Journal of Business and Management Sciences, 2023, Vol. 11, No. 6, 317-342
Available online at http://pubs.sciepub.com/jbms/11/6/3
Published by Science and Education Publishing
DOI:10.12691/jbms-11-6-3

The Impact of Applying Supply Chain Practices to Develop Crisis Responsiveness (Applied Study on Pharmaceutical Companies)

Walaa Zakaria Abd El hady[1,*], Amal Mustafa Asfour[2]

[1]Arab Academy for Science, Technology and Maritime Transport, Graduate School of Business (AASTMT), Cairo, Egypt
[2]Associate Professor of Business Administration, Former director of Arab Academy for Science Technology & Maritime Transport Port Said branch
*Corresponding author: supplychain2228@gmail.com

Received November 11, 2023; Revised December 12, 2023; Accepted December 19, 2023

Abstract Purpose**:** Through global Supply Chain Management SCM, performance is attained, and suppliers and clients are key contributors. Thus, one of the key problems facing firms is their ability to create extensive networks of suppliers and customers, and then to structure and manage those networks. These abilities support businesses in gaining agility and flexibility, keeping them competitive and enabling them to incorporate innovations in their supply chain operations with all of their partners. Therefore, the importance of the science and art of Supply Chain Management SCM is the most important issue nowadays. Due to the pharmaceutical industry's prominence in the Egyptian economy, businesses have begun to investigate how supply chain management strategies enhance organizational responsiveness, particularly during times of crisis. These ideas include :(1) Supply chain management procedures, which cover supplier collaboration, customer relationships, and information sharing; (2) Crisis responsiveness of the organization, which covers operational system responsiveness, logistic process responsiveness, and supplier network responsiveness; (3) A company's competitive advantage (long term success). **Aim and objectives:** Examine the impact of supply chain management strategies, including cooperative relationships with strategic suppliers, information exchange, and supply chain responsiveness. This study also explores the relationship between supply chain responsiveness and the firm's operational system, logistical process, supplier network, and competitive advantage. **Research methodology:** the paper adopts the positivism philosophy and follows a deductive approach. Using a qualitative design with survey strategy targeting, the Sample size of 382 from 20 companies from all sector divisions operating in Egypt. **Main results:** The study found that dimensions of Supply Chain Practices directly impact both Crisis Responsiveness. **Recommendations:** Businesses try to qualify employees to prepare them for growth and change. Businesses must define flexible, realistic, and achievable objectives that are structured, controlled, and prioritized within the industry in accordance with their importance. **Limitations and Future Work** researchers should consider that participants with low levels of English literacy would not be able to reply to the survey. Future research should include bilingual questionnaires to boost participation. The study focused on supply chain practices (as an independent variable). Therefore, it is suggested to study the factors affecting organizational crisis responsiveness.

Keywords: *supply chain management, supply chain practices, strategic supplier partnership, customer relationship management, communication, information sharing, logistic process responsiveness, crisis responsiveness, operation system responsiveness, organization long term success, flexibility, agility, competitive advantage*

Cite This Article: Walaa Zakaria Abd El hady, and Amal Mustafa Asfour, "The Impact of Applying Supply Chain Practices to Develop Crisis Responsiveness (Applied Study On Pharmaceutical Companies)." Journal of Business and Management Sciences, vol. 11, no. 6 (2023): 317-342. doi: 10.12691/jbms-11-6-3.

1. Introduction

The corporate world of today is more competitive and global than it was in the past. Shorter product life cycles, quick new product releases, and clients who are more intelligent, informed, and sophisticated are characteristics of modern business. This makes supply chains more responsive. In order to maintain and even improve competitive advantage, modern supply chains must be able to react quickly, effectively, and efficiently to changes in the marketplace. Therefore, research into supply chains' responsiveness is interesting. In this study, the effects of different production processes based on modularity both inside and outside the organization are examined in relation to supply chain responsiveness. For the supply chain responsiveness construct, it creates a

legitimate and trustworthy tool that will be useful to academics and practitioners alike. The study evaluates the effect of supply chain responsiveness on the end variable, the firm's competitive advantage. For practitioners, this study has some significant repercussions. Given current levels of various specific SCM and modularity-based manufacturing practices, which have a direct impact on supply chain responsiveness and its dimensions, this research offers appropriate recommendations on the areas that might use improvement. Additionally, the report makes appropriate suggestions for improvement based on the present state of the major leading SCM techniques and supply chain responsiveness standards, which directly affect an organization's ability to maintain a competitive edge.

Over the past two decades, as globalization has taken center stage, the study of supply chain practices management has garnered enormous interest from academic researchers and business professionals. Supply chain practices management is a crucial tool for tracking global developments and positioning the business for long-term competitive advantage in reaction to crisis as more and more sectors go global. Both industrialized and developing nations have published numerous publications on strategic management. There are, however, few empirical studies that look at the connection between supply chain practices management and crisis reactivity in the Egyptian pharmaceutical industry. This necessitated this investigation.

In conclusion, this study investigated the importance of applying the supply chain management practices "SCPM" strategic supplier, Customer relationship management, Communication (flow of data and Data Dependability and Reliability) and its impact on the Crisis Responsiveness of the companies, Operation System Responsiveness, Logistic Process Responsiveness, and Organization Long Term Success.

1.1. Research Statement

The development and capture of benefits related to supply chain crisis management (CM) for society as a whole is made possible by awareness and understanding of the critical crisis preparedness and recovery activities and processes carried out by actors involved in multi-organizational response and management initiatives.

The respondent organizations focused on reducing the number of suppliers they used after assessing the performance of their supply base in order to consolidate their purchasing volumes and get rid of those who couldn't fulfil their commitments. Databases on supplier performance identified the persistently unreliable vendors. To further improve the effectiveness and capacity of their supply bases, respondent organizations took part in supplier management.

Organizations rarely have the chance to assess their internal organizational structures or develop long-term strategic strategies. Therefore, CRISIS companies must better grasp their responsibilities and take into account each stage of the CM lifecycle when building their initiatives. Therefore, a clear overview of relevant, interrelated systems and procedures is necessary for any business and its network to comprehend and predict the implications of system changes brought about by CRISIS throughout time.

In general, businesses didn't give their IT systems' security enough thought. Because it lacked the essential experience, the company frequently employed a third party to handle the management of its IT systems. However, the essential tenets of all business operations are the accessibility of communication systems and the usage of data. A few days of disruption or data loss could cause the company to incur huge losses and expenses. This area need special attention from many enterprises. Although many organizations struggle with a lack of time and money, staying still is not an option. In order to reduce internal crisis causes, resources must be strategically managed. Tactical planning and strategic external relationship management also provide organizations more control over what is said about them and what rumors await those who mismanage their external communications; but, they cannot prevent or provide security against any form of unforeseen crisis. So the problem is the shortage of applying supply chain practices that could affects crisis responsiveness in pharmaceutical companies and how a business can adopt supply chain strategies with its suppliers and clients for organization long term success?

1.2. Research Gap

Many researchers have studied the role of supply chain practices with all its phases in increasing organizational performance. However, this study reveals some research gaps:

There is a lack of research that specifically examines the impact of applying supply chain practices to develop crisis responsiveness in the Egyptian pharmaceutical sector. Much less attention has been paid to supply chain practices. This lack of attention provides an opportunity for these theoretical contributions.

Based on a review of previous research studies on supply chain practices and crisis responsiveness, there are several factors that influence supply chain Practices and crisis responsiveness, such as financial and non-financial indicators. Unfortunately, there is no research that has developed a comprehensive model for supply chain practices to develop crisis responsiveness.

1.3. Research Objectives

This study’s main objectives are to:

1). Investigate the connections between performance and strategic supplier alliances and to test the effects of each strategic supplier partnership indicator on performance.
2). Determine whether elements impacting strategic supplier alliances have a significant impact on the business success.
3). Examine the impacts of strategic supplier cooperation, customer connections, and information exchange. The current study also looked at how supply chain flexibility could help to balance the effects of information sharing, supplier alliances, customer connections, and competitive advantage.
4). Ascertain the impact of supply chain management

strategies, including cooperative relationships with strategic suppliers, information exchange, and supply chain responsiveness. This study also explores the relationship between supply chain responsiveness and the firm's operational system, logistical process, supplier network, and competitive advantage.

1.4. Research Questions

This work's goal is to address the following research questions:

1. What are the primary general actions and procedures in the SCM stages of readiness and recovery?
2. How were the supply chain management's key determinants changed by the crisis?
3. How do predictability, lack of alternatives, and lack of planning impact the supply chain during a crisis?
4. How general activities and processes impact crisis preparedness and recovery at the inter-organizational and operational levels of practice?
5. Would such information eliminate the majority of the coordination problems and information asymmetries that are present in SCM?

1.5. Research Significance

1.5.1. Scientific Importance

The intricacy of crises forces supply chain managers to create crisis-induced strategies rather than the conventional strategies that emphasize competitive considerations. The need for introspective and retrospective socio-economic insights on the contexts, priorities, and themes of supply chain management in times of crisis is highlighted by recent crises, such as the coronavirus outbreaks, widespread product recalls, and financial crises. These crises also highlight the rising frequency and severity of crises. By methodically assembling the pertinent body of scholarly work, outlining current research methodologies, capturing strategic priorities and themes of complexity in research studies, and highlighting opportunities for further research, this study aims to review the literature on supply chain management during times of crisis.

1.5.2. Practical Importance

The economic environment has been challenging for multinational firms for a long time. The global industry has benefited from a number of variables, mainly the supply of raw materials or components. Therefore, it is now more important than ever for risk managers to identify, assess, manage, and educate themselves about the dangers they are facing as early as possible.

1. The investigation of how diverse businesses maintain production continuity and material availability in emergency situations was the major goal of this study. The theoretical underpinning of the study is presented first, and then interviews with companies that operate in a global market. There are no category restrictions on the businesses being interviewed.
2. The study's execution employed semi-structured theme interviews. How to ensure own production and how to ensure supplier production in the supply chain were the two areas that the study's subject was divided into from a risk management standpoint.
3. Organizations obviously vary from one another in terms of ensuring production and material availability. However, each organization determines the appropriate level of risk management. Only at a few businesses did it appear challenging to understand how to do this and what it meant.

This study makes a significant contribution to the Egyptian pharmaceutical sector community of practice in several ways: At first, there was evidence to support the following claims:

(1). SSP determinants, such as "Continuous Improvement Programs with Suppliers," "Joint Problem Solving with Suppliers," "Planning and Goal Setting with Suppliers," "Emphasis on High Quality Suppliers," and "Long Term Relationships with Suppliers," have positive and direct effects on product quality performance.

(2). Strategic supplier cooperation in supply chain management raises business success indirectly by improving product quality.

(3). Product quality performance, notably product conformance, performance, reliability, and durability, has an immediate and beneficial impact on business performance, including return on sales, return on asset, market share, and profitability.

(4). "Continuous improvement programs with suppliers" are the factor that contributes most to the adoption of strategic supplier partnerships, followed by "shared problem solving with suppliers," "planning and goal setting with suppliers," and "focus on high quality suppliers."

1.5.3. Theoretical Background and the Literature Review

By outlining the key tenets of the idea of supply chain practices and their effect on crisis response, this study discusses the theoretical underpinnings of supply chain practices in businesses. Also looks at the theoretical underpinnings of supply chain procedures by highlighting their significance and outlining the key factors and characteristics in troubled business organizations.

2. Strategic Supplier

2.1. Practices in Supply Chain Management (SCMPs)

(Blome et al., 2014)[1] In order to effectively and efficiently use the resources available, these capabilities integrate not only the company's internal activities but also those of the supplier and customer bases. (Tarigan et al., 2019)[2] Supply chain practices are a practical activity carried out by businesses in the flow of the supply chain in order to boost business performance and competitiveness of businesses concurrent with the flow of the supply chain. D'Eusanio et al. (2019) [3] noted that in organizations that

heavily rely on the SC, the SC depends on physical actions related to the alteration of organizational resources and the movement of raw materials from the initial stage to the final phase, as well as actions related with information, material, and financial flows for creating a decisional system that incorporates with all the procedures of acquiring, production, delivery, and customer services in the organization. Siagian et al., (2020) [2] Coordination and collaboration with associated partners, including as suppliers, middlemen, outside service providers, and clients or consumers, are also included in SCM. SCM incorporates supply and demand agreements between or among businesses

2.2. Organizational Performance and Supply Chain Practices (Sustainable Supply Chain Management) (SSCM)

(Zailani et al., 2012) (Wang and Sarkis, 2013) [4], Implementing SSCM activities encourages better content, high maintenance, and originality, improves business success and creates a corporate brand with a strong market presence. According to Gonzalez-Gallego et al. (2015) [4], SCM is the art and science of fostering synergistic partnerships between partners across distribution channels so that goods can be distributed to "the right consumer. Lii and Kuo (2016) [6] came to the conclusion that supply chain integration (namely, supplier integration and internal integration) has a mediating influence on innovation orientation and company performance. (Ahmed and Sarkar, 2018) [4] Practices with the long-term objective of sustaining the health of the community, climate, and economy are the key contributors to the sustainability of commercial organizations.

2.3. Competitive Advantage and Supply Chain Practices

Competitive advantage, is the organization's capacity to forge a defensive posture relative to its rival (Cost, Quality, flexibility, delivery window, and commitment to creativity). According to (Baum & Bird, 2010) [3] for all businesses, it is crucial to understand how creativity influences the relationship between IT acceptability and CA as well as the relationship between IT acceptance and service uniqueness. Phan et al. (2011) [3] pointed out that flexibility is listed as the core of industrial competences for manufacturing organizations, and this includes the ability to change capacity, as well as the ability to change capacity at the actual minimum cost while still maintaining the ability to produce small batches of goods and launch new products. According to Elgazzar, Tipi, Hubbard, and Leach (2012) [5] state that by tying the performance of the supply chain processes to the business's financial strategic goal, companies can gain a competitive edge and create strategies for improved SCM. These strategies are then tied to the area of improving financial performance as the primary focus. According to Marinagia et al. (2014) [3] provide a very clear illustration of organizations as open IT by developing new IT-related tools, global competition, and improved client demands to reevaluate how they can take advantage of IT competences to better manage all of their organizational operations and enable information delivery through organizations by combining both internal and external business operations.

2.4. The association between SSCM and OP "The efficiency of an organization (OP)"

Golicic and Smith (2013) [4] analyzed more than 20 years of research on sustainable supply chain policies and the overall impact of those particular activities on corporate efficiency. Findings show a positive and significant association between sustainable supply chain practices and firm efficiency. According to Chan et al. (2016) and Lin and Tseng (2016) [4], SSCM aims to maximize supply chain business and environmental performance. Das (2017) [4] examined the four SSCM success factors of ecological efficiency, social performance, operational performance, and competitiveness. Hong et al. (2018) [4] offer objective proof of the positive correlation between SSCM activities and business results that are centered on the Chinese manufacturers' enquiry. (Abdallah and Al-Ghwayeen, 2019) [4] Companies must anticipate working to combat changes in dynamic, unpredictable surroundings in order to improve their businesses in today's most successful and profitable environment.

2.5. Firm Performance and Strategic Supplier Partnership (SSP)

According to Frohlich and Westbrook (2001; Schoenherra and Swink, 2012) [1], external integration has two directions: forward integration for the physical flow of deliveries between suppliers, manufacturers, and customers; and backward coordination of information technologies and the flow of data from customers, to manufacturers, to suppliers. (Smith, Hair, & Ferguson, 2014) [5] A long-lasting, fruitful retailer-vendor connection, is a very typical and classic example of a sustainable cooperation. Goals related to the market may be evaluated using the company's market share and/or customer satisfaction. [N. Pfanelo, "Supply chain partnership, collaboration, integration and relationship commitment as predictors of supply chain performance in South Africa SMEs," Business and Social Sciences Journal, Vol. 2, No. 1, pp. 134-168, 2017] [6] The relationship between the supplier and the buyer is particularly antagonistic for the organizations, according to scholars. By working with more suppliers, the business can ensure supply continuity, negotiate prices, and increase competition. If a low-value product is being produced, then this strategy is appropriate. Partnerships with suppliers are by their very nature strategic and typically involve the organization's top management. The market is extremely complicated, and business resources are quite scarce.

2.6. Supply Chain Strategy with a Focus on Responsiveness

A flexible and cooperative relationship between the buyer and the seller, along with appropriate information sharing, will undoubtedly boost each party's competitive

edge in the market. Flexibility at all levels of the supply chain is necessary for an organization to emphasize responsiveness. And according to (Gosling et al., 2010) [7] to do this, providers must be able to adapt to sudden fluctuations in demand. In tracking organizational efforts to attain long- and short-term flexibility, clarity regarding the necessity of supply chain responsiveness can also be a crucial aspect. Forslund (2014) [8] recently demonstrated how the caliber of the connections between retailers and their suppliers affects the level of logistics performance. Strategic retail supplier partnerships have been demonstrated to have a favorable impact on key supplier performance by Hamister (2012). Gandhi et al. (2017) [2] proposed the following eight parameters to gauge supply chain performance in manufacturing firms: a trusted supplier with proper delivery, reliability, and consistency; the firm can control costs and have a thorough understanding of the supply chain; the company can quickly respond to customer requests; and the company has the appropriate quantity of inventory.

2.7. Supplier Quality Procedures

(Berry and Waldfogel, 2010) [7] The performance of the buyer's inventory, quality, and productivity can all be improved by reducing supplier quality failures. This is crucial for boosting brand loyalty in the consumer, encouraging repeat business, and luring in new clients. (Baird et al., 2011) [7] The operational efficacy of a buyer and the quality of final products are directly impacted by supplier quality procedures.

3. Customer Relationship Management (CRM)

3.1. Customer Relationship Management Elements that Affect Responsiveness

CRM aims to enhance sales by fostering customer relationships through a company-wide system of tools, technology, and practices. CRM is therefore more of a strategic business and process issue than a technical one. According to [Scott Follows, 2003] [9] CRM is a marketing tactic that goes above and beyond boosting transaction volume. Its goals are to boost revenue, profitability, and customer satisfaction. Because the purchasing decision is typically a collaborative effort among participants in the decision-making process, it can be challenging to identify who is the genuine consumer. Payne and Frow (2005) [10] claim, In order to avoid the possible issues connected with a limited technology centered definition, CRM must be considered as strategic, cross-functional, and process-based. Greenberg (2010) [10] defined CRM as a philosophy and a business strategy supported by a system and technology aimed to enhance human interactions in a corporate setting. CRM is sometimes referred to as a smart fusion of technology and commercial activity. (Yadollahinia et al., 2018) [4] If CRM is integrated into the SCM process and decision-making phase, it is considered to be effective.

3.2. Features and Advantages of E-CRM for Managing Customer Relationships

the use of a website for consumer development, i.e. the use of email and web-based information to promote purchasing; quality management of the email list (covering email addresses and integrating information from consumer profiles from other databases in order to target); data mining to improve targeting; providing online personalization or mass customization; providing online consumer services.(Stefanou, Sarmaniotis, & Stafyla, 2003)(Torres, 2004) [11] Due to the fundamental design of information technology and data from customer databases, CRM technology is also a crucial strategic instrument for an organization to succeed in CRM application. (King and Burgess, 2008) [12] Since CRM and enterprise resource planning (ERP) are both business software technologies, their implementations are relatively comparable. Siu, Noel Y.-M. 2016. [13] in actuality, e-CRM is a company's online integrated strategy for consumer services, marketing, and sales. Customer retention (offering individualized service, access to a community of buyers, discounts for loyalty), customer extension (this may involve sending additional information via direct e-mail, etc.), and customer acquisition are the three main components of CRM systems. By utilizing cutting-edge technologies, the relationship between the business and its customers is enhanced and strengthened (from computerized contact centers to intelligent tools). E-CRM enables businesses to improve business performance and make the most of every client connection.

3.3. Process for Strategic CRM Reporting on Profitability and Performance

The most crucial elements promoting the adoption of CRM in enterprises are the customer management practices. Beginning with getting to know customers and fostering positive relationships with them based on the actions of the targeted groups, the process begins. (Lambert and Burduroglu, 2000) [14](Nykamp, 2001) [11] The profitability reports contain data that can be used to gauge and pitch the relationship's worth to each client and to top management inside the company. Value must be assessed in terms of expenses, effects on sales, and related investments, or the efforts put forth won't be rewarded. (Lager and Storm, 2012) [15] Application development in the process industries might then be seen as a reflection of this kind of "backward-integrated collaborative development method" and instead as a "forward-integrated collaborative approach." In that regard, a successful application developer could be referred to as a "lead supplier," or alternatively, a preferred supplier of both goods and related services.

3.4. The Impact of Customer Satisfaction and CRM Applications on Organization Responsiveness

Ryals et al. (2000) [16] provide a thorough review of the CRM literature and discuss the requirement for a plan

for customer-facing systems to converge in order to provide a single perspective of the client or rivals. Due to the fact that perceived quality influences customer satisfaction, (Reinartz, Krafft, and Hoyer 2004) [14] CRM applications also have an indirect impact on customer satisfaction via influencing perceived quality. Second, by supporting the quick, precise processing of client orders and requests as well as the continuing management of customer accounts, CRM software enable businesses to enhance both the perceived quality of the product as well as the dependability of consumption experiences. Customer happiness is positively impacted by perceived quality, which is improved by both increased customizability and decreased consumption experience variability. Third, CRM applications assist businesses in managing client interactions more skillfully throughout the relationship's inception, maintenance, and termination stages. The secret to managing client happiness and loyalty is, in turn, good management of the customer relationship. (Lin and Chen, 2017) [17]Organizations must develop specific dynamic supply chain responsiveness skills to enable them to integrate, reconfigure, and deploy resources efficiently and quickly in order to meet customers' constantly changing needs because customer needs are not static but can change significantly and quickly over a short period of time. Amedofu et al. (2019) [17] investigated supply chain management strategies, including strategic supplier development, customer connection, information sharing, and information quality, as drivers of customer development among start-up businesses.

4. Communication

4.1. SCM Information Technologies and Systems (IS/IT)

When it comes to electronic commerce and supply chains, telecommunication satellites can be thought of as the greatest, most effective, and occasionally the only means of connection between two sites on the world.

(Elbert, 2004) (Jin, 2006) [18] Due to its ability to deliver timely, accurate, and trustworthy information, IT in the supply chain outperforms both the focal company and its partners. (Yanjing, 2009) [19] Integration of ERP with CRM is a crucial issue for internal business process integration. Due to the growing demand among businesses in integrating a new CRM system with their existing ERP system, many ERP suppliers now offer an ERP-CRM integration package. Moreover, if a company wants to engage in e-business, they should prioritize establishing ERP and CRM systems.

4.2. Performance of the Supply Chain and Information Sharing (IS)

Initially, SCM was concerned with the control of inventory in a supply chain. Later, this idea was expanded to encompass all supply chain management operations. In order to maximize overall profitability, supply chain management, entails managing flows between and among supply chain stages. Salvador et al. (2001) [20] investigated the effects of interactions between a company's customers and suppliers on time-based performance in order to attain high material quality. These interactions were discovered to offer data that can be used to enhance operations control and coordination, favorably affecting time-based performance. According to Shen et al. (2007) [18], today's market demands are changing so quickly that integrating different information systems at previously unheard-of levels of interoperability is necessary to share knowledge and work with companies. (Museli and Jafari Navimipour, 2018) [18] Organizing integration the coordination between the elements and processes of such organizations has become a hard issue with the development of human societies and the transition of small firms into large organizations that need to perform more extensive and sophisticated human resources responsibilities. (Mohammadi et al., 2018) [18] When compared to service-oriented integration, supply chain activities eventually shift toward IT-based business processes. This action is taken to boost the adaptability of IT-based applications in business networks.

4.3. Communication and Reliance in Online Communities

(Gefen, Karahanna, & Straub, 2003; Kim & Park, 2013; Pavlou, 2002) [21] How to develop customer trust when communicating with consumers, as well as how to uphold trusting relationships through online communication (Daim, Ha, & Reutiman, 2012; Kasper-F) [21] the buyer and the vendor are typically the only two persons involved in e-commerce site communications.

4.4. Social media Communication

(Lingel & Naaman, 2012) [21] Mass communication reaches a bigger audience and communicates more information than conventional interpersonal peer-to-peer contact. It is quick and simple to get information from social networking platforms. Social media sites typically support all three of the communication types simultaneously, in contrast to previous computer-mediated communication. Social media communication, regardless of the types of communication used, helps to strengthen interpersonal bonds. A high level of trust can improve online communication. Trust is a relationship indicator. Therefore, a thorough comprehension of trust is required. (Wirtz, van Ambtman, & Bloemer, 2013) [21] Group consciousness emerges through communication and engagement, which fosters a feeling of group identity.

4.5. Interorganizational Communications Research (the role of personal relations in business)

(Gedeon, Fearne, and Poole 2009), and Hutt, Stafford, Walker, and Reingen (2000) [22] found that failing to maintain personal relationships frequently has negative effects on the relationship between firms. (Borgatti and Li 2009)(Galaskiewicz 2011) [22] Researchers propose for the purposes of this research that the development of personal relationships with members of supply chain partner firms will result in the creation of social capital

manifested as relational embeddedness. As social networks frequently form among people who cross boundaries within inter organizational network, personal relationships are regarded as the "soft" sort of links inside a network. (Payne, Moore, Griffis, and Autry 2011) [22] Based on theoretically derived benefits related to the formation of social ties, the rapidly developing theorization surrounding inter organizational social capital enables a potential explanation of why business actors should be interested in forming both professional and personal relationships with members of supply chain partner firms.

4.6. What SCM, IT, and CA Have to do with One Another

Waghmare and Mehta (2014) [3] point out that IT enables SCM to attain the CA of the organization in comparison to the rest of its rivals in the market. IT is important for the SC's management and coordination, as well as its decision-making process. Additional activities and pledges to promote the improvement of any useful organization's quality in light of the SC network are included in the sharing of information in a systematic language. Moreover, Cai and Yang (2014) [3] came to the realization that the asset frontier directly affects distribution and flexibility through IT and that the method and environmental factors influence the tradeoff between the competitive priorities, such as price, value, and distribution.(Han et al., 2017; Obeidat, & Otibi, 2015) [3] In order to effectively adopt SC, businesses must actively share information with their partners, and in order to improve information sharing, businesses must invest in cutting-edge information technology.

4.7. The Impact of IT on Supply Chain Agility and Collaborative Knowledge Creation in Responding to Unprecedented Pandemic Crises

(Ngai et al., 2011; Alzoubi and Yanamandra, 2020) [23] Information technology (IT) and its role in embracing supply chain agility have drawn a lot of attention. But despite the increasing rise in the value of intellectual capital in today's enterprises, its effects on supply chain agility in the face of a historic catastrophe have received little attention. (Tuan, 2016; Shiranifar et al., 2019) [23] Organizational knowledge can be used to enhance supply chain management as well as performance, entrepreneurial orientation, innovation, learning, customer happiness, and competitiveness. (Al Humdan et al., 2020) [23] The ability to detect and respond to turbulence swings, dynamic requirements, and unforeseen changes in the market environment, either reactively or proactively, by modifying functions and operations flexibly and quickly. (Lo et al., 2021) [23] As with other organizational capacities, academics have acknowledged that a thorough understanding of dynamic capabilities necessitates a look at expected results and performance monitoring. Organizations are facing hitherto unheard-of obstacles to their survival as a result of COVID-19. Corporate sustainability focuses on how businesses can maintain themselves in their society.

4.8. Management of the Digital Supply Chain

(Gammelgard, 2007) [24] Knowledge management and learning can be considered as tools that can infuse innovation into supply chains and as drivers of supply chain expansion. (CapGemini, 2016) [24]The functioning of the supply chain has been significantly impacted by digitalization, and it is evident that the switch from a traditional supply chain to a digital supply chain (DSC) continues to be a strategic advantage that generates long-term value for organizations. Ageron and co. (2020) [24] The introduction of developing technologies and the use of information systems that increase the integration and agility of the supply chain are what are referred to as the "digital supply chain," which also improves customer experience and long-term performance of the company. According to Preindl, Nikolopoulos, and Litsiou (2020) [24], the DSC makes real-time data accessible to help corporate success goals like sales, benefit, market share, efficiency, responsiveness, expense, dependability, and longevity. This increases awareness of material flows through the supply chain and reduces bullwhip effects. The supply chain companies that collaborate with DSN have better communication and cooperation, which enables prompt product distribution to customers.

5. Logistic System Responsiveness

Operational decisions have a more constrained scope in terms of geography and time than tactical decisions, which are medium-term choices that must be made and implemented in order to implement the company's chosen strategy Performances.

5.1. Multi-Agent Systems for Crisis Management Logistics [A. Kaddoussi, N. Zoghlami, S. Hammadi, H. Zgaya. An Agent-Based Distributed Scheduling For Crisis Management Supply Chain.

International Journal of Computational Intelligence Systems. 6. 156-173. 10.1080/18756891.2013.761774] [25] Propose to set up a resolution system that is based on the breakdown of the whole process into a number of less complicated jobs that are carried out in parallel, with the primary goal of addressing the issues of exponential complexity. A dynamic distributed architecture can be implemented well thanks to the multiagent notion. Therefore, we suggest setting up a multiagent system in order to produce an effective and effective optimum treatment with regard to complexity. This system, dubbed OBCA (Optimization Based on Communicating Agents), is furnished with a plethora of features involved in the process of optimizing the operation of the logistics chain and the crisis response.

5.2. A Model of Organizational Responsiveness to Stakeholders

According to Gill and Biger (2012) [26], the perception of obstacles to small business growth includes a lack of capital, difficulties in the market, and regulatory hurdles. (Singh et al., 2012) [26] The main risks that business encounter while working in the supply chain include fluctuating raw material prices, the sharing of sensitive information, and seasonality of demand. Using six categories—supply side risk, manufacturing side risk, demand side risk, logistics side risk, environment side risk, and information side risk—Punniyamoorthy et al. (2013) [26] categorized all supply chain hazards. (Kumar and Routroy, 2014; Loader, 2015) [26] The main hurdles that companies encounter while attempting to fulfil the demands of global competition are insufficient technologies and resource constraints. Kumar et al. (2014) [26] Insufficient understanding of SCM, uncertainty surrounding client orders and demands, and middlemen's engagement in supply chains are the key issues. Sharma and Routroy (2016) [26] found that risk variables like data security, information leaks, and reluctance to share information had an impact on a company's income. According to Baporikar et al. (2016) [26], poor customer service, a lack of qualified labor, inadequate marketing techniques, and access to financing are all factors that limit the growth of businesses.

5.3. The Supply Chain Management and Logistics from a Responsiveness Perspective De Bruin et al. (2005) [27]

claim that maturity models can be either comparative, prescriptive, or descriptive. Descriptive models aim to represent the current state of the supply chain system. The goal of prescriptive models is to target actions towards raising levels of maturity. Last but not least, comparative models aim to maximize the model's capacity to produce a thorough comparison across scenarios through benchmarking across enterprises. (Gligor et al. 2019) [28] They accomplish this by either combining their existing traits of adaptability, flexibility, agility, improvisation, and resilience or by developing a new combination in response to market demand. Although it is commonly known that combining resources improves a company's and its supply chain partners' ability to compete, researchers argue that responsiveness influences and/or facilitates the choice and assembling of resources with which to compete. (Zighan, Al-Kalha, et al., 2021) [29] Being resilient is having the ability to bounce back from a difficult situation and adjust. While (Horzela & Semrau, 2021) [29] identifies a number of proactive frameworks and methods that have been applied to production changeover. For instance, some of the most well-known techniques include the single-minute exchange of die (SMED) and total productive maintenance (TPM). (Ishfaq, Davis-Sramek, & Brian Gibson, 2021) [28] According to the concept of adaptability, supply chain flows should be structurally modified in response to perceived changes in the market and environment. In order to respond to change, supply chain managers may use a modular design such as postponement. Additionally, retailing companies could increase warehouse capacity closer to the customer by contracting with (outsourced) warehouses rather than relying on more distant (owned) warehouses and retail locations if they anticipate an increase in demand for Omni channel fulfilment. All of these techniques aim to increase responsiveness.

5.4. Organizational Adaptability: A Structural Modification

Organizational resilience is the ability to foresee, plan for, react to, adapt to, survive through, and thrive in the face of disturbances. According to Lengnick-Hall et al. (2011) and Kantur and şeri Say (2012) [29] the ability of an organization to deal with change and "bounce back" to normal has been referred to as organizational resilience. According to Jayant & Ghagra (2013), " (Pettit, Croxton, & Fiksel, 2013: 49) [28] adaptability refers to a firm's capacity to "adjust the supply chain's design to meet the structural shifts in markets, modify supply network strategies, products and technologies," and "modify operations in response to challenges or opportunities.(Yilmaz Borekci et al., 2015) [29] In order to avoid collapsing in the face of shocks, a corporation must have the following five interconnected capacities: (1) an absorption capacity; (2) a capacity for renewal; (3) an appropriation capacity; (4) a dynamic capacity; and (5) a change capacity. Therefore, organizations must increase their internal capacities and SC resilience in order to reach a degree of organizational resilience. (Williams et al., 2017) [29] resilience requires combining both (1) a defensive approach, which involves thinking about preventative and downstream risk management measures that make it possible to cope with the shock when it occurs, and (2) a proactive approach, which involves being inventive and creative to see new solutions and take steps to regenerate. (Wieland & Durach, 2021) [29] Emphasizes that organizational resilience encompasses far more than just the capacity to recover from a disaster.

5.5. Supply Chain Resilience: Flexibility: Modifying a policy

In contrast to the longer-term adaptability dimension, (Gulati, 2010) [29] Operational resilience is concerned with an organization's capacity to continue providing goods and services in the face of unfavorable occurrences by foreseeing, preventing, recovering from, and adjusting to the conditions imposed by such events. Engelhardt-Nowitzki (2012) [28] sees flexibility as a midterm strategy for coping with change. (Chan et al., 2017) [29], flexibility or safety stocks benefit from preventative SC risk management. (Craig et al., 2018; Frost et al., 2000) [29] Operational resilience is the capacity of an organization to follow its goals and take advantage of opportunities despite challenging conditions like a security breach or economic downturn. (Yu et al., 2019) [29] Numerous research projects have recently concentrated on SC resilience from an upstream perspective, including researching performance, reaction, SC features, risk mitigation capacities, and the severity of

SC disruptions. (Pettit et al., 2019) [29] The body of research supports three key responses that define organizational resilience: (1) the capacity to foresee disruptions and proactively prepare businesses for them, (2) the effectiveness and efficiency of responding to disruptions when they occur, and (3) the capacity to recover from disruption and learn from it.

5.6. Dynamic Ability (DC)/ Switchover in Production

(Bernardes, 2010, p. 48) (Qrunfleh & Tarafdar, 2011; Bernardes & Hanna, 2009) [29] embodies the interaction between firms as they look for effective and efficient changes to the behaviors, norms, processes, and policy within their supply chain structure and operations. (Fletcher et al. 2013) [28] Each of these fields offers a clear fundamental perspective that encompasses particular dependent variables or outcome measurements. As a result, these clearly defined basic viewpoints provide logical boundaries around the study of each topic and direct scholars toward developing discipline-defining theory and knowledge. Comparable to how organizational knowledge develops, the accumulating of that knowledge then serves as the field's foundation. (Teece, 2007, 2018) [29] The principal parts of DCs adhere to the managerial procedure of sensing, grabbing, and configuring resources as follows: I) sensing: learning exercises that transfer knowledge to DCs; ii) seizing: integrating suppliers and customers to identify customers' needs and ways to meet those needs; and iii) resource configuration: upholding the necessary routine to adopt change and reconfigure assets and structure in accordance with these changes. The ability of a company to integrate, build, and reconfigure internal and external competences to deal with changes in the business environment is referred to as a DC.

5.7. Reactivity of the Supply Chain, the Logistics Process and the Operations Systems

(Chu and Wang, 2012; Kim et al., 2013) [17] Businesses' ability to adapt quickly and quickly to changes in dynamic environments depends not only on their internal operations systems but also on how responsive their primary supply chain partners are. (Singh et al., 2019) [17] Many organizations place a high priority on achieving responsiveness in the transportation, warehousing, and distribution operations because it allows businesses to respond swiftly and effectively to market developments. (Giannakis et al., 2019) [17] The inputs and resources that feed into the logistical processes of the business for production and subsequent delivery to clients are delivered to the focal firm swiftly and reliably by highly responsive suppliers of raw materials and component parts for manufacturing enterprises. The same is true for service firms, especially those that serve as middlemen. In these cases, the responsiveness of suppliers to an organization may directly influence its own responsiveness to its consumers. Thus, (Asamoah et al., 2020a; Chu and Wang, 2012) [17] responsive suppliers offer a third party resource of capability that can be incorporated into the business to improve the responsiveness of its logistics processes to adapt to changes in the dynamic environment.

5.8. Customer Development and Responsiveness of Logistics Processes

Hartmann and De Grahl (2011) [17], found that the flexibility of the logistics service had a favorable and considerable impact on customer retention, customer extension, and customer referrals, is also consistent with this point of view. The study advances the claim that a company's ability to respond to changes in the business environment influences its ability to draw in, please, and keep customers. (Saenz et al., 2018) [17] To add value for an organization's clients, a responsive logistics system must be developed. The ability to deliver goods and services to consumers on time and in the desired condition enables businesses with high logistics process responsiveness to increase customer satisfaction and retention. Additionally, the responsiveness of the logistics process acts as a moderator in the ways that the responsiveness of operations systems and the responsiveness of the supplier network promote customer development. The basic reason why businesses are able to produce the numbers and product mix that customers want is because of their operations systems. a company's ability to be responsive to customers can be improved by leveraging the responsiveness of its supplier network, which can help it attract new clients and better serve and keep current ones.

5.9. Response Time of the Logistics Process as a Mediator

A stochastic multi-objective model for a forward logistic network was presented by [R.B. Franca, E.C. Jones, C.N. Richards, J.P. Carlson, Multi-objective stochastic supply chain modeling to evaluate tradeoffs between profit and quality, Int. J. Product. Econ. http://dx.doi.org/10.1016/j.ijpe.2009.09.005.] [30]And employs the Six Sigma measure to assess the caliber of raw materials purchased by suppliers. Under uncertain demand, the problem's goals are to maximize SC's profit and reduce the overall quantity of defective raw material parts. Reverse logistics has received more attention over the past ten years as a result of decreasing primary resource consumption, pollution avoidance, waste management, government legislation, environmental concerns, social responsibility, and customer pressures. All operations involving the conversion and informational flows of goods and services from the material sources to the end users are referred to as reverse logistic. (Chu and Wang, 2012) [17]The responsiveness of major supply chain partners, particularly suppliers, is now playing an increasingly critical role in how well businesses are able to fulfil customer demand as it grows more variable.

6. Operation System Responsiveness

When unavoidable hardware and software problems compromise availability or responsiveness targets, a

datacenter performance crisis occurs. The main focus of the application operators is to maintain system stability and prevent crisis escalation; [D. Patterson, A. Brown, P. Broadwell, G. Candea, M. Chen, J. Cutler, P. Enriquez, A. Fox, E. Kiciman, M. Merzbacher, D. Oppenheimer, N. Sastry, W. Tetzlaff, J. Traupamn, and N. Treuhaft. Recovery oriented computing (ROC): Motivation, definition, techniques, and case studies. Technical report, UC Berkeley, March 2002] [31]Automatic performance crisis detection requires tools to record these patterns and compare them to prior patterns stored in a database, effectively reducing problem identification to information retrieval.

6.1. Planning in Advance (Operational Planning)

Planning gives businesses a way to monitor and deal with change and uncertainty ,According to Grant (2003) and Ramanujam et al. (1986), Anderson's (2004) research [32], Planning was linked to higher levels of company performance in dynamic situations.(Sandberg, 2007) [33] Effective collaboration requires the integration and coordination of operational tasks. Improvements in lead time and other intangible impacts have been linked favorably to collaboration in operations planning, which enables the integration of operations and capacities of all participants. Nonetheless, it is essential that all SC partners work together to prioritize goals and objectives that live up to their expectations.

6.2. InfoSec (Information security)

Researchers in operations and supply chain management may be most suited to fill in some of the gaps in the information security literature, (Herath and Rao 2009; Johnson and Goetz 2007) [34] InfoSec research has historically concentrated on technology solutions like encryption and firewalls because it has its roots in computer science. While this may lead practitioners to believe they can maintain confidentiality using only technology, (Anderson and Moore 2006, Bulgurcu et al. 2010) [34] indicated that technology frequently fails due to issues like improper implementation, employee noncompliance, and misaligned behavioral incentives. (Ransbotham et al. 2016) [34] InfoSec experts have highlighted the gaps in the OSCM literature as well as the necessity to comprehend the conflicts in today's increasingly interconnected digital business environments

6.3. Operation Flexibility and Agility

Das (2001) [35] defines flexibility as a manufacturing system's capacity to change states while maintaining strict schedule and cost parameters, even when volume and/or diversity increase. Range and penalty show the connotation of the concept, while the capacity to switch between states shows its extension. According to Narasimhan et al. (2006) [35], agility is the capacity to swiftly alter an entity's operational conditions in response to uncertain or shifting needs. Both definitions include the concept of reconfiguration in a somewhat clear manner. In general, the definitions' connotations have not yet been sufficiently established to allow for a higher level of precision. These definitions generally include the idea that uncertainty should be tolerated or buffered within specific pre-determined restrictions, which agrees with Vokurka and Fliedner's (1998) claim that the circumstances requiring a buffer are defined beforehand.

6.4. Operation Process Responsiveness

More recently, the majority of authors appear to associate responsiveness purely to external events and came to the conclusion that responsiveness should be thought of as a notion that is only consumer centric. Reichhart and Holweg (2007) [35] noted that As a result, they define responsiveness as the speed with which a system can modify its output within the spectrum of four flexibility categories (product, mix, volume, and delivery) in reaction to an external stimulus. The researchers noticed that most authors only link responsiveness to external events, they looked to the management literature for support on Ackoff's (1971) concept of system reaction (stimuli). In fact, Holweg (2005) [35] traces the development of responsiveness to systems thinking in management. According to the management literature, responsiveness is the capacity to alter organizational tactics in response to environmental challenges or opportunities (Weick, 1979; Tushman et al., 1986; van de Ven and Joyce, 1981). (De Waard & Kramer, 2008) [36] Although almost all expeditionary crisis-response operations are distinct initiatives, they are all carried out by task forces that are similarly (modularly) organized. (Doz & Kosonen, 2008, 2010) [36] Due to the growing perception that tactical performance and strategic maneuvering are connected, sensing has emerged as a critical skill linked to organizational responsiveness.

6.5. Understanding Organizational Structures for Crisis Response and Institutional Design

The design of crisis management is still about fostering collaboration between the numerous response organizations and communities—the relevant stakeholders—that arrive at a disaster scene to offer assistance, engage in trans boundary work (Boin, 2009), develop a common understanding (Laakso & Palomäki, 2013) [37], and set up emergency response systems. (Greenwood et al., 2010) [37] In general, the principles of crisis management have a significant impact on corporate decision-making. (Boersma et al., 2014) [37] Crisis management philosophies outline how a crisis is viewed, how stakeholders organize their interactions and actions, and how information about the crisis is shared.(Jensen & Thompson, 2016) [37] The Incident Command System (ICS), which is incorporated and used in various ways by emergency response groups, is the key institution in crisis management. Furthermore, citizens' efforts and members of civil society play a crucial role in crisis response (Ferguson et al., 2018; Helsloot & Ruitenberg, 2004; Kendra & Wachtendorf, 2016; Schmidt et al., 2018) [37] The use of current social institutions is the most efficient way to manage crises, which has implications for crisis management and response planning. After a disaster,

newly constructed top-down response mechanisms won't function as well as they are expected to (Boin &'t Hart, 2003) [37].

6.6. The Trading Zone's Social, Cultural and Political Dimension

If there is one feature of crisis coordination that jumps out, it is how frequently crisis responders are overwhelmed by a variety of information sources when having to make "on-the-spot" judgments. (Bharosa et al., 2010; Bui et al., 2000) [37] Because of the social nature of the trading zone, the crisis partners begin to construct a shared understanding of the COP that is yet dynamic due to the social character of the trading zone. Participants in the trading zone are (have to be) capable of incorporating diverse disciplinary perspectives rather than developing an exclusive notion of the true or perfect COP. (Fleming & Spicer, 2008, 2014) [37] the political aspect shows a continual and mutually decided interaction between different players. Instead of using coercive authority in a hierarchical manner, this interaction between the players is more like a battle amongst them. (Gabriel & Connell, 2010) [37] In contrast to conventional story forms with a beginning, middle, and finish, crisis narratives and narratives regarding crisis information frequently consist of fragmented storylines that appear briefly during interactive interactions. Different epistemic, professional backgrounds or epistemic cultures, such as specialized language, jargon, roles, and norms (Laakso & Palomäki, 2013) [37], are encountered by the many responding organizations in the trading zone. An area that offers bounded (for local gatherings) or distributed (for dispersed teams) habitats of knowledge practice is the trading zone.(Dwyer & Hardy, 2015) [37] When there is limited time to create social interactions that generally take time to form, quick trust is essential. People in the trading zone begin to move, and they don't have much time to become used to the varied interactions between the diverse reaction organizations. Therefore, the social dimension of the trading zone is about how a crisis is made meaning of as a group effort.

7. Organization Long Term Success

Beyond merely transmitting and integrating information between suppliers and their customers, collaborative SCM incorporates tactical shared decision-making between the partners in the areas of collaborative planning, forecasting, distribution, and product creation for the Organization long term success.

7.1. Supply chain Coordination (SCC)/SCM Collaboration Systems

According to the literature, businesses should exchange digital assets with as many supply chain partners as they can, and they should do so to the utmost extent practicable. The typical advantages of early supplier involvement, according to Huang and Mak (2000) [38], include "lower development costs, early availability of components, visibility of the cost-performance trade-off, consistency between design and supplier's process capabilities, and decreased engineering revisions." In conclusion, concurrent product and process design, as well as customer and supplier interaction, will lead to increased performance. (Ataseven & Nair, 2017) [39] It is frequently made to work with shared management information systems. Integration of the supply chain is dependent on its components, such as its strengths, duration, scope, and depth. Each of these factors is essential to completing the subsequent stages. (Budacu & Pocatilu, 2018) [39] Four dimensions—strength, duration, scope, and depth—can be used to define integration as it relates to the supply chain. While independent, each of these four dimensions must be handled and integrated.

7.2. Agile Methodologies

This approach helps teams specifically when they need to build software in response to an emergency. According to Baramichai et al. (2007) [39] People, quality, functionality, tools, time, process, value, and concept are important factors in agile practice.(Kumar & Bhatia, 2012) [39] Different ways could be used to define an agile process; one in particular is supply chain management, which is utilized to respond rapidly and meet market demands. (Gligor et al., 2015) [39] Being vigilant and quick to react is what is meant by being agile or agile in the supply chain. Through information exchange among all supply chain participants and the capacity to anticipate, identify, and investigate market prospects and monitor them through innovative organizational learning, it might be seen as being more adaptable and sensitive to changes in customer demands.

7.3. Reduced Lead Time

Lead-time is frequently thought of as a crucial performance measurement instrument. (Christensen et al., 2007) [39] The length of time required to perform a procedure from beginning to conclusion is often measured by lead-time reduction. Additionally (Lin, 2016) [39] demonstrated that the lead-time, which begins with order entry, is the total amount of time between the customer's order and operations activities, which include material planning, administration, purchasing, transportation time, handling and storing time in inventory, warehousing preparation processes through packing and packaging, and finally distribution and delivery to the customer.(Fattahi et al., 2017) [39] The goal of lead-time reduction is to reduce the amount of time needed to complete a process from start to finish. Lead-time reduction refers to the overall time required to acquire, transfer, and prepare materials for delivery to customers in any supply chain operation or service delivery. The amount of time needed to complete the full process is measured by lead-time reduction factors like pre-processing, manufacturing, and post-processing. (Ciccullo et al., 2018) [39] Pre-processing, manufacturing, and post-processing are possible lead-time reduction dimensions. Organizations typically calculate lead-time reduction based on these factors.

7.4. Crisis Management Practices and Approaches: Insights from Major Supply Chain Crises

The regular operation of a supply chain can also be hampered by such emergencies. Technological crises are defined by Perrow (2007) [40] as man-made crises without malicious intent. The recent study supported how particular decision-making procedures before, during, and after a crisis might impact a company's ability to recover from a supply chain crisis. Strong upstream and downstream supply chain communication is required for effective collaboration management and maintaining strong connections with the organization's primary suppliers. (Hittle & Leonard, 2011) [40] For a given component, businesses typically select a single supplier since they can offer a more appealing pricing. Yet, the expenses that may arise during a crisis cannot be compared to the cost savings of working with a single supplier. (Juttner & Maklan, 2011) [40] Assessment and appraisal of the crisis, as well as the planning of several recovery scenarios, are common crisis management techniques. The majority of case studies lacked crisis management strategies, although recently more businesses have adopted this idea.

7.5. Supply-chain crises / Supply Chain Risk of Disruption

The discussion of supply chain risk has gained traction within OSCM.The research on supply chain disruptions frequently suggests stepping up digital communication between partners in the supply chain. Closing or bankruptcy of the supplier: (Bankruptcy Filings, 2008) [41] A good level of supply chain diversity and risk analysis might nevertheless leave a corporation vulnerable to supplier issues, despite the argument that poor supplier performance should be anticipated and avoided. A supplier could be impacted by a client in another market since the problems with that customer may have an impact on their own market and disrupt the supply chain. A natural disaster: Supply chain crises can be brought on by a variety of factors outside of management's control. The entire supply chain may experience shortages as a result of a natural disaster in a region with abundant natural resources. Storms and other natural occurrences may potentially obstruct shipping lanes or block access to vital hubs and ports. (Wilson, 2007) [41] Modern supply chains are more vulnerable because of globalization to cultural and political influences in addition to weather and resource availability. The availability of goods and services across a global supply chain may be significantly impacted by civil unrest, political upheaval, and other circumstances of a similar nature. Inaccuracy or loss during transit: (Barnes and Oloruntoba, 2005) [41] Even when a supply chain has been well foresighted, crises can still damage it. Diligence and preparation can reduce reliance on incompetent suppliers and offer a hedge against high risks. Goods can be prevented from reaching their intended destinations by shipping mishaps, tracking errors, and even piracy, frequently at a crucial stage in the supply chain. Particularly near the end of the supply chain when a considerable amount of value has been added and replacing the lost commodities is challenging and expensive, rare items and materials with lengthy lead times can be particularly challenging to replace. A supplier's failure to deliver or poor quality: (Matook et al., 2009) [41] Active management can be used to prevent supply chain issues brought on by underwhelming supplier performance. As a result, rather than a supply chain crisis, we view low quality or a supplier's failure to deliver as a management failure by the receiving organization to prevent such performance. Commodity price increases or additional cash flow difficulties: A corporation that depends on a certain component or raw material for production may experience severe strain on its working capital and, eventually, its financial stability. (Tsai, 2008) [41] Planning for or hedging against commodity price variations is a necessary skill for any supply chain manager, but as this is not a study in cash management, it is not a technique to prevent a supply chain crisis. (Hassini, 2008) [41] It is possible to mistake a company's generally poor financial condition for a supply chain issue without digging into management behavior outside the scope of this research. For instance, a supplier who refuses to deliver a vital component because they haven't received payment in months is not a sign of a crisis in the supply chain. Similarly, a supplier who is unable to deliver in less time than the given lead-time owing to inadequate planning or bargaining on the part of the customer is not a crisis of the supply chain.

7.6. Evaluation of Impact of Success Factors of Supply Chain Strategy and Flexibility on Supply Chain Performance

The current trend towards international outsourcing and intra-firm trading is explained by another model put out by Ornelas and Turner (2008) [42]. Chen et al. demonstrate the possibility of outsourcing being driven by strategic goals as well as financial ones (2004). The market for intermediate products has undergone trade liberalization, thus they model strategic outsourcing as a reaction. In Ostrovsky's (2008) study [42], which puts out a supply chain matching model, the stability of supply chain networks is examined. While relying on the model's same-side substitutability and cross-side complementarity assumptions, the author derives the necessary criteria for the existence of stable networks. With the help of an empirical analysis and a difference-in-difference methodology, Bergin et al. (2009) [42] compared the volatility of the export-processing industries in Mexico and the US and discovered that, on average, the value added fluctuations in the Mexican outsourcing industries are twice as high as those in the US. The authors also provide an outsourced theoretical model that might be used to explain this stylized fact. Du et al. (2009) [42] develop a model for bi-sourcing, a tactic that international corporations are increasingly using. A portion of the decrease in trade flows during economic crises may be explained by the usage of this technique, which comes with the choice to favor either an internal or external source of intermediate inputs.

7.7. A Review of the Literature on Logistics and Sustainability

The integration of social and environmental issues has only recently been conceptualized by Carter and Jennings (2002) [43] under the umbrella of LSR, which unites the formerly independent concepts of the environment, diversity, human rights, safety, and philanthropy and the community as they relate to logistics management. The role of purchasing in LSR, which they refer to as PSR, is empirically operationalized by Carter and Jennings (2004). According to Nike (2005, p. 29) [43]: Transparency throughout the industry of our respective contract factories will foster more collaboration, the sharing of monitoring information, and the reinforcing of remedial expectations across the industry. As a result, suppliers might not have to deal with conflicting audit demands from various consumers as much. According to Rivera-Camino (2007) [43], this transparency includes both more conventional cause-related marketing and green marketing initiatives from a stakeholder perspective (Drumwright, 1996). Coordinating vertically throughout a supply chain and horizontally across networks can both increase transparency.

7.8. Strategic Commitment to Environmental Sustainability (SGO)

Sensing changes in the external environment and adapting to them typically marks the beginning of strategic orientation. (Huang and Mak, 2000; Gerwin and Barrowman, 2002; Koufteros et al., 2007) [38] Demonstrated that strong coordination between product design, process design, and supply chain design is essential, and suppliers' and customers' engagement is needed from the very beginning of product development. (Christmann and Taylor, 2002; Albino et al., 2009) [38] Firms are being forced to reevaluate their environmental strategy as a result of legislative restrictions, international standards, and social awareness of green products. International businesses are under increasing pressure to follow local laws and regulations as well. (Hong et al., 2004a) (Hong et al., 2004b; Rauniar et al., 2008a) [38] Integrated product development IPD necessitates top managers' strategic participation and substantial information sharing among cross-functional team members. A clear project aim is a crucial component of IPD.

7.9. Public Finance and Public Participation

According to Howe (2006) [43], crowdsourcing is a combination of crowd (defined as the mass of people) and outsourcing of business-related tasks in a corporation. Cooperatively or alone, the task is completed. According to Estellés-Arolas and González-Ladrón-de-Guevara (2012) [43], crowdsourcing can also be employed as a participative online activity in which a large group of individuals respond to a company's request for their expertise and ideas.Nakatsu et al. (2014) [43] discussed an approach of a taxonomy of crowdsourcing based on the characteristics of the tasks given to the crowd, identifying seven categories: low commitment contractual hiring (human intelligence tasks), high commitment contractual hiring (online employment platforms), low commitment idea generation (consumer-driven innovation), high commitment idea generation (contests; online problem-solving platforms), low commitment collaboration (real-time problem solving), and (geo-located data collection, distributed knowledge gathering).

7.10. Effect of Success and Recovery Experience on Organizational Learning from Extreme Performance Experience. Understanding a Company's Own Success Experience

Beyond the conventional ideas of survival and dissolution, failure-related constructions cover a wide range of other phenomena. According to studies on organizational learning, (Chuang and Baum 2003; Miner et al. 1999) [44] businesses can benefit from failures both their own and those of others. In line with this, (Haunschild and Rhee, 2004). (Kim and Miner 2007) [44] Learning scholars have lately started to investigate how to learn from various failure-related situations, such as product recall and near-failure at the industrial level. By speculating on how businesses can benefit from their own recovery experiences, we characterize this type of failure experience as taking place when a firm confronts impending failure due to a critical performance fall but then significantly improves its performance above an acceptable threshold. Since it provides pre-post contrasts, apparent workable answers to earlier challenges, and emotional reactions from organizational members, recovery experiences may actually have a higher learning value than success. (Schwab and Miner 2008) [44] Success experience also attracts attention inside the organization and fosters confidence in ongoing learning initiatives because it is very salient. These risks can arise when a company tries to learn from any level of success experience, but managers of companies with little prior success experience are more likely to exhibit potential biases and misunderstandings of success. (Kim and Finkelstein 2009; Levitt and March 1988) [44] Particularly, a lack of prior success might cause businesses to incorrectly credit routines or methods that in reality contributed very little to their success. They will adopt poor, irrelevant, or even destructive activities and routines as a result of the inaccurate attributions brought on by incomplete knowledge, which will undermine their viability.

7.11. The Relationship between an Organization's Own Success and Recovery Experience

Experience variation increased learning rates and according to theories of associative learning, the presence of contrasting information aids in the understanding of events or concepts. (Morris and Moore 2000) [44] Discovered that by removing causal ambiguities and uncertainties surrounding the experienced results, the availability of opposing information improves the effectiveness of experiential learning. (Gavetti and Levinthal 2000) [44], earlier models have proposed that a more detailed cognitive map resulting from contrasting experiences will likewise result in shrewder search

behavior. Haunschild and Sullivan (2002) [44] discovered that airlines that had more diversified causes of earlier failures had fewer errors afterward, attributing this finding to the advantages of having a wide range of expertise. In a problem-solving experimental environment. Schilling et al. (2003) [44] these studies build on established theories of statistical inference that contend that high variability in a firm's experience aids in drawing more precise conclusions about its actions and results. Similar to this, researchers suggested that success and rehabilitation experience will complement one another's value. (Sternberg 2003) [44] The combination of recovery and success experiences is a particularly promising one from a learning standpoint. We have seen that both organizational attention and success are likely to be very contagious. Particularly, the lack of prior experience of a certain kind will often cause decision-makers' attention to be drawn in an extreme direction, leading to biases in interpretation and the potentially destructive acts mentioned above. Contrasting types of experience can be combined, nevertheless, to balance decision-makers' cognitive maps and lessen the impact of this issue. (Gupta et al. 2006, March 1991) [44] Businesses that solely rely on success and recovery experience to learn may narrow their attention to past initiatives that appeared to be effective while failing to look more broadly for potential improvements. Such uneven and constrained search behavior may lead to the adoption of ineffective routines or possibly have a negative impact on long-term performance or survival. (Taylor and Greve 2006) [44] Over their histories, businesses accumulate several forms of experience, and depending on the degree of the same type of experience, each type of experience offers potential for both positive and negative learning outcomes.

7.12. Consistency of goals

The idea that all trading partners share comparable value systems and have compatible goals is essential to SC collaboration. (Jap, 2001; Lejeune & Yakova, 2005; Min et al.) [33] Goal congruence, also known as formalization or incentive alignment, is thought to be a crucial component of successful collaboration, including the development of performance measures, joint goals and objectives, IT standardization, defining roles and responsibilities of each partner, formalizing the nature of shared information, aligning collaborative schedules, and jointly developing an implementation plan (Mentzer et al., 2001; Sandberg, 2007) [33] Most importantly, top management officials' active participation and support have been necessary for this process to succeed. (Daugherty et al., 2006) [33] By removing uncertainty, promoting attention, and saving time, formal rules and standards for operational processes improve performance.

8. Proposed Research Model

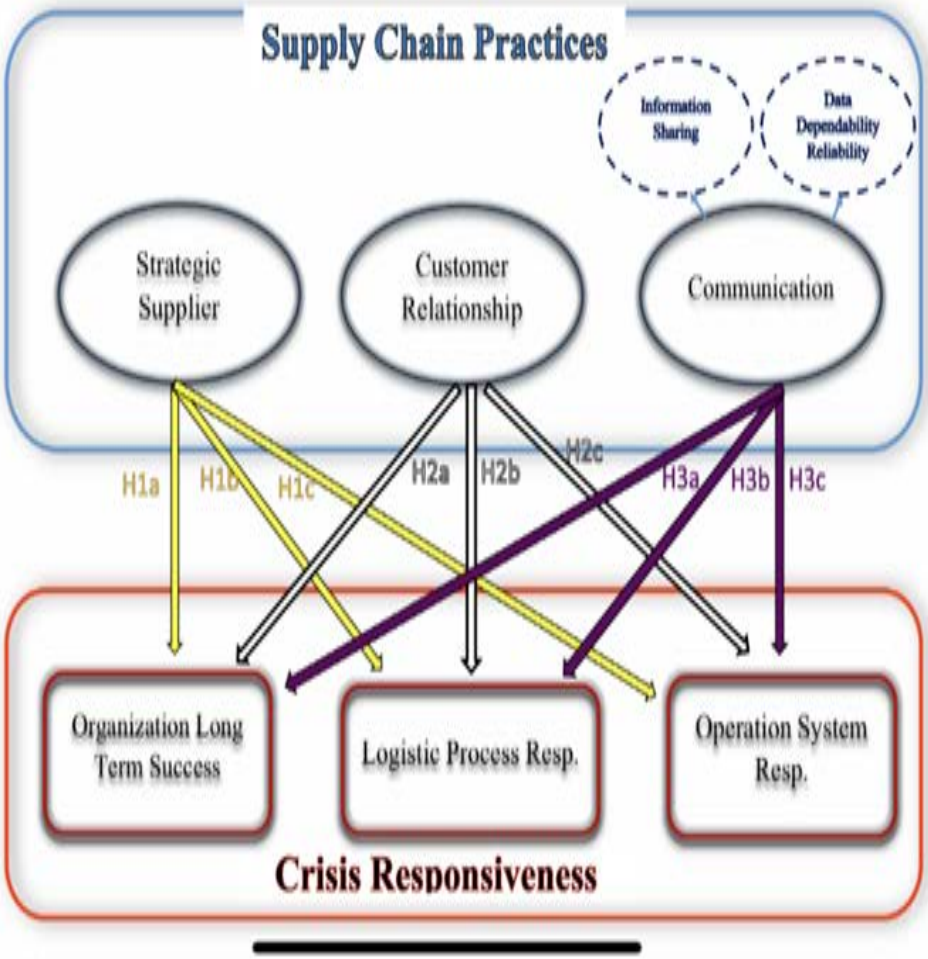

Figure 1. The main framework of the study may be represented by the model that is shown above

8.1. The Hypothesis of the Research

The main hypothesis is: There is Statistically Significant impact of supply chain practices (strategic supplier – customer relationship – communication) on crisis responsiveness (logistic process responsiveness- operation system responsiveness- organization long term success) “in pharmaceutical companies".

Several hypotheses emerge from this main hypothesis:

H1-a: There is Statistically Significant impact of strategic supplier on logistic process responsiveness.

H1-b: There is Statistically Significant impact of strategic supplier on operation system responsiveness.

H1-c: There is Statistically Significant impact of strategic supplier on organization long term success.

H2-a: There is Statistically Significant impact of customer relationship on logistic process responsiveness.

H2-b: There is Statistically Significant impact of customer relationship on operation system responsiveness.

H2-c: There is Statistically Significant impact of customer relationship on organization long term success.

H3-a: There is Statistically Significant impact of communication on logistic process responsiveness.

H3-b: There is Statistically Significant impact of communication on operation system responsiveness.

H3-c: There is Statistically Significant impact of communication on organization long term success.

9. Research Methodology

9.1. Population

Employees of the operational companies in the Egyptian pharmaceutical sector make up the population of this study since its goal is to investigate how supply chain practices, organizational structure, and uncertainties affect organization responsiveness in pharmaceutical enterprises.

The study was conducted in Egypt and focused on the Egyptian pharmaceutical sector. The Egyptian market of pharmaceutical 653 companies divided into two sectors (I) Manufacturing (ii) Distributors

9.2. Sample Size

A sampling technique was used to select respondents who are employees of different departments of the supply chain. Respondents came from multiple departments including Strategic supplier management, Human Resources, Customer relationship management, Accounting, Supply Chain, Manufacturing, Quality Assurance, Warehousing, Internal Audit, Procurement and Marketing.

The study applied the sampling technique while the research focused on the Egyptian pharmaceutical sector companies, which are considered to have a large geographically dispersed population, hence the researcher divided the population into two groups. The researcher carefully follows the following steps to define the sample size:

Step #1: Define the population: The total Egyptian pharmaceutical companies include 653 companies with a total of 142,780 employees.

Step #2: Subdivide the sample into categories: choose categories carefully to represent the population well. Each category has a distribution of characteristics similar to the distribution of the population as a whole. Therefore, the researcher divided the population into two categories (manufacturing and distributing companies).

Step #3: Selection of the sample: The study focused on a specific number of companies based on the sampling technique, therefore the study focused on (20) companies from each group:

I. Manufacturing; (16) companies

ii. Distributers (4) companies.

Based on the selected companies, the total number of employees is (63,500), which matches my research population. Therefore, the sample size represents the population, which is calculated using the following formula:

N (Population Size) = 63,500, Confidence Level is 95%, Confidence interval is 5%, Z score is 1.96

The sample size will be 382 (Note: The sample size identified by sample calculator).

Table 1. “Table prepared by the researcher”

S	Company name	Total Employee numbers	S	Company name	Total Employee numbers
1	**Novartis**	**4000**	**11**	**Pharco**	**4000**
2	**Pfizer**	**1300**	**12**	**Rameda**	**1500**
3	**GSK**	**1000**	**13**	**Hikma**	**2000**
4	**Sanofi**	**2000**	**14**	**Orchidia**	**1000**
5	**Eva pharma**	**4000**	**15**	**GNP**	**1000**
6	**Amoun**	**4000**	**16**	**HPG**	**1700**
7	**MUP**	**2000**	**17**	**Egydrug**	**10000**
8	**Sedico**	**2000**	**18**	**Ucp**	**8000**
9	**Eipico**	**2000**	**19**	**Pharmaoverseas**	**5000**
10	**HSO**	**2000**	**20**	**Ibnsinapharma**	**5000**
Total			63,500		

9.3. Research Strategy

This study relies on a self-administered questionnaire that was developed in accordance with prior research as part of its survey methodology. Surveys are one type of qualitative methodology (Hair, Hult, Ringle, & Sarstedt, 2017). [45] The following are the reasons why this paper depends on the questioner. It aids in gathering a great deal of data. It is simple to deliver to a big group of individuals, and it saves money because the researcher doesn't have to go to each respondent's home. It is also timely and effective since research may quickly reach a large number of employees. It is a valid and trustworthy instrument as well, but researchers must make sure the questions they utilize are well-developed. The findings of the questionnaire may be easily measured using different statistical software programs. It is simple, clear-cut, and objective to examine questioners (Anon, 2016).

9.4. Research Philosophy

A descriptive study design was used for the current study. In order to determine the impact of supply chain practices (as an independent variable) on crisis responsiveness (as a dependent variable), this study relied on the descriptive analytical technique, which is "a means to define and measure the phenomena examined by

collecting, classifying, and evaluating the problem". The descriptive approach also means the type of research that is carried out by surveying the members of the study community or a sample of them to describe the phenomenon studied in terms of its nature and degree of existence. According to (Sekaran, & Bougie, 2010) [45], the descriptive study design is not experimental in that it deals with relationships between variables in a natural rather than a laboratory setting.

Accordingly, positivism is the preferable appropriate philosophy (sekaran, 2003)—positivism focuses on researching sociology that depends on the study of facts in a scientific and systematic way. Positivism observes behaviors and actions scientifically. These social facts should be objectively measured (Blackstone, 2012).

9.5. Questionnaire Development

The study utilized a closed-end structured questionnaire to collect primary data from a sample of Egyptian pharmaceutical companies. The survey questionnaires comprised three sections, each geared towards collecting specific data. Section A covered demographics. Section B covered the proposed 3 dimensions of supply chain practices, which included strategic supplier, customer relationship and communication. Finally, Section C covered crisis responsiveness dimensions, such as logistic process responsiveness, operation system responsiveness and organization long term success.

10. Data Analysis, Results (Findings) & Discussion

This presents the data analysis part of this paper. The analysis of this paper was done using the statistical package for social sciences (SPSS V28) for both descriptive and inferential statistics, and (SmartPLS 3.2.9) for SEM-PLS modeling.

10.1. The Respondents' Demographics

The demographic characteristics of respondents were reported in Table 2 associated with some graphs that can be found in appendix B. Between the respondents, there 61% were males, and 39% were females. About the respondents' career, 32% were heads of department, 23% were administrative, 18% were general directors, 14% were planners, and 13% were project managers. Regarding the total employee in the organization, 20% have 100, 19% have between 101 and 500, 17% have between 501 and 1000, 28% have between 1001 and 5000, 9% have between 5001 and 10000, and 6% have more than 10000. Among the respondents, there about 4% had less than one year of experience in the company, 32% had from 1-10 years, 26% had from 10-15 years, 17% had from 15-20 years, and 21% had more than 20 years of experience in the organization.

Demographic statistics include personal information, such as gender, job level and work experience. Some demographic relating to organization information are also included such as organization's total employee headcount. Many researchers have measured multiple demographic variables and used them as a control variables, particularly in regression analysis. However, in this study the effects of personal and organizational characteristics are removes from the regression analysis because these variables may undesirably impact on the core relationship examination, that is, the effects of the independent variable of supply chain practices on the dependent crisis responsiveness. Therefore, data on these variables was collected and analyzed only for descriptive purposes. For exploratory purposes, data related to organizational demographics is however, explode to investigate any relationship between the main study variables and demographics which might be of interest for future researchers.

Table 2. Demographic characteristics

		N	%
1/7 What is your gender?	Female	149	39.0%
	Male	233	61.0%
2/7 What is your career level?	Administrative	89	23.2%
	General director	67	17.6%
	Head of department	124	32.4%
	Planner	53	13.8%
	Project manager	49	13.0%
3/7 What is your organization's total employee headcount?	100	76	19.8%
	101-500	74	19.4%
	501-1000	66	17.2%
	1001-5000	108	28.2%
	5001-10000	35	9.2%
	More than 10000	23	6.2%
4/7 Years of experience	Less than one year	17	4.4%
	1-10 years	121	31.8%
	10-15 years	100	26.2%
	15-20 years	65	17.0%
	Above 20 years	79	20.6%

10.2. Normality

Normality refers to the data distribution of a single variable (Field, 2013) [46]. In the best-case scenario, data will take a bell-shaped curve to indicate a normal distribution (Hair, Celsi, Money, Samouel, & Page, 2016) [47]. The normality test is one of the first measures required to verify that the data collected are appropriate for statistical data analysis. In other words, data not normally distributed might affect the reliability and validity of statistical data analysis (Hair, Black, Babin, & Anderson, 2014) [48].

Table 3. Normality diagnostics

Construct	Abbr.	N	Skewness	Kurtosis
Strategic supplier	SS	382	-0.220	-0.116
Customer relationship	CR	382	0.028	-0.218
Communication	COM	382	0.136	-0.673
Operation system resp.	OSR	382	-0.162	0.142
Logistic process resp.	LPR	382	-0.638	1.284
Organization long term success	OLTS	382	-0.020	-0.382
Supply chain practices	SCP	382	0.170	-0.249
Crisis responsiveness	CRS	382	-0.098	0.031
Remark: Normality assumption attained				

In terms of measuring normality, researchers (Hair, Hult, Ringle, & Sarstedt, 2017 [49]; Kline, 2016 [50]; Hair, Black, Babin, & Anderson, 2014) [48] recommended using two values to measure the shape of data distribution: Skewness and kurtosis. Skewness refers to measuring the symmetry of the data distribution, while kurtosis refers to the height of the distribution (Field, 2013) [46]. Positive Skewness value indicates that the distribution is skewed to the left, and negative Skewness value indicates that the distribution is skewed to the right (Kline, 2016). Positive kurtosis indicates that the distribution is too peaked, and negative kurtosis indicates that the distribution is too flat (Kline, 2016). The values for Skewness between -2 to +2 and kurtosis between -7 and +7 are considered acceptable in order to prove normal distribution (Hair et al. 2014; Byrne 2016) [51]. The results of the normality test in the Table 3 show that the values of Skewness and kurtosis for the constructs of the model were within the specified range.

10.3. Common Method Bias Test

Common method bias (CMB) occurs when the collected responses are results of the design of the instrument rather than a reflection of the participants' perspectives. Method bias is a measurement error that affects the validity of the findings of the study (MacKenzie and Podsakoff, 2012) [52].

Table 4. Results of Harman's single-factor test

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.627	32.376	32.376	12.627	32.376	32.376
2	3.184	8.165	40.542			
3	1.862	4.774	45.315			
4	1.739	4.458	49.773			
5	1.585	4.064	53.837			
6	1.254	3.215	57.052			
Extraction Method: Principal Component Analysis.						
Remark: No problem exists						

CMB can be detected through running Harman's single-factor test, which is commonly used by researchers. This test is conducted through loading all of the variables into an exploratory factor analysis and examining the results of an un-rotated factor analysis while placing a constraint to extract one factor only. The percentage of the factor's explained variance determines whether the bias is present or not. If the total variance of the factor is less than 50%, then the common method bias does not affect the data. The percentage of the factor's explained variance determines whether the bias is present or not. If the total variance of the factor is less than 50%, then the common method bias does not affect the data. The aforementioned method was followed to test the data for common bias method. Table 4 presents the results of the test, which indicate that the common method bias does not affect the data since the total variance of the first factor is about 32% which is less than the 50% threshold.

10.4. Internal Consistency Reliability

The internal consistency reliability examines whether all of the indicators associated with a construct are actually measuring it (Pallant, 2010) [53]. There are different ways to measure the internal consistency. Cronbach's alpha is a statistical measure that is the most commonly used for this purpose. Cronbach's alpha provides the average correlation between all of the indicators that belong to one construct.

Table 5. Reliability of measurement model analysis

Construct	Cronbach's Alpha	rho_A	Composite Reliability	Remark
Communication	0.846	0.849	0.886	Internal Reliability consistency attained
Crisis responsiveness	0.903	0.909	0.917	
Customer relationship	0.792	0.798	0.852	
Logistic Process Resp.	0.795	0.814	0.86	
Operation System Resp.	0.841	0.851	0.882	
Organization Long Term Success	0.74	0.764	0.828	
Strategic supplier	0.828	0.829	0.872	
Supply chain practices	0.916	0.918	0.927	

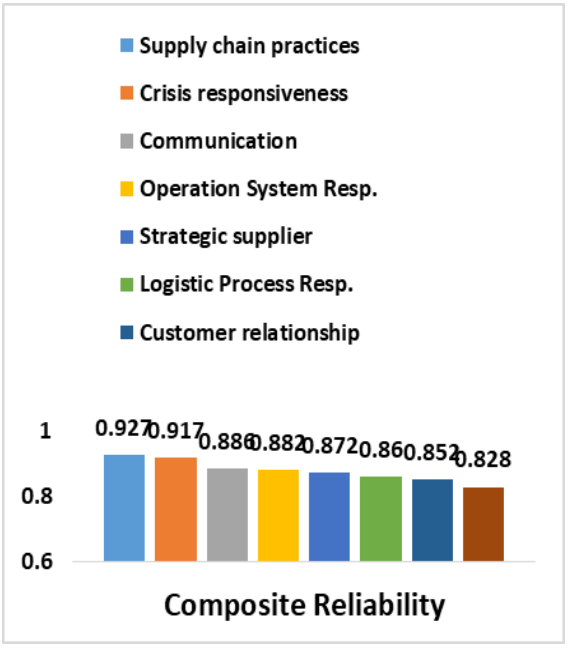

Figure 2. Composite reliability values

Despite its popularity, Cronbach's alpha is criticized for assuming that all of the indicators have equal outer loadings (Hair et al., 2017), and that the number of indicators influences the calculation of Cronbach's alpha in that fewer items produces lower value, especially in scales with items fewer than 10 (Pallant, 2010, Hair et al., 2017) [53]. Due to the limitations of Cronbach's alpha, researchers are advised to use other measures of internal consistency such as composite reliability (CR), which

measures the internal consistency while considering that each indicator has a different outer loading. The accepted value of reliability is 0.7; however, values above 0.6 are also accepted. Following the previous rules, the reliability of each construct was assessed using the calculations provided in SmartPLS. The results in Table 5 show that all constructs had Composite Reliability scores of more than 0.6. Figure 2 presents the results of the internal consistency reliability after arrange it from the largest to the smallest. Those findings provide evidence of the high reliability and sufficient internal consistency of the constructs.

10.5. Convergent Validity

The convergent validity evaluates the correlation between the variables that measure one construct. The convergent.

Validity of reflective measurement models is usually evaluated using the outer loadings of the items and the average variance extracted (AVE).

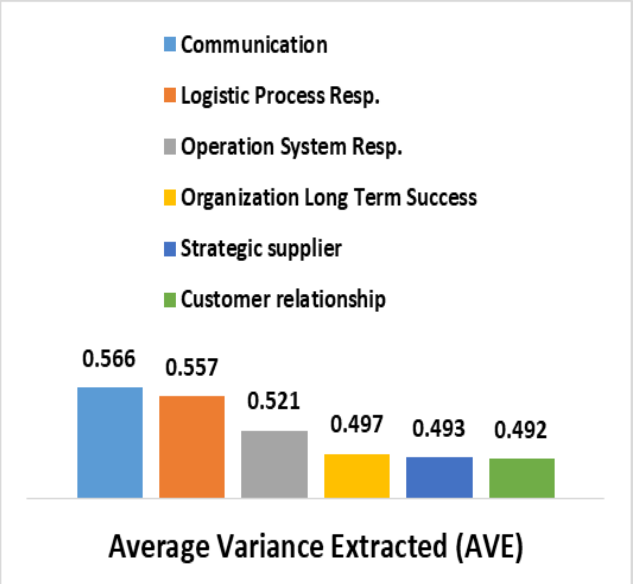

Figure 3. AVE values

Table 6. Convergent validity analysis (AVE)

Construct	Average Variance Extracted (AVE)	Remark
Communication	0.566	Convergent validity attained through AVE values
Customer relationship	0.492	
Logistic Process Resp.	0.557	
Operation System Resp.	0.521	
Organization Long Term Success	0.497	
Strategic supplier	0.493	

The AVE is a common measure used to establish convergent validity which represents the grand mean of the squared loadings of the indicators measuring a construct. The recognized values of AVE are those larger than 0.5; however, values below 0.5 are also acceptable provided the values of CR are greater than 0.6 (Fornell and Larcker, 1981). Following the previous guidelines, the convergent validity through AVE in Table 6 was established.

Table 7. Item Loading

	Strategic supplier	Customer relationship	Communication	Operation System Resp.	Logistic Process Resp.	Organization Long Term Success
V1	0.689					
V2	0.75					
V3	0.708					
V4	0.723					
V5	0.715					
V6	0.638					
V7	0.689					
V8		0.691				
V9		0.796				
V10		0.737				
V11		0.646				
V12		0.624				
V13		0.701				
V14			0.745			
V15			0.774			
V16			0.736			
V17			0.811			
V18			0.741			
V19			0.7			
V20				0.539		
V21				0.604		

	Strategic supplier	Customer relationship	Communication	Operation System Resp.	Logistic Process Resp.	Organization Long Term Success
V22				0.78		
V23				0.735		
V24				0.806		
V25				0.804		
V26				0.738		
V27					0.543	
V28					0.774	
V29					0.767	
V30					0.798	
V31					0.815	
V32						0.691
V33						0.733
V34						Deleted
V35						Deleted
V36						Deleted
V37						0.484
V38						0.808
V39						0.763

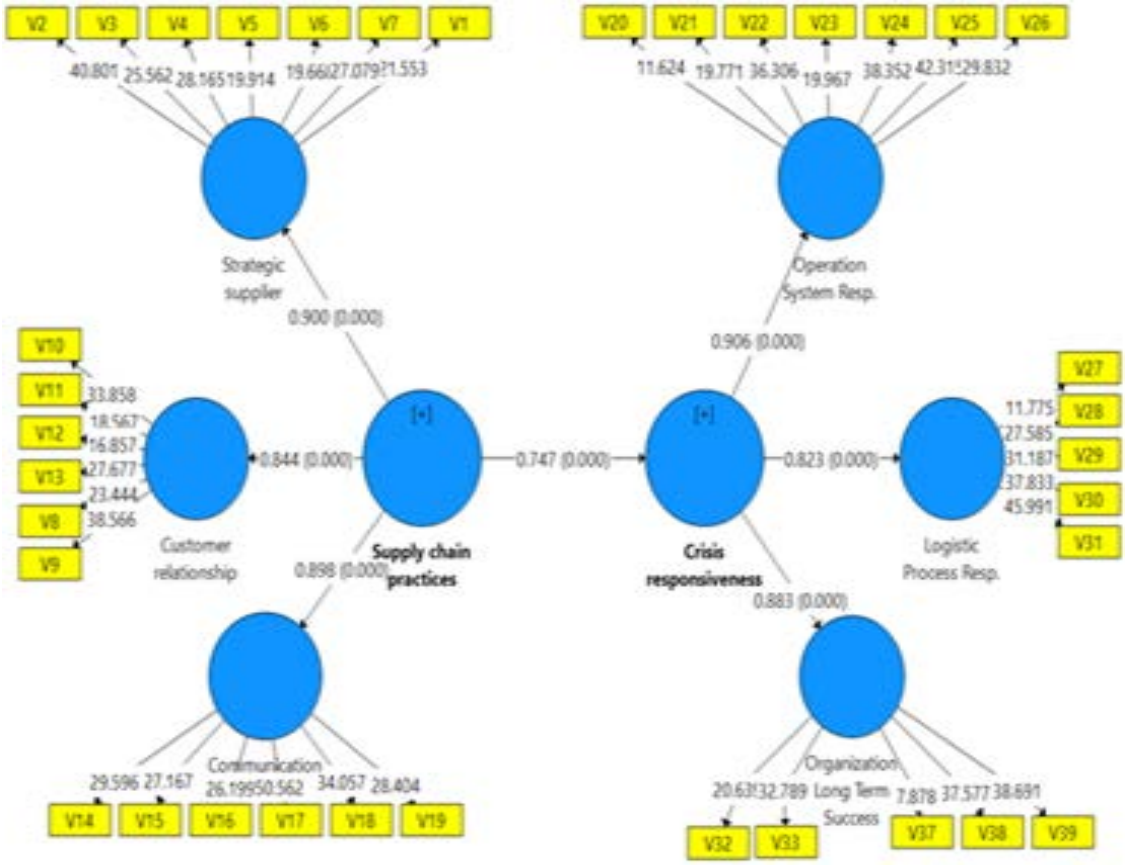

Figure 4. Structural model (Main hypotheses)

Item loading is another measure of reliability, the outer loadings required is 0.70 (Hair et al., 2014, Hair et al., 2017). The reason behind specifying that the outer loading should be at least 0.70 is because the square of a standardized item's outer loadings, which is also known as communality, indicates how much variance is shared between the construct and the item. The square of 0.70 will approximately equal to 0.50. This means that if an item has an outer loading of 0.70, the construct can explain about 50% of the item's variance (Hair et al., 2017). However, the authors suggested if the outer loading is between 0.4-0.7; we should analyze the impact of indicator deletion on internal consistency reliability. If deletion does not increase measure(s) above threshold, we should retain the reflective indicator. Three items (V34, V35, V36) were removed because of low factor loading, and all other items in Table 8 satisfy the conditions, so, they were retained as in Figure 2.

10.6. Collinearity

Collinearity occurs when there is a high correlation between two constructs, which produces interpretation issues (Hair, Hult, Ringle, & Sarstedt, 2017). If more than two constructs are involved, it refers to collinearity or multicollinearity.

Collinearity can be assessed using the variance inflation factor (VIF), which is obtained by dividing one by tolerance referring to the variance explained by one independent construct not explained by the other independent constructs (Hair, Hult, Ringle, & Sarstedt, 2017; Benitez-Amado, Henseler, & Castillo, 2017) [54]. A VIF value of 5 or higher indicates a high collinearity (Hair, Ringle, & Sarstedt, 2011; Hair, Hult, Ringle, & Sarstedt, 2017) [49]. All VIF values in Table 4. were below the cut-off point; providing evidence that the collinearity between independent constructs does not exists.

10.7. Path Coefficients

Path coefficients refer to the estimates of the relationships between the model's constructs (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014) [55]. Those coefficients range from +1 to -1, where +1 means a strong positive relationship, 0 means a weak or non-existence relationship, and -1 means a strong negative relationship (Garson, 2016) [56]. When assessing PLS path, studies should report path coefficients beside the significance level, t-value, and p-value (Hair, Sarstedt, Ringle, & Mena, 2012) [57].

The hypothesis testing has been done to understand the signs, size, and statistical significance of the estimated path coefficients between the constructs. Higher path coefficients suggest stronger effects between the predictor and predicted variables. The significance of the supposed relationships has been established by measuring the significance of the p-values for each path with threshold $p < 0.05$, $p < 0.01$ be used to assess the significance of the path coefficient estimations (Henseler et al., 2009; Hair et al., 2017).

Table 8. Variance inflation facto

Path	VIF	Remark
Supply chain practices -> Crisis responsiveness	1	NO collinearity problem exists
Strategic supplier -> Logistic Process Resp.	1	
Strategic supplier -> Operation System Resp.	1	
Strategic supplier -> Organization Long Term Success	1	
Customer relationship -> Logistic Process Resp.	1	
Customer relationship -> Operation System Resp.	1	
Customer relationship -> Organization Long Term Success	1	
Communication -> Logistic Process Resp.	1	
Communication -> Operation System Resp.	1	
Communication -> Organization Long Term Success	1	

Table 9. Results of Hypothesis testing

Path	B	t-value	P-value	95% Bias-Corrected CI		Remark
				LB	UB	
Supply chain practices -> Crisis responsiveness	0.747	34.205	0	0.701	0.786	Supported
H1a: Strategic supplier -> Organization Long Term Success	0.562	17.966	0	0.495	0.617	Supported
H1b: Strategic supplier -> Logistic Process Resp.	0.428	12.398	0	0.353	0.489	Supported
H1c: Strategic supplier -> Operation System Resp.	0.672	28.427	0	0.619	0.712	Supported
H2a: Customer relationship -> Organization Long Term Success	0.544	16.415	0	0.47	0.602	Supported
H2b: Customer relationship -> Logistic Process Resp.	0.514	13.051	0	0.429	0.583	Supported
H2c: Customer relationship -> Operation System Resp.	0.619	20.885	0	0.556	0.672	Supported
H3a: Communication -> Organization Long Term Success	0.706	33.575	0	0.656	0.741	Supported
H3b: Communication -> Logistic Process Resp.	0.495	14.107	0	0.415	0.555	Supported
H3c: Communication -> Operation System Resp.	0.665	28.149	0	0.618	0.708	Supported

CI=Confidence Interval; LB=Lower Bound; UB=Upper Bound

11. Conclusion

Aligned with the study objective, the analysis has managed to present a comprehensive framework that includes very important relevant aspects of the supply chain practices and shows the direct relationship of the supply chain practices and the crisis responsiveness. All the hypotheses were confirmed based on the survey analysis. The existing body of research provides evidence for three primary responses that characterize organizational resilience: (1) the ability to anticipate disruptions and take proactive measures to prepare businesses for them, (2) the efficacy and efficiency of responding to disruptions as they arise, and (3) the ability to recover from disruptions and derive valuable insights from the experience. Additionally, it is imperative to note that the enhancement of IT-based supply chain capabilities has facilitated expedited responsiveness to market fluctuations, granting organizations a competitive advantage over their counterparts. The acquisition of these abilities will ultimately enhance the supply chain management's adaptability, thereby safeguarding the business from imitation by competing enterprises. The generation of social capital through communication flows is seen to be a consequence of these intimate friendships, and it can exhibit notable differences compared to the expected outcomes of conventional business-oriented partnerships. The formation of social networks often occurs among individuals who traverse boundaries within interorganizational networks, wherein personal interactions are commonly perceived as the "soft" type of connections inside a network.

This study aims to examine the potential benefits that businesses can derive from their own recovery experiences. Specifically, we define this sort of failure event as occurring when a firm faces imminent collapse as a result of a large decline in performance, but then manages to substantially increase its performance to surpass an acceptable threshold. Recovery experiences possess a potentially greater learning value than success due to their ability to offer pre-post contrasts, viable solutions to previous obstacles, and elicitation of emotional responses from individuals within an organization. Moreover, the presence of experiential diversity has been found to enhance learning rates. This finding aligns with theories of associative learning, which propose that the inclusion of contrasting information facilitates the comprehension of events or concepts.

11.1. Practical Implications

The study's goal was to advance knowledge of supply chain management techniques by examining the connections between strategic supplier partnerships, customer relationships, information exchange, and supply chain crisis responsiveness. This study was one of the first to examine the relationship between strategic supplier partnerships - supply chain responsiveness, customer relationships - supply, and supply chain responsiveness by developing and testing a research framework of supply chain management practices and supply chain responsiveness constructs, and by conducting an analysis of a number of consumer goods firms with valid and reliable instrument. Overall, this study adds to our understanding of the function of supply chain management methods, supply chain responsiveness, and the competitive advantage of the firm in the supply chain management industry.

Several significant consequences for practitioners flow from this study's findings:

First, firms are increasingly adopting supply chain management strategies in the hopes of enhancing supply chain responsiveness and the firm's competitive advantage as the focus of business competition shifts from among organizations to between supply chains partners. The research's conclusions provide SCM practitioners confidence that it is a competitive strategy that works, and they show that putting SCM techniques in place has a significant impact on a company's ability to respond quickly to market demands and maintain a competitive edge.

Second, firms need to be more responsive in order to quickly address client wants in the fast-paced, global competition of today. Furthermore, for the firm to be fully responsive, responsiveness on all dimensions—namely, the supply side, within the organization, and downstream—is required. There is a lot of confusion regarding what supply chain responsiveness means, and it hasn't been well defined. Examples include flexibility and agility. The research shows the practitioners what makes responsiveness so important as well as how to achieve it.

Thirdly, the study offers companies a set of reliable and valid metrics for assessing, benchmarking, and contrasting the responsiveness of the supply chain at various supply chain nodes, including those for manufacturers, distributors, wholesalers, and retailers as well as suppliers of raw materials and components. The metrics created in this study are capable of capturing the various facets of supply chain responsiveness, making them useful for practitioners to understand both the direct effects of this responsiveness on organizational performance as well as its immediate results.

11.2. Limitations

There is a wealth of empirical and theoretical research on supply chain practices and organizational responsiveness, but little empirical study has been done on the relationship between these practices and crisis response. As a result, it was difficult to corroborate the study's findings by comparing the test result hypotheses with those of earlier studies. The 20 pharmaceutical businesses in Egypt were chosen at random, the results do not accurately reflect the public as a whole. The association between supply chain procedures and crisis response should be revisited in future studies, with a bigger sample size that includes more enterprises in the Egyptian pharmaceutical industry. The study is limited in that it can only focus on a few of the critical facets of the chosen variables, such as: the impact of strategic supplier, customer relationship, communication (data reliability and data dependability) in supply chain practices as an independent variable. As well as logistic responsiveness, operation process responsiveness, organizational long term success to assess crisis responsiveness as a dependent variable. Therefore, it is advised to integrate other indicators in order to measure the chosen variables from

different angles. It has been extremely challenging to collect the essential data, for example, to analyze the company's performance based on the company's revenue, sales, profits, etc., according to the key data in the company's data availability and unavailable data owing to its regulations and limits. The majority of the study's data came from a survey that participants responded to base on their knowledge and experience. The use of secondary data sources, such as the financial statements for the previous three years, to assess the success of the company was crucial. Moreover, by offering quantitative indications, it will be possible to examine in more detail how well the supply chain practices has been applied to crisis responsiveness. The majority of the survey respondents also provided the researcher with useful feedback on two important issues. The questionnaire has a lot of questions, and it takes a while to report all of them. Second, considering that the majority of respondents are not familiar with the terms mentioned, the survey should be conducted in Arabic rather than merely English.

11.3. Recommendation for Future Researches

Despite the current study's insightful findings, there is still much to be discovered in this area, particularly for graduate-level research. Future research should take into account extending the current study's findings to other industries in Egypt, such as food, oil & gas, and tourism, in order to gain a more thorough understanding of supply chain practices, crisis responsiveness, and sustainability in various contexts. Further research is necessary to determine the influences on communication, customer relationships, and strategic supplier partnerships, as well as how these influences affect crisis responsiveness. The implications of cultural diversity on supply chain tactics and the function of leadership in advancing SCM are two additional aspects of SCP and CR that might be explored in future research but were not covered in the current study. It is also important to look into more current subjects that have been shown to affect SCP, such as the effect of organizational SCP on achieving a company's competitive edge and the impact of applying organizational SCP to entrepreneurship. This study may offer important information about how businesses might use SCP to promote innovation and grow their bottom line. Further research is needed in a number of areas related to strategic supplier partnerships, customer relationships, and communication. Researchers can learn more about the variables that affect organizational identity by examining these subjects, and businesses can utilize this knowledge to create a solid, agile, and long-lasting corporate culture that promotes long-term business success.

References

[1] supply chain practices and performance: the indirect effects of supply chain integration Veera Pandiyan Kaliani Sundram Centre for Technology and Supply Chain Management, Universiti Teknologi MARA, Selangor, Malaysia V.G.R. Chandran Department of Development Studies, University of Malaya, Kuala Lumpur, Malaysia, and Muhammad Awais Bhatti College of Business Administration, King Faisal University, Al Hufūf, Saudi Arabia*: An International Journal, Vol. 23 Iss 6 pp. 1445 – 1471* Received 3 March 2015 Revised 2 October 2015 Accepted 21 October 2015.

[2] The effect of supply chain practices on retailer performance with information technology as moderating variable Zeplin Jiwa Husada Tarigana, Juan Alexander Jiputraa and Hotlan Siagiana International Journal of Data and Network Science 5 (2021) 47–54* © 2021 by the authors; licensee Growing Science, Canada.

[3] The effect of supply chain management on competitive advantage: The mediating role of information technology Amineh A. Khaddama*, Hani J. Irtaimehb and Basema S. Baderba Amman Arab University, Jordan b Hani J. Irtaimeh, The World Islamic for Science & Education University, Jordan* Uncertain Supply Chain Management 8 (2020) 547–562.

[4] Impact of sustainable supply chain management and customer relationship management on organizational performance * Saikat Das and H.M. Kamrul Hassan Department of Marketing, University of Chittagong, Chattogram, Bangladesh* International Journal of Productivity and Performance Management Vol. 71 No. 6, 2022 pp. 2140-2160 © Emerald Publishing Limited 1741-0401.

[5] Supply Chain Management Practices, Competitive Advantages and Firm Performance: A Case of Small and Medium Enterprises (SMEs) in Vietnam*Duong Vu Xuan Quynh, Nguyen Hoang Huy International University-Vietnam National University, Ho Chi Minh City, Vietnam *Journal of Modern Accounting and Auditing, March 2018, Vol. 14, No. 3, 136-146.

[6] Competitive Advantage: Exploring the Role of Partnership with Suppliers, Customer Relationship and Information Sharing as Antecedents*Wahyuddin Latunreng, Chairun Nasirin. Department of Business Administration Faculty of Administration Science Institute STIAMI Jakarta, Indonesia Department of Health Administration, Collage of Health Science (STIKES) Mataram, Indonesia*Int. J Sup. Chain. Mgt Vol. 8, No. 6, December 2019.

[7] Supply Chain Strategy and the Role of Suppliers: Evidence from the Indian Sub-Continent* Muhammed Shakeel Sadiq Jajja Vijay R. Kannan Shaukat Ali Brah Syed Zahoor Hassan* The authors gratefully acknowledge the institutional and financial support of the Association of Management Development Institutions in South Asia (AMDISA) that facilitated the collection of data in India.

[8] The Importance of Key Supplier Relationship Management in Supply * Christoph Teller (corresponding author) Surrey Business School, University of Surrey GU2 7HX Guildford, United Kingdom; Herbert Kotzab Institute for Logistics and Supply Chain Management, University of Bremen 2000 Bremen, Germany; kotzab@uni-bremen.de; David B. Grant Logistics Institute, University of Hull HU6 7RX Hull, United Kingdom; Christina Holweg Department of Marketing; Vienna University of Economics and Business 1020 Vienna, Austria*Chains (published in the International Journal of Retail and Distribution Management in 2016.

[9] The relationship between a company and its customers Hamid Tohidi School of Industrial Engineering, South Tehran Branch, Islamic Azad University, Tehran, Iran E-mail: H_tohidi@azad.ac.ir Mohammad Mehdi Jabbari Department of Electrical Engineering, South Tehran Branch, Islamic Azad University, Tehran, Iran* International Journal Of Business And Management Studies Vol 4, No 2, 2012 ISSN: 1309-8047 (Online) 45.

[10] The critical success factors for customer relationship management implementation: a systematic literature review* Meyliana Faculty of Computer Science, University of Indonesia, Depok, 16424, Indonesia and School of Information Systems, Bina Nusantara University, Jakarta, 11480, Indonesia Email: meyliana@ui.ac.id Email: meyliana@binus.edu *Corresponding author Achmad Nizar Hidayanto and Eko K. Budiardjo Faculty of Computer Science, University of Indonesia, Depok, 16424, Indonesia Email: nizar@cs.ui.ac.id Email: eko@cs.ui.ac.id* Int. J. Business Information Systems, Vol. 23, No. 2, 2016.

[11] Factors affecting customer relationship management practices in Thai academic libraries Piyawan Siriprasoetsin, Kulthida Tuamsuk, Cholabhat Vongprasert Department of Information Technology, Maejo University, Thailand - Information and Communication Management Program, Khon Kaen University, Thailand* The International Information & Library Review (2011) 43, 221e229 *2011 Published by Elsevier Ltd.

[12] Evaluating human factors in customer relationship management Case study: private banks of Shiraz city Mehdi Bagheri Ghalenooiea,*, Hosein Khorrami Sarvestania Department of Industrial Engineering, Persian Gulf University, Bushher, Iran*Procedia Economics and Finance 36 (2016) 363-373.

[13] Customer relationship management (CRM) – How to build strong online relationship with the 10.Customers Monika Angeloska-Dichovska, PhD University St. Kliment Ohridski – Bitola, Faculty of Economics - Prilep monika.angeloska@uklo.edu.mk Marjan Angeleski, PhD University St. Kliment Ohridski – Bitola, Faculty of Economics – Prilep marjan.angeleski@uklo.edu.mk*.

[14] Customer relationship management as a business process * Douglas M. Lambert Department of Marketing and Logistics, Fisher College of Business, The Ohio State University, Columbus, Ohio, USA* journal of Business & Industrial Marketing 25/1 (2010) 4–17 q Emerald Group Publishing Limited [ISSN 0885-8624].

[15] Application development in process firms: adding value to customer products and production systems Thomas Lager1 and Per Storm2 1 Centre for Innovation, Technology and Entrepreneurship, Grenoble Ecole de, Management, BP 127 – 38003, Grenoble Cedex 01, France. thomas.lager@grenoble-em.com 2 Department of Material Sciences, Royal Institute of Technology, KTH, SE-100 44 Stockholm, Sweden. storm@kth.se* R&D Management 43, 3, 2013. © 2013 The Authors. R&D Management © 2013 John Wiley & Sons Ltd.

[16] Factors for success in customer relationship management (CRM) systems Wilson, H.N., Daniel, E.M. and McDonald, M.H.B. In print for Journal of Marketing Management, vol 17 (2001) Cranfield School of Management, Cranfield, Bedford, MK43 0AL, UK.

[17] The effect of supply chain responsiveness on customer development David Asamoah, Dorcas Nuertey, Benjamin Agyei-Owusu and Joseph Akyeh Kwame Nkrumah University of Science and Technology, Kumasi, Ghana* The International Journal of Logistics Management Vol. 32 No. 4, 2021 pp. 1190-1213 © Emerald Publishing Limited 0957-4093.

[18] The impact of information technology and communication systems on the agility of supply chain management systems Roya Dehgani Mizan University, Tabriz, Iran, and Nima Jafari Navimipour Department of Computer Engineering, Tabriz Branch, Islamic Azad University, Tabriz, Iran* Kybernetes © Emerald Publishing Limited 0368-492X.

[19] The impact of Information Technology on the development of Supply Chain Competitive Advantage Catherine Marinagia *, Panagiotis Trivellasb , Damianos P. Sakas c a,b Department of Logistics, Technological Educational Institute of Central Greece, GR32200, Thiva, GREECE c Department of Informatics and Telecommunications, University of Peloponnese, GR22100, Tripoli, GREECE* Procedia - Social and Behavioral Sciences 147 (2014) 586-591.

[20] The Impact Of Operational Quality: A supply Chain View Vijay R. Kannan Department of Business Administration Utah State University Logan, UT 84322-3510, USA, Email: v.kannan@usu.edu Keah Choon Tan Department of Management University of Nevada, Las Vegas Las Vegas, NV 89154-6009, USA,kctan@unlv.nevada.edu September 18, 2004.

[21] Understanding trust influencing factors in social media communication: A qualitative study Xusen Chenga,⁎, Shixuan Fua,1, Gert-Jan de Vreede b,2 a University of International Business and Economics, Beijing 100029, China b University of South Florida, Tampa 33620, USA* International Journal of Information Management 37 (2017) 25–35.

[22] The role of personal relationships in facilitating supply chain communications: A qualitative study David M. Gligor and Chad W. Autry the University of Tennessee* Journal of Supply Chain Management, Volume 48, Number 1, January 2012.

[23] The impact of intellectual capital on supply chain agility and collaborative knowledge creation in responding to unprecedented pandemic crises Khaled Saleh Al-Omoush a,* , Daniel Palacios-Marqu´es b , Klaus Ulrich c a Al-Zaytoonah University of Jordan, Amman Jordan b Universitat Polit`ecnica de Val`encia, Spain c ESIC Business & Marketing School, Spain* Technological Forecasting & Social Change 178 (2022) 121603.

[24] Mechanisms Influencing Knowledge Acquisition and Digital Supply Chain Management: A conceptual Paper Tamma Elhachemi The Faculty of Economic, Commercial and Management Sciences, University of Echahid Hamma Lakhdar, Eloued, Algeria Tchimotam@gmail.com Abdesslam Menacer Economics, Management and Commerce Faculty, Financial and Accounting department, Lounici Ali University, Blida 2, Algeria menacer2020@gmail.com Faouzi Mehirig The Faculty of Economic, Commercial and Management Sciences, University of Echahid Hamma Lakhdar, Eloued, Algeria faouzihidaya@gmail.com* Turkish Online Journal of Qualitative Inquiry (TOJQI) Volume 12, Issue 6, July, 2021: 5079-5091.

[25] Logistics Flow Optimization for Advanced Management of the Crisis Situation Imane CHAKIRa , Mohamed EL KHAILIa *, Mohamed MESTARIa a Laboratory SSDIA, ENSET Mohammedia, Hassan II University of Casablanca,BP. 159, Mohammedia, Morocco* Procedia Computer Science 175 (2020) 419–426* The 15th International Conference on Future Networks and Communications (FNC) August 9-12, 2020, Leuven, Belgium.

[26] Coordination and responsiveness issues in SMEs supply chains: a review* Ravinder Kumar Amity University, Rajesh Kumar Singh Management Development Institute Gurgaon, India* this publication at: https://www.researchgate.net/publication/315758623.

[27] The Maturity of Humanitarian Logistics against Recurrent Crises Jesus Gonzalez-Feliu 1,*, Mario Chong 2 , Jorge Vargas-Florez 3 , Irineu de Brito Jr. 4 , Carlos Osorio-Ramirez 5 , Eric Piatyszek 6 and Renato Quiliche Altamirano 2 1 Supply Chain, Purcahsing and Project Management Department, Excelia Group, La Rochelle Business School, 17000 La Rochelle, France 2 Engineering Department, Universidad del Pacifico, Lima 15072, Peru; m.chong@up.edu.pe (M.C.); r.quilichealtamirano@up.edu.pe (R.Q.A.) 3 Engineering Department, Pontifica Universidad Católica del Peru, Lima 15088, Peru; jorge.vargas@pucp.edu.pe 4 Environmental Engineering Department, Sao Paulo State University, São José dos Campos 12247-004, Brazil; irineu.brito@unesp.br 5 School of Business and Public Accounting, Faculty of Economic Sciences, Universidad Nacional de Colombia, Bogotá Cra 45, Colombia; caosoriora@unal.edu.co 6 Département Génie de l'Environnement et des Organisations, Institut Henri Fayol, Ecole des Mines de Saint-Etienne, 42000 Saint-Etienne, France; piatyszek@emse.fr * Correspondence: gonzalezfeliuj@excelia-group.com* Social Sciences. 2020, 9, 90.

[28] A Responsiveness View of logistics and supply chain management Robert Glenn Richey1 | Anthony S. Roath1 | Frank G. Adams2 | Andreas Wieland3 1 Raymond J. Harbert College of Business, Auburn University, Auburn, AL, USA 2 Department of Marketing, Quantitative Analysis & Business Law, Mississippi State University, Mississippi State, MS, USA 3 Department of Operations Management, Copenhagen Business School, Frederiksberg, Denmark* Journal of Business Logistics published by Wiley Periodicals LLC Received: 15 April 2020 | Revised: 28 July 2021 | Accepted: 23 August 2021.

[29] The 4Rs supply chain resilience framework: A capability perspective Nidal Yousef Dwaikat1 | Saad Zighan2 | Moheeb Abualqumboz3 | Ziad Alkalha4 1 Department of Industrial Engineering, An - Najah National University, Nablus, Palestine 2 Business Administration, University of Petra, Amman, Jordan 3 Project and Operations Management, Manchester Metropolitan University, Manchester, UK 4 School of Business, The University of Jordan, Amman, Jordan* J Contingencies and Crisis Management. 2022; 30: 281–294. wileyonlinelibrary.com/journal/jccm* Received: 2 June 2021 | Revised: 5 January 2022 | Accepted: 10 January 2022.

[30] A new multi-objective stochastic model for a forward/reverse logistic network design with responsiveness and quality level Majid Ramezani a , Mahdi Bashiri a,⇑ , Reza Tavakkoli-Moghaddam b aDepartment of Industrial Engineering, Shahed University, Tehran, Iran bDepartment of Industrial Engineering, College of Engineering, University of Tehran, Tehran, Iran* Applied Mathematical Modelling 37 (2013) 328–344 received 7 June 2010 Received in revised form 5 February 2012 Accepted 28 February 2012 Available online 7 March 2012.

[31] Fingerprinting the Datacenter: Automated Classification of Performance Crises Peter Bod´ık EECS Department UC Berkeley Berkeley, CA, USA bodikp@cs.berkeley.edu Moises Goldszmidt Microsoft Research Mountain View, CA, USA moises@microsoft.com Armando Fox EECS Department UC Berkeley Berkeley, CA, USA fox@cs.berkeley.edu Dawn B. Woodard Cornell University Ithaca, NY, USA woodard@cornell.edu Hans Andersen Microsoft Redmond, WA, USA hansande@microsoft.com*, April 13–16, 2010, Paris, France. Copyright c 2010 ACM 978-1-60558-577-2/10/04.

[32] Measuring organizational responsiveness: the development of a validated survey instrument James Hoyt College of Business Administration, Troy State University, Troy, Alabama, USA, and Faizul Huq and Patrick Kreiser College of Business, Ohio University, Athens, Ohio, USA* Management Decision Vol. 45

No. 10, 2007 pp. 1573-1594 q Emerald Group Publishing Limited 0025-1747.

[33] Assessing Effectiveness of Supply Chain Collaboration: An Empirical Study, Amarpreet S. Kohli University of Southern Maine akohli@usm.maine.edu. John B. Jensen University of South Carolina* Supply Chain Forum an International Journal Vol. 11 - N°2 - 2010• January 2010.

[34] On the Inattention to Digital Confidentiality in Operations and Supply Chain Research Brett Massimino* Cornell University, 340 Statler Hall, Ithaca, New York 14853, USA, bjm272@cornell.edu John V. Gray, Yingchao Lan Fisher College of Business, The Ohio State University, 2100 Neil Avenue, Columbus, Ohio 43210, USA, gray.402@osu.edu, lan.63@osu.edu Production and Operations Management Vol. 27, No. 8, August 2018, pp. 1492–1515.

[35] A theoretical review of flexibility, agility and responsiveness in the operations management literature Toward a conceptual definition of customer responsiveness Ednilson Santos Bernardes and Mark D. Hanna Department of Finance and Quantitative Analysis, Georgia Southern University, Statesboro, Georgia, USA* International Journal of Operations & Production Management Vol. 29 No. 1, 2009 pp. 30-53 q Emerald Group Publishing Limited 0144-3577.

[36] Drivers of Organizational Responsiveness Experiences of a Military Crisis Response Organization Erik de Waard • Henk Volberda • Joseph Soeters* Journal of Organization Design JOD, 2(2): 1-14 (2013).

[37] Foundations of Responsive Crisis Management: Institutional Design and Information Kees Boersma, Department of Organization Sciences, Vrije Universiteit Amsterdam and Jeroen Wolbers, Institute for Security and Global Affairs, Leiden University.

[38] Implementation of strategic green orientation in supply chain An empirical study of manufacturing firms Paul Hong College of Business Administration, University of Toledo, Toledo, Ohio, USA He-Boong Kwon Division of Business, Concord University, Concord, West Virginia, USA, and James Jungbae Roh Rohrer College of Business, Rowan University, Glassboro, New Jersey, USA* European Journal of Innovation Management Vol. 12 No. 4, 2009 pp. 512-532 q Emerald Group Publishing Limited 1460-1060.

[39] The Role of Supply Chain Integration and Agile Practices in Improving Lead Time During the COVID-19 Crisis Haitham M. Alzoubi, Skyline University College, UAE Hamzah Elrehail, Abu Dhabi School of Management, UAE https://orcid.org/0000-0001-6935-3355 Jalal Rajeh Hanaysha, School of Business, Skyline University College, UAE Anwar Al-Gasaymeh, Applied Science Private University, Jordan Raid Al-Adaileh, Skyline University College, UAE* International Journal of Service Science, Management, Engineering, and Technology Volume 13 • Issue 1.

[40] Crisis management practices and approaches: Insights from major supply chain crises Stavros T. Ponisa *, Athanasia Ntallab a Heroon Polytechniou 9, Zografos, Athens, 15780, Greece b Heroon Polytechniou 9, Zografos, Athens, 15780, Greece* Procedia Economics and Finance 39 (2016) 668 – 673* 3rd GLOBAL CONFERENCE on BUSINESS, ECONOMICS, MANAGEMENT and TOURISM, 26-28 November 2015, Rome, Italy* Peer-review under responsibility of the Organizing Committee of BEMTUR- 2015.

[41] Decision making in advance of a supply chain crisis Brad Hittle VingTech Corporation, Biddeford, Maine, USA, and Karen Moustafa Leonard Department of Management and Marketing, Doermer School of Business and Management Sciences, Indiana University-Purdue University Fort Wayne, Fort Wayne, Indiana, USA* Management Decision Vol. 49 No. 7, 2011 pp. 1182-1193 q Emerald Group Publishing Limited 0025-1747.

[42] International Supply Chains and Trade Elasticity in Times of Global Crisis* Hubert Escaith: Economic Research and Statistics, WTO Nannette Lindenberg: Institute of Empirical Economic Research, University of Osnabrück Sébastien Miroudot: Trade and Agriculture Directorate, Trade Policy Linkages and Services Division, OECD * Staff Working Paper ERSD-2010-08 Date: February 2010.

[43] A framework of sustainable supply chain management: moving toward new theory Craig R. Carter and Dale S. Rogers University of Nevada, College of Business Administration, Reno, Nevada, USA* International Journal of Physical Distribution & Logistics Management Vol. 38 No. 5, 2008 pp. 360-387 q Emerald Group Publishing Limited 0960-0035.

[44] Organizational Learning from Extreme Performance Experience: The Impact of Success and Recovery Experience June-Young Kim Marquette University, juneyoung.kim@marquette.edu Ji-Yub Kim University of Southern California Anne S. Miner University of Wisconsin – Madison* Published version. Organization Science, Volume 20, No. 6 (November-December 2009).

[45] Sekaran, U., & Bougie, R. (2016). Research Methods for Business: A Skill-Building Approach (6th ed.). (7, Ed.) Chichester, UK: Wiley & Sons Ltd.

[46] Field, A. (2013). Discovering Statistics Using IBM SPSS Statistics (4th Ed.). (M. Carmichael, Ed.) London: SAGE.

[47] Hair, J. F., Celsi, M., Money, A., Samouel, P., & Page, M. (2016). Essentials of Business Research Methods. New York: Routledge.

[48] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). Multivariate Data Analysis. (7th Ed.) Pearson.

[49] Hair, J. F., Hult, G. T., Ringle, C. M., & Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) (2nd Ed.). Los Angeles, CA: SAGE.

[50] Kline, R. B. (2016). Principles and Practice of Structural Equation Modeling. New York: Guilford Press.

[51] Byrne, B. (2016). Structural equation modeling with AMOS. New York, NY: Routledge.

[52] Mackenzie, S. B. & Podsakoff, P. M. 2012. Common method bias in marketing: causes, mechanisms, and procedural remedies. Journal of Retailing, 88, 542-555.

[53] Pallant, J. (2010). SPSS survival manual, 4th. England: McGraw-Hill Education.

[54] Benitez-Amado, J., Henseler, J., & Castillo, A. (2017). Development and Update of Guidelines to Perform and Report Partial Least Squares Path Modeling in Information Systems Research. 21 Pacific Asia Conference on Information Systems (PACIS 2017), (pp. 1-15). Langkawi. Retrieved from http://aisel.aisnet.org/pacis2017/86/.

[55] Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging Tool in Business Research. European Business Review, 26(2), 106-121.

[56] Garson, G. D. (2016). Partial Least Squares: Regression and Structural Equation Models. Asheboro, NC, USA: Statistical Associates Publishers. Retrieved from https://www.smartpls.com/resources/ebook_on_pls-sem.pdf.

[57] Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. Journal of the Academy of Marketing Science, 40(3), 414–433.

The research Questionnaire

Dear Participants,

This study **aims** to ascertain the impact of supply chain management strategies, including cooperative relationships with strategic suppliers, information exchange, and supply chain responsiveness. This study also explores the relationship between supply chain responsiveness and the firm's operational system, logistical process, supplier network, and competitive advantage.

The **goals** of this study's research were to examine how supply chain management practices, such as strategic supplier partnerships, customer relationships, and information sharing, affect supply chain responsiveness and to ascertain whether supply chain responsiveness affects a company's responsiveness in crisis .

You are invited to participate in this survey with approximately other 500 people. This survey will be part of a thesis in partial fulfillment of the requirements for the award of the degree of Doctorate on Business Administration “DBA”.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey, or its procedures you may send email to supplychain2228@gmail.com with a subject "FEEDBACK to Supply chain practices Survey".

It will take approximately (5-10) minutes to complete the survey. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions.

Thank you very much for your time and support. Please start with the survey now by clicking on the Continue button below.

1. What is your gender?
   - Male
   - Female
2. What is your career level?
   - General director
   - Head of department
   - Administrative
   - Planner
   - Project manager
3. What is your organization’s total employee headcount?
   - 100
   - 101-500
   - 501-1000
   - 1001-5000
   - 5001-10000
   - More than 10000
4. Years of experience
   - Less than one year
   - 1 – 10 years
   - 10 – 15 years
   - 15 – 50 Years
   - Above 20 years

Please indicate your relative rate for the criteria provided according to the following:

1 = Strongly Agree – 2=Agree – 3=Neutral – 4= Disagree – 5=Strongly Disagree - N/A = Not Applicable

S	Question	Indicators	Rate				
			1	2	3	4	5
Supply chain practices (independent variable) 1.Strategic supplier partnership							
1	We consider quality as our number one criterion in selecting suppliers.	Strategic supplier partnership					
2	Our suppliers deals with us in an open and honest way(If there are any issues that might affect our firm, our trading partners will keep us fully informed)	Strategic supplier partnership					
3	The organization is selecting suppliers based on their product development capabilities	Strategic supplier partnership					
4	Suppliers have cost effective transportation systems	Strategic supplier partnership					
5	We include our key suppliers in our planning and goal-setting activities	Strategic supplier partnership					
6	The organization works together with its suppliers to deal with crisis	Strategic supplier partnership					
7	We can efficiently restructure our supplier base in case of long-term changes in the market, the regulatory infrastructure, or our competitors ‘strategies	Strategic supplier partnership					

2.Customer relationship (CR)							
8	Organization frequently interacts with customers to set its reliability, responsiveness and other standards	Customer relationship (CR)					
9	Organization frequently measures and evaluates customer satisfaction	Customer relationship (CR)					
10	Organization frequently determine future customer expectations	Customer relationship (CR)					
11	Creativity and talent of human resource have important role in customer relationship management	Customer relationship (CR)					
12	Customer Input (CI) Employing routine follow up procedures for customer inquiries or complaints	Customer relationship (CR)					
13	The Organization works together with your customers to deal with crisis	Customer relationship (CR)					
3.Communication (Quality of information sharing (IQ))							
14	Organization exchanges information with its trading partners on time	Information Sharing					
15	Information exchange between our trading partners and us is accurate.	Data Dependability Reliability					
16	Information exchange between our trading partners and us is reliable. (Our trading partners keep us fully in-formed about issues that affect our business).	Data Dependability Reliability					
17	There is efficient flow of information throughout the supply chain network	Information Sharing					
18	Technological assets can be used for different types of missions and tasks during crisis	Data Dependability Reliability					
19	Delivery of the latest technology products/services to our customers is essential	Information Sharing					
crisis responsiveness (dependent variable) 1. Operation System Responsiveness							
20	All members of our supply chain should team up to maximize value for the end customer	Operation System Responsiveness					
21	The organization can identify any potential crisis before it occurs	Operation System Responsiveness					
22	Our organization has the capacity to easily shift functions and tasks in case a crisis response operation requires this.	Operation System Responsiveness					
23	From its permanent structure our organization is capable of repeatedly adjusting to changing mission contexts.	Operation System Responsiveness					
24	During crisis response operations our units can easily divide essential operational activities amongst each other.	Operation System Responsiveness					
25	During crisis response operations our units can easily adjust to changing operational circumstances.	Operation System Responsiveness					
26	During crisis response operations the composition of a formation can be altered if the operational circumstances require this.	Operation System Responsiveness					
2.Logistic Process Responsiveness							
27	We delay final product assembly activities until the last possible position (or nearest to customers) in the supply chain.	Logistic Process Responsiveness					
28	Movement of stock between locations should be changing as per requirement	Logistic Process Responsiveness					
29	Mode of delivery of products should have variety of options including outsourcing options	Logistic Process Responsiveness					
30	Our supply chain should be able to economically satisfy variation in demand	Logistic Process Responsiveness					
31	Variety of distribution system should be available for delivery of products	Logistic Process Responsiveness					
3. Organization Long Term Success /Responsive Supply Chain Strategy (RSCS)							
32	The organization fined that crisis planning measures actually useful in crisis event(s)	Organization Long Term Success					
33	Our organization tries to secure its added value by being capable of dealing with all kinds of crisis situations	Organization Long Term Success					
34	Most organizations lack a formal and comprehensive crisis management plan.	Organization Long Term Success					
35	Organizations tend to start planning for crisis management after the actual crisis occurrence.	Organization Long Term Success					
36	Organizations merely focus on reactive protection and recover activities.	Organization Long Term Success					
37	After the crisis, the organization plan to recover from the crisis	Organization Long Term Success					
38	After the crisis, the organization convert the crisis into new development opportunities	Organization Long Term Success					