a framework that could conceptualise both demand and supply is highlighted to be fundamental in creating consumer value. A performance measurement metric is also crucial in assessing marketing and supply chain alignment results. The alignment has been repeatedly supported in the literature; however, there is little focus on identifying metrics that assess the impact.

This paper is to highlight the impact of marketing and supply chain collaboration towards operational performance. The scope of the study will be limited to the SME landscape in Indonesia, specifically within the grocery industry. Hence, the research adopts a case study of SMEs operating within the grocery landscape. The case study company was established in 2018 as an online grocery service to provide convenience for its consumers. The company utilises digital marketing channels to promote its offerings and an ERP system to maintain its operations. The areas of marketing are discussed, specifically digital marketing and its capabilities. In addition, the areas of the supply chain are also discussed, emphasising the three flows, namely financial, information, and material flow. Hence, this paper provides a framework applicable to aligning marketing and supply chain activities and measurement metrics to streamline the decision-making process.

The paper outlines the importance of S&OP in balancing demand and supply within firms. The outcomes suggest that both demand and supply spectrums may have separate roles in fulfilling the collaboration, where marketing

operates toward building the demand, while the supply chain is tasked to serve the demand. The research also outlines the differences in S&OP applications across industries, primarily between manufacturing and retail sector through aspects such as time frame, input, objective, scope, and mechanisms. Further conclusions of the analysis provide us with the opportunity to suggest a framework that could be applicable to retailers in order to increase their performance as well as associated performance metrics.

Considering the retailer's positioning, the research identifies key pillars, namely product, demand, and supply, which is translated to the proposed S&OP framework. The paper also emphasises on the importance of risk management through product planning, which is the driving factor in the execution of supply-demand collaboration within retailers. Finally, the performance indicators comprised of financial, operational, and process standpoint are proposed, in consideration from various examinations.

The contributions of this paper include:

- The operations planning in the retail industry is different from other industries, emphasising on management of product offering. Hence, we propose a framework that would adapt towards the retail industry. Our proposed framework consists of additional steps leaned towards product and distribution management, which is prevalent within the industry context.
- The performance metrics have also been established, in order to improve accountability between departments. We found the similarities between metrics among industries, emphasising on metrics that capture the overall business performance. The research specifically suggest metrics upon three pillars, namely from operational, financial, and consumer related metrics.
- The research outlines the suggested implementation of framework and metrics, in order to provide practitioners with further comprehension towards evaluating their business performance.

2. Literature Review

The importance of marketing is the exchange of values between parties. Moreover, marketing emphasises how exchanges are made, encouraged, and promoted. It is defined as an organisational purpose containing a set of actions to formulate, convey, and deliver value to consumers and maintain consumer relationships to benefit the organisation and its key stakeholders. While these views provide a great comprehension of marketing, it is also essential for firms to establish consumer relationships (Morgan et al. 2009). Having the presence of relationship marketing can produce long-term consumer relationships and improve consumer retention. Firms can also reduce marketing costs, target high-net-worth consumers, and facilitate the development of databases, which translates to increased marketing effectiveness. Another fundamental concept of relationship marketing lies within the core values seen in its focus on collaboration and mutual value creation, which considers all value chain members, from suppliers to customers, as supporters in value creation rather than adversaries (Wang 2020; Wang and Head 2005).

Supply chain management is best elaborated as integrating business operations from the original suppliers through the end-consumers in products, services, and information that add value for consumers, according to the Global Supply Chain Foundation. Supervision of chains consists of planning, realising, and maintaining the efficiency and effectiveness of the discharge and storage of goods or services. In addition, the related information between consumption points to meet consumers' needs is also considered. Supply chain management is **integration**, reflected as a particular form of strategic collaboration between chain members, which drives the channel's overall performance. Therefore, the primary orientation of supply chain management is to meet consumers' expectations, where companies can distribute products to consumers promptly, have excellent quality, and are cost-efficient (Setijadi et al. 2021). Effective supply chain management requires players to create long-term relationships. Therefore, successful supply chain management involves forming strategic alliances. In this case, supply chain management emphasises a relationship orientation. Conclusively, those inter-firm affinities connect firms, driving success. The proposed firm partnerships may also involve an expansive range of strategic alliances among manufacturers, distributors, and information technology professionals to provide functional integration (Setijadi et al. 2021).

The research has emphasised the S&OP process, which is utilised to coordinate crucial activities within a company. The effects of applying such processes enable an improved flow throughout the chain. The previous chapters have highlighted supply chain flows consisting of information, financial, and material flows (Adamczak et al. 2013; Rakićević 2018). S&OP is transforming into a demand-driven process. As a result, a more significant focus is given to the demand planning phase of the process. In addition, many authors highlight the importance of considering the company's strategic objectives when determining actions required to balance the demand and

supply. In other words, outcomes should consider potential supply constraints while aligning the company's strategic direction (Kymäläinen 2020; Wagner et al. 2014). The end goal for this process would be to balance demand and supply and improve vertical and horizontal alignment.

Examining further, the core of S&OP is joint planning and decision-making between departments, where the result would eventually enhance consumer service and performance within the supply chain. Generally, the S&OP process uses inputs like demand, sales and production plans, while supply, procurement, and distribution are less significant. However, both Thomé et al. (2012) and Prokopets (2012) argue that the production capacity must also be considered and evaluated along with constraints on pricing, competitive actions, and inventory.

Although the basic S&OP process involves the proposed five steps, it will still cater to following the industry and company business model. Hence, constraints must be identified before a company can achieve the intended supply-demand balance.

In order to have more comprehension regarding S&OP, we compare various implementations across industries. The comparison would identify aspects such as objectives, scope, input, mechanisms, and time frame.

	Manufacturing	Retail
Time Frame	Emphasises on long-term planning (12,-24 months) towards production.	Involves multiple increments of time horizons, ranged from 3,6,12-month period.
Input	Marketing, Finance, Operations	Marketing, Finance, Operations
Objective	Achieve alignment between production and inventory levels.	Manage product requirements and availability in accordance to demand, identify supply side requirements.
Scope	Manages material and production requirements.	Manages large product assortments.
Mechanisms	Meetings, Organisation, Performance Management, Tools	Meetings, Organisation, Performance Management, Tools

Figure 1. Comparison between Manufacturing and Retail S&OP

We refer to the research provided by Kymäläinen (2020) and Ivert et al. (2015) that examines S&OP implementation within manufacturing. S&OP within manufacturing is typically utilised to develop a long-term plan for production and inventory levels and forecast future demand. It is a collaborative process that requires input from all departments, including sales, marketing, finance, and operations. The goal of S&OP in manufacturing is achieve alignment between that production and inventory levels towards demand. The processes for S&OP in manufacturing and retail also involve different levels of detail and analysis. In manufacturing, S&OP typically involves analysing detailed data such as production costs, inventory levels, and customer demand.

On the other hand, S&OP in retail is often more focused on understanding customer preferences and trends so that the proper inventory is available when needed. Finally, S&OP in manufacturing and retail also differ in terms of the time frame they cover. In manufacturing, S&OP typically covers a longer time frame and involves more detailed planning. On the other hand, in retail, S&OP often covers a shorter time frame and is more agile in responding to changes in customer preferences. Furthermore, we identified that both industries implement similar steps/activities among operations planning in terms of fulfilling demand and supply. However, since retail is mainly demand-centric, we would identify a difference within product where retail would firmly revolve.

Methodology

Both qualitative and quantitative methods are utilised in case studies that analyse business operations undertaken by the company. As the proposed process consists of the contribution from the management, further testing is required to explore the contributions of the proposed relationship to the case study company. Researchers argued that supply chain management research mainly emphasises quantitative methods when conducting empirical studies focusing heavily on statistical testing and simulation techniques. Supply Chain Management research is interdisciplinary; thus, various quantitative and qualitative methods should be conducted. Haddad (2016) and Elzarka (2010) suggested using hybrid methods by combining qualitative and quantitative methods to provide an in-depth viewpoint. The research design is categorised as the general and strategic plan that relates the conceptual research problem to the empirical research approach and also entails further investigation regarding the concepts, theories, and practices between the marketing-supply chains. Further, collecting important data could support the framework development.

3.1 Data Collection

The research is based on literature from disciplines and observations. Conceptual frameworks in the previous chapter were developed to investigate the likely impact of marketing-supply chain management integration on performance. Data collection aims to systematically gather information related to the research to ensure accuracy and facilitate data analysis. The data is collected in two ways: semi-structured theme interviews. The interview aims to gather insight from the companies' approach to implementing marketing, their usage of digital channels, and the impacts and difficulties experienced in using them. The interview also discussed the company's supply chain activities and how digital marketing has affected supply chain operations. In addition, the research obtained various data regarding historical performance (quantitative), business models, procedures, and consumer-supplier relationships through the interview. The case company was selected to inspect the retail-SME sector in Indonesia, specifically within the grocery space.

3.2 Case Study

Company A was founded in 2018 as an e-grocery SME based in Indonesia. The company aims to provide various products, including food, beverages, and basic household needs. Company A has a growing team of 15-20 employees with an annual sales turnover of up to 900 million Rupiah. As an e-grocer, they establish their presence by leveraging online platforms such as websites and social media. Like other grocers, they provide wide assortments of items, emphasising providing ready-stock items sourced from various suppliers. Operating online, the company relies on their website as their point of sale, acting as a consumer touchpoint whereby orders are transmitted, received, and delivered to the consumer.

The purpose of the study is to examine the implementation of a Sales and Operations Planning (S&OP) process at a supermarket. S&OP is a management process that helps businesses align their demand and supply in order to better serve their customers and achieve corporate objectives. According to the interview, the case study company has indicated four main components within their decision-making process: demand planning, supply planning, the pre-meeting, and execution within their operations, which is currently implemented.

Demand planning consists of forecasting the demand for the supermarket's products based on a variety of factors. The demand planning provides the purpose is to consolidate the sales forecast and construct a demand plan in collaboration with the sales team. The demand plan is used as the main input for the S&OP process. The current process of demand planning includes a review of the sales forecast, forecasting accuracy, and order intake. The output of the demand review is a demand plan that reflects the true needs of the market. The company would usually review their performance on a monthly basis in order to identify which items are selling and demanded by their consumers. The method of identification is mainly derived through their E-Commerce and Website, where it is connected to their internal book-keeping software.

Supply planning, on the other hand, involves determining the availability of the supermarket's products and the necessary actions to ensure that they are in stock and ready for sale. The company have emphasised on providing availability and assortments for their consumers. Hence, this step mainly consists of coordination with their suppliers through messaging and direct calls. Supply planning for the company revolves around confirming the right amounts of products to be stocked and time horizon for delivery.

The pre-meeting is an important part of the S&OP process, as it accounts key departments from within the supermarket to discuss and review the demand and supply plans. This meeting allows for the identification of any potential issues or opportunities, and helps to ensure that the plans are aligned with the supermarket's goals and objectives.

Finally, the execution phase involves implementing the plans developed during the previous steps, including placing orders with suppliers, adjusting inventory levels, and managing the flow of products through the supply chain. By carefully managing the demand and supply of its products, the supermarket can improve its customer service, increase its profitability, and gain a competitive advantage in the market.

The implementation of marketing strategies provided significance to how the company operates. At the core of every marketing strategy lies the marketing mix. Gummesson (2011); Haddad 2016; Gyenge et al. (2021) mentioned that consumers seek other ways to gain value when purchasing through companies. The adoption of digital marketing has also shifted how marketers view each different element. Product assortment has been recognised as one of the most influential determinants of customers' channel choice. In a specific retail

context, It is perceived that extent of breadth (product categories), depth (SKUs within a variety) and selection of brands (number of brands) are available. It is indicated that consumers' behaviour towards a retail store or website is deeply connected to the assortment offered (Jindal et al. 2021).

Company A emphasises generating marketing Activities from their websites and social media channels. This statement was also supported by Rahayu and Day (2015), where most SMEs regard websites as the most important marketing channel and communications. Consumers would browse products and promotions from their websites instead of going through the company's social media page. The information obtained from its website and social media channel could be processed and distributed quickly due to the help of its IT systems. It is supplemented by the company's ERP system, which helps dismantle data obtained from its consumers. The process would translate to faster decision-making among departments, enabling a quicker response to consumer demands. When demands are satisfied, it will translate to financial performance within sales revenue.

Interview results show that company A aims to provide consumers with a no-hassle and simple online grocery shopping experience. To achieve this, delivery lead times are kept to a minimum by implementing same-day delivery. According to Table 1, the company provides various products in different categories. The types of supply chains for companies may vary by their respective industries. A single-stage supply chain system is utilised by company A, primarily observed within retail industries. The system is considered simple, where the retailer would procure inventory from various suppliers and would store it within their designated warehouse. Having adequate inventory ensures stock availability to anticipate consumer demands.

Additionally, this strategy differentiates from other online groceries, such as Happy Fresh, which relies on resellers and does not have inventory (made-to-order).

Company A deals with diverse suppliers from different product categories concerning their supply chain practices. Within stocking its inventory, problems could be identified, such as the inability to switch among suppliers. As each brand has designated suppliers within a geographical area, company A may not have the flexibility to switch if there are any shortages, translating to stockouts. Hence, the need to manage its supply side becomes more prevalent.

Company A leverages its operations in managing the supply chain by implementing its ERP System. The interviewee stated that the main advantage of implementing its ERP system was information visibility and improved processing speed. In addition, business processes are kept streamlined, enabling the identification of incoming information and allowing fast decision-making.

The interviewee stated that the company has started to adopt marketing activities digitally and supply chain efforts are streamlined enabling fast information flow. However, the performance of the company has not reflected optimal, primarily within its inventory and profitability. Further interviews suggest that the company is undergoing a few challenges within their current business, elaborated below.

The inability to encapsulate developing consumer preferences and seasonality influence the company's overall performance.

Pricing competition is evident, mainly derived from online and traditional retailers.

Establishing alignment within supply-demand planning of the business is inevitable, proposing a new approach to be adopted.

Supply chain issues arise from establishing working relationships, coordination, and the ability to switch among various suppliers.

3.3 The Need for Retail S&OP

Implementations of the S&OP process is commonly used within the manufacturing industry. Therefore, a different approach is required to cater for the retail sector. Observations have shown a minimum focus on integrated planning within retail compared to implementations within manufacturing. One difference is a more substantial contribution to functional roles in retailing. Much of S&OP is generally applied to manufacturing firms. While applications of S&OP may have a different trajectory, according to Kristensen and Jonsson (2017), manufacturing firms emphasise managing a dynamic complexity (uncertain demand and supply) in terms of volume and quantity within their S&OP design to prepare for disruptions. Unlike manufacturers, retailers position themselves as a medium or portal for suppliers, where there is a growing increase in the dependencies of suppliers on retailers. Suppliers drive value to retailers by providing high delivery reliability and fast delivery times. However, current

retail positioning and dependencies on supplier capabilities have reduced the retailers' urgency towards strategizing, perhaps translating to the underdeveloped level of planning integration in retailing compared to manufacturing. In addition, we can conclude distinct differences that may contribute to retail's tactical planning:

- Retailers provide the availability to consumers by emphasising their strategies toward product assortments.
- In managing uncertainty, retailers focus on sub-planning promotions, product introductions, and seasonal planning.
- Mitigation strategies in safety stock and pre-orders are required to manage uncertain demand during market events.
- Compared to manufacturing firms, retailers' supply chain demand is **consumer-centric**, and how consumers react to demand drivers.

Retailers act as a medium; hence they would manage a large and varied spectrum of products and consumers, emphasising their demand planning while ensuring availability from suppliers. The essence within the retail context incorporates complex assortments, supplier, channel base, and supply and demand uncertainty. The planning purposes in retail are emphasised toward high availability and efficient handling of an expansive assortment of products accompanied with sufficient volumes to realise scale benefits. A study by Adamczak et al. (2013); Dreyer et al. (2018) observes the operations planning process undertaken across four categories of retail grocery companies. Three characteristics influence retail strategy planning: product, demand, and supply.

Product-related characteristics comprise various assortments of grocery products. Depending on the items, they may have an interrelated demand and limited short life. Hence, retail firms need to emphasise product management, to balance the fast changes in market preferences with shortening product life cycles. In identifying demand-related characteristics, retail companies provide various consumer touch points through channels such as supermarkets, food service, and online platforms, which emphasise diverse consumer segments following an increase in complexity. In addition, companies also have to consider market cycles such as seasonality, promotional periods, and bundling strategies, further translating to price fluctuations. Further, grocery retailers must continuously address supply and demand requirements (promotional and pricing strategies). Supply-related characteristics reflect the nature of grocery retailers, where having a diverse product arrangement would be considered pivotal in attracting consumers. Hence, retailers usually source products from various choices of suppliers. This translates to the management of replenishment cycles that are short and reliable due to the previously mentioned shelf life and high service level conditions. This characteristic contrasts with several products' long lead times, distribution requirements, and seasonality.

3. Retail S&OP Framework

The following S&OP process is elaborated below, consisting of five steps: data gathering, product planning, demand planning, supply planning, and balancing & execution. These processes will be discussed further.

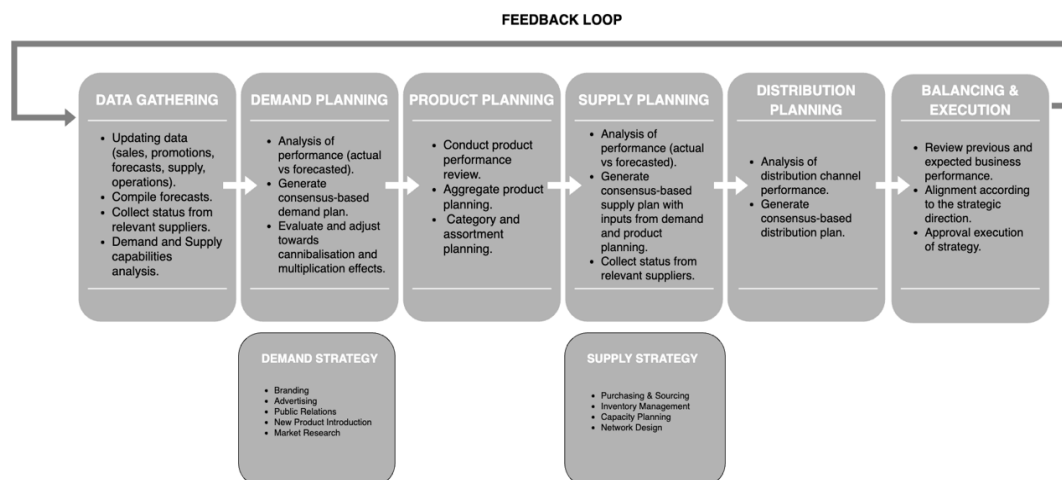


Figure 2. Proposed Retail Centric S&OP Framework

	Data Gathering	Demand Planning	Product Planning	Supply Planning	Distribution Planning	Balancing and Execution
Goal	<ul style="list-style-type: none"> Updating sales, supply, forecasts, and operations data. Compile forecasts Supplier status collection Demand and supply capability analysis 	<ul style="list-style-type: none"> Analysis of actual vs forecasted performance Consensus-based demand plan Cannibalisation and multiplication strategies 	<ul style="list-style-type: none"> Product performance review Aggregate product planning Category and assortment planning 	<ul style="list-style-type: none"> Analysis of actual vs forecasted performance Consensus-based supply plan Adaptation following demand 	<ul style="list-style-type: none"> Analysis of each distribution channel Consensus-based distribution plan Establish proper resource allocation 	<ul style="list-style-type: none"> Review business performance Strategic Alignment
Input	-	<ul style="list-style-type: none"> New product plans Consumer insights Market analysis Sales forecast 	<ul style="list-style-type: none"> Product Status Resource and capacity requirements Sales record Inventories 	<ul style="list-style-type: none"> Demand plan Inventory plan Capacity capabilities Supplier capabilities 	<ul style="list-style-type: none"> Demand plan Supply plan Product roadmap Consumer insights 	<ul style="list-style-type: none"> Demand and supply plans Alternative arrangements Potential issues
Output	<ul style="list-style-type: none"> Collected and compiled data 	<ul style="list-style-type: none"> Demand plan/forecast Opportunities 	<ul style="list-style-type: none"> New product plans/introduction Product roadmap Growth identification 	<ul style="list-style-type: none"> Supply plan Supplier output Identified Capacity constraints 	<ul style="list-style-type: none"> Distribution plan 	<ul style="list-style-type: none"> Updated plans Approval and execution Further improvements

Figure 3. Retail S&OP Process Breakdowns

Data gathering is considered the first step within the S&OP process. This step aims to compile information from different departments, such as marketing, sales, inventories, finance, and external suppliers. Data collecting would play the role of providing a baseline for advancing to the next steps. These processes are divided into three steps: updating information according to the desired time frame, generating sales information to be utilised within new forecasts, and disseminating information to the appropriate entities.

The expected output of the process is to create a demand plan/roadmap outlining any changes within opportunities, vulnerabilities, and assumptions for further developments. In addition, the process identifies performance from the previous period and identifies misalignment, corrective actions, and sales forecasts (Kymalainen 2020). The role of marketing is significant and relies on inputs such as market segmentation, forecasts, and targeted marketing mixes (Haddad, 2016; Wagner et al., 2014). Identifying a targeted marketing mix would also be vital in determining how to satisfy best the proposed market segment, including product, price, promotions, and place. Authors have also expressed forecasting to be one of the most crucial outputs. Hence historical sales data is used in conjunction with previous steps to generate a demand forecast for the upcoming period.

Product planning identifies current performance and determines the future direction of the product portfolio. Inputs on product improvements, positioning, and considerations on product life cycles are administered. Retailers would manage a varied range of products curated from different suppliers. The product planning process is mainly vital since their product assortment is concerned with their growth (Jindal et al. 2021). The process analyses data from product performance, sales records, capacity requirements, and inventories. According to Thome et al. (2012), it is also worth it for firms to also consider an SKU-Based S&OP. The process involves a mix of family level and SKU for specific products. The argument is also preferred due to the need for firms to track a product's life cycle performance to manage all changes happening. Hence, we would prioritise the emphasis on product planning, in order to manage the product variability within retail (Dreyer et al. 2017).

The supply plan should always provide enough capacity to demand and find solutions to close the demand-supply gap. Hence, supply plans consider the supplier's accommodation, warehousing, and transportation. These aspects are essential for retailers due to their business model that aims to provide availability for consumers. We would argue that having an agile supply chain would benefit retailers in being flexible and responsive through restructuring resources and strategies. Another factor in achieving supply planning is through supply chain relational capabilities, which enables the creation, leverage, and management of the structure of a supply network (mainly suppliers and distributors). Particular importance is emphasising buyer-supplier relationships through direct coordination with consumers and suppliers (build trust, manage hardships, achieve synergy), as noted in an interview conducted by Golgeci and Gligor (2017). We would observe relational capabilities to be pivotal for retail firms.

The management of sales channels has also been emphasised by Haddad (2016); Rooderkerk and Kok (2017), suggesting the contribution of marketing mix, which is place. Supply chain is also derived from the physical distribution concept. Retailers aim to provide the availability of products to consumers. Hence, managing channels is essential for retailers, as they are placed as suppliers' intermediaries. In the process, success may depend on how their sales channels perform, urging companies to allocate their resources within the designated lanes properly.

Demand planning may also play a part in identifying consumer segments, translating to differences in shopping preferences across channels; hence, it became crucial for retailers to consider which products and promotional approaches to allocate within each channel. Supplier relationships would also have to be built with upstream and downstream partners, where they would aid in delivering customer value through providing product availability and timely service. In conclusion, the interplay between marketing and supply chain would ultimately help optimise strategies on the previously mentioned marketing mix into value delivered within each consumer touchpoint, which is realised when products are delivered within the right time, place, and at the right price.

The step considers plans from previous actions encompassing demand, supply, and distribution. Next, company management would consider any trade-offs and implications and establish contingency plans. Finally, plans and a performance review are approved if there are no objections. However, a feedback loop is provided if conflicts occur, suggesting management revise their strategies accordingly.

4. Performance Metrics

Applicated metrics also need to be cross-functional, meaning could be applied to review any functions involved. The aim of applying the S&OP process is to balance managing the demand and supply. Several approaches could be undertaken to reach these objectives, such as aiming for operational improvements in inventory and enhanced product management, sales, and capacity. These metrics are grouped within financial and operations performance categories to define key performance indicators.

Source	Financial	Operations
Haddad (2016)	Sales Turnover, Sales Volume	Forecast Accuracy, Perfect Orders, Stock Days on Hand
Tuomikangas and Kaipia (2014)	Profit, Revenue	Order Case Fill Rate, Forecast Accuracy, Quality Measures, Delivery Lead Time
Cecere et al. (2009)	Profitability, Revenue	Forecast Accuracy, Perfect Orders, Inventory Turnover
Thomé et al. (2012)	Production Costs, Distribution Costs	Inventory (days of inventory, stock value), cash-to-cash cycle, on-time delivery, customer satisfaction/retention

Figure 4. S&OP Performance Metrics Assessed

It is argued by Cecere (2009) that having a substantial amount of performance metrics is seen as a disadvantage, translating to a loss of focus and an inability to define an operation's key details and goals. Table 3 indicates that each author has different views regarding their interpretation of metrics. Hence, this shows there is no set of identifiable metrics that should be used, suggesting variable applications in accordance to company processes and industry. It suggested that financial and operational indicators may measure performance. However, a joint agreement is evident between specific marketing capabilities and supply chain performance, suggesting organisations can design performance metrics consisting of quantitative and qualitative measurements.

Research is done by Gunasekaran et al. (2001); Cecere et al. (2009) specified on measurements pillars. Specifically, performance measurements related to delivery, inventory and logistics costs and customer service, suggesting alignment to customer satisfaction in the developed performance metrics. Several papers have suggested the inclusion of marketing performance measurements, where findings suggest a similarity within consumer-oriented performance metrics. The relationship between marketing and SCM confirms that marketing can influence improved performance by the supplier and customer relationship management throughout the marketing channels. Another similarity is identified within both departments in creating value, hence as suggested by Lamberti and Noci (2010), there is a similarity between performance metrics as performance measures such as lead time, service level, and percentage of turnover generated have been studied in the literature.

Metrics derived from a customer-oriented perspective may provide clarity between marketing and supply chain as the significant boundaries to this integration are conflicting KPIs, as shown by the empirical study done by Juettner et al. (2007), which examines representatives from eight large organisations from departments such as sales, marketing and SCM. It is found that KPIs have been increasing due to organisation policies. However, the demand and supply collaboration would always be at risk. Therefore, solutions to achieve integration were suggested, such as reducing the number of KPIs, implementing KPIs that capture overall business performance, and creating responsive KPIs that react to the changing market environment, which is also stated by Cecere (2009).

A total of five key performance indicators are adapted, chosen considering similarities between the case study firms, adapted from a case study of a fast-moving consumer goods multinational company and references from applications within retailers. These performance metrics would provide a foundation to measure collaboration between departments, further providing an applicable method for enterprises. While the scale of the enterprise differs, the concept of marketing and supply chain collaborative efforts are evident; hence the proposed indicators are further elaborated below.

Measurement	Explanation
Sales Turnover	The number of earnings yielded from the company's sales of the company product
Perfect Order Fulfilment	The number of orders fulfilled 100% within a correct assortment within a specific period
Inventory Forecast Accuracy	Comparison of initial forecast towards actual sales
Inventory Turnover	Number of times inventory is sold or used in a period

Figure 5. Proposed Retail Performance Metrics

5. Results, Applications and Recommendations

Figure 2 below illustrates the application of the S&OP framework for a retail company, specifically within supermarkets. It would represent the flow of associated activities to fulfil the proposed demand and supply balance. We observe the nature of the retail sector and the case study company, an online supermarket SME. The grocery sector is enhanced by the involvement of technologies, disrupting how firms may conduct their supply chain marketing processes. The research further identified that online grocery shopping had shifted consumer habits and expectations. The S&OP process above is meant to encapsulate, illustrate, and guide the case study company to overcome the proposed problems identified within the previous section which are:

- The inability to encapsulate developing consumer preferences
- Intensifying competitive landscape
- The need to establish alignment within supply-demand planning
- Supply chain issues arise from establishing working relationships, coordination, and the ability to switch among various suppliers

Figure 6 would illustrate how the proposed framework would be applied towards the case study company, providing as a guideline in order to improve current operations and identify vital processes within sales and operations planning.

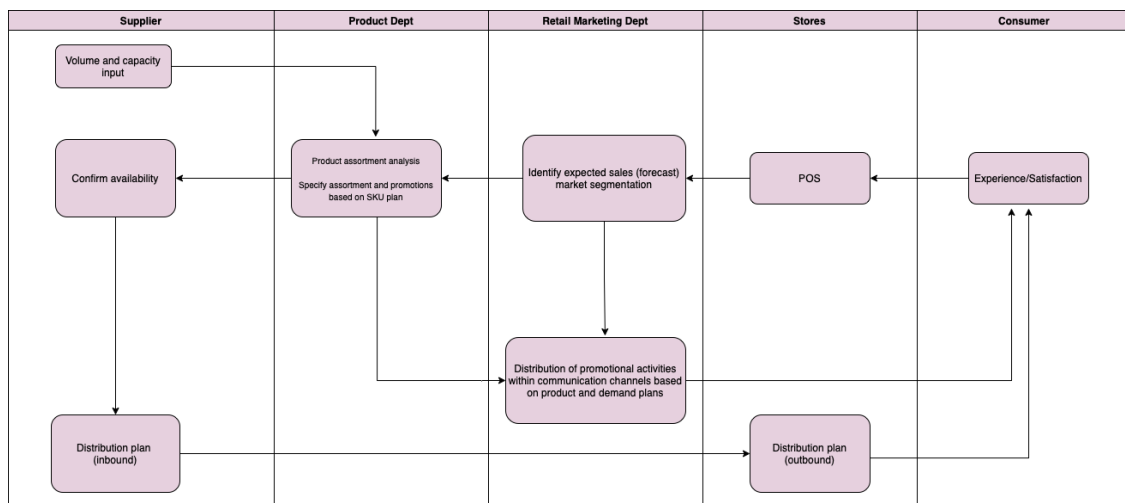


Figure 6. Proposed Application of Retail S&OP

We may imply that applications towards S&OP may have fair similarities across industries. However, previous section has outlined the strategic decision-making factors that may apply within retailers. Hence, we would like to focus on two steps, product and distribution planning. Both of the steps are included in the consideration of retail that requires the management of high product variability, various sales channels, and a shorter planning horizon compared to manufacturing.

Product planning would play the vital role of identifying key performance within the product portfolio, translating to decisions of expanding, reducing, or cannibalising a certain product or SKU. The planning process would further provide management with a projection towards its offering, to be used within supply planning. Further use of the process may encourage transparency within the organisation, enabling better decision-making. With the application of product planning, it is expected for retailers to provide more attention in calibrating their offerings in order to fulfil consumer demands.

Conversely, distribution planning enables resource allocation within sales channels. We note that more retailers are leaned towards an omni-channel process, hence would involve allocation of resources. In terms of channels, each medium may have differences in consumer behaviour, translating to differing preferences. The process further provides retailers to further evaluate approaches towards each channel, in terms of promotional strategies and inventory allocations. When distribution channels are properly structured, retailers would be able to provide the consumers with availability, in accordance with consumer preferences translating to a success.

Current metrics that the company utilise would be their inventory levels, received orders, and profitability. The current situation of the company was the poor capability to establish a clear guide towards managing performance. Specifically, the company would lack supply related metrics that reflect overall environment towards their inventory and future demand. Their product portfolio is large, hence would expect fluctuation in requirements. The company are unable to determine the right allocation of inventory due to uncertainties in supply availability and or varying demands of the consumer. We would further emphasise the company to apply metrics that are aligned with the S&OP process and have clear track record available.

The results below are taken from previous performance in order to encapsulate current conditions, using numerical analyses. The results would further provide a concrete view upon the company's operations hence leading to proposed recommendations towards further applications of the proposed metrics.

Measurement	2020	2021	Recorded Result (2020 – 2021)	Expected Direction
Sales Turnover	IDR 990M	IDR 1.03B	3% Increase YoY	Increase
Perfect Order Fulfilment	97%	98%	1% Increase YoY	Increase
Inventory Forecast Accuracy (Mean Average Percentage Error)	40%	36%	10% Decrease YoY	Decrease
Inventory Turnover	8.8	8.5	5% Decrease YoY	Increase

Figure 7. Proposed Application of Performance Metrics

The sales turnover indicates how the company’s overall business would perform throughout the two-year period. These provided a great indication of marketing and supply chain coordination, showing more remarkable sales growth during the year. The proposed observation indicated an increase of 3% over the two years, from IDR990 million to IDR1.03 billion. The growth is measured through the total sales turnover of each year, with main contributors from the consumer’s traffic towards the website supplemented with the shifts in behaviour. As of currently, the case study company has not improved current analysis methods towards evaluating their growth, hence, we recommend the following.

Recommendations:

- The case company could utilise the metrics further by evaluating their sales channels. The objective may be achieved through considering their various sales channels, more transparency could be seen in terms of sales contribution, and determine which channels provide the most turnover.
- The metric is suggested to be implemented more towards the demand planning process, where the team could be maximising resources towards building the demand on the most-profitable channel.

One of the main advantages of the case study company is its ERP system. For multinational companies such as Huawei, Unilever, and Proctor Gamble, the system allows the visibility of information when executing orders. Interview results have revealed that the ERP system allows the identification of information such as finances, inventory, sales, and management of orders. Interconnected with its website, company A can receive and disseminate information promptly. This translates to proper delivery scheduling, providing consumers with excellent service. It is shown a fulfilment rate of 97% within the first year, followed by an increase of 1% in the second period. These systems were also implemented within multi-national companies such as Huawei, which impacted their fulfilment rate up to 98%. While current conditions proved effective, we would also suggest the following.

Recommendations:

- Provided with capable tools, the case study company could further utilise the metric to measure their consumer service levels. We suggest to maintain their current performance of providing great order fulfilment. This could be implemented within the distribution planning phase of our suggested S&OP.
- Further usage of the metric could help in coordination with suppliers. The initial inputs for the metric is comprised of total orders and missed/defect orders. The data could also be used by forwarding results to the suppliers in as an evaluation of their performance towards defect or expired products.
- We further argue that by applying and reviewing performance in a timely manner may provide the company to identify any shortcomings that may arise.

While the company experienced an improvement in forecasting accuracy, we compared it with the benchmark provided by research done by Hançerlioğulları et al. (2016), stating the industry average for food stores to be 10% which is relatively distant from the benchmark. The identification of key trends across periods may benefit the company in decision-making towards stocking up their inventory. Further translation of the trend is associated with consumer behaviours within previously specified periods, amounting to increased purchasing. The company has also stated the sudden increase within certain periods is a result of a follow up purchase to compensate for

previous month's decline. The author further compared various forecasting approaches by examining its current and seasonality methods.

It is identified that the seasonality trend is the most accurate to encapsulate current conditions of the company, indicating an improvement within current MAPE of 40% to 36% YoY. It is further emphasised for the company to apply new forecasting strategies to improve its performance toward the industry average by considering seasonality and patterns towards consumer purchasing behavior, that may impact how the company would structure their inventory.

Recommendations:

- Considering industry dynamics is one of the inputs that has to be implemented for further periods. We could see a seasonality factor in grocery retailing, where certain periods may seem to have profound performance. Implementing the factor may further improve the way companies structure their product offering.
- We would emphasise the metric to be used within product planning stage, where retailers would review their forecasts across their offerings. We would also suggest forecasting to be implemented across categories to identify differences within products.
- Continuous improvements within MAPE, it is advised to always compare to the benchmark, being the average supermarket turnover. According to Hançerlioğulları (2010), the average MAPE is amounted to 11-12%/year. The company is advised to aim towards the benchmark, by shifting their product planning strategies.
- Moreover, the metric could be further utilised in order to provide decision-making inputs towards improving, reducing, or cannibalising any SKU.

According to the interview results, the first period amounted to a turnover rate of 8.8, caused by a spike in demand or referred to as sales surprise, where the demand is underestimated, causing actual sales to be higher. Within the case study, the authors indicated a two-month stock-out, where the supply cannot fully absorb the demand. Meanwhile, the second period recorded a decrease in turnover to 8.5. A decrease in performance is identified, due to an increase in the cost of goods sold by 18%, indicating the company had sold more and concurrently stocked more in inventories throughout the period.

The food stores industry has one of the highest average turnover rates of 11.2, derived from retailers such as Kroger and Albertson's. Compared to the industry average, it could be concluded that the company still falls short; however, it still indicates a potential for improvement. Inventory turnover performance is often associated with the company's ability to replenish their stocks; as mentioned previously, MNEs that identify improvements within their forecasting techniques may also improve their sourcing and planning processes. However, (Hançerlioğulları 2010) suggested the latter, where inventory forecasts (MAPE) are negatively correlated with inventory turnover, but introducing MAPE, facilitates identifying variability (seasonality) of inventory ratios across periods.

Recommendations:

- Turnover progress should be evaluated frequently, in accordance to the planning objective. We also identified diverse product SKUs within the company, further suggesting the application of the metric to be diversified among product offerings. The action will translate to more transparency within operations planning.
- The metric features how the inventory is depleted with the consideration of costs and inventory value. Further usage of the data could be forwarded to the product and supply departments as an input, along with forecasting.
- Confirming the availability with suppliers is also a solution to maximise utilisation of this metric, where the case study company can coordinate with suppliers towards cost-minimisation through arrangements such as construction of alternative payment terms, reviewing product specifications, and or streamlining operational activities.

We have identified current practices of the operational process of the case study company. The section above is formed to provide a conceptualisation towards the application of the proposed framework and metrics. Further use of the section may provide the company as a guideline in order to improve its operational procedures. While we have not managed to apply our proposed methodology, we would further encourage for the case study company or even other companies operating within the retail industry to refer and applicate our proposed findings in order to achieve an improved performance within their company.

6. Conclusion

The paper proposed an S&OP framework and a set of performance metrics applicable to balance demand-supply for the retail industry. More practically, the paper conceptualises an improvement by applying the proposed framework. The results of this research have suggested alternative methods for improving marketing and supply chain collaboration, specifically within retailing. In light of the contribution, there is considerable research for future exploration, we recommend as follows.

- The research outlines the framework and performance metrics that enhance operations planning towards retail applications. We used a case study to identify key considerations, operational activities, and capabilities towards implementations. Furthermore, we would suggest the proposed framework to be carried out in a dedicated time frame in order to properly identify the significance.
- The current research only involved one case study company. While it is also foreseeable to use the current methods, further examinations could involve more case study participants to validate the usefulness of marketing and supply chain collaboration. We would further conceptualise a thorough outcome when added participants are included within the research.
- The current research only considers internal factors, such as company compatibility in implementing the proposed framework. Hence, we would also consider external factors within execution in order to precisely determine the impacts of marketing-supply chain collaboration. The consideration of external and internal factors may provide companies with a dynamic view of the current environment, hence translates to better execution of the proposed collaborative framework.

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