Lisbon School of Economics & Management
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MASTERS IN MANAGEMENT (MIM)

MASTERS FINAL WORK

INTERNSHIP REPORT

HOW SUPPLY CRISIS BRINGS RESILIENCE: THE CASE OF PROCTER & GAMBLE

RAQUEL AZEVEDO MOUTINHO

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Finally, I want to dedicate my thesis to my grandfather Manuel Azevedo. Wherever he is, I hope he is proud.

ABSTRACT

With the Covid-19 pandemic, supply chain resilience has become one of the most interesting and critical topics, as businesses have had to rethink their global strategy, emphasizing the importance of supply chain strategies. This internship report aims to demonstrate the critical nature of supply chain risk management as a precursor to resilience. As a result, the internship report covers the literature on supply chain and supply chain disruptions, emphasizing the effect of COVID-19, supply chain risk management and best practices, and finally, resilience. Then, the report addresses the internship functions and activities that took place throughout the eight months, with an emphasis on supply risk management tactics. Finally, a discussion of practices followed by Procter and Gamble (P&G) was confronted with the academic literature. The results show that the company demonstrated significant resilience not only through robust risk management strategies but also through its ability to adapt existing strategies and processes to the new environment during the pandemic.

Keywords: Supply Chain, Risk, Mitigation, Disruptions, Covid-19, Procter and Gamble, Resilience, Allocation,

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ABBREVIATIONS

AOV	Advanced Order Visibility
ATP	Available To Promise
AV	Availability Leader
BOP	Business Operating Planning
BP	Business Planner
CADW	Commercial Auto Dish Wash
CBA	Cost Benefits Analyses
CCL	Critical Codes List
CDM	Customer Demand Managers
CFO	Chief Financial Officer
CFR	Case Fill Rate
CIL	Customization Initiative Leader
CLOM	Customer Logistic Operations Manager
CPG	Consumer Packaged Goods
CSO	Customer Service Operations
CTLL	Customer Team Logistics Leader
DC	Distribution Center
EAN	European Article Number

FBNL	France, Belgium, Netherlands and Luxembourg
FMCG	Fast Moving Consumer Goods
FPC	Final Product Code
GHG	Greenhouse Gas
HDW	Hand Dish Wash
ISM	Institute of Supply Management
KPI	Key Performance Indicators
MDA	Market Delivery Analyst
MPO	Market Planning Organization
MSU	Measure Statistical Unit
NPI	Non-performance Inventory
OSA	On-shelf Availability
P&G	Procter and Gamble
PGP	Procter and Gamble for Professionals
PIPO	Phase-in, Phase-out
PO	Phase out
PVPs	Purpose, Values, and Principles
QTY	Quantitity
RBU	Regional Entrepreneurs
SAMBC	Service as Measured by the Customer
SBU	Sector Business Units
SC	Supply Chains
SCRM	Supply Chain Risk Management
SKU	Stock-keeping Unit
SMO	Selling and Market Operations

SNO	Supply Network Operations
Tops	Transport Operations
WHO	World Health Organization

1. INTRODUCTION

This internship report focuses on the eight-month internship at Procter & Gamble in Brussels and represents the master's final work for the ISEG Masters in Management. The internship's purpose was to get expertise in supply chain management as well as my introduction to the employment market. During my time at Procter and Gamble, I worked in the market planning department as a Business Planning Leader for the Procter and Gamble for Professionals (PGP) category and Availability leader for PGP and Home Care. My primary responsibilities during the internship included developing an accurate forecast, ensuring excellence in supply chain execution for initiative launches, and supporting customer service by collaborating closely with Sales, Marketing, and Customer Logistics counterparts. I was also responsible for ensuring service protection via mitigation strategies and overseeing the implementation of all activities to ensure a seamless customer transition.

To facilitate comprehension, this report is divided into four sections: The first section reviews the literature with an emphasis on supply chains, supply chain disruptions caused by covid-19, supply chain risk management, and supply chain resilience. The second section focuses on Procter & Gamble, the company's structure, mission, values, and principles, as well as its sustainability and supply chain. The following section discusses the internship functions and activities that occurred throughout the eight months, emphasizing supply. The last section compares the supply chain methods adopted during the internship to the authors' stated best practices in a disruption.

2. LITERATURE REVIEW

2.1 Supply Chain Definition

A supply chain is a network of organizations and processes that enable a diverse range of businesses (providers, producers, distribution partners, and vendors) to join forces, collaborate, and coordinate the acquisition of raw materials, the conversion of those raw materials into stipulated finished product, and the delivery of those final products to customers. (Ivanov et al., 2017). It is the process of integrating, coordinating, and regulating commodities, resources, and information as they travel from a supplier through several customers and ultimately to the end consumer. The supply chain is crucial because it ensures the timely completion of all activities between suppliers and consumers. Consequently, supply chains include the acquiring or sourcing, production, distribution, and sale activities (Emmett & Granville, 2007).

Supply networks are dynamic systems whose structure and properties are continually changing. Supply chains are characterized by their diverse structure designs and the structural parameters' capacity to adapt in reaction to absolute and relative elements at various phases of the supply chain. (Madhavi & Wickramarachchi, 2021). Each business has several supply chains since it engages with multiple suppliers and serves multiple clients. While portions of the purchasing, manufacturing, transportation, and selling operations for each finished product may be the same or relatively similar, the complete supply chain for each product will be unique and will often include a complex pattern. As a result, businesses will be linked externally and internally to several supply chains (Emmett & Granville, 2007).

2.2. Supply Chain Risk Management

Supply chain risk management (SCRM) is a broad topic. To have a clearer understanding of SCRM, it is necessary to understand risk and risk management. Risk

exists since it is impossible to predict precisely what will happen in future occurrences. One widely recognized definition of risk is: risk refers to the uncertainty that surrounds future events and operational results. As a result, the risk is not just about bad outcomes but also about the probability of these outcomes, whether good or hostile (Waters, 2007).

Risk management identifies actions that include risk, works to prevent failure before it occurs, minimizes it when it does, mitigates the negative consequences of these events, and restores operations to their intended state. (Slack et al., 2016). Risks should be managed and handled once they have been identified to minimize their negative influence in unfortunate circumstances and optimize the realization of possibilities. Risk management aims to ensure the smooth running of scheduled activities and safeguard the organization against supply chain interruptions.

2.3. Supply Chain Disruptions

Supply chain disruption is an unintended and unanticipated triggering event at a single point in the supply chain, followed by a condition posing a considerable danger to the firm's normal flow of business operations. (Bode & Wagner, 2015). Supply chain disruptions are often triggered by low-probability but high-impact events, such as natural catastrophes and unnatural disasters and diseases like earthquakes, tsunamis, nuclear accidents, SARS, Ebola, and COVID -19.

Disruptions in the worldwide supply chain began at the end of January 2020 when the World Health Organization (WHO) proclaimed the coronavirus outbreak a global health emergency. For years, global supply chains evolved and became more complicated to reduce the cost and time required to transfer products and services worldwide. The epidemic of COVID-19 pitched these highly refined mechanisms into chaos.

The Institute of Supply Management (ISM) reports that nearly 75% of businesses have experienced supply chain interruption. Additionally, 81% anticipated some difficulty

shortly, 62% indicated delays in getting items, and 53% indicated issues obtaining information from China (Bridget McCrea, 2020). Indeed, according to a Fortune Magazine article, 94 percent of Fortune 1000 firms have experienced supply chain interruptions due to the pandemic in early 2020 (Erik Sherman, 2020). The COVID-19 epidemic has focused attention on supply chains and called into question more than 30 years of progress toward globalization. It was a wake-up call for organizations to plan and prepare for the unexpected to be robust and adaptable in their business practices, emphasizing the need for more resilient supply chain operations (Feinmann, 2020). The critical criteria for Fast Moving Consumer Goods (FMCG) companies, such as Procter and Gamble, to survive both pre-and post-COVID-19 conditions are perseverance, survival, actual information, order time delivery, consistency, business intelligence, cooperation, incorporation, and planning and forecasting.

Due to supply chain disruptions, demand volatility, and government measures to address the issue, the pandemic influenced supply chain activities, operations, procedures, and management. Shutdowns of factories, border and travel constraints and harbor closures affected the supply chain. Global supply chains connecting China, the United States, and Europe were harshly harmed, which resulted in price volatility as supply became constrained. Due to the delays, increased demand, and order congestion, demand fragility and shocks occurred, hurting retail and online purchases. Additionally, significant obstacles remained in satisfying enormous demand while maintaining quality and consistency. Since the pandemic's beginning, numerous governments have taken proactive steps to protect their populations, establishing stringent movement restrictions via lockdowns, social isolation, and quarantine. Stress and anxiety can affect supply chain operations and performance. Government measures lead to a decline in production and a considerable reduction in international trade flows (Magableh, 2021).

As a result, prices increased dramatically during the pandemic, having a detrimental effect on the interaction between suppliers, retailers, and consumers, resulting in extended lead times because of delays in obtaining items from the source and delays in delivery, disruptions in shipping, cargo circulation, hauling, shipping, and unloading, as well as additional delays at frontiers and harbors, return profits, and revenue decline, undermining retailers' ability to manage. Additionally, manufacturing capacity deteriorates, influencing the sources of output. The absence of disruption plans linked with low inventory levels, dependence on a single provider, or a lack of diversification significantly underestimates the chance of severe disruptions—the emphasis on immediate and cost-cutting results in a shortage of risk knowledge and contingency preparation. Additionally, there are difficulties acquiring information and data from stakeholders, a lack of absolute transparency, incorporation, and coordination, and disparities in technology use across the supply chain (Magableh, 2021; Zhu et al., 2020). As a result, the COVID-19 pandemic is unlike any previous black swan event in human history. It affects both demand and supplies concurrently, posing substantial challenges for companies seeking to maintain a consistent flow of goods and services (Magableh, 2021).

To thrive, FMCG enterprises must develop robust supply chains via effective supply chain planning, forecasting, distribution network, supplier interactions, and anticipating the effects of economic and social conditions. Prosperous resilient SCs integrate the efforts of FMCG enterprises toward sustainable performance via an open and transparent framework.

2.3 Best Supply Chain Risk Management Practices

Supply Chain Risk Management strategies aim to decrease vulnerability. The effects of disruptions are choosing or evaluating the best choices for a particular risk management objective: producing, defending, and increasing shareholder value by managing the uncertainties that influence the firm's goals (Barton et al., 2002).

The first stage in supply chain risk management is regularly identifying and analyzing hazards. Because the severity of disruption repercussions is contingent upon their early detection, organizations must use risk identification to efficiently identify their origins (M. M. H. Chowdhury & Quaddus, 2017). Due to the resource limitations, gathering information on vital existing processes and partnerships is critical to maximizing SCRM efficiency (Kleindorfer & Saad, 2009). Consequently, risk assessment is essential, as it dictates the outcome of subsequent operations (Fan & Stevenson, 2018).

The second step, risk assessment, is defined as analyzing the frequency of risk and calculating its effect. This approach gives detailed information regarding risk antecedents and significant vulnerabilities, focusing on the interdependence and prompt events (Kleindorfer & Saad, 2009; Manuj & Mentzer, 2008; Wieland & Wallenburg, 2013). The intensity of disruption consequences is determined by the length of the risk event and the transmission rate. As a result, risk assessment seeks to prioritize the detected threats. Furthermore, it aims to prepare for risk management procedures, mitigation, and management (Fan & Stevenson, 2018; Wieland & Wallenburg, 2013).

Risk mitigation, the third stage, seeks to control risks by mitigation strategies implemented before the disruption, such as through emergency plans implemented after the event. (Azadegan et al., 2020; Bode & Wagner, 2015; Manuj & Mentzer, 2008). Close engagement with partners and understanding the relevance of procedures inside the company are essential for risk mitigation to be effective. Risk mitigation findings will be

valuable in the succeeding phase of risk management (Fan & Stevenson, 2018; Wieland & Wallenburg, 2013).

Numerous studies have shown the importance of risk control, the fourth stage, in lowering the occurrence and severity of hazards, emphasizing the need to evaluate these procedures' effectiveness. Risk management is accomplished by systematic methods, preparation, employee risk awareness, clear strategies, and thorough objectives (Manuj & Mentzer, 2008; Wieland & Wallenburg, 2013).

It is also necessary to understand what each step requires. For SC risk identification, it is crucial to be aware of hazards in the supply chain, how they seek short-term risk, obtain data, and define early warning indications (Fan & Stevenson, 2018). Risk assessments include five items: recognizing the sources of the risks, evaluating the likelihood of the risks, analyzing its implications, categorizing supply risks, and assessing the urgency (Fan & Stevenson, 2018; Wieland & Wallenburg, 2013). On the other hand, risk mitigation consists of three steps: reactiveness tactics, their judgment of such reactive measures, and the relevance of that practices (Azadegan et al., 2020). Finally, risk control is quantified using four criteria: employee sensitization to risk awareness, risk management systems, the chance of mitigation, and impact reduction (El Baz & Ruel, 2021).

The COVID-19 pandemic created a one-of-a-kind environment of disruption and consequences. Therefore, most standard procedures are challenging to implement. In this sense, organizational recovery will differ depending on how well they manage their risk. The most effective technique for developing a risk management system is to understand risk variety, priority, and resolutions thoroughly. Firms must build resilience to effectively plan for and react to unanticipated situations (Bier et al., 2020). The COVID-19 catalyzes developing long-term resilient supply networks to cope with any crises.

Therefore, awareness and expertise of SC Risk Management and SC Resilience are vital because disruptions, even if they are unlikely to occur, may have severe consequences for businesses if they do appear.

Furthermore, SCRM activities positively and substantially influence SC resilience. SC risk identification and management are crucial, but risk mitigation is the most important. That implies that improving risk mitigation should be a top focus for SC resilience. Firms should prioritize the development of effective and up-to-date risk identification methods since they impact the other SCRM activities and, consequently, their SC robustness and stability (El Baz & Ruel, 2021).

Numerous authors have proposed various solutions for mitigating the effects of COVID-19, emerging from the pandemic, and planning for future disruptions in reaction to the present susceptibility. Several studies have shown that increasing production early and making swift decisions may assist in preventing gaps (Lozano-Diez et al., 2020; Mehrotra et al., 2020; Veselovská, 2020). Additionally, supply chains may reallocate resources from non-critical locations and reroute people away from non-critical tasks to shorten reaction times (Leite et al., 2020).

Moreover, supply networks might require capacity expansion. Rather than adding permanent capacity, researchers have recommended generating temporary accommodation by removing non-essential processes (Leite et al., 2020; Paul & Chowdhury, 2021). Developing widely distributed production sites with related operational assistance is a valuable practice for planning. Simultaneously, while acknowledging the need to increase manufacturing capacity, several researchers have proposed approaches to change product qualities, such as essential qualifications, to serve a greater number of consumers with the available resources (Paul & Chowdhury, 2020; Veselovská, 2020). To increase the supply chain's receptiveness and diversity of needs is

suggested to restructure and improve logistics, including reconfiguring manufacturing facilities, trying to diversify sites, and optimizing transportation routes, as businesses source in today's globalized world. Even if some of the company's suppliers are local, the majority are likely to be situated elsewhere. Manufacturers and carriers have faced supply shortages due to offshore suppliers abruptly ceasing operations in reaction to local restrictions enforced by lockdowns. This has resulted in severe production delays and commercial backlogs. (Richards & Rickard, 2020). Additionally, increasing capacity is not realistic nor viable if raw materials are scarce, which causes the manufacturing process to halt. Movement restrictions have influenced transportation and logistics management and different kinds of transportation, including ocean, air, trucking, and rail. These resulted in delays and threatened the free flow of goods, posing a threat to global commerce. As a result, enhancements to transportation routes and faster modes of distribution were recommended. Thus, even when businesses outsource to other countries, they must balance local manufacturing and foreign trade to minimize susceptibility (Chiaramonti & Maniatis, 2020; Deaton & Deaton, 2020). Additionally, supply chains should diversify their suppliers across many locations to prevent production interruptions during a lockdown at a single location (Deaton & Deaton, 2020; Ivanov & Das, 2020; Paul & Chowdhury, 2020; Remko, 2020; Sharma et al., 2020)

Additionally, it is recommended to increase visibility via supply network mapping to forecast future interruptions and their consequences and to improve supply chain interactions and partnerships to protect businesses from adverse effects, allowing for rapid recovery and planning for future occurrences (Ivanov & Dolgui, 2020; Paul & Chowdhury, 2020; Sharma et al., 2020). Besides motivation, knowledge management via the exchange of vital information, ideas, and knowledge and process synchronization helps in handling the consequences of COVID-19 and prevents information ambiguity

(Gunessee & Subramanian, 2020; Sharma et al., 2020). Supply chains must incorporate real-time flexibility or dynamic reactions into their design while also incorporating resilience mechanisms since proactive and adaptable strategies may help reduce supply networks' susceptibility to external shocks (Ivanov & Das, 2020; Ivanov & Dolgui, 2020). In addition, strengthened supply chain partnerships and cooperation may protect businesses from unfavorable consequences, allowing for rapid recovery and preparedness for future occurrences (Paul & Chowdhury, 2020; Sharma et al., 2020).

Prior to this pandemic, most research on supply chain strategies concentrated on a single disruption scenario, neglecting to consider how a disrupted node's effect might be spread across the supply chain. Consequently, supply linkages were weaker than they should have been (P. Chowdhury et al., 2021).

Table 1 - Supply Chain Risk Management Practices per author

Supply Chain Risk Management Practices	**Author**
Early production increase	(Lozano-Diez et al., 2020; Mehrotra et al., 2020; Veselovská, 2020)
Extension of capacity and reassign resources	(Leite et al., 2020; Paul & Chowdhury, 2020)
Modifying product characteristics	(Paul & Chowdhury, 2020; Veselovská, 2020)
Management of knowledge and Information	(Gunessee & Subramanian, 2020; Sharma et al., 2020)
Real-time strategy changes, adaptive strategies, and dynamic reaction	(Ivanov & Das, 2020; Ivanov & Dolgui, 2020; Leite et al., 2020; Lozano-Diez et al., 2020; Sharma et al., 2020; Veselovská, 2020)
Suppliers and operations dispersed over several locations and enhancement of transportation.	(Chiaramonti & Maniatis, 2020; Deaton & Deaton, 2020; Ivanov & Das, 2020; Paul & Chowdhury, 2020; Remko, 2020; Sharma et al., 2020)
Improved relationships and collaborations throughout the supply chain and enhancing visibility	(Gunessee & Subramanian, 2020; Ivanov & Dolgui, 2020; Leite et al., 2020; Paul & Chowdhury, 2020; Sharma et al., 2020)

2.4. Supply Chain Resilience

Resilience is a multifaceted, collaborative, responsive capability that allows organizations to preserve stability, react to and recover from shocks, and reclaim

performance through the absorption of adverse effects, adaptation to unpredicted variations, and capitalization on success or failure experience (El Baz & Ruel, 2021). There are several definitions for supply chain resilience. Supply chain resilience is the supply chain's capacity to survive shocks and re-establish operational capabilities after disruptions. It is a supply chain's dynamic capacity to minimize the likelihood of encountering sudden disruptions, resist the spread of disorders by retaining control over structures, and swiftly and efficiently recover and react to overcome the disturbance and return the supply chain to a healthy state of operation (Kamalahmadi & Parast, 2016). According to Birkie, a company also can foresee and adapt to maintain operations (Birkie & Trucco, 2020).

Preparedness, Response, and Recovery are the crucial yet complimentary topics for resilience. A strategy is effective in terms of readiness if it is proactive in anticipating future disturbances; in terms of reaction, if it allows the supply chain to respond promptly and correctly; recovery, if it restores to its previous or even superior condition.

Resistance capacity refers to a system's capability to lessen the impact of disruption by preventing it or shortening since the start of the interruption and the begging of recovery. At the same time, recovery capacity refers to a system's ability to resume regular operation after an interruption. System recovery is defined by a stabilization phase followed by a pursuit of a steady level of performance. Depending on various disruption and competitive variables, the eventual steady-state performance may or may not revert to pre-disruption levels. While sustainability, risk management, lean supply chain management are crucial for company success, resilience is critical since it serves as the basis of recovery after a disruption (M. M. H. Chowdhury & Quaddus, 2017).

The COVID-19 epidemic created an unusual and exceptional circumstance for SC resilience in which SC survival necessitates large-scale stability (Ivanov & Dolgui, 2020).

The robustness of the SC network enables access to the short- and long-term performance in the outcome of disruptions; it allows the creation of appropriate for sourcing, manufacture, and advertising in anticipation of potential shocks. Furthermore, it helps the network to retain a competitive edge in high-risk scenarios (Ivanov & Dolgui, 2020; Li & Zobel, 2020).

A resilient supply chain model emphasizes these trade-offs and takes a comprehensive, all-inclusive approach to supply chain decision-making. Since no supply chain is entirely self-contained across all nodes and hence immune to disruptions, such decisions must be contextualized by a business's supply chain and more extensive network interactions using resilience analytics.

When analyzing their resilience measures, they are grouped into three categories in theoretical models: the time needed to recover, the extent of recovery, and the profit lost during the recovery period (Behzadi et al., 2020). When considering SC complexity, resilience may help alleviate disturbances (Birkie & Trucco, 2020). SC resilience is contingent on the ability to restructure resources in response to disturbances (Sá et al., 2019). Cooperative measures such as knowledge sharing and communication increase the resilience of SCs by enhancing their awareness, speed, and adaptability (Scholten and Schilder, 2015). Domestic and foreign SC networks may help improve the resilience of the SC and its customer's satisfaction (Asamoah et al., 2020).

Similarly, the risk of epidemics on supply chains can be categorized into three components. The first is the long-term presence and unexpected amplification of disruptions. Second, the simultaneous dissemination of disruptions inside the SC, the propagation of disease outbreaks among people, and concomitant disruptions in supply, demand, and distribution. Moreover, epidemics and pandemics are different disruptions. They represent a systemic risk to practically all supply networks on both an internal and

external level. Therefore, resilience is necessary to avoid catastrophic failure and make the supply chain able to survive the disruptions. (Ivanov & Das, 2020).

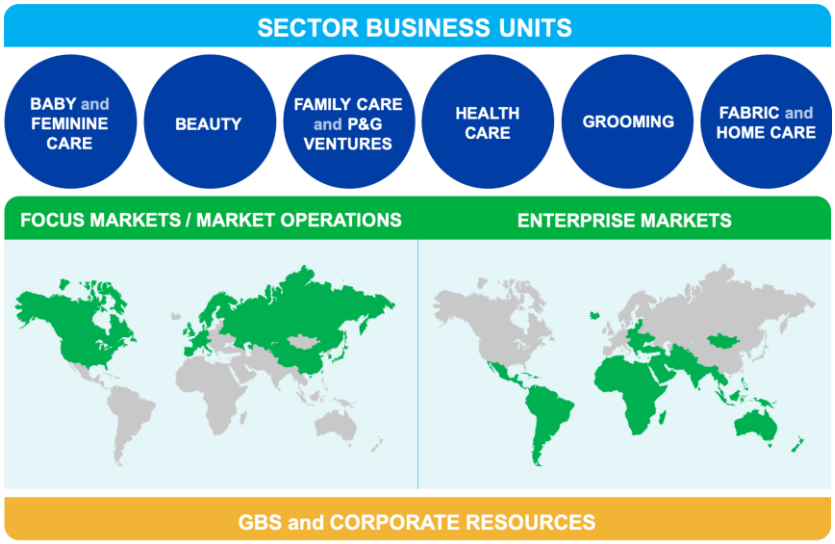
3. THE ORGANIZATION

3.1 Procter & Gamble structure

Procter & Gamble is an American multinational firm specializing in consumer products created in Ohio by William Procter and James Gamble in 1837, that now distributes over 300 branded items in over 160 countries. Procter and Gamble comprise six sector business units (SBU): baby and feminine care, beauty, family care, P&G ventures, health care, grooming and fabric, and home care. There are ten categories within the six SBU: baby Care, feminine care, family, home care, fabric care, skin, and personal care, grooming including appliances, oral care, private health care, and Procter and Gamble for Professionals (PGP), which is inside Home Care (*Procter and Gamble*, 2022). SBU is the driving force in the company; they are responsible for the Company's biggest and most successful markets, designated Focus Markets, which account for around 80% of revenue and 90% of after-tax profit. Market Operations collaborates with the six SBUs in each Focus Market to provide scaled market services and capabilities, including customer teams, transportation, warehousing, logistics, and external representation for P&G. The RBU (regional entrepreneurs) are the owners of the sector business units. The rest of the world is divided into Enterprise Markets, which are self-contained entities accountable for sales, profit, and value creation. To attain these mutually agreed-upon business goals, the SBUs build innovation strategies, supply chain plans, and operational frameworks for the Enterprise Markets. Due to their favorable market growth rates, Enterprise Markets are essential to P&G's future expansion and value creation. The SBUs,

Market Operations, and Enterprise Markets rely on critical corporate resources focused on scaled services, governance, stewardship, and areas requiring a high level of understanding. This structure helps a company become more empowered, flexible, and responsible, accelerating development and value generation.

Figure 1 - P&G Structure and Governance



Source: (*Procter and Gamble*, 2022)

3.2 Purpose, Values, and Principles

Purpose, Values, and Principles (PVPs) serve as the foundation for P&G, including corporate governance, which is the method through which management, shareholders, and the Board of Directors ensure that all investors, shareholders, and creditors are protected against managers acting only in their self-interest. The PVPs form the bedrock of P&G's distinctive culture. The company has evolved and altered throughout nearly 181 years of history, but these components have lasted. The Purpose unites the enterprise behind a shared purpose and growth plan focused on daily improvements to the lives of more customers. It inspires Procter & Gamble workers to make a difference daily. The values reflect the attitudes that shape all interactions, while the principles characterize P&G's unique approach to work every day.

P&G's reputation is earned via action, by doing what's right. What is said, what is done, the goods created, the services given, and the way of conduct defines the business, which is the only way to do business as a global leader. Procter & Gamble aims to create branded goods and services of exceptional quality and value that enhance the lives of current and future generations of consumers globally. This mission statement emphasizes the level of product quality that the company deems to be at the very least exceptional. It indicates that the business does not scrimp in this area to ensure that its clients get the maximum benefit. The statement is composed of the following components: exceptional quality, improved lives, and improved communities.

The fundamental values of Procter & Gamble are integrity, leadership, ownership, passion for winning, and trust (*Procter and Gamble*, 2022). For almost a century, maintaining competitiveness and relevance has been difficult for many businesses, made much more difficult by unanticipated economic circumstances. Procter & Gamble, on the other hand, has been able to resist these influences because of these fundamental beliefs, which keep the corporation always winning. The principles are as follows: respect for all persons, the pursuit of excellence, outward emphasis, mutual interdependence as a way of life, strategic work, innovation, value mastering, and inseparability of the firm and individual interests.

3.3 Value Creation

Ti Tu Ta is the structure of how P&G builds category value. Ti is a trade-in, Tu stands for trade up, and ta means trade across. Trade-in is how you made a customer go to the category for the first time, the new shoppers. Trade up is once the shopper is already in the category how you made him go to premium price products. Finally, trade across is how you made the customer buy more products at once. Moreover, the goal is to make sure the basket of the customer keeps increasing and at the same time becomes more

premium, maintaining loyal customers. The growth strategy of Procter and Gamble is to superiority to win with consumers spread across four pillars: superior goods, superior design, superior marketing, and better retail execution all contribute to the superior experience.

The way Procter & Gamble conducts business demonstrates a corporation that assures the highest possible quality of goods to meet the first component of its goal statement. This, the corporation believes, is a critical component of igniting improvement and development in its clients' lives. Therefore, the business plan is based on the expansion and success of current brands and goods and the development of new items. The marketplaces and industrial sectors are very competitive. Hence, collaboration with the clients is the key to enhancing our goods' in-store presence and capturing the first moment of truth when a consumer is buying. It is also necessary to win the second moment of truth when a customer tries a product and determines if it matches their expectations and is a good value. To build the company is essential to continue to provide consumers with fresh, unique goods and branding. Primary research and product development efforts to enable sustainable organic growth throughout the fiscal year maintained a high priority. While many of the advantages of these initiatives may not be recognized for many years, Procter & Gamble thinks they illustrate the Company's commitment to future development.

Procter & Gamble's fiscal year 2021 results were outstanding. Organic sales climbed by more than 6% during the fiscal year, core earnings per share increased by 11%, currency-neutral core earnings per share increased by 11% and adjusted free cash flow productivity improved by 107 percent. Apart from comparable excellent outcomes before the outbreak, these successes under adverse circumstances highlight the inherent strength of Procter & Gamble's integrated strategy and structure.

3.4 Sustainability

Along with providing value to customers, Procter & Gamble is committed to environmental protection and other community empowerment initiatives. The 2030 ambition emphasizes brands, society, employees, and the supply chain. With regards to branding, the aims are to use innovation and P&G brands to delight customers and have a positive impact, to have 100 percent of P&G leadership brands enabling and inspiring responsible consumption, to have 100 percent of P&G packaging recyclable or reusable, and to increase consumer trust through transparency, ingredient innovation, and sharing P&G safety science. For society, the emphasis is on the transformational potential of partnerships, on establishing transformative relationships that allow people, the planet, and P&G to prosper. Concerning employees, the goal is to engage and empower P&G employees to integrate sustainable practices into their work and society, to educate employees at all levels, to recognize achievement, and to include recognition into each employee's performance evaluation. Finally, the ambition for the supply chain is to reduce P&G's footprint, pursue circular solutions, and achieve carbon neutrality within a decade while protecting and enhancing the forests on which P&G relies, improving the livelihoods of palm shareholders by increasing yields from existing lands and achieving 100 percent renewable electricity and a 50% reduction in GHG emissions at all P&G sites.

3.5 Supply Chain in Procter & Gamble

P&G's supply chain processes have changed significantly during the last three decades. Without question, digital technology is a major force behind this transition. The supply chain management's emphasis has switched to sophisticated planning procedures informed by real customer demand and facilitated by digital analytical forecasting and operational planning. A demand-driven approach, in which manufacturers are responsible

for detecting and reacting to demand as rapidly as feasible, involves manufacturers rethinking their production to shipping network architecture. P&G incorporated a data-driven production flow into its operations to satisfy this need, increasing responsiveness and transparency. Consequently, the supply chain's digital components, formerly distinct, separate processes, have evolved into management of the whole network in a more integrated, real-time manner.

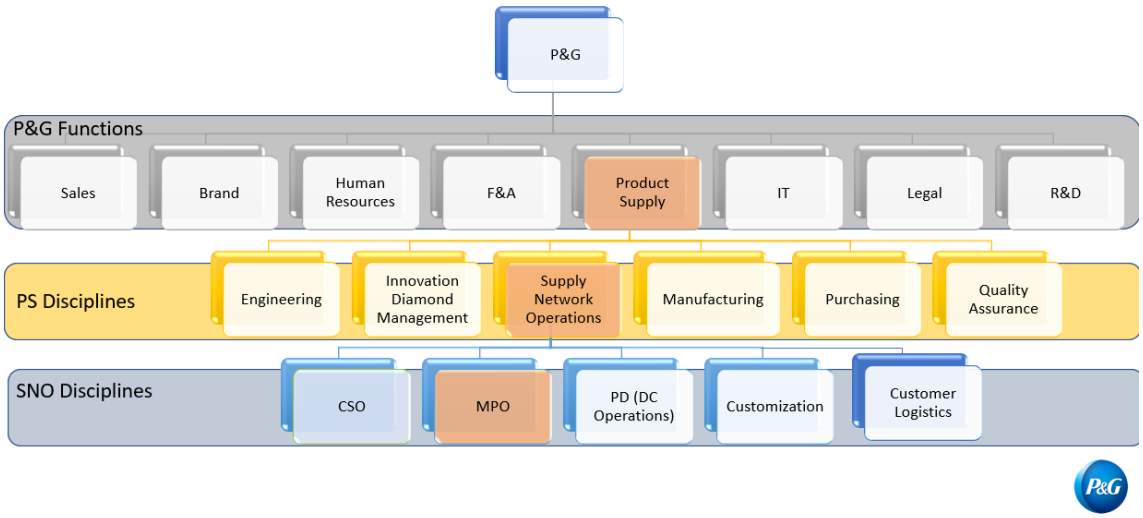
Successful businesses engage in supply chain resilience to mitigate risks and gain efficiency. The supply chain of Procter & Gamble is highly complex, both structurally and dynamically. P&G has invested extensively in data, manufacturing, and e-commerce technology during the last decade. Their investments exemplify how a long-term technology strategy may pay-out during economically challenging times. Along with logistical assistance, data analytics aids are manufacturing. With technology to forecast future bottlenecks, P&G can reformulate some products, which we are actively doing, without jeopardizing their quality or having a significant impact on the consumer, which gives the flexibility to adapt to material availability or cost variations.

In a supply chain-sensitive market, competing consumer packaged goods (CPG) firms have battled to maintain availability and profitability. Nonetheless, P&G achieved record revenues, earnings, and operational cash flows in the fiscal year 2021, providing clear proof that its efficiency efforts are paying off. A worldwide supplier base enables businesses to react rapidly to supply chain interruptions while reducing their economic effect through the ability to temporarily source from other areas, which allows P&G to address short-term challenges. P&G looks ahead, forecasts potential bottlenecks, and then chooses to boost inventory levels. Procter and Gamble supply networks' robustness is essentially defined by the degree of flexibility possible to create inside it.

3.6 Supply Network Operations

The selling and market operations (SMO), where I worked, supports the SBU, being the way to distribute the products that the RBU owes, being in charge of the distribution. SMO has customer teams with customer business development, local insights, localized marketing, transportation, warehousing, planning. Procter and Gamble are divided into several functions: Sales, Brand, Human Resources, Finance and Accounting (F&A), Product Supply, Information Technology, Legal, and Research and Development (R&D). Inside the Product Supply, there is engineering, innovation diamond management, supply network operations, manufacturing, purchasing, and quality assurance. Deep diving in the supply network operations is divided into customization, market planning organization (MPO), customer service operations (CSO), DC operations, and customer logistics.

Figure 2 - P&G Organizational Chart



Source: (*PROCTER AND GAMBLE*, 2022)

MPO is organized by category. Business Planner, the category leader role, works on long-term demand and initiatives. The business planner consolidates all the category areas into perspective to build category end-to-end operating strategies and systematically coordinates action plans to improve and deliver category results. They are demand master,

initiative leader, service facilitator, and category coordinator. Availability leader is the service guardian, are the risk fighter, service protector, and supply strategist.

Customization is divided into two roles, the Customization Initiative leader (CIL) and the techpacker. The customization Initiative Leader is leading a set of customized SKUs per category, designs, and cost savings while the techpacker shows the complete technical execution of these SKUs.

The Customer logistics team is split into several roles. Customer team logistics leader (CTLL) is building together with the customer value creation to optimize the supply chain and availability, to make sure there is a Win-Win between the customer and P&G. Customer demand managers (CDM) work on short-term forecasting volume clinics where they look at the promos for the coming weeks up to 6 months, which needs to be translated as forecast to the plants. The customer logistic operations manager (CLOM) is the team leader of the customer operations analyst; they are the face towards our customers, doing order management daily, organized by customers. The claims team works in prevention and fast claims resolution to avoid cash impact. The transport operations team oversees the haulier contact, on-time delivery, and optimization of trucks.

3.7 FBNL Supply Chain

FBNL stands for France, Belgium, Netherlands and Luxembourg. This cluster manages the supply chain of the four countries. It operates with Rumst Dc and Mivas customization center in Belgium, Amiens DC in France, Eskirchen DC and Altfeld Dc in Germany, and worldwide P&G DC, plants, and suppliers. It all starts with the raw materials and the respective suppliers worldwide. They deliver to P&G production plants or external manufacturers (ESS), providing finish products to our local distribution center. Most of our products are produced in PG-owned plants. For the FBNL market, we have direct plant deliveries, which is when we ship directly to the customer DC and can ship from

the plant to a P&G distribution center, in this case, Rumst DC. The local customization is done by Mivas, a manipulation center located in Rumst, DC. Pack materials suppliers deliver cartons, plastic, and coupons to Rumst dc to produce customized products. The customer organizes the distribution from the customer DC to the customer.

Not all categories have the same supply chain responsiveness; it depends on where the products are produced. And it also depends on how fast the supply chain can react. Fabric and home care have high responsiveness. Therefore, the supply crisis impacts the lower responsiveness categories where the products are produced farther away, like in China. Moreover, with less responsiveness, the forecast accuracy needs to be better.

Regarding the timings in the supply chain in P&G, we can analyze from the end of the chain, starting from the timing needed in the store. If we have a promotion in-store in week X, the products need to be in customer DC 2 weeks in advance, so they need to leave P&G DC 3-4 weeks before the promotion depending on the customer. Thus production needs to start three months upfront in the plant, and the plant needs to have all the raw materials six months before the promo in store.

It is also essential to understand the different types of orders in the FBNL market. The customers can place orders through their systems, be an advanced order visibility order (AOV), and vendor-managed inventory order (VMI). AOV is a collection of system solutions and process transformations that convert known and plannable customer events into a differentiated order signal for Order Management and Supply Planning to drive the appropriate supply chain response, balancing service and inventory. AOVs may be derived from advanced sales orders or forecasts. VMI is a supply chain arrangement where the supplier assumes control of the seller's inventory management choices, implying that P&G arranges the orders.

4. MY INTERNSHIP

I worked for Procter & Gamble in Brussels from July 1st 2021 to February 28th 2022 in the Market Planning Organization (MPO) under the Supply Network Operations (SNO) department. I was the Business Planner and Availability Leader for Procter & Gamble for Professionals in France and Benelux and the Availability Leader for Home Care in France and Benelux. I understood Supply Chain complexity by developing forecasts, coordinating the execution of initiative launches from a supply chain perspective, supporting our customers' service, and establishing mitigation strategies with the customer teams.

Concentrating on the two categories on which I worked. Home care is the SBU that grew the fastest with the pandemic because people clean more at home and value more safety. Home care strategy is divided into three essential topics: value, nature, health, and all territories. Value via accelerating convenient and performing products that improve customers' cleaning experience. Temperament and health focus on sustainability and convenience, health, and safety. Lastly, all territories refer to exploring new segments to play in and all areas to develop business.

PGP stands for Professional Procter and Gamble. The difference with retail is the sizing: PGP is the largest size available because Professional consumption is more significant than retail; The pricing and promo, size discount vs. retail, promo strategy overall in line with retail 1+1; claims and packaging, PGP branding silver, and different benefits and shares on the pack; and the formula, PGP has a different formula vs. retail to add superior value to end-users, for example, hospital products cannot have the same perfume as retail products. The PGP strategy is based on four fundamental principles. The first is safety for cleaning personnel, guests, and the environment. The second is simple to learn for the staff, easy to use versatile products, simple line up. The third is effective in delivering a superior cleaning performance, more effective operations, and

outstanding visual experience for cleaning personnel and guests. The last is environmentally friendly; the goal is to create a simple line that means fewer transportation emissions and less plastic waste, recyclable packaging, renewable electricity.

4.1 Business Planner

As a Business Planner, I was the demand master, which consists in being the owner of the monthly BOP cycle (Business Operating Planning) with Sales, finance, and Marketing to work a forecast, in collaborating with the Demand Planners in Warsaw Planning Center to transfer the forecast into the supply systems and closely work with the customer Demand Managers to understand the upcoming promotions of the different customers. Additionally, it is the business planner's responsibility to be the initiative leader for the category under their accountability, in my case, PGP. It implies working closely with the Initiative Leaders in Geneva and Warsaw and the customer teams to make sure new launches and product changeovers are managed smoothly at our customers. The BP oversees creating all the master data and forecast for the new initiates and follows up with them even after their launch. It is essential to understand that initiatives can be of 3 forms, which we denominate the type of customer conversion related to the Final product code (FPC). There is the phase-in FPC and the; these-out one, the PIPOs. There are three types of customer conversion: soft change, hard change, or new. The soft changes are internal, only the FPC changes and not the affecting P&G but not the customer. These changes are minor modifications to the products that the customers don't need to know once they have no impact. Therefore, they are the easiest to manage since we have the Phase-out (PO) forecast as a reference. The Hard changes are the opposite; it impacts the customer, so both FPC and EAN change, meaning that the changes are visible; for example, a difference in the packing or the formula of the product suffers a significant

difference. And lastly, the new ones, that as the name implies, it a launch of a new product. In terms of management, Hard changes and new initiatives are the same.

4.2 Availability Leader

As an Availability Leader, my focus was the risk. A risk in the supply chain appears when: stock + safety stock < demand (forecast or/and orders). In P&G, risks can be in the supply as for line interruption, stolen or damaged stock, delay in transportation, and global crisis as covid-19. On the other hand, risks can be on-demand, like unexpected orders and no forecast. Lastly, it can be a DC cut such as late picking, late shuttling, and human error.

The measure of the risk is calculated based on the volume in measure statistical unit (MSU): Risk (MSU) = QTY at risk (=missing) x SU factor. Therefore, there is a Daily cycle, where before 11h, the AV is in contact with the market delivery analyst (MDA) to become aware of all risks and try to mitigate them. At 11h, there is the order cut off, which means after this moment, no changes are possible anymore; there is no more the possibility to mitigate the risk of the day. Between 11h and 11:30h, the availability team's first check is to check all blocks in the order; they can be credit limit blocks, trucks too full, or even manual errors inside the orders. Then, from 11:30h to 12:30h, there is a review line by line of the availability, and a decision is made for lines that are not possible to supply, which means that there was no mitigation possible. After the AV has to do the release, create all deliveries per DC, and the final actions check. The deliveries flow to the DC and transport team, creating the shipments and combining the orders inside trucks. Finally, at 14:30h, all shipments are sent to hauliers, which will book the loading slots at DC.

Therefore, the AV is the service guardian, which means it is his responsibility to assure that inside his category, in my case, PGP and Home Care can fill all orders and, if not possible, try to find a mitigation plan for them.

Thus, in P&G, there are measures to evaluate the service to guarantee that it aligns with P&G KPIs and, most importantly, the customer ones. The first measure is the case fill rate (CFR) which is how P&G measures the way they supply their customers supplier DC. For example, if the customer order 10 cases but P&G only deliver 9, the CRF is 90%. The second measure is the service as measured by the customer (SAMBC), and as the name says, is the customer's perception of P&G service. Some customers check the numbers of lines orders delivered, others in the volume, others in value or number of products. And the last one is the on-shelf availability (OSA) measured by the shopper, comparing what is on the shelf vs. what needs to be on the shelf.

Another responsibility of the AV is the non-performance inventory (NPI), which is the stock that is not selling, being stopped at the DC, consuming space, and money. When there is too much forecast compared to orders, overproduction generates NPI. Hence, The AV needs to find a solution for this. The most common option for significant amounts of NPI is the broker wave, which is made with specific customers for a lower price. There is also the possibility to sell to GARP, which is to sell for less developed countries for even a lower price. The last two and not so recommend options are making a sample or scraping it.

4.3 Mitigation Plans and Allocation

Regarding availability at P&G, we may categorize it into three stages: business as usual, managed supply, and constrained demand or allocation. When business is conducted typically, supply exceeds demand, indicating that demand is unconstrained, and that more volume can be covered. Internal and external service measures should be at or near the

target, so there is no SAMBC effect, and typical risk mitigation methods are followed when faced with a managed supply scenario, it is possible to cover the basic plan but not the additional volume, supply issues may exist. We can anticipate some SAMBC effect, but it will be minor. Therefore, the business will fall into a constrained demand situation without some action. In this instance, the managed supply procedure must be followed to return availability to the target within eight weeks. This process entails informing commercial teams, so P&G drives no new plans with the customers on the constrained product families and the expected impact on each of them. These are short to medium-term conditions. When the duration is between mid and long-term, we have already entered an allocation stage, which indicates that supply is insufficient to meet unconstrained demand, implying a significant SAMBC effect and in commercial relationships due to limited demand even for the base plan. In this situation, a multidisciplinary effort is put into place in the allocation process by market and customer to attempt to lower demand to allocation volume based on impact evaluations and prioritizations. The new and uncommitted plans are removed; it was considered the temporary suspension of sale on SKUs if initial availabilities are less than 50% of unconstrained demand, the suppressed demand is to be reported in CFR and is executed the allocation cost-benefit analyses (CBA). Communication is critical throughout this procedure. During my eight months internship, all three stages happened.

Mitigation plans are actions to end or reduce the risk as to the last chance not to cut volume. In Procter and Gamble, as an availability leader, there are several mitigation plans that we can implement. The first is an order data check, ensuring no customer mistakes in orders sent in quantities, codes, and dates. Another mitigation plan is the manual substitutions, switching from one Final Product Code to another one sharing the same EANs and with availability, only applicable on soft change PIPOs since there is no

customer impact. The AltBom process can also be a mitigation process that consists in modifying the bill of materials when a material is missing (base code or pack mat) to produce and mitigate the risk. It is also possible to DC switch from one DC to another with more stock to reduce the risk but is only applicable on complete truck orders & limited categories only. In this process in necessary to have approval from the customer, DC, and transport teams. Another plan is switching to an alternative code with a different EAN that offers a similar product to the customer, but the codes need to belong to the customer portfolio. When a shortage is flagged, the AV needs to check which alternative code can be proposed to the customer based on availability, and it needs to be validated and then changed the FPC in the order or asked for a new order. One of the most common mitigation plans is late loading which consists of loading the order later to wait for stock arrival but is not feasible for the part load. There is also a Threshold is 1 MSU & only three requests per DC per day, and it needs to be approved by CLOM, Tops, and DC. Order Postponement is the most used method. It consists in asking the customer to delay the order where the risk is too high. AV asks via email to postpone the order to a later ATP date, and CLOM contacts the customer to check whether it is possible to delay the order.

In Home Care, inside the cleaning systems category, the Swiffer products are mainly produced in China. Hence, on August 18 of 2021 when China shut down the Ningbo-Zhoushan port, the world's third busiest port, after an employee was found infected with COVID-19, the supply chain of Swiffer stopped, with massive delays in containers shipments. Therefore, we started the allocation process once it was a long out-of-stock period. First, the Commercial priorities were aligned, and the allocation CBA was executed. In the Swiffer allocation process, the order of prioritization was the displays, then the promotional order, after the shelf order according to the running rate by

customers in previous months, and lastly, other deals if remaining allocation available with a case-by-case assessment. The operating principles were to share a proactive communication by the customer on allocated volume shared minimum of six weeks in advance for promotions to allow promo adjustment without penalties and service impact, for incremental volume above the given volume by customer needs to validation and answer will be shared within a week and alternatives will be offered whenever possible. Also, every week, shipments vs. allocation by the customer by SKUs were checked to share interventions needed and potential reallocation. Therefore, during several week orders postponements were suggested as order remove request once the volume was not according to the allocation shared to the customer, and every time possible, we tried to cover the orders with alternative codes of the Swiffer, if not possible of another category of home care or in the worst case of Fabric care, but always code from the customer portfolio. For three months, the cleaning systems and Home Care service were way below target. Still, it was possible to recover one month before the prevision, which led to customer satisfaction.

On PGP, we faced a managed supply situation on Hand Dish Wash (HDW) from London, where it was produced and on commercial auto dish wash (CADW), we had cans availability. In the HDW, being a managed supply situation covering the base volume as possible, monthly volume was allocated per cluster according to base forecast. All incremental volume was assessed case by case if any stock was left. On CADW, being a short-term duration risk, regular mitigation strategies, such as delay orders and late loading, were implemented. Both cases require customer team communication.

Figure 3- P&G Allocation and Managed Supply

	Green	Yellow	Red
Stage	Business as Normal	Managed Supply	Constrained Demand/Allocation
Demand vs. Supply	C:D ≥ Target *unconstrained demand + upside volume*	1.0 < C:D < Target *base plan, but no upside*	C:D < 1.0 *Not sufficient to cover unconstrained demand*
Duration	Short Term (< 4weeks)	Short to Mid Term (4- 8 weeks)	Mid to Long Term (> 4 weeks)
SAMBC Impact	None	Minimal	Major
Service Management / Action plan	Standard Supply processes *(Daily, Weekly DDS, Codes @risk, Critical codes..)*	- Managed Supply process - Inform Commercial team about constrained families - Communication to Cust. Team	- Allocation CBA - Multifunctional work to reduce demand to allocation volume - Communication to Cust. Team
Constrained Demand	No	No	Yes

Source: (*Procter and Gamble*, 2022)

5. Conclusion

5.1 Introduction

As mentioned before, the COVID-19 pandemic is unprecedented in human history., impacting simultaneous demand and supply. Therefore, to survive, FMCG companies, such as Procter and Gamble, must establish resilient supply chains via efficient supply chain practices.

5.2 Discussion

Using my internship in Procter and Gamble as a springboard, we assessed the pandemic's influence on the company's supply chain and the practical measures for mitigating interruptions. Concerning the early production increase, an extension of capacity, and reassign resources, P&G adjusted for the higher lead times imposed by the covid limits by increasing safety stocks in products with longer lead times, the minimum order quantity, which is the smallest amount that can be produced in a single batch, was raised, making it possible to have more abundance in a single batch. Additionally, it is essential to highlight the order placement in the P&G system, such as VMI and AOV orders, which enables the organization to plan production more precisely and earlier since

we have a long-term perspective on the system. Also, prioritization is critical in P&G so that the resources are allocated to the urgent task and reduce reaction times.

However, although (P. Chowdhury et al., 2021; Veselovská, 2020) have proposed to change product qualities, such as essential qualifications, to serve more customers with present resources, P&G's first component of its goal statement is to assure the highest possible quality of goods. As a result, there is a quality assurance department to ensure product quality. Any product that does not reach the goal or has a problem is subjected to a quality inspection. If feasible, solutions such as re-stickering the products or qualifying new suppliers are consistently implemented. P&G, even during the pandemic, didn't lower the quality standards.

As a global firm with manufacturing sites and suppliers spread throughout the world, dispersion is not an issue for P&G. However, as shown by the Swiffer allocation, dispersion during a disruption might be a concern because of transportation constraints. As a result, P&G's distribution should be more globally balanced, with backup suppliers located closer to the plants in the event of a lockout. However, such measures represent a significant added price since manufacturing costs in Europe are more extensive, and supplier quality certification does not always work as expected. Regarding transportation improvements, P&G could investigate quicker vehicles such as aircraft since this disruption resulted in many railway delays and hauler concerns. Additionally, routes should be upgraded not just in terms of speed but also of sustainability. Moreover, the routes should be improved from a speed point of view and a sustainable one. Many P&G transportation routes include several travels to save production costs, and due to structural issues, that could be reduced. It may result in a higher manufacturing cost but lead times and emissions to the planet would be minimized in the long run.

Regarding real-time strategy changes, adaptive strategies, and dynamic reactions, we can state that all mitigation plans implemented, from order postponement to DC switch or even late loading, represent adaptive strategies and dynamic reactions from all teams involved in the process, with a customer-centric mindset. The allocation process is the most dynamic approach, requiring regular adaptation to supply fluctuations and constant contact between all departments and the client. The only disadvantage discovered was that when it came to structural processes, implementing structural adjustments is not always straightforward for a large multinational corporation, it is tough to modify a procedure that has always been done in this manner, even with the remedy already in place. P&G can only achieve real-time strategy changes, adaptive strategies, and dynamic reaction through improved relationships and collaborations throughout the supply chain and increased visibility. Collaboration and teamwork are pillars of P&G; in every process, teams work collaboratively to achieve and exceed all objectives; people are P&G's greatest asset. Using my everyday work as an example, coordination between the market planning team, the customer team, the transportation and distribution team, the planning center, and sales team, and the interchange of information and visibility between them keeps the supply chain moving.

Indeed, visibility is critical to success, and transparency is a fundamental principle of P&G. All information is provided through meetings, messages, and dashboards accessible to all employees. The daily meetings between the market delivery analyst (MDA) and the AV where risks are recognized and then the daily meeting where the AV informs the customer team about mitigation strategies, as well as the weekly meeting with the full SNO, or even the links between the BP and sales team to ensure all forecasts are correct, are proof of this. Communication and cooperation are critical in P&G, which is made feasible through knowledge and information management. At P&G, we believe in

learning via experience; we constantly expand our expertise through seminars and cross-team information sharing. Indeed, every two weeks, a BP workshop was held, and every week an AV meeting was held, during which the most knowledgeable individuals shared new methods of doing specific tasks or even suggested ways to enhance them. There are meetings of the horizontal process network (HPN), at which all better recommendations are considered, and action plans are established.

By comparing the authors' best practices in the event of a disruption to the approaches used by P&G, we can conclude that P&G's supply networks exhibited a high degree of resilience. P&G uses risk identification to effectively identify risks, analyze their impact on each customer, manage risks via mitigation methods, and assess the strategies' success and customer satisfaction after the occurrence. Prior to the pandemic, Procter & Gamble had implemented robust risk management measures, but during the pandemic, the company was able to adapt existing strategies and processes to the new environment, demonstrating significant resilience. P&G can recover from disruptive occurrences, and the company's quiet performance absorbs dire consequences by adjusting to unforeseen developments and profiting on success or failure information.

To summarize, COVID-19 acted as a significant catalyst for businesses to reconsider their global strategy, emphasizing the need for supply chain strategies and resilience to prevent catastrophic failure and equip the supply chain to survive shocks.

5.3 Contributions

The review of the literature was undertaken with the goal of finding current definitions of Supply Chain Resilience and understanding the connection with SCRM decision-making. As a result, implementing risk management strategies is a critical and effective approach for organizations seeking a competitive edge, as risk management is the connection between resilience and risk occurrences. This report contributes by merging

empirical research on supply chain resilience, demonstrating the feasibility of resilience via the use of practical indicators from Procter & Gamble, and addressing the relationship between supply chain resilience techniques in theory and practice. As a result of the advantages to SC resilience, the results may assist organizations in initiating SCRM operations or strengthening current procedures. Businesses may be able to reconsider their supply chain strategy in terms of both efficiency and resilience with the availability of realistic resilience evaluations. Additionally, this report demonstrates how difficult it is to maintain a supply chain network during disruptions and the critical need of evaluating how the impact of a disturbing node may propagate across the supply chain.

During disruptions, real-time strategy changes, adaptive strategies, and dynamic reactions are required to mitigate the risks, but where decision-makers evaluate the revenue maximization, customer impact, and the feasibility of the strategies. However, how to incorporate a sustainable factor into the design of a resilient supply chain network requires more research.

As mentioned before, Procter & Gamble has adopted robust risk management procedures, having demonstrated tremendous resilience by adapting existing strategies and processes to the new environment. The structural dynamics in the SC impacts operational dynamics in terms of ordering, inventory, production control decisions, and transportation. Being P&G, a multinational enterprise, although it has all the resources and capabilities needed, trying to reinvent the distribution and production model is difficult for a large-scale system, however, the company should seek alternative sources of supply and transportation, such as investing in production near the main source of distribution, which consequently will improve transportation. Additionally, the firm demonstrates a high degree of adaptability and a solid corporate culture with excellent organizational skills, which enables P&G to be resilient and flexible to any kind of

disturbance. As a result, P&G should continue to pursue the strategies developed during the covid-19.

5.4 Limitations

According to the reviewed literature, the research field of SC Resilience is expanding, and a correlation between risk and resilience is evident. However, as with any study, it has limitations that allow for more investigation.

Diverse supply chains may need distinct supply chain strategies. For instance, a global corporation such as Procter & Gamble has distinct inputs and outputs from a small business. As a result, various supply chains value trade-offs and define risks differently. Additionally, the interconnection of supply chains comprised of various goods or services may be critical to understanding, as it may necessitate the use of distinct supply risk management methodologies. Thus, when assessing the impact of COVID-19 on the performance and financial capabilities of businesses, not all may possess the necessary resources and capabilities, and implementing mitigation strategies is expensive and complex.

This introduces another constraint when analyzing their resilience measures: the time required to recover, the extent of recovery, and the profit lost during the recovery period. Since businesses with distinct characteristics will have different degrees of resilience, once resources and competencies to implement supply risk management strategies are also different and conclusions of this report are constrained by P&G standards. A comparable analysis of enterprises in other sectors or industries is essential, since conditions vary greatly across nations.

Another gap is when studying various types of disruptions in supply chain resilience strategies, they consistently emphasize recovery from unanticipated disruptions and systemic risks. While pandemics provide a unique threat, supply chain resilience should

not be the exclusive emphasis during the recovery phase, equal weight should be given to the early stages as well, since recovery is impossible without risk identification.

Also, businesses should develop link SCRM processes to increase the resilience of their SCs and survive shocks. However, can the companies maintain a constant state of awareness of the environment? While firms have increased their focus on the resilience of their global SCs in response to the COVID-19 pandemic developing strategies, it is unclear whether these practices can be maintained.

REFERENCES

Azadegan, A., Mellat Parast, M., Lucianetti, L., Nishant, R., & Blackhurst, J. (2020). Supply Chain Disruptions and Business Continuity: An Empirical Assessment. *Decision Sciences*, *51*(1), 38–73. https://doi.org/10.1111/deci.12395

Barton, T. L., Shenkir, W. G., & Walker, P. L. (2002). *Making enterprise risk management pay off*. Financial Times/Prentice Hall PTR.

Behzadi, G., O'Sullivan, M. J., & Olsen, T. L. (2020). On metrics for supply chain resilience. *European Journal of Operational Research*, *287*(1), 145–158. https://doi.org/10.1016/j.ejor.2020.04.040

Bier, T., Lange, A., & Glock, C. H. (2020). Methods for mitigating disruptions in complex supply chain structures: A systematic literature review. *International Journal of Production Research*, *58*(6), 1835–1856. https://doi.org/10.1080/00207543.2019.1687954

Birkie, S. E., & Trucco, P. (2020). Do not expect others do what you should! Supply chain complexity and mitigation of the ripple effect of disruptions. *International Journal of Logistics Management*, *31*(1), 123–144. https://doi.org/10.1108/IJLM-10-2018-0273

Bode, C., & Wagner, S. M. (2015). Structural drivers of upstream supply chain complexity and the frequency of supply chain disruptions. *Journal of Operations Management*, *36*(1), 215–228. https://doi.org/10.1016/j.jom.2014.12.004

Bridget McCrea. (2020). *Measuring COVID-19's Impact on the World's Supply Chains*. https://www.sourcetoday.com/supply-chain-trends/article/21126824/measuring-covid19s-impact-on-the-worlds-supply-chains

Chiaramonti, D., & Maniatis, K. (2020). Security of supply, strategic storage and Covid19: Which lessons learnt for renewable and recycled carbon fuels, and

their future role in decarbonizing transport? *Applied Energy*, *271*, 115216. https://doi.org/10.1016/j.apenergy.2020.115216

Chowdhury, M. M. H., & Quaddus, M. (2017). Supply chain resilience: Conceptualization and scale development using dynamic capability theory. *International Journal of Production Economics*, *188*, 185–204. https://doi.org/10.1016/j.ijpe.2017.03.020

Chowdhury, P., Paul, S. K., Kaisar, S., & Moktadir, Md. A. (2021). COVID-19 pandemic related supply chain studies: A systematic review. *Transportation Research Part E: Logistics and Transportation Review*, *148*, 102271. https://doi.org/10.1016/j.tre.2021.102271

Deaton, B. J., & Deaton, B. J. (2020). Food security and Canada's agricultural system challenged by COVID-19. *Canadian Journal of Agricultural Economics/Revue Canadienne d'agroeconomie*, *68*(2), 143–149. https://doi.org/10.1111/cjag.12227

El Baz, J., & Ruel, S. (2021). Can supply chain risk management practices mitigate the disruption impacts on supply chains' resilience and robustness? Evidence from an empirical survey in a COVID-19 outbreak era. *International Journal of Production Economics*, *233*, 107972. https://doi.org/10.1016/j.ijpe.2020.107972

Emmett, S., & Granville, D. (2007). *Excellence in inventory management: How to minimise costs and maximise service*. Cambridge Academic.

Erik Sherman. (2020). *94% of the Fortune 1000 are seeing coronavirus supply chain disruptions: Report*.

Fan, Y., & Stevenson, M. (2018). A review of supply chain risk management: Definition, theory, and research agenda. *International Journal of Physical*

Distribution & Logistics Management, *48*(3), 205–230. https://doi.org/10.1108/IJPDLM-01-2017-0043

Feinmann, J. (2020). PPE: What now for the global supply chain? *BMJ*, m1910. https://doi.org/10.1136/bmj.m1910

Gunessee, S., & Subramanian, N. (2020). Ambiguity and its coping mechanisms in supply chains lessons from the Covid-19 pandemic and natural disasters. *International Journal of Operations & Production Management*, *40*(7/8), 1201–1223. https://doi.org/10.1108/IJOPM-07-2019-0530

Ivanov, D., & Das, A. (2020). Coronavirus (COVID-19/SARS-CoV-2) and supply chain resilience: A research note. *International Journal of Integrated Supply Management*, *13*(1), 90. https://doi.org/10.1504/IJISM.2020.107780

Ivanov, D., & Dolgui, A. (2020). Viability of intertwined supply networks: Extending the supply chain resilience angles towards survivability. A position paper motivated by COVID-19 outbreak. *International Journal of Production Research*, *58*(10), 2904–2915. https://doi.org/10.1080/00207543.2020.1750727

Ivanov, D., Tsipoulanidis, A., & Schönberger, J. (2017). *Global Supply Chain and Operations Management*. Springer International Publishing. https://doi.org/10.1007/978-3-319-24217-0

Kamalahmadi, M., & Parast, M. M. (2016). A review of the literature on the principles of enterprise and supply chain resilience: Major findings and directions for future research. *International Journal of Production Economics*, *171*, 116–133. https://doi.org/10.1016/j.ijpe.2015.10.023

Kleindorfer, P. R., & Saad, G. H. (2009). Managing Disruption Risks in Supply Chains. *Production and Operations Management*, *14*(1), 53–68. https://doi.org/10.1111/j.1937-5956.2005.tb00009.x

Leite, H., Lindsay, C., & Kumar, M. (2020). COVID-19 outbreak: Implications on healthcare operations. *The TQM Journal*, *33*(1), 247–256. https://doi.org/10.1108/TQM-05-2020-0111

Li, Y., & Zobel, C. W. (2020). Exploring supply chain network resilience in the presence of the ripple effect. *International Journal of Production Economics*, *228*, 107693. https://doi.org/10.1016/j.ijpe.2020.107693

Lozano-Diez, J., Marmolejo-Saucedo, J., & Rodriguez-Aguilar, R. (2020). Designing a resilient supply chain: An approach to reduce drug shortages in epidemic outbreaks. *EAI Endorsed Transactions on Pervasive Health and Technology*, *6*(21), 164260. https://doi.org/10.4108/eai.13-7-2018.164260

Madhavi, B. R. H., & Wickramarachchi, R. (2021). Decision-making models for a resilient supply chain in FMCG companies during a pandemic: A systematic literature review. *2021 International Research Conference on Smart Computing and Systems Engineering (SCSE)*, 216–222. https://doi.org/10.1109/SCSE53661.2021.9568303

Magableh, G. M. (2021). Supply Chains and the COVID-19 Pandemic: A Comprehensive Framework. *European Management Review*, *18*(3), 363–382. https://doi.org/10.1111/emre.12449

Manuj, I., & Mentzer, J. T. (2008). Global supply chain risk management strategies. *International Journal of Physical Distribution & Logistics Management*, *38*(3), 192–223. https://doi.org/10.1108/09600030810866986

Mehrotra, S., Rahimian, H., Barah, M., Luo, F., & Schantz, K. (2020). A model of SUPPLY-CHAIN decisions for resource sharing with an application to ventilator allocation to combat COVID -19. *Naval Research Logistics (NRL)*, *67*(5), 303–320. https://doi.org/10.1002/nav.21905

Paul, S. K., & Chowdhury, P. (2020). Strategies for Managing the Impacts of Disruptions During COVID-19: An Example of Toilet Paper. *Global Journal of Flexible Systems Management*, *21*(3), 283–293. https://doi.org/10.1007/s40171-020-00248-4

Paul, S. K., & Chowdhury, P. (2021). A production recovery plan in manufacturing supply chains for a high-demand item during COVID-19. *International Journal of Physical Distribution & Logistics Management*, *51*(2), 104–125. https://doi.org/10.1108/IJPDLM-04-2020-0127

Procter and Gamble. (2022). https://pt.pg.com/

Remko, van H. (2020). Research opportunities for a more resilient post-COVID-19 supply chain – closing the gap between research findings and industry practice. *International Journal of Operations & Production Management*, *40*(4), 341–355. https://doi.org/10.1108/IJOPM-03-2020-0165

Richards, T. J., & Rickard, B. (2020). COVID-19 impact on fruit and vegetable markets. *Canadian Journal of Agricultural Economics/Revue Canadienne d'agroeconomie*, *68*(2), 189–194. https://doi.org/10.1111/cjag.12231

Sá, M. M. de, Miguel, P. L. de S., Brito, R. P. de, & Pereira, S. C. F. (2019). Supply chain resilience: The whole is not the sum of the parts. *International Journal of Operations & Production Management*, *40*(1), 92–115. https://doi.org/10.1108/IJOPM-09-2017-0510

Sharma, M., Luthra, S., Joshi, S., & Kumar, A. (2020). Developing a framework for enhancing survivability of sustainable supply chains during and post-COVID-19 pandemic. *International Journal of Logistics Research and Applications*, 1–21. https://doi.org/10.1080/13675567.2020.1810213

Slack, N., Brandon-Jones, A., & Johnston, R. (2016). *Operations management*.

Veselovská, L. (2020). Supply chain disruptions in the context of early stages of the global COVID-19 outbreak. *Problems and Perspectives in Management*, *18*(2), 490–500. https://doi.org/10.21511/ppm.18(2).2020.40

Waters, C. D. J. (2007). *Supply chain risk management: Vulnerability and resilience in logistics*. Kogan Page.

Wieland, A., & Wallenburg, C. M. (2013). The influence of relational competencies on supply chain resilience: A relational view. *International Journal of Physical Distribution & Logistics Management*, *43*(4), 300–320. https://doi.org/10.1108/IJPDLM-08-2012-0243

Zhu, G., Chou, M. C., & Tsai, C. W. (2020). Lessons Learned from the COVID-19 Pandemic Exposing the Shortcomings of Current Supply Chain Operations: A Long-Term Prescriptive Offering. *Sustainability*, *12*(14), 5858. https://doi.org/10.3390/su12145858