

2015

# Strategies for Mitigating Supply Chain Disruptions

Johnny Bowman Jr  
*Walden University*

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# Walden University

College of Management and Technology

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Johnny Bowman, Jr.

has been found to be complete and satisfactory in all respects,  
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Walden University  
2015

Abstract

Strategies for Mitigating Supply Chain Disruptions

by

Johnny Bowman, Jr.

MS, University of Phoenix, 2007

BS, Edward Waters College, 2004

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

December 2015

## Abstract

Disruptions in the supply chain are becoming more common as supply chains become more complex, and supply chain managers of warehouse distribution centers need strategies to minimize the impact of disruptions. In this study, the focus of the research questions was on strategies supply chain managers could use to mitigate the impact of disruptions. The conceptual frameworks for this study were the resource dependence theory and the normal accident theory, which link supply chain disruptions with resource availability and the inability to eliminate disruptions. An exploratory case study involved exploring how supply chain managers of a warehouse distribution center in Jacksonville, Florida, successfully used strategies to mitigate the impact of a disruption after it occurred. Data came from responses to semistructured interview questions from these managers ( $n = 6$ ) and archival documents related to policies, procedures, and business continuity planning of a warehouse distribution center in Jacksonville, Florida. I analyzed the data by using Atlas.ti qualitative analysis software. There were 6 themes that emerged: collaborating to minimize the impact of disruptions, disruptions precursors, identifying and assessing impact of disruptions, resources used to minimize impact of disruption, strategies to mitigate disruptions, and supplier relationships. The results could contribute to social change by minimizing the negative effects disruptions have on an organization's profitability and performance. Social change can come from business leaders who are able to maintain and sustain their businesses after a supply chain disruption has occurred.

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## Dedication

The completion of this dissertation would have not been possible if it were not for my Lord and Savior, Jesus Christ. Through His power, comfort, and reassurance, I found the strength and focus to keep pushing forward to the finish line.

I would like to dedicate this dissertation to my wife, LaBrena, and my children, Johnny III, Jasmine, Jamaiah, and Jayla, for their unwavering support and encouragement during my pursuit of this degree. Your unconditional love and support during the many hours that I sat at our kitchen table working on this dissertation were essential to my success. I love you all. I would also like to dedicate this dissertation to my sister Annquinette, and my nieces Ashley and Lanier, for your support and encouragement. I feel special gratitude to my wonderful parents, Shirley and Johnny Bowman, Sr., whose guidance and provisions during my childhood helped me understand the importance of education. With Christ, all things are possible.

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## Table of Contents

List of Tables .....	v
Section 1: Foundation of the Study.....	1
Background of the Problem .....	1
Problem Statement .....	2
Purpose Statement.....	3
Nature of the Study .....	3
Research Question .....	6
Interview Questions .....	6
Conceptual Framework.....	7
Definition of Terms.....	9
Assumptions, Limitations, and Delimitations.....	10
Assumptions.....	10
Limitations .....	10
Delimitations.....	11
Significance of the Study .....	11
Contribution to Business Practice.....	11
Implications for Social Change.....	12
A Review of the Professional and Academic Literature.....	12
Strategy for Searching the Literature.....	13
Supply Chain and Supply Chain Management .....	13
Supply Chain Collaboration.....	17



Supply Chain Technology.....	20
Supply Chain Performance .....	25
Supply Chain Sustainability.....	26
Supply Chain Risk Management .....	28
Supply Chain Disruptions.....	32
Resource Dependence Theory .....	36
Normal Accident Theory .....	37
Transition and Summary.....	38
Section 2: The Project.....	40
Purpose Statement.....	40
Role of the Researcher .....	40
Participants.....	42
Research Method and Design .....	43
Research Method .....	44
Research Design.....	45
Population and Sampling .....	48
Ethical Research.....	49
Data Collection Instruments .....	50
Data Collection Technique .....	52
Data Organization Techniques.....	54
Data Analysis .....	54
Reliability and Validity.....	57

Reliability.....	57
Validity .....	57
Transition and Summary.....	59
Section 3: Application to Professional Practice and Implications for Change .....	61
Introduction.....	61
Presentation of the Findings.....	62
Theme 1: Collaborating to Minimize the Impact of Disruptions.....	65
Theme 2: Disruption Precursors .....	68
Theme 3: Identifying and Assessing Impact of Disruptions.....	69
Theme 4: Resources Used to Minimize Impact of Disruption .....	72
Theme 5: Strategies to Mitigate Disruptions .....	74
Theme 6: Supplier Relationships .....	75
Applications to Professional Practice .....	77
Implications for Social Change.....	79
Recommendations for Action .....	80
Recommendations for Further Study .....	81
Reflections .....	82
Summary and Study Conclusions .....	83
References.....	84
Appendix A: Interview Protocols .....	123
Appendix B: Interview Questions.....	126
Appendix C: Informed Consent Form .....	127

Appendix D: Introductory Letter .....	129
Appendix E: Interview Guide .....	131

## List of Tables

Table 1 <i>Demographic Data for Supply Chain Managers</i> .....	64
Table 2 <i>Themes</i> .....	65
Table 3 <i>Collaboration</i> .....	68
Table 4 <i>Disruption Precursors</i> .....	69
Table 5 <i>Identifying and Assessing Impact of Disruption</i> .....	72
Table 6 <i>Resources Used to Minimize Impact of Disruptions</i> .....	73
Table 7 <i>Strategies to Mitigate Disruptions</i> .....	75
Table 8 <i>Supplier Relationships</i> .....	77

## Section 1: Foundation of the Study

Supply chains have a critical role in the performance of an organization. When a supply chain disruption occurs, a significant impact on shareholder value may result (Wildgoose, Brennan, & Thompson, 2012). The foundation of this doctoral study was exploring strategies that can reduce the effect of disruptions on supply chains. Supply chains have become more sophisticated, and organizational leaders must implement supply chain strategies to increase revenue, reduce costs, and reduce assets (Sodhi, Son, & Tang, 2012). Organizational leaders cannot avoid supply chain disruptions but can respond successfully by combining the right innovation capabilities and effective strategies (Golgeci & Ponomarov, 2013). The results of this study could provide guidance to supply chain managers in warehouse distribution centers regarding how to reduce the impact of disruptions, possibly resulting in increased sustainability and profitability.

### **Background of the Problem**

The way organizational leaders conduct business has evolved due in part to increased international trade and to global sourcing and distribution (Christopher, 2012). Many organizations are experiencing lower costs and improved profitability because of operations occurring outside their home countries (Wright & Datskovska, 2012). However, these changes also increase the possibility of disruptions across the supply chain. Between 1998 and 2007, approximately 600 U.S. companies suffered a supply chain disruption that resulted in at least a 9% reduction in share price (Wildgoose et al., 2012). Supply chain disruptions affect not only the immediate and direct performance in

the supply chain, but also include changes in supply chain design, policies, and strategic level configurations (Hilmola & Lorentz, 2012).

As such, supply chain managers in warehouse distribution centers were key informants to this study because they can play a major role in implementing strategies to mitigate disruptions in the supply chain. Strategies supply chain managers in warehouse distribution centers can implement to mitigate disruptions include using forecasting techniques, applying inventory policies in their organization to prevent stock shortages, eliminating obsolete inventory, and implementing information systems to communicate information effectively and accurately to avoid gaps with supply chain partners (Ame & Kimwaga, 2013). Supply chain managers need to recognize changes in the environment, identify driving forces behind the changes, and recognizing the value of collaboration as a strategic response to the changing environment (Fawcett, Magnan, & Fawcett, 2010).

### **Problem Statement**

Globalization has increased the probability of supply chain disruptions (Hilmola & Lorentz, 2012). Every organization faces exposure to disruption risks, and organizational leaders need to analyze and understand the risks before determining a solution to limit their effect (Xanthopoulos, Vlachos, & Iakovou, 2011). A 2-week supply chain disruption of a port closure could cost companies revenue losses up to \$190 million (Pant, Barker, Grant, & Landers, 2011). The general business problem is supply chain disruptions have negative effects on profitability and performance. The specific business problem is that some supply chain managers in warehouse distribution centers have limited strategies to mitigate disruptions in supply chains.

### **Purpose Statement**

The purpose of this qualitative exploratory case study was to explore strategies supply chain managers in a warehouse distribution center use to mitigate disruptions in supply chains. Through interviews and reviewing archived documents, I explored how supply chain managers in a warehouse distribution center were successful at employing strategies to mitigate disruptions in the supply chain. In this study, I conducted interviews with at least five supply chain managers in a warehouse distribution center and reviewed documents related to policy, procedure, and business continuity planning. Data collection took place at a warehouse distribution center located in Jacksonville, Florida. The results of this study could affect positive social change by identifying strategies to minimize supply chain disruptions and potentially leading to greater sustainability and profitability.

### **Nature of the Study**

The qualitative approach was appropriate for this research method. When little information is available on emerging topics, qualitative methods are applicable for exploratory research (Hair, Celsi, Money, Samouel, & Page, 2011). A qualitative research approach involves collecting, analyzing, and interpreting narrative and visual information (White, Oelke, & Friesen, 2012). The focus of this study was exploring how supply chain managers successfully mitigate disruptions in a warehouse distribution center. Quantitative research involves testing a hypothesis, testing a theory, and analyzing statistical data (Fowler, 2008), which were not the intent of this study. The mixed method research approach involves using both quantitative and qualitative methods to gain an

understanding of the phenomena in conjunction with examining supportive statistical data and exploring plausible solutions to identified problems (Venkatesh, Brown, & Bala, 2013). Time constraints for the study and the complexity of mixed method research were factors for not selecting the mixed method (Sadan, 2014). The mixed method is a combination of qualitative and quantitative approaches used to resolve a problem.

The case study design was appropriate for exploring the research objective because of the *how* and *why* nature of the objective (Denzin & Lincoln, 2011). A single case study design is appropriate when exploring a specific and complex phenomenon within its real-world context (Yin, 2014). The phenomenological research method is appropriate for understanding subjective experience and gaining insights into people's motivations and actions, rather than for revealing the objective and strategic methods employed (Bann, 2009; Skiba, 2014). The purpose of this study was to explore how supply chain managers in a warehouse distribution center were successful at employing strategies to mitigate disruptions in the supply chain. Researchers use the phenomenological research design to explore the lived experiences of individuals to understand the problem (Moustakas, 1994). Although phenomenology is suitable for a researcher to describe and interpret the meaning of a phenomenon, the phenomenological design was not the best method for this study, as the basis of the study was more on objective information than subjective. I used company documents related to policy, procedure, and business continuity planning to explore how supply chain managers successfully mitigate supply chain disruptions, which is different just a phenomenological approach.



The focus of the grounded theory research design is on generating theory from data (Khan, 2014) collected over a long period of time from observing groups (Amerson, 2011; Bluhm, Harman, Lee, & Mitchell, 2011; Hunter, Murphy, Grealish, Casey, & Keady, 2011). The focus of grounded theory research is developing theories and using empirical analysis to reinforce the theories (O'Reilly, Paper, & Marx, 2012), which was not the intent of this study. The focus of the case study research design is on gaining a perspective on activities and situations (Yin, 2014). The ethnographic research design was also not appropriate for this study as it involves studying cultures of specific groups (Yagi & Kleinberg, 2011). In addition, the narrative research design was not suitable because the purpose of this study was not examining the life experiences of a single individual (Safari & Thilenius, 2013); rather, it was to explore the extent to which supply chain managers were successful employing strategies to mitigate disruptions in a supply chain. The case study design was specifically appropriate for addressing research questions that involve gaining an understanding of social or organizational processes (Moll, 2012). The focus of a case study design is one issue or concern with the intent of providing a general understanding of a particular phenomenon (Stake, 1995). The issue under investigation was supply chain disruptions.

The qualitative case study approach is appropriate for gathering data from qualified participants in a natural setting within their organization (Yin, 2014). Data collection included semistructured telephone interviews and a review of archived organizational data. I made multiple attempts to conduct face-to-face interviews with each participant. Due to busy schedules that involved traveling outside of the state, each

participant requested a phone interview instead. Upon consultation with my dissertation chair, I scheduled and conducted phone interviews. Studying individuals in relation to their natural settings includes the opportunity to gain a comprehensive understanding of a situation (e.g., Yin, 2014). When there is a relatively new field of scientific investigation in which researchers have either not clearly identified or formulated research questions or not obtained the data required for a hypothetical formulation, an exploratory case study approach is usually applicable (Streb, 2010). Exploratory case studies are suitable when researchers make an effort to provide relevant information in support of the phenomenon under study (Kim & Egan, 2011).

### **Research Question**

The research question for this study was as follows: What strategies do supply chain managers in a warehouse distribution center use to mitigate supply chain disruptions?

### **Interview Questions**

I derived the following interview questions after a thorough review of the literature:

1. Please describe a recent disruption your warehouse distribution center faced.
2. What resources were needed to minimize these disruptions?
3. Describe how the disruption impacted your warehouse distribution center.
4. Describe how logistics relationships with suppliers impact your warehouse distribution center's performance.

5. What data did you gather from the supply chain disruption as it was occurring?
6. What types of precursors, if any, were identified when the disruption occurred at your warehouse distribution center?
7. How did you respond to the disruption at your warehouse distribution center?
8. What type of collaboration, if any, was used to minimize the disruption?
9. How did the disruption impact your internal and external supply chain relationships?
10. What strategies did you use to mitigate the supply chain disruption you described?
11. What other strategies have you used to mitigate other supply chain disruptions at your warehouse distribution center?
12. What other information (if any) would you like to share concerning how you mitigate supply chain disruptions?

### **Conceptual Framework**

The conceptual framework for this qualitative exploratory case study included the resource dependence theory (RDT) and the normal accident theory (NAT). According to the RDT, introduced by Pfeffer and Salancik (1978), the basis of organizational performance is the level of dependence on various resources (Bryant & Davis, 2012). Also according to the RDT, the survival of an organization depends on its leaders' ability to acquire critical resources on a long-term basis (Wolf, 2014). In the literature, RDT supporters have indicated leaders of firms in the supply chain should depend and

collaborate on pursuing higher performance gains for the future, as opposed to pursuing short-term benefits at others' expense (Sarkis, Zhu, & Lai, 2011).

The RDT was suitable for my study, as it provided information pertaining to how organizational leaders can link customer and supplier relationships to reduce uncertainty in their operating environment (e.g., Carter & Rogers, 2008). According to RDT, developing interorganizational relationships is one way to acquire needed resources and to reduce uncertainty and dependence (Pfeffer & Salanick, 2003). The concept that applies to this study is logistics relationships can control logistics resources in an attempt to manage uncertainty, which leads to higher relationship quality and fewer occurrences of disruptions (Chu & Wang, 2012). This theory served as part of the framework because insight was necessary to connect sustainable supply chain management and external pressures. In addition to the RDT as a conceptual framework, the NAT was also appropriate for this study.

According to the NAT, accidents are inevitable when there is an interaction between complexity and tight couplings (Marley, Ward, & Hill, 2014). Also according to the NAT, introduced by Perrow in 1999, unexpected disruptions are difficult to manage because leaders do not know the primary cause of the disruption immediately (Perrow, 2011). Gathering information from the supply chain disruption as it is occurring allows managers to assess the situation immediately (Marley et al., 2014). The concept that applied to this study was that identifying precursors such as interactive complexity and tight coupling can be beneficial to supply chain managers in determining if an alternative strategy involving disruption mitigation is possible, as indicated by NAT (Marley et al.,

2014). These theories were relevant to my study on exploring strategies to minimize the impact supply chain disruptions may have on an organization.

### **Definition of Terms**

Many of the terms and concepts for the supply chain used in this study appear in the academic and business literature. The following terms are the most relevant to this study.

*Global supply chain.* The global supply chain environment includes new opportunities for organizations of all sizes and access to new markets, capital, and technology, which leads to the ability to purchase the best goods at the best prices (Kuei, Modu, & Lin, 2011).

*Supply chain disruption.* A minimum of two organizations engaged in a relationship that experience interorganizational phenomena (Bode, Wagner, Petersen, & Ellram, 2011).

*Supply chain management.* The multidisciplinary philosophy used to describe how organizations conduct business (Ellram & Cooper, 2014). Supply chain management is a production distribution network that enables an environment for integrity, integration, process optimization, operational efficiency, continuous improvement, and competitive capabilities (Kuei et al., 2011).

*Supply chain relationships.* Effective planning and coordinating between buyers and sellers based on information sharing and trust among partners, with the belief that all partners will follow through with what they say they will do (Srinivasan & Srivastava, 2012).

*Supply chain risk management*. A complex phenomenon involving relational buyer–supplier relationships, key decision makers, and mechanistic management control systems (Grötsch, Blome, & Schleper, 2013).

### **Assumptions, Limitations, and Delimitations**

#### **Assumptions**

The major assumption in this study was that distribution warehouse managers would provide thoughtful and honest responses during the interviews. Because participation was voluntary and participants received an assurance of confidentiality, this assumption was likely met. Further, I assumed that participants' responses would support the literature review in this study and the findings could help identify strategies supply chain managers in warehouse distribution centers could use to minimize supply chain disruptions.

#### **Limitations**

Limitations define possible weaknesses that may affect a study (Kirkwood & Price, 2013). A limitation of this study was the availability of the participants. Due to their busy travel schedules, it was necessary to conduct the interviews by telephone. The participants in this study were managers of a warehouse distribution center located in Jacksonville, Florida. As is true of all qualitative studies, there is a limitation regarding the generalizability of the findings from the study (Yin, 2014). Thus, the results produced are tentative and not fixed. That is, there is a limitation on replicability. By providing rich and descriptive data, the study could have transferability.

**Delimitations**

Delimitations are features of a study that a researcher chooses to limit the scope and boundary of the study (Mitchell & Jolley, 2010). The set boundaries of this study were in learning, understanding, and exploring the perceptions of managers regarding their experience identifying supply chain risks and strategies to mitigate the impact of supply chain disruptions in their organization. In addition, I only included managers in one warehouse distribution center in Jacksonville, Florida. Delimitations narrow the scope of a study by specifying what a researcher will not include in the study (Rusly, Corner, & Sun, 2012).

**Significance of the Study****Contribution to Business Practice**

Increased complexity in the global business environment and a focus on efficiency has led to a higher probability of supply chain risks and culminated in supply chain disruptions that affect supply chain performance (Blackhurst, Dunn, & Craighead, 2011). Logistics is the part of the supply chain that involves planning, implementing, and controlling the efficient and effective forward and reverse related information between the point of origin and the point of consumption to meet customer requirements (Janvier-James, 2012). Management of the supply chain is therefore important and relative to the success or failure of the organization. As a result of the increased competition in the supply chain environment, organizational leaders are under tremendous pressure to cut costs. Most of the costs incurred in supply chains are due to poor decision making and failures to forecast uncertainty in conditions (Wadhwa, Saxena, & Chan, 2008). The

results from this study may help business leaders improve sustainability and minimize the impact of supply chain disruptions.

### **Implications for Social Change**

This study may affect organizations involved in moving products through the supply chain process that reach the end consumer. Specifically affected organizations may include those in warehouse distribution, which were the focus of this study. The findings in this study include strategies that could lessen the impact associated with supply chain disruption and result in preventing businesses from extensive revenue loss.

### **A Review of the Professional and Academic Literature**

The purpose of this qualitative exploratory case study was to explore strategies for mitigating disruptions in supply chains. This section includes a review of literature and resources related to the research topic. The organization of the review of literature moves from a broad focus of supply chain categories to focused strategies relative to mitigating disruptions in supply chains. In the following sections, the discussion covers supply chain management, supply chain collaboration, supply chain technology, supply chain risk management, supply chain disruptions, and supply chain strategies. To gain a better understanding of the literature on the topic of mitigating disruptions in supply chains, it is imperative to analyze the key components of this topic. The research questions address how supply chain managers in warehouse distribution centers view the efficacy of strategies in place to manage supply chain disruptions and the strategies necessary to reduce the frequency and costs associated with supply chain disruptions.



### **Strategy for Searching the Literature**

The strategy for the review consists of a broad and focused search of various sources across multiple disciplines: scholarly journal articles, books, and electronic media. Key sources from search engines on the Walden University library research databases included Business Source Complete, ABI/INFORM Complete, ProQuest, SAGE Premier, and Emerald Management Journals. The literature review involved reviewing more than 256 relative sources. The study includes 195 peer-reviewed references, with 171 of the references published between 2011 and 2015, and 24 references published in 2010 or earlier. The percentage of peer-reviewed articles published within 5 years of my anticipated graduation is 88%. The key words searched included *supply chain management*, *supply chain disruptions*, *business continuity planning*, *supply chain risk management*, *global supply chain*, *supply chain risks*, *mitigating supply chain risks*, *preventing disruptions*, *responding to disruptions*, *technology and supply chains*, and *supply chain partners*.

### **Supply Chain and Supply Chain Management**

A supply chain consists of a flow of activities that move a product or service from the main manufacturer to the end consumer or customer (M. M. Sharma, 2013). The activities involve several components of the supply chain, such as raw materials, manufacturers, intermediate manufacturers, final product manufacturers, wholesalers, distributors, and retailers (M. M. Sharma, 2013). Supply chain management is a set of decisions and activities used to integrate suppliers, manufacturers, warehouses, transporters, retailers, and customers effectively to ensure the distribution of the right

product or service in the right quantities to the right locations at the right time to satisfy customers (Misra, Khan, & Singh, 2010). Meijboom, Schmidt-Bakx, and Westert (2011) agreed with Misra et al. (2010) in that supply chain management involves the integration of other organizations and the coordination of the flow of materials to meet customer demand by way of increasing the competitiveness of the entire chain. One of the critical elements of effective supply chain management involves downstream integration and upstream collaboration with an organization's partners and customers (C. G. Kumar & Nambirajan, 2013). Determining the relationship between lean thinking and value creation in supply chains could help customer satisfaction, increase internal customer performance, provide innovative products, and provide guidance for supply chain management (Shamah, 2013).

Supply chain management has evolved from an investigation perspective of standalone research to a sustainability perspective (Carter & Easton, 2011). Using resources efficiently and reducing costs while integrating processes is the aim of supply chain management (Gupta, Abidi, & Bandyopadhyay, 2013). Supply chain management is a social software package that promises inter- and intrafirm alignments, information sharing to ensure outstanding performance, and integration of resources and transactions across traditional boundaries to build mutually beneficial competitive advantage (Awa, Awara, & Emecheta, 2010). Supply chain management involves different business activities but primarily minimizing costs, improving service interaction with business supply chain partners, and improving flexibility in supply chain activities (Tarofder, Marthandan, Mohan, & Tarofder, 2013). However, one of the challenges associated with

supply chain collaboration and integration is the difficulty organizational leaders have developing a successful strategic alliance plan.

Barriers to collaboration arise from the nature of interfirm collaboration, corporate cultures, inadequate information sharing, and inconsistent metrics (Fawcett, Magnan, & McCarter, 2008). Brekalo, Albers, and Delfmann (2013) investigated strategic alliance plans and discovered 70% of all strategic alliance plans fail. To address this dilemma, management must identify organizational capabilities to maintain a successful strategic alliance plan that incorporates logistics activities and partners.

Changing markets, globalization, intense competition, technology, and information sharing are contributing factors in transforming how business leaders conduct business (Gupta et al., 2013). Sometimes partners in a supply chain take actions that are not optimal for the overall performance of the supply chain in a bid to maximize their own profits (Sekip Altug & van Ryzin, 2014). However, business success depends primarily on organizational leaders' ability to integrate their network of business relationships (Simon, Di Serio, Pires, & Martins, 2015). Moreover, organizational leaders must have an understanding of the factors that affect their partners' performance to take full advantage of the supply chain (Cheng & Tang, 2014).

Competing in the global market and remaining competitive requires organizational leaders to recognize the impact supply chain practices have on improving their own performance and on the performance of their supply chain partners (Cook, Heiser, & Sengupta, 2011). Businesses operating in the global environment face a variety of challenges such as competition, operating with an emphasis on efficiency and cost

reduction, and satisfying consumer demand (Cruz, 2013). Every supply chain manager must cope with supply chain uncertainty (Simangunsong, Hendry, & Stevenson, 2012). Moreover, supply chain managers have the difficult task of managing global suppliers and subcontractors to ensure the timely delivery of cost effective, high quality products and components (Chaudhuri, Mohanty, & Singh, 2013).

Partners in the supply chain have different skills and abilities. The agency theory is suitable in supply chain management to provide insight into engineering relationships and to gain understanding regarding how participation within the supply chain manages risks, aligns incentives, and forges relationships (Fayezi, O'Loughlin, & Zutshi, 2012). Collaboration between partners helps to build relationships. Some of the benefits of collaboration in supply chains are higher quality, lower costs, more timely delivery, efficient operations, and effective coordination of activities (Soosay, Hyland, & Ferrer, 2008). To investigate the relationship between supplier relationships and reducing costs, So and Sun (2011) collected data from production managers and general managers through questionnaires and found strong supplier relationships along with lean practices can lead to reduced costs, shipment deliveries with shorter lead times, and improved throughput. The performance of the supply chain as a whole is a critical factor in achieving an effective supply chain (Janvier-James, 2012).

Sharing information between supply chain partners can lead to a series of supply links, design links, manufacturing links, and logistics links, which could lead to improved system visibility (Jayaram, Tan, & Nachiappan, 2010). Moreover, sharing activities that create new knowledge and then disseminating that knowledge can improve organizational

capabilities (Farooq & O'brien, 2012). Thus, leaders of supply chains with good communication and information sharing can seamlessly integrate activities and processes that enhance supply chain management.

### **Supply Chain Collaboration**

Supply chain collaboration has evolved and did not receive acknowledgment as a necessary component in the supply chain in the past. Global competition has caused organizational leaders to strive for greater supply chain collaboration by leveraging the resources and knowledge of key suppliers and valued customers to reduce uncertainty, lower transaction costs, build core competence, maximize learning opportunities, and improve competitive positioning (Cao, Vonderembse, Zhang, & Ragu-Nathan, 2010). Supply chain collaboration means more than one element of the chain is responsible for managing or implementing practices and procedures (Chang & Graham, 2012). When leaders form and maintain vertical connections between organizations in the supply chain, the supply chain will function efficiently from initial supplier to final consumer (Hearnshaw & Wilson, 2013).

Communication is a significant factor for supply chain agility (Gligor & Holcomb, 2012). Moreover, cooperation among supply chain partners can lead to increased coordination and collaboration and directly influence the agility of the supply chain (Gligor & Holcomb, 2012). Relationships that are collaborative provide organizational leaders the opportunity to (a) integrate and connect their organizations toward enhanced operational performance and (b) improve supply chain processes (Soosay et al., 2008). Leaders of organizations engaged in a collaborative relationship

demonstrate openness in sharing critical information relative to risk and events that may lead to a disruption (Juttner & Maklan, 2011). Furthermore, collaborative relationships affect (a) visibility, (b) recovery, (c) organization, (d) adaptability, (e) anticipation, (f) security, (g) market position, and (h) communication with external organizations (Pettit, Fiksel, & Croxton, 2010).

Sharing and coordinating information between supply chain members is an effective strategy for improving global performance (Montoya-Torres & Ortiz-Vargas, 2014). Supply chain coordination through sharing information has been beneficial in (a) reducing unnecessary inventory, (b) eliminating stock-outs, and (c) responding to demand spikes (Zhou & Piramuthu, 2013). To investigate the relationship between logistics providers and manufacturers, Li, Ford, Zhai, and Xu (2012) conducted an exploratory case study using data collected from U.S. manufacturing organizations and found manufacturers will make a commitment toward a long-term relationship if they believe the logistics provider is honest, is passionate, and cares about their business. Success in the global environment requires all members in the supply chain to collaborate toward the same goals, which results in more market profitability and quality products with less lead time (Chan & Prakash, 2012). One of the most important elements in leveraging supply chains to achieve competitive advantage is through collaboration (Richey, Adams, & Dalela, 2012).

Increased communication and information sharing between organizations can result in a higher level of trust between the organizations and improve their working relationships (McDowell, Harris, & Gibson, 2013). Moreover, communication between

organizations enhances coordination and integration of the supply chain (Rose-Anderssen, Baldwin, & Ridgway, 2010). Enhancing coordination and collaboration in supply chains ranges from implementing (a) electronic transactions for purchase orders and invoices; (b) demand forecasting, production, and planning; and (c) inventory replenishment strategies (Bandyopadhyay, Jacob, & Raghunathan, 2010). However, the working relationships between employees working at the organizations directly influence communication between supply chain organizations (Gligor & Autry, 2012). Effective communication between organizations is a major factor in achieving competitive advantage in the business environment by (a) increasing efficiencies, (b) entering new markets, and (c) enhancing market power (Sambasivan, Siew-Phaik, Zainal, & Yee, 2011).

Long-term relationships play a part in minimizing the impact of supply chain uncertainty as well as disruptions (Sheffi & Rice, 2005). However, the depth of relationships within the supply chain may be shallow when a partner has experienced previous problematic relationships plagued by risks as a result of supply uncertainty and supply chain disruptions (Mitreęa & Zolkiewski, 2012). The strongest degree of supply chain unity directly relates to the degree of trust and relationship commitment among supply chain partners (Park et al., 2012). Furthermore, collaborative activities such as information sharing and joint relationship sharing encourage commitment and trust among supply chain partners (Nyaga, Whipple, & Lynch, 2010).

Collaboration has an impact on team functioning (Andres, 2013) and sustains and fosters the supply chain identity and culture within the organization, in addition to being

the organizational glue to support culture building and identity management of the supply chain (Gambetti & Giovanardi, 2013). In a study of 48 organizations, 76 work-team members proclaimed that relationships could influence knowledge sharing and work-team performance (Henttonen, Janhonen, & Johanson, 2013). In an exploratory study of professionals, junior managers, and sales and marketing executives, Malik (2013) found a link between the role of collaboration within teams and job satisfaction that indicated employees who have satisfaction regarding their jobs could lead to better engagement with others in the organization.

The analysis of data from 238 manufacturing plants revealed a direct relationship between management practices, communication, and the way collaboration influences quality performance (Zeng, Anh, & Matsui, 2013). Collaboration within the supply chain is necessary for success. Forecast information sharing is a specific supply chain activity in which trust and social characteristics are important (Ebrahim-Khanjari, Hopp, & Iravani, 2012). After interviewing 17 leaders from two different industries, Jaca, Viles, Tanco, Mateo, and Santos (2013) discovered teamwork was one of the most powerful tools to encourage success across any activity.

### **Supply Chain Technology**

Web technologies provide supply chain organizations with various opportunities by ensuring efficiency in operations, facilitating inventory management, improving supply chain performance, making communication easier and more frequent with business partners, and providing electronic payment systems to enhance business payment processes (Tarofder et al., 2013). The use of information technology is



increasing within rapidly changing business environments. Information technology is one of many components organizational leaders can adapt to gain sustainability and a competitive advantage (Drnevich & Croson, 2013). Uses of information technology in the hospital industry include aligning standards, technologies, strategic opportunities, and organizational objectives (Bradley, Pratt, Byrd, Outlay, & Wynn, 2012). In contrast, Bhakoo and Chan (2011) conducted research by using a case study design and the results identified technology-related management and business issues that could arise while implementing e-business processes in the health care supply chain, which included the lack of consistency, poor data quality, and the global nature of supplies. Furthermore, information technology such as web–electronic data interchange and vendor-managed inventory has increased the visibility of information within the supply network (Mohdzain, White, & Ward, 2012).

Information technology changes the way employees work and communicate both within and outside organizations by reducing cost, improving quality, and speeding up processes (Lin, 2011). Investments into information technology can influence organizational strategies, provide information that results in an increased value of making investments in other resources or capabilities, and influence management toward more effective decision making (Drnevich & Croson, 2013). Information technology affects business success directly because it affects the mechanisms through which organizational leaders create and capture value to earn a profit (Drnevich & Croson, 2013).

Comparatively, documentation in the research findings of Goh and Kauffman (2013) indicated sustaining competitive advantage by using information technology will

become more challenging as information becomes more accessible. A major issue with information technology is assessing the true financial value (Barua et al., 2010). For example, radio frequency identification technology (RFID) creates value within a supply chain through making inventory and demand more visible but does not account for the value created by investments across a supply chain if all supply chain members are not a part of the RFID project (Barua et al., 2010). However, leaders can use RFID technology to improve supply chain processes, which include handling materials with better efficiency, managing assets more effectively, and improving the availability of products (Azevedo & Carvalho, 2012). These types of advantages can increase optimization efficiency, but potential bottleneck issues resulting from implementing technology, such as privacy and security violations, could also result in disruptions in the supply chain (Azevedo & Carvalho, 2012).

Technology and e-business applications that involve e-commerce, e-procurement, and e-collaboration have overcome many business challenges (Johnson & Whang, 2002). E-commerce helps a network of supply chain partners identify and respond quickly to changing customer demand captured over the Internet, while leaders use e-procurement for procuring direct or indirect materials electronically, as well as for handling value-added services such as transportation, warehousing, customs clearing, payment, quality validation, and documentation (Johnson & Sevnjin, 2002). In addition, e-collaboration facilitates the coordination of various supply chain partners, suppliers, and customers over the Internet (Johnson & Sevnjin, 2001).

Supply chain e-collaboration continues to affect how companies interact with each other and their customers (Awa et al., 2010). Information technology has led to growth in the industry through enhanced safety, convenience, accuracy, flexibility, and other internal business processes (Gil-Saura, Ruiz-Molina, & Calderón-García, 2010). Global economic development and growing international competition have also made supply chain collaboration an important strategic and operational issue, which has caused organizational leaders to rethink their electronic business and global supply chain strategies (Chang & Graham, 2012).

Advances in technology have helped to improve the dissemination of information between supply chain members, which could strengthen the supply chain against disruptions. Establishing e-business and global supply chain management strategies will contribute to business success in a global environment (Chang & Graham, 2012). Collaborative computer-based information systems have become a major trend in business environments, have improved communication abilities in the supply chain, and have provided a few advantages such as reduced search costs, reduction in inventory, and tighter links to customers (Grossman, 2004). A qualitative study conducted in Taiwan involved using a government-supported industry and implementing business-to-business e-commerce projects to explore e-business strategies that influence global supply chain collaborations (Chang & Graham, 2012). The results indicated that the alignment of e-business strategies is essential to reducing the costs and uncertainty of supply chain operations (Chang & Graham, 2012).

Information technology provides opportunities to achieve a higher level of service quality, internal and external customer satisfaction, and lower organizational costs (Tarcan & Varol, 2010). E-business environments have a facilitating infrastructure for solving issues concerning the traditional supply chain, such as scalability and flexibility for efficient collaboration between supply chain partners (Kwon, Im, & Lee, 2011). However, e-business is potentially disruptive in supply chains as it relates to supply chain interfaces (Caldwell, Harland, Powell, & Zheng, 2013). Moreover, information technology creates opportunities for competitive advantages, but also leads to unauthorized vulnerabilities (Ratnasingam, 2006). Many of the vulnerabilities in the form of security issues and unforeseen threats add additional costs as organizational leaders adopt supply chain management e-collaboration technologies (Ratnasingam, 2006). Four types of risks make IT management imperative: technological risk, organizational risk, implementation risk, and relational risk (Ratnasingam, 2006).

Four supply chains that conduct business electronically underwent exploration at 3-year intervals. The results indicated three of the greatest e-business supply chain risks from management's perspective are profitability, privacy, and security (Caldwell et al., 2013). However, Gil-Saura et al. (2010) indicated supply chain technologies such as web–electronic data interchange and vendor-managed inventory have increased the visibility of information within the supply network. Many organizational leaders are extending the way they use information technology to improve their competitiveness in the competitive global environment (Olatunde, Chan, & Wang, 2012).

## **Supply Chain Performance**

Performance of the supply chain is an important issue, and supply chain partners must reinforce their cooperative behavior, activities, and collaborative efforts to achieve higher levels of performance (Jao-Hong & Chih-Huei, 2014). All members in the supply chain must work as a team to improve service quality and supply chain performance (W. Liu & Xie, 2013). Moreover, sharing knowledge among supply chain members is a key activity toward enhancing supply chain performance (Cai, Goh, de Souza, & Li, 2013). However, knowledge sharing within the supply chain may not take place easily or automatically among supply chain partners (Cai et al., 2013). Moreover, knowledge sharing and integration may be ineffective if the conditions are not conducive or if partners involved are not appropriate (Jayaram & Pathak, 2013).

A connection exists between the performance of the supply chain and significant factors such as employee fulfillment, product reliability, customer fulfillment, on-time delivery, profit growth, and working efficiency (Ip, Chan, & Lam, 2011). Developing collaborative relationships, using information technology, and implementing vendor management strategies help to improve supply chain performance (Charan, 2012). The primary concern of supply chain performance is how to manage dependency between various supply chain members, along with the combined effort of all supply chain members to achieve mutually established goals (Charan, 2012). Furthermore, task complexity, language skills, communication media, and intercultural training influence the creativity and productivity of the team (Berg & Holtbrügge, 2010).

The results from data collected from the three largest logistics service providers in Sweden revealed three obstacles of supply chain performance: lack of understanding and knowledge, poor capabilities for performance metric definitions, and poor information technology solutions for performance reporting (Forslund, 2012). In another study, Singh, Sohani, and Marmat (2013) found supply chain integration was a major factor in improving supply chain performance. Moreover, suppliers, customers, and information sharing also positively relate to supply chain performance (Sherwat & Ogunyemi, 2012).

Decisions made with regard to production and distribution influence supply chain performance (Fahimnia, Luong, & Marian, 2012). Warehouse management and distribution play a critical role in achieving supply chain efficiency. Operations such as receiving, shipping, storing, and order picking contribute to achieving warehouse optimization (Alonso-Ayuso, Tirado, & Udías, 2013). However, there are several factors to consider that make optimizing a logistics decision a difficult task (Milewski, 2014). In addition, RFID technology can help to improve supply chain productivity and enhance warehouse optimization (Xu, Ming, Zhou, Song, He, & Li, 2013).

### **Supply Chain Sustainability**

Organizational leaders can retain and strengthen competitive advantage by coordinating and integrating all their business operations through sustainability considerations (V. Sharma & Giri, 2013). The alignment of sustainability and supply chain management is increasing (Ashby, Leat, & Hudson-Smith, 2012). A sustainable supply chain has alignment between organizational structuring, organizational culture, and organizational commitment (Fiona & Rowlinson, 2011). Moreover, core

competences need developing in regard to the environment and internal resources for an organization to maintain a competitive advantage and its sustainability (Fiona & Rowlinson, 2011).

Creating a sustainable supply chain does not fall under the control or responsibility of one individual or organization within the supply chain, but rather multiple partners in the supply chain must participate to fulfill the necessary responsibilities (Winter & Knemeyer, 2013). Ethical and multicultural values are important in planning and implementing effective management practices and organizational sustainability (Florea, Cheung, & Herndon, 2013). To investigate the relationship between organizations and supply chain sustainability, Wolf (2014) used data collected from 1,621 organizations and applied the RDT to analyze the corporate sustainability performance relationship. The results indicated stakeholder pressure, availability of resources, and supply chain management strategies influence an organization's sustainability (Wolf, 2014).

Supply chains have revolutionized the production, storage, and distribution of goods around the world (Nagurney, Yu, & Floden, 2013). Long-term organizational sustainability requires integrating marketing considerations and supply chain considerations (Closs, Speier, & Meacham, 2011). Integrating marketing considerations entails understanding from a marketing and supply chain perspective that communication, product design, channel selection, component selection, production, materials sourcing, packaging, distribution, and recycling decisions strongly influence sustainability goals (Closs et al., 2011).

The literature on RDT links to this study and to Pagell and Shevchenko's (2014) argument that while supply chain sustainability has gained popularity, the world's ability to provide natural resources is running out, and stakeholders are demanding action on climate change and employee working conditions in supplier factories in other countries. Thus, a lot of work is still necessary, and gaining organizational sustainability remains an aspiration of organizational leaders (Pagell & Shevchenko, 2014).

### **Supply Chain Risk Management**

Risk management involves having a structured approach in managing threatening uncertain events using a sequence of human activities that includes (a) completing a risk assessment, (b) developing strategies to manage risk assessment, and (c) mitigating the impact of risks by using managerial resources (Azad, Saharidis, Davoudpour, Malekly, & Yektamaram, 2013). The focus of supply chain risk management is on developing new approaches to manage disruptions (Ghadge, Dani, Chester, & Kalawsky, 2013). Risks in supply chains are becoming more important due to supply and demand uncertainty, market globalization, shorter product and technology life cycles, and increased use of sourcing (Jahanbakhsh & Akafpour, 2013). Many organizational leaders have implemented supply chain strategies to increase revenue, reduce costs, and reduce assets and have become more sophisticated and vulnerable to disruptions (Sodhi et al., 2012). Moreover, the current high level of volatilities in the business industry is going to get worse, and the increasing uncertainties and risks for businesses indicate a direct relationship between risk management and competitive advantage and require strategic-level attention to risk management (Elahi, 2013). Organizational leaders can design an



efficient supply chain network if they understand the supply chain risks that could disrupt performance and the severity of their impact (Punniyamoorthy, Thamaraiselvan, & Manikandan, 2013).

A disruption in the supply chain can increase as the result of risk involving demand. Many factors such as selling price or demand stimulating services can affect demand (K. Chen, Yang, & Liu, 2012). Supply chains are vulnerable to two types of supply uncertainties: yield uncertainty and disruptions (Giri & Roy, 2011). Unexpected haphazard events can change the demand or production cost, resulting in a large sudden demand (K. Chen et al., 2012). For example, a volcano that erupted in Iceland in 2010 disrupted millions of air travelers and affected time-sensitive air shipments (Chopra & Sodhi, 2014). Supply chain managers can reduce risk and protect their supply chains from serious and costly disruptions by (a) increasing inventory, (b) using multiple suppliers, and (c) adding capacity at different locations.

Evaluating risk uncertainty is an important step in establishing effective risk management practices, and organizations should follow these six steps to mitigate risks: (a) identify sources of uncertainty, (b) individualize appropriate options, (c) examine the subsequent risk, (d) analyze the supply chain, and (e) implement supply chain risk strategies (Cucchiella & Gastaldi, 2006). To investigate the relationship between supply chain risk management and organizations, Christopher, Mena, Khan, and Yurt (2011) collected data from managers in seven different industries and discovered many organizational leaders use informal methods to manage supply chain risks as opposed to formal methods. Supply chain complexity increases the difficulty of correctly identifying

sources of risk because they are less visible in complex supply chain operations (Vilko & Hallikas, 2012). Moreover, correct identification of the risk and its impact are dependent upon company position within the supply chain and level of analysis performed (Vilko & Hallikas, 2012).

World events are affecting organizations' supply chain and have made risk management strategies more important (Wieland & Wallenburg, 2013). Risks in supply chain management apply to different types of threats, including (a) environmental, (b) technological, (c) human, (d) organizational, and (e) political (Azad et al., 2013). Risks in a simple security breach could delay or cause a disruption of the delivery of goods to the prescribed destination (C. Yang & Wei, 2013). The instability of the business world increases risks, but using structural flexibility in the supply chain is one way to adapt to fundamental changes in the business environment (Christopher & Holweg, 2011).

The basis of the long-term sustainability of an organization and its suppliers is the leaders' understanding of how they should manage risks (Choi & Krause, 2006). Organizational leaders use different practices to increase efficiency of the supply chain, but many practices may also increase supplier dependency, which results in the organization being more vulnerable to supply chain disruptions (Choi & Krause, 2006). How organizational leaders use strategies to mitigate risk depends on the leaders' perception of risks (Ellis, Shockley, & Henry, 2011). Using backup production to reduce the impact cost associated with a disruption can mitigate supply chain risk, but backup production adds an extra expense during periods when the supply chain is uninterrupted (Samaddar & Nargundkar, 2010). Moreover, organizational leaders can effectively

mitigate risk by (a) encouraging coordination and collaboration between buyers and suppliers and (b) introducing flexibility within the supply chain as a risk mitigation tactic (Franklin, 2011).

There are many opportunities for organizational leaders to gain the benefits of trading in the global environment but there are also risks (S. Kumar, Himes, & Kritzer, 2014). Outsourcing has become more popular as company leaders focus on their core competencies and seek partnerships with other companies to supply noncore components. Creating an integrated global supply chain requires managing activities across boundaries. One of the biggest challenges of global integration is organizational transformation from an inwardly focused vertical structure to an outwardly focused horizontal business (Christopher, 2012).

The results from data collected from employees of a multinational organization who routinely worked with colleagues around the world indicated team autonomy was more important and influential in enhancing decision quality in a highly culturally diversified context (Drouin & Bourgault, 2013). Managing tensions with teams on a global scale, and enhancing team performance, includes having a clear charter and operating principles, being agile about the way team members think, and making sure team members are clear about why they exist as a team (R. J. Thomas, Bellin, Jules, & Lynton, 2012). Distance, time zone, and cultural differences represent barriers for sharing knowledge and the reason for the need to spend more time exchanging experiences when teams are working on projects in different countries (Wendling, Oliveira, & Maçada, 2013).

## **Supply Chain Disruptions**

The global business environment and the potential for disruptions are expanding. Organizational leaders who follow the outsourcing trend face global competition, which makes the organizations vulnerable to operational risks and disruptions and could lead to lost revenue, poor company reputation, and even company closure (S. Liu, Lin, & Hayes, 2010). The changing global environment indicates the need for company leaders to consider various strategies and management processes to reduce the impact of a supply chain disruption after it occurs or avoid it altogether (Kessler et al., 2012). Supply chain disruptions are increasing in frequency and the impact of disruptions can be costly and potentially cause portions of the supply chain to come to a halt (Son & Orchard, 2013). Disruptions in organizations often result in large financial losses and impose a negative impact on operating performance and shareholder wealth (Macdonald & Corsi, 2013). For example, leaders at Menu Foods Corporation conducted a recall that caused the company to lose at least \$70 million as a result of wheat gluten and chemicals in more than 60 million cans of pet food (Y. Chen, 2014). Furthermore, the port strike on the west coast of the United States in 2002, and the dock strike at the Kwai Tsing container terminal in Hong Kong in 2013, led to serious shipping delays and large financial losses (Loh & Thai, 2015). Disruptions affected the flow of materials, and supply chain disruptions included the immediate and direct performance implication in the supply chain, as well as changes in supply chain design, policies, and strategic-level configurations (Hilmola & Lorentz, 2012). The increase in probable supply chain

disruptions indicates further attention from organizational leaders is necessary (Hilmola & Lorentz, 2012).

Since the 2008 financial crisis, economic disruptions such as currency fluctuations, commodity price volatility, and government investment restrictions have occurred more frequently (Wright & Datskovska, 2012). Organizational leaders face transforming their supply chain risk management strategies to manage these potential supply chain disruptions. Strategies to mitigate potential supply chain disruptions have become more important because a failure of any one element within a supply chain can cause disruptions for all partners within the supply chain (B. Yang & Yang, 2010). In 2008, General Motors lost \$800 million in operating earnings as a result of their key supplier going on strike (Shukla, Lalit, & Venkatasubramanian, 2011).

Even though supply chain disruptions may have a negative effect on organizations, which could lead to the loss of customers and revenue, many organizational leaders do not have a plan in place to respond to disruptions within their supply chain. Seventy-three percent of business managers believed having a business continuity plan was important for their organization, and 94% believed a business continuity plan would reduce the impact of supply chain disruptions (Asgary & Naini, 2011). More than half of the 1,257 companies studied by Asgary and Naini (2011) had no business continuity plan in place.

Supply chain disruptions may occur as a result of natural disasters, unstable political conditions, poor financial conditions, or poor economic conditions (Olatunde et al., 2012). Disruptions in a supply chain may directly relate to external or internal sources

(Zsidisin & Wagner, 2010). Disruptions can prevent manufacturers and retailers from satisfying market demands and add unexpected organizational costs by requiring organizations to increase inventories, adjust production and shipping schedules, incur excessive backordering, and offer discounted prices to customers when goods or products are not in the right place at the right time (Co, David, Feng, & Patuwo, 2012). Moreover, a disruption in the supply chain directly affects an organization's solvency and the sustainability of the supply chain as a whole (Tang & Musa, 2011). However, flexibility in the supply chain allows the chain to respond to changes stemming from the supplier to the end customer with minimum penalty in costs, quality, delivery, labor, and performance (Tiwari, Tiwari, & Bhardhai, 2013).

Global supply chains are vulnerable to disruptions (Hurn, 2013). No company can operate in a completely secure environment without risk (Jereb, Cvahte, & Rosi, 2012). For example, supply chains that involve energy are critical for the United States, and any disruption could cause a major economic impact on companies whose leaders deal with energy (Urciuoli, Mohanty, Hintsa, & Boekesteijn, 2014). The increase in global maritime trade, which includes the 80% of the world's trade carried by sea, can face challenges such as piracy, international terrorism, hostile neighboring states, political turbulence, and natural disasters (Hurn, 2013). The global business environment has also increased in complexity. In an exploratory case study, disruptions detracted from organizational resiliency and had a negative impact on an organization's operations and performance as a 10-minute plant fire prohibited the delivery of semiconductor chips and cost Ericsson \$400 million in lost revenue (Blackhurst et al., 2011).

On March 11, 2011, a tsunami hit the northeastern part of Japan and left the area with high casualties, property losses, and a regional and global nuclear crisis (Norio, Ye, Kajitani, Shi, & Tatano, 2011). The tsunami disaster had an immediate effect on the Japanese economy and caused Japan's gross domestic product in the second quarter of 2011 to drop by 2.1% and industrial production and exports to drop by 7% and 8%, respectively (Fujita & Hamaguchi, 2012). The estimated financial impact of the Japan earthquake that led to the tsunami in 2011 was in the range of \$300 billion and did not account for the financial impact sustained by individual companies dependent upon Japanese suppliers (Chakravarty, 2013). The tsunami disaster also interrupted the flow of goods in the supply chain. Many assembly manufacturers across Japan could not receive critical components and had to suspend their operations (Fujita & Hamaguchi, 2012).

Disruptions lead to supply chain uncertainty, which negatively affects the performance of the supply chain and leads to unsatisfied customers (Shukla et al., 2011). For example, in 2008, General Motors suffered a loss of \$800 million in operating earnings as a result of their key supplier going on strike for 11 weeks (Shukla et al., 2011). Further, a tornado disrupted one of Caterpillar's key production facilities that manufactured highly critical pressure couplings, which resulted in a potential halt to the production of Caterpillar machines around the world (Shukla et al., 2011). Political and economic factors contribute to the possibility of supply chain disruptions as well (Hurn, 2013). Any interruption of the global supply chain will have serious economic consequences such as the tsunami caused in Japan in 2011 (Hurn, 2013). When a disruption occurs, policy makers should facilitate mitigation capabilities by providing up-

to-date information on the disruption and making an effort to return things to normal (Hilmola & Lorentz, 2012). In addition, it is important for organizational leaders to distinguish between a crisis that leaders cannot reasonably foresee in a timely manner to avoid it and a crisis of poor management (Hittle & Leonard, 2011).

### **Resource Dependence Theory**

The literature on RDT links to this study's problem statement of how an organization's ability to acquire external resources and mitigate supply chain disruptions directly relate to an organization's survival. The focus of RDT is on an organization's control, power, and vulnerabilities in its external resource provisions (Bode et al., 2011). Resource scarcity has a major impact on organizations and industries and causes significant management problems (Bell, Mollenkopf, & Stolze, 2013). Prajogo and Sohal (2013) concurred and supported Bell et al. (2013) regarding issues involving the management of scarce resources that had a significant impact on supply chain strategies. An organization's dependence on its partners to supply external resources, and the organization's desire to minimize its dependence to maximize its power, is a primary focus of RDT (Pfeffer, 1981).

Data collected from 3,945 organizations in Germany, Austria, and Switzerland were suitable to explore to determine whether a relationship existed between an organization's supply chain distribution and exchange relationship in the manufacturing sector (Bode et al., 2011). The data analysis results indicated the level of trust in the exchange partner shapes organizational responses to supply chain disruptions, which leads to different information processing needs and different responses (Bode et al.,



2011). Leaders of nonprofit organizations employ RDT to obtain information as leverage to get something in return that reduces uncertainty in their environment and secures needed resources (Carman, 2011). Leaders form relationships between organizations to access capital and resources not available within their own organization, which makes the necessity of maintaining these relationships critical in improving organizational sustainability and minimizing possible disruptions (Greening & Rutherford, 2011).

Organizational leaders need to obtain resources from external sources to survive, which creates dependence between organizations and outsiders such as suppliers and competitors (I. S. N. Chen & Fung, 2013). To investigate the relationship organizational leaders form with their suppliers and customers in the apparel supply chain, I. S. N. Chen and Fung (2013) used a cluster analysis based approach and found how organizational leaders structure relationships related to the flow of information, goods, and resources for the supply chain to be effective. Supply risks and potential disruptions relate to insufficient natural resources and have implications in current and future supply chains (Bell et al., 2013).

### **Normal Accident Theory**

The NAT also linked to this study's problem statement. Supporters of NAT contend that accidents become inevitable as systems become more complex and tightly coupled (Perrow, 1999). To investigate the relationship between supply chains and disruptions, Habermann (2009) used a multivariate analysis and NAT to analyze data collected from 189 participants. The results indicated complexity was a key component that affects supply chain disruptions (Habermann, 2009). Contributing to the NAT were

Marley et al.'s (2014) suggestion that reducing interactive complexity to mitigate supply chain disruptions by maintaining low operational levels makes problems more visible and causes fewer disruptions. Moreover, decreasing the level of interactive complexity under conditions of tight coupling can aid in an organization being less susceptible to a supply chain disruption (B. Yang & Yang, 2010).

Supporters of the NAT have indicated that accidents or disasters, although not wanted, are inevitable because of complex technical systems (Cooke & Rohleder, 2006). In systems characterized by complex interactions and tight coupling, accidents are likely (Zahariadis, 2012). Large organizations are often in interactive, complex, and tightly coupled supply chains and have more employees involved in managing and communicating with different departments, suppliers, and customers, which makes it critical to identify areas of potential vulnerability (Wagner & Neshat, 2012).

### **Transition and Summary**

Section 1 included a general introduction to the research of my study. The specific business problem is some supply chain managers in warehouse distribution centers have limited strategies to mitigate disruptions in supply chains. The purpose of this exploratory qualitative case study was to explore strategies for mitigating disruptions in supply chains. The study included two related theories chosen to explore what strategies supply chain managers in warehouse distribution centers have in place to manage supply chain disruptions. An evaluation of other possible methods indicated the qualitative research design would be the most appropriate design. The data that I collected and analyzed led to the development of strategies that supply chain managers in warehouse distribution

centers may use to minimize supply chain disruptions and to achieve greater organizational sustainability.

Section 1 also included the foundation of the study, background of the problem, statement of the problem, purpose and nature of the study, research questions, description of the conceptual framework, definitions of key terms, assumptions, limitations, delimitations, and significance of the study. Moreover, Section 1 included a review of the literature related to the research topic. Section 2 includes the design of the proposed study related to strategies company leaders use to manage disruptions in supply chains. Furthermore, Section 2 includes the purpose of the study and a discussion on population and sampling; ethical research; data collection instruments, technique, and organization; data analysis; and reliability and validity. Section 3 includes the findings and application.

## Section 2: The Project

Section 2 includes a restatement of the purpose of the study and a description of the research, the participants, and the research method and design. After the description of the research method and design follow the population and sampling, ethical research, data collection method, and reliability and validity measures, followed by the transition and summary. Section 3 includes an overview of the study and a presentation of the findings.

### **Purpose Statement**

The purpose of this qualitative exploratory case study was to explore strategies supply chain managers in a warehouse distribution center use to mitigate disruptions in supply chains. Through interviews and reviewing archived documents, I explored how supply chain managers in a warehouse distribution center were successful at employing strategies to mitigate disruptions in the supply chain. In this study, I conducted interviews with six supply chain managers of a warehouse distribution center and reviewed documents related to policy, procedure, and business continuity planning. Data collection took place at a warehouse distribution center located in Jacksonville, Florida. The results of this study could affect positive social change by identifying strategies to minimize supply chain disruptions and potentially leading to greater sustainability and profitability.

### **Role of the Researcher**

As is true with all qualitative studies, I served as an instrument of data collection (Denzin & Lincoln, 2010), which meant that I mediated all data rather than mediation occurring through more mechanistic means. Qualitative researchers need to describe

relevant aspects of self, including any biases, assumptions, expectations, and experiences to qualify their ability to conduct the research (Greenbank, 2003). My professional experience in relation to the area of research includes teaching theoretical courses in a supply chain management program at a state college in Florida. However, I had no professional links or business arrangements with the organization or participants in the study. I separated my personal feelings and experiences when interpreting participants' responses to avoid possible biases and personal views. To accomplish this, I used the process of bracketing to separate my personal experiences, perceptions, morals, and beliefs from the research data (Tufford & Newman, 2012). In addition, I kept a research journal, as recommended by Punch (1998), to explicate personal reactions, reflections, and insights into myself and my past and indicated how bracketing took place.

I adhered to the ethical principles and guidelines noted in the *Belmont Report* and Walden University's Institutional Review Board (IRB). Ethical guidelines include respecting personal autonomy and diminished autonomy, following the principles of beneficence and justice, gaining informed consent, assessing risks and benefits, and selecting subjects fairly (U.S. Department of Health and Human Services, 1979).

I collected data through face-to-face interviews with supply chain managers responsible for managing supply chain disruptions in a warehouse distribution center environment. I used the epoché process of setting aside prejudgments, as recommended by Moustakas (1994). Researchers use epoché to allow the development of new knowledge and to avoid invalidating information from previous knowledge and preconceived judgments. The interviews with participants were voluntary, and the

participants could terminate an interview at their request. I asked each participant the same open-ended questions in the same order and used bracketing to mitigate any preconceptions throughout the research process. The bracketing method helped mitigate preconceptions in the research and included maintaining a research journal and writing memos during the data collection and analysis process (Tufford & Newman, 2012). I also reviewed company documents related to policy, procedure, and business continuity planning. A prepared interview protocol (see Appendix A) was suitable for limiting inconsistencies and omissions (Morton, Rivers, Charters, & Spinks, 2013). An interview protocol is a valid method to measure and map an individual's considerations when making complex decisions (De Ceunynck, Kusumastuti, Hannes, Janssens, & Wets, 2013). The data analysis included using Atlas.ti qualitative data analysis software. I also assured the participants of the confidentiality of their interview responses.

### **Participants**

I chose the participants for this study using a purposive sampling approach to ensure the inclusion of participants with the most information on the characteristic of interest in the study (Guarte & Barrios, 2006). The eligibility requirements for participants were a position as manager and an ability to provide rich details to understand supply chain disruptions. The specific requirement was that the participants had experienced success in mitigating supply chain disruptions.

The process of gaining access to participants and meeting ethical requirements began with obtaining permission from Walden University's IRB. The potential participants received information about the benefits, risks, and confidentiality of the

study through a consent form (see Appendix C). The participants for this qualitative exploratory case study were supply chain managers who worked at a warehouse distribution center located in Jacksonville, Florida, who experienced success in mitigating supply chain disruptions.

I sent an introductory letter (see Appendix D) to leaders of warehouse distribution centers who voluntarily served on a supply chain management advisory board. I attend the supply chain management advisory board meetings as a contributing faculty member representing a supply chain management program at a state college. Upon request, warehouse leaders provided a list of names and e-mail addresses of managers who had experienced success at employing strategies to mitigate disruptions in the supply chain. The ways to gain access to participants in a qualitative study are telephone calls, e-mails, and face-to-face contact (Mikene, Gaizauskaite, & Valaviciene, 2013). Participants' participation for this study was voluntary, and all data collected were confidential. Interviews began after I obtained permission from warehouse leaders.

Successful qualitative research includes building a working relationship with participants (Swauger, 2011). I built a working relationship with participants by communicating with them on a consistent basis through e-mail and telephone after they agreed to participate in this study. I informed participants of their ability to withdraw from the study at any time without facing any ramifications.

### **Research Method and Design**

Qualitative research involves focusing on people's lived experiences and the meaning placed on the events, processes, and structures of their normal social setting

(Skinner, Tagg, & Holloway, 2000). The case study approach involves investigating a contemporary phenomenon when the boundaries between the phenomenon and context are obvious (Yin, 2014).

### **Research Method**

The qualitative case study method was the most appropriate method to explore the extent to which supply chain managers in a warehouse distribution located in Jacksonville, Florida, were successful at employing strategies to mitigate disruptions in the supply chain. Qualitative research reflects the personal side of individuals' opinions and is situational, interpretive, and experience-based (Stake, 2010). Qualitative researchers explore themes corresponding to what participants have experienced and see phenomena from participants' perspective (Toloie-Eshlaghy, Chitsaz, Karimian, & Charkhchi, 2011).

A quantitative research method was not appropriate for this study because quantitative research involves determining if a theory is true (Fowler, 2008). Moreover, quantitative researchers use measurement strategies to develop knowledge based on cause and effect (Bernard, 2013). There are three main differentiating factors between qualitative and quantitative research: researchers using the qualitative research method seek to construct knowledge, in contrast to researchers using the quantitative research method who seek to discover knowledge; the role of the researcher is more personal in qualitative research than in quantitative research; and the focus of qualitative research is on understanding a phenomenon, whereas the aim of quantitative research is to explain the phenomenon (Stake, 1995).



The quantitative research method was not suitable for this study primarily because I was not testing a hypothesis, nor did I collect numerical data (Hoe & Hoare, 2012, 2013). The mixed-method approach includes a combination of both qualitative and quantitative methods in a single study (Small, 2011). This study did not include variables to examine or compare; therefore, the mixed-method research method and quantitative research method were not suitable for this study. The qualitative research method best aligned with the purpose of this study, which was to explore the extent to which supply chain managers in a warehouse distribution center were successful at employing strategies to mitigate disruptions in the supply chain. The qualitative method was appropriate because it participants were able to express their insight of the phenomenon in their own words (Coenen, Stamm, Stucki, & Cieza, 2012).

### **Research Design**

Selecting an appropriate research design is important, as the research design is a researcher's blueprint for research (Yin, 2014). Five qualitative designs received consideration for this study. The five designs were (a) the narrative research design, (b) the grounded theory design, (c) the phenomenological design, (d) the ethnographic research design, and (e) the case study design. The main concern of the narrative research design is gathering information from one participant's story to extract experiential meaning (Marshall & Rossman, 2011). This study involved gathering information from more than one individual to explore how supply chain managers successfully employ strategies to mitigate supply chain disruptions. Therefore, the narrative research design

was not suitable for this study because the purpose of this study was not to explore one participant's story.

The focus of the grounded theory research design is starting with data and using those data to develop a new theory (Reiter, Stewart, & Bruce, 2011). Researchers use the grounded theory design to develop theories that can fit the phenomenon (Smythe, 2012). The grounded theory was not suitable because the focus of this study was not to develop a new theory, but rather to understand the strategies supply chain managers in a warehouse distribution center used to mitigate disruptions in the supply chain.

The phenomenological research design involves clarifying individual lived experiences to gain knowledge of a phenomenon studied (Finlay, 2012). Although an association exists between interviewing participants to gain perspectives through their lived experiences and phenomenological research (Englander, 2012), I used company documents related to policy, procedure, and business continuity planning and triangulated the data gleaned from the interviews and documents. Phenomenological research involves seeking an understanding of the relationship between individuals and social life (Ployhart & Ward, 2011). The focus of this study was not to gain an understanding between individuals' relationships, but rather to explore how supply chain managers successfully mitigate supply chain disruptions. The purpose of this study was not to explore just their perceptions and experience, but rather to explore the strategies used to mitigate supply chain disruptions. Therefore, the phenomenological research design was not the most appropriate design.

The ethnographic research design involves a pool of participants who are of the same race, culture, and location (Bernard, 2013). Researchers use the ethnographic research design to study cultural groups over a prolonged time frame in a natural environment and focus on understanding the behaviors of a culture opposed to understanding the phenomenon from participants' viewpoint (Wilson, 2012). The ethnographic research design involves creating a descriptive written account of a culture or group (Yin, 2014), which did not align with the study purpose.

This qualitative case study involved exploring how supply chain managers successfully mitigate disruptions in a warehouse distribution center. When conducting research using a case study approach, the focus of the study is more likely known in advance and designed around an established theory or method (Stake, 1995). A case study design involves using an in-depth exploration of a single case or a small number of cases (Verner & Abdullah, 2012). Researchers use case study designs when researching emerging ideas from multiple sources (Trkman, 2010). Based on this explanation, the case study design was the most appropriate research design to gain the lived experiences and perceptions of supply chain managers who were successful mitigating disruptions in a supply chain.

Obtaining data saturation involves a two-step method. In the first step, the researcher selects a minimum sample size, and if the researcher reaches data saturation, then Step 2 involves conducting two more interviews. If no new ideas emerge, the interviews cease (Francis et al., 2010). If data saturation does not occur, the researcher repeats Step 2 until saturation occurs. Data saturation occurred after the fourth interview

when no new themes emerged. Saturation of data occurs when the collection of new data does not result in any new information on the issue under investigation (Kerr, 2010). In this study, saturation occurred when information from participant interviews became redundant (Kisely & Kendall, 2011).

### **Population and Sampling**

The population for this qualitative exploratory case study was supply chain managers in Florida who experienced success in mitigating supply chain disruptions. Purposive sampling was the method used to engage the business leaders at one warehouse who were the most knowledgeable about supply chain disruptions in their organizations. The objective of using purposive sampling is to select the most information-rich participants or cases who best serve the research objectives (Patton, 2002). This sampling method is similar to a maritime metaphor of casting a wide net and then choosing the most fitting fish from the catch (DeFeo, 2013).

To ensure I did not inconvenience the participants but that I did protect their privacy and confidentiality, interviews took place through private telephone lines during times suggested by the participants. The criteria for selecting potential interviewees included success with mitigating supply chain disruptions, management level, and responsibility within the warehouse distribution center. I contacted potential interviewees to participate in this study through e-mail and formal letters of invitation. Six participants enrolled in the study and data saturation occurred after four interviews.

### **Ethical Research**

Protecting participants' identity, following ethical standards that respect human dignity, and complying with academic principles to ensure integrity are researchers' obligations (McCormick, Boyce, Ladd, & Cho, 2012). In an effort to maintain ethical results, I advised participants that I would offer no incentives for participating in the study. Further, participants understood their right to withdraw from the study at any time, without ramification, by informing me they no longer desired to participate.

Researchers use an informed consent form to protect participants and all parties involved in the research process (Coram, 2011). All participants signed an informed consent form prior to participating in the study (see Appendix C). The informed consent form provided participants with their responsibility in the study, the risks participating in the study, and how to mitigate those risks. I used pseudonyms as opposed to their actual names and did not use any personal information that could identify the participants.

After obtaining permission from Walden University's IRB, I began the qualitative case study by collecting data through interviews with supply chain managers who were responsible for managing supply chain disruptions. Interviews took place through teleconferences. In addition, after receiving permission from the supply chain manager of the distribution center, I reviewed company documents related to policy, procedure, and business continuity planning. The data collection process included several steps to ensure the study complied with established principles, abided within the legal frame for research with human subjects, and protected participants from physical harm and psychological distress (Erickson & Cho, 2011). My duty was to protect the identity of the participants in

the sample. In an effort to protect the participants' identity, I did not use their actual names or any other personal information in the study findings. Moreover, I used a coding system to ensure the information obtained had no link to participants' identities. I will keep all the electronic and paper documents for the study, which includes transcripts from interviews, notes, and documents signed by the participants to participate in the study, confidential.

I adhered to the ethical principles and guidelines in the *Belmont Report* and Walden University's IRB. Ethical guidelines in the *Belmont Report* include respecting personal autonomy and diminished autonomy, following the principles of beneficence and justice, gaining informed consent, and assessing risks and benefits. I also selected participants fairly (U.S. Department of Health and Human Services, 1979).

The electronic data for this study included e-mail correspondence from the participants. I locked the paper documents and external electronic documents in a single-key file cabinet that is only accessible by me. Five years after the completion of my study, I will dispose of the data by shredding paper documents and erasing any electronic data from the thumb drive containing the data.

### **Data Collection Instruments**

Primary data in this qualitative case study came from direct interactions with participants. I was the tool for collecting information for this qualitative exploratory case study. I used semistructured interviews and a review of company archival documents to collect data, and I used a recording device to record interviews with participants' permission evidenced by a consent form to enhance the reliability and validity of the data

collection process. Testing the recording device prior to the interviews helped to ensure proper recording.

Interview protocols are important to mitigate bias and to ensure reliability and transferability for future research (Turner, 2010). Preparatory protocols included obtaining permission before starting data collection; identifying the steps to take before, during, and after each interview; and developing interview questions to gain information (Jacob & Furgerson, 2012) regarding how supply chain managers in warehouse distribution centers mitigate supply chain disruptions. The interview protocol for this study is in Appendix A, interview questions are in Appendix B, the informed consent form is in Appendix C, the introductory letter is in Appendix D, and the interview guide is in Appendix E.

There were two means of data collection for this study: semistructured interviews and archival documents related to policy, procedure, and business continuity planning. The interviews included a semistructured interview questionnaire (see Appendix B). The characteristics of a semistructured interview include (a) open-ended questions followed up with probes; (b) specific questions; or (c) topics, issues, or areas that researchers may want to know more about, but do not have enough information in the beginning of the study to form specific questions (Merriam, 2009).

In an effort to enhance the reliability and validity of the data collection process, I used transcript checking and member checking. Transcript checking allows participants to check for accuracy (Jonsen & Jehn, 2009). Member checking involves providing participants with the opportunity to ensure the credibility and consistency of the

researcher's interpretation (Goulding, 2002). Reviewing themes and the accuracy of findings is a means to achieve research dependability recommended by Koelsch (2013).

### **Data Collection Technique**

Data collection is the process of gathering information to answer the research questions (Alasuutari, 2010). In a case study, researchers use multiple sources for collecting data (Yin, 2014). The methods used to collect data for this study were in-depth interviews and a review of archived company documents related to policy, procedure, and business continuity planning. Case studies are more credible and accurate when researchers use various data sources (Onwuegbuzie & Leech, 2010). In-depth interviews guided by open-ended questions are a common method of collecting data (Bansal & Corley, 2012). Researchers who interview participants face-to-face have the opportunity to clarify any misunderstandings during the interview process (Kisely & Kendall, 2011). However, interviewing participants face-to-face may pose a disadvantage to data collection because participants may not feel comfortable answering sensitive questions in person (Kisely & Kendall, 2011).

After receiving approval from Walden's IRB, I contacted potential interviewees through e-mail and included an informed consent form for them to sign (see Appendix C) and return to the mailing address or e-mail address provided on the form. I contacted each participant to schedule a time for the interviews. I made multiple attempts with each participant to conduct face-to-face interviews. Due to busy schedules that involved traveling outside of the state, each participant requested a phone interview instead. Upon consultation with my dissertation chair, I scheduled and conducted phone interviews. I



reviewed the warehouse distribution center's company documents related to policy, procedure, and business continuity planning to explore what strategies supply chain managers successfully used to mitigate supply chain disruptions.

The purpose of reviewing pertinent documents related to supply chain disruptions was to gain an understanding of how supply chain managers at a warehouse distribution center successfully handled supply chain disruptions. In addition, I compared all information obtained from the document review process with information obtained from semistructured interviews. When data collected through document review corroborate the interview statements of participants, then a comprehensive case study results (Yin, 2014). Semistructured interviews are a valid source of information when participants are subject matter experts (DiCicco-Bloom & Crabtree, 2006). The supply chain managers in the warehouse distribution center in Florida were subject matter experts on the topic researched in this study.

I used member checking to ensure trustworthiness in the study (S. Thomas, 2012). Member checking includes verifying words said with transcripts of dialogues for accuracy. Moreover, member checking includes the sequencing, consistency, and frequency of those checks, which bolster the study's trustworthiness. In addition, researchers should cross check the literal translation with intent to ensure participants meant what the researcher recorded (Shenton, 2004). Member checking also entails sharing the data analysis to validate the researcher's interpretation of the participants' experiences (Koelsch, 2013). It is important to communicate ideas openly and to reassure participants that they can speak freely during the interview process (Moustakas, 1994).

### **Data Organization Techniques**

I collected, coded, and analyzed information for themes and trends. Retrieving data for analysis can be intense (Yin, 2014). Description, pattern identification, concept categorization, and generalization are standard approaches to organizing and analyzing qualitative case study data (Patichol, Wongsurawat, & Johri, 2014). It is important for researchers to use data organizing strategies such as planning interviews, conducting interviews, and making sense of interview data (Rowley, 2012). I used the Atlas.ti qualitative data analysis software to organize and analyze responses from participants.

A thumb drive was suitable for storing participants' transcribed interviews. A locked file cabinet is an appropriate location for safeguarding data, audiotapes, thumb drives, and backup disks of the separate Microsoft Word files for each participant (Mutula, 2014). I also kept a journal to annotate details of the data collection process. All information associated with this study will remain stored in a secured container and maintained for 5 years. At the end of the 5-year period, I will destroy all paper documents with a paper shredder and all data collected electronically by using hard-drive data removal software.

### **Data Analysis**

Data analysis is a systematic review of data elements involving data interpretation to discover underlying meaning (Salajeghe, Nejad, & Soleimani, 2014). To gain knowledge and understanding of the strategies supply chain managers can use to mitigate disruptions, I developed an interview protocol (see Appendix A) and the following semistructured open-ended interview questions (see Appendix B):

1. Please describe a recent disruption your warehouse distribution center faced.
2. What resources were needed to minimize these disruptions?
3. Describe how the disruption impacted your warehouse distribution center.
4. Describe how logistics relationships with suppliers impact your warehouse distribution center's performance
5. What data did you gather from the supply chain disruption as it was occurring?
6. What types of precursors, if any, were identified when the distribution occurred at our warehouse distribution center?
7. How did you respond to the disruption at your warehouse distribution center?
8. What type of collaboration, if any, was used to minimize the disruption?
9. How did the disruption impact your internal and external supply chain relationships?
10. What strategies did you use to mitigate the supply chain disruption you described?
11. What other strategies have you used to mitigate other supply chain disruptions at your warehouse distribution center?
12. What other information (if any) would you like to share concerning how you mitigate supply chain disruptions?

After completing the review of archival data and interviews, I performed an analysis of the data. I categorized data into themes identified from each participant and analyzed the data to establish common views, as recommended by Yin (2014). My

analysis involved searching for supporting evidence relative to strategies used to mitigate supply change disruptions. I used the analyzed data and information to (a) fill the literature gap, (b) provide answers to the guiding research question, and (c) encourage further research. I used Atlas.ti qualitative data analysis software to help manage and analyze the data. I adopted a coding system to identify patterns and relationships, as expected in a qualitative study (Chang & Graham, 2012). In addition, I used Atlas.ti to help manage, organize, and analyze the nonnumerical or unstructured data. The software users can classify, sort, and arrange information; examine relationships in the data; and extract themes and patterns to build theories and models related to the problem under investigation (Chang & Graham, 2012).

Data analysis involves preparing and organizing data for analysis and identifying themes (Yu, Abdullah, & Saat, 2014). Triangulation is a data analysis process of combining data sources to study the same social phenomenon (Denzin & Lincoln, 2010). The four types of triangulation are (a) data triangulation, (b) investigator triangulation, (c) theory triangulation, and (d) methodological triangulation (Denzin & Lincoln, 2010). I used data triangulation, the use of a variety of data sources, in this study. The types of data I reviewed and analyzed were archival documents and semistructured interviews. Using more than one source of data is a means to enhance the depth of study and reduce bias (Yin, 2014). Triangulation of multiple data sources and member checking constitutes creditability, conformability, and transferability in research.

Using multiple sources of evidence to triangulate the findings strengthens a study and enhances the quality of case study research (Yin, 2014). I reviewed company

documents related to policy, procedure, and business continuity planning and compared them to the interview data with the aim of answering the research question pertaining to what strategies distribution managers can use to minimize supply chain disruptions.

### **Reliability and Validity**

#### **Reliability**

In qualitative studies, it is important to maintain accurate findings and consistent documentation of the steps of the procedures taken (Yin, 2014). In an effort to ensure reliability and validity, I was transparent throughout the processes. Researchers can estimate reliability by the coding of the original data in qualitative research (Delattre, Ocler, Moulette, & Rymeyko, 2009). In a case study, steps and procedures should be explicit and well documented to show reliability and to enable others to replicate the study (Ardhendu, 2014). To achieve reliability and validity in qualitative research, researchers use research strategies to achieve credibility, dependability, confirmability, and transferability (Denzin & Lincoln, 2011).

#### **Validity**

When conducting research, it is insufficient for researchers to rely on their intuition rather than clearly demonstrating the validity of their work (Goffin, Raja, Claes, Szwejczevski, & Martinez, 2012). I used member checking to ensure the validity of participants' responses. Member checking is a method used to promote credibility in a case study (E. Thomas & Magilvy, 2011) that involves reviewing data interpretations with participants of the study to incorporate feedback or needed changes to the final

narrative (Tracy, 2010). Verifying the interview information of respondents can help to establish construct validity (Yin, 2014).

Researchers can use validity to establish if the research measures what they intended or how truthful the results of the research are by considering dependability, credibility, transferability, and confirmability (Kisely & Kendall, 2011). In qualitative research, dependability is equivalent to reliability (Yilmaz, 2013). Providing a rich, thick description of the research process, along with member checking, can ensure transferability of a study in qualitative research (Yilmaz, 2014).

In an effort to ensure dependability, I provided a rich description of the processes used to gather and analyze the data as a means to accommodate research replication of another researcher investigating similar research (Elo et al., 2014). To increase transferability, I used a chain of evidence, accurately recorded observations, and documented assumptions used in the study. I ensured confirmability of this study by using multiple sources of data to enable triangulation and corroboration, completing a peer-review process, and maintaining a chain of evidence that will track data collection and analysis to the research problem and research questions of this study (Andrade, 2009; Goldblatt, Karnieli-Miller, & Neumann, 2011; Singh & Miller, 2010). Researchers can achieve credibility in qualitative research when data are in depth or provide a rich, thick description and when the study includes a detailed articulation of the meanings of data to aid in understanding the phenomenon under study (Tracy, 2010). Credibility in qualitative research involves establishing the results of the research being credible or

believable from the participant's perspective through triangulation (Lee, Mishna, & Brennenstuhl, 2010).

To reduce bias, I triangulated the data from participants' interview questions against company documents related to policy, procedure, and business continuity planning. Triangulation helps reduce biases while increasing the reliability and validity of a study (Jonsen & Jehn, 2009). In addition, using multiple sources of data can increase internal validity (Goffin et al., 2012). From collected and analyzed data, I developed a logic model to gain an understanding of the phenomenon. In case study data analysis, researchers can use logic models as an evaluative tool for understanding complex phenomena (Yin, 2014).

Researchers frequently use data saturation in qualitative research, which is the point at which no new information emerges on the topic under research (Kerr, 2010). In qualitative research, the point at which data saturation occurs defines the sample size and indicates the data collected are sufficient (Kerr, 2010). To ensure data saturation for this study, I interviewed participants until the information received from participants was redundant and no new themes emerged. After the fourth participant interview, no new themes emerged and data saturation occurred. I then interviewed two more participants to confirm that I had achieved saturation.

### **Transition and Summary**

In Section 2, I presented a justification for selecting a qualitative exploratory case study research methodology and design. Section 2 also included a description of the purpose, role of the researcher, participants, and data collection activities. In addition,

Section 2 included a discussion on the case study design, as well as the data analysis methods, reliability, and validity of the study. Section 3 includes an overview and the findings of the study, along with a discussion regarding the application of the findings to professional practice, implications for change, and recommendations for action and future research.



### Section 3: Application to Professional Practice and Implications for Change

#### **Introduction**

The purpose of this qualitative exploratory case study was to explore how supply chain managers in a warehouse distribution center were successful at employing strategies to mitigate disruptions in the supply chain. The population included participants in a warehouse distribution center. Participants were manager-level employees with warehouse-related responsibilities who had experienced success with mitigating supply chain disruptions. This section includes an overview of the study and the findings, along with a discussion regarding the application of the findings to professional practice, implications for change, and recommendations for action and future research.

The final grouping of all responses revealed six main themes. The first emergent theme related to the need for supply chain managers and collaborating partners to minimize the impact of disruptions in the distribution center. The second emergent theme revealed potential precursors to supply chain disruptions. The third emergent theme included strategies needed to mitigate disruptions. The fourth emergent theme involved identifying and assessing the impact of supply chain disruptions. The fifth emergent theme revealed resources that can minimize the impact of supply chain disruptions. The sixth emergent theme related to having supplier relationships within the supply chain to mitigate supply chain disruptions. The shared experiences revealed could inform other supply chain managers of warehouse distribution centers about possible strategies to lessen the impact of disruptions or even prevent the disruption altogether.

### **Presentation of the Findings**

The guiding research question for this study was as follows: What strategies do supply chain managers in a warehouse distribution center use to mitigate supply chain disruptions? This section includes participants' responses, emerging themes, and conclusions. These areas helped address the research question in this study.

The theoretical framework of the study included RDT by Pfeffer and Salanick (1978) and NAT introduced by Perrow (1999). The rationale for using RDT related to developing relationships to acquire needed resources to mitigate disruptions (Chu & Wang, 2012). The RDT applied to strategies for mitigating disruptions by linking organizational leaders' ability to acquire external resources to their organizations' survival. The NAT was applicable in researching how to manage unexpected disruptions that result from an unknown cause (Perrow, 2011). By using the RDT and NAT, I gained an internal and external understanding of the strategies used to mitigate disruptions.

I used a purposive sampling approach to select participants. The first step involved sending an introductory letter to leaders of warehouse distribution centers who voluntarily served on a supply chain management advisory board. Warehouse leaders provided a list of names and e-mail addresses of managers who had experienced success employing strategies to mitigate supply chain disruptions. The supply chain managers interviewed were two regional logistics managers, a department shipping manager, an operations manager, a transportation manager, and a logistics core team leader.

I made multiple attempts to conduct face-to-face interviews with each participant. Due to busy schedules that involved traveling outside of the state, each participant

requested a phone interview instead. Upon consultation with my dissertation chair, I scheduled, conducted, and recorded phone interviews. After conducting the interviews, I transcribed each interview and reviewed the data to check for accuracy in participants' responses. I validated the data by using member checking, which involved reviewing the data interpretations with participants and incorporating feedback into the final narrative, as recommended by Tracy (2010). I entered the data gathered from participant interviews into the Atlas.ti qualitative software to organize and analyze the information. A review of company documents related to policy, procedure, and business continuity planning and the data from the interviews provided triangulation of the findings validated the results.

The demographic data for the six participants are in Table 1. The gender composition was four males and two females. Two participants (33%) had 16 or more years of service with the company, three participants (50%) had 6-15 years of service with the company, and one participant (17%) had 2-5 years of service with the company. With regard to years of experience as a manager, two participants (33%) had been managers for 16-20 years, one participant (17%) had been a manager for 6-15 years, and three participants (50%) had been managers for 2-5 years. Table 1 includes a summary of the participants' gender, number of years with the company, and number of years as a manager.

The findings were six themes related to strategies for mitigating supply chain disruptions. I related the themes to the literature review and conceptual framework. Supply chain managers may use these themes to understand participants' perceptions and

implement new strategies. After transcribing the data and replacing participants' names with P1, P2, P3, P4, P5, and P6, I used Atlas.ti to code the recurring words and themes.

Table 1

*Demographic Data for Supply Chain Managers*

Categories and item	Participant ( $N = 6$ )	Total	% of total
Gender			
Male	P1, P2, P4, P6	4	67
Female	P3, P5,	2	33
Years with the company			
2-5	P3	1	17
6-15	P1, P2, P5	3	50
16-20	P4, P6	2	33
Years as a manager			
2-5	P2, P3, P5	3	50
6-15	P1	1	17
16-20	P4, P6	2	33

All participants agreed supply chain managers could use different strategies to mitigate supply chain disruptions. Five out of six participants (83%) regarded identifying and assessing the impact of a disruption as a high priority and profitable in reducing the probability of future disruptions. All participants agreed that supply chain managers could use resources to minimize the impact of disruptions. Although some participants (P1, P2, and P4) viewed strengthening supplier relationships as a factor in mitigating disruptions, others (P3, P5, and P6) did not provide a comment. P1 noted, "When a disruption occurs, our main suppliers would send us whatever goods they were going to send us, but now in larger quantities." P2 noted, "After the percentage of our order request started to diminish, we started to get a little bit more concerned and started doing our due diligence to find alternate suppliers to mitigate the impact of the disruption." P4 noted, "We depend on suppliers obviously first and foremost for the supplies that we use

to pack our products every day.” P2, P3, and P5 (50%) viewed identifying disruption precursors as a means to mitigate supply chain disruptions. Five out of six participants (83%) agreed that collaborating with supply chain partners could minimize the impact of supply chain disruptions. P1, P2, P3, P5, and P6 provided views regarding collaborating with supply chain partners. I included these views under Theme 1. The six themes from the data analysis process appear in Table 2.

Table 2

*Themes*

Themes	No. of participant responses	% of participant responses
Collaborating	11	13
Disruption precursors	4	5
Identifying/assessing	27	33
Resources	8	10
Strategies	24	29
Supplier relationships	9	11

**Theme 1: Collaborating to Minimize the Impact of Disruptions**

The first emergent theme, based on Interview Question 8, pertained to what type of collaboration, if any, the participants used to minimize the impact of a disruption. Five out of 6 participants (83%) stated one of the first steps taken after a disruption occurred was collaboration between supply chain partners. P1 noted,

One of the first things we did was contact our branches in Ft. Lauderdale, Orlando, Tampa, Alabama, and Atlanta. We used those branches and we all collaborated together. We also collaborated with our normal shipping vendors and conducted regional conference calls with our home office.

Collaboration in the supply chain is a vital capability that supply chain managers can use to improve supply chain performance (Fawcett, Fawcett, Watson, & Magnan, 2012). P2 stated, “We maintained a pretty strong line of communication between our logistics team, our procurement team, operations and regulatory teams.” Five of the six participants mentioned collaboration among supply chain partners as a vital step toward minimizing the impact of the supply chain disruption after it had occurred. P5 noted, “Different departments will collaborate if we need to pull people from one position to another. We also inform the employees of the process.” Internal collaboration within the organization was just as important as collaborating with external supply chain partners. P2 noted, “Communication is the critical piece that goes across all facets in terms of internally externally. If our goal for everybody is to find a customer with professionalism, uninterrupted product flow, then communication becomes more critical than anything out there.”

Collaborative supply chain practices can only improve operational performance when the information shared is of high quality and shared throughout the supply chain (Wiengarten, Humphreys, Cao, Fynes, & McKittrick, 2010). Moreover, the degree of collaboration among supply chain partners is dependent upon the degree to which supply chain partners share trust (Lai & Woodside, 2015). P6 noted, “We went out with communications from a sales level to our customers, so our customers had information on where we were with the situation and that things could be delayed.” P1 also noted the importance of sharing information throughout the supply chain: “Our home office makes

the communication to our customers regarding where our branch is going to be and that we are shifting from a one-day service model to a two-day service model temporarily.”

Collaborative activities such as joint relationship efforts, information sharing, and mutually created knowledge can increase supply chain resilience (Scholten & Schilder, 2015). P3 noted,

UPS is our primary carrier. We partner with them to come up with certain solutions to try to identify our packages and get them priority to move through their network quicker. This will assist us in avoiding competing with retail shipments because our freight needs to be delivered next day, as it is health care products.

The influence trust has on collaboration in information sharing and risk sharing affects logistics efficiency (Ha, Park, & Cho, 2011).

In applying RDT principles to Theme 1, the outcome of the data related to RDT, as the level of trust within the supply chain influences how organizational leaders respond to the supply chain disruption (Bode et al., 2011). Organizational leaders can reduce the impact of a disruption by being ready to deploy a collaborative, timely, and effective response (Sheffi, 2015). Participants’ responses to the need for supply chain managers and partners collaborating to minimize the impact of supply chain disruptions are in Table 3.

Table 3

*Collaboration*

Open-ended question	No. of participant responses ( $N = 6$ )	% of participant responses
1	5	45
2	2	18
3	1	9
4	0	0
5	2	18
6	1	9

**Theme 2: Disruption Precursors**

The second emergent theme, based on Interview Question 6, pertained to what type of precursors, if any, supply chain managers identified when the disruption occurred. Detecting disruptions before they occur is sometimes not possible. Three of the six participants (50%) expressed their experiences with identifying precursors prior to a disruption. P1 stated, “Most supply chain disruptions that we have are unanticipated.” P2 noted, “When the system goes down, there is no warning. One moment we are processing orders and the very next second there is an issue and the system goes down. There is no signal or precursor to this happening.” Organizational leaders can increase supply chain resiliency by improving the ability to detect and respond to disruptions quickly (Sheffi, 2015).

P2 noted, “Our suppliers would just come back every now and then and say, we cannot give you 100% of your demand. You are down to 90%. As that number went down, we started getting a little bit more concerned.” A connection exists between operational responsiveness to a disruption and organizational performance, thereby



indicating supply chain efficiency is a precursor to disruptions (Hallavo, 2015). Thus, if the supply chain is not functioning efficiently, disruptions are more likely to occur.

P4 noted,

You can put preventive action steps in place, whether that is a maintenance plan or whether that is a checklist. But that still doesn't mean precursors can be identified prior to a disruption occurring. Failures are going to happen no matter how you have prepared yourself and steps you to take to prevent them. Failures are going to happen.

In applying NAT to Theme 2, the outcome of the data related to NAT in that accidents or disasters, although not wanted, are inevitable because of the complexity of systems (Cooke & Rohleder, 2006). Participants' responses to what type of precursors, if any, supply chain managers identified when the disruption occurred are in Table 4.

Table 4

*Disruption Precursors*

Open-ended question	No. of participant responses ( $N = 6$ )	% of participant responses
1	0	0
2	2	50
3	1	25
4	0	0
5	1	25
6	0	0

**Theme 3: Identifying and Assessing Impact of Disruptions**

The third emergent theme, based on Interview Questions 3 and 9, pertained to identifying and assessing the impact of disruptions to the distribution center. After supply chain managers have identified difficulties, then supply chain managers can design and

implement strategies to achieve desired results (Tanco, Jurburg, & Escuder, 2015). The documents reviewed related to policy, procedure, and business continuity planning at the warehouse distribution center located in Jacksonville, revealed that Florida has a quality management system maintained through quality policy, quality objectives, corrective and preventive action, and management review. The policy and procedure manual included processes and procedures to ensure the availability of resources and information necessary to achieve planned results. These processes include reviewing (a) average monthly service sales, (b) vendor fill rates and purchase order completion times, (c) vendor products to ensure the licenses held are correct, and (d) private label contracts.

Five out of six participants (83%) provided comments to support the theme of identifying and assessing the impact of disruptions to the warehouse distribution center.

P1 noted,

First, if there is a power outage only for a few hours, we pull the orders in the building and start making phone calls to our branches to let them know that we are out of service. If it is a longer term disruption and we are out of service for 24 hours or more, we send our orders to a different distribution center.

P2 noted, “We used UPS quantum view to pull reports for all of our shipments, and put pivot tables on them to make it easier to segregate which reports were potentially affected.”

The lack of coherent and integrated logistics strategies such as transportation and distribution infrastructure and procurement strategies undermines logistics performance (Thompson, 2015). P3 noted, “Last holiday season, we had hundreds of packages that

were delayed because the carriers were so overwhelmed with shipments from Black Friday and Cyber Monday that several hundreds of shipments were delayed in the network.” In addition, P4 noted,

We had an infrastructure issue. Our conveyer system is run by a third party. A third-party software company runs the actual brains of the conveyer. We recently upgraded the system in preparation for implementation of a new warehouse management system. The system failed and the person responsible for off-site 24-hour support was traveling at the time, so we were down for approximately 12 hours.

Being able to respond to unanticipated changes and handle external disruptions smoothly is an objective of supply chain agility (Charles, Lauras, & Van Wassenhove, 2010). P1 stated, “When the disruption occurred, we just kind of stepped back and evaluated what was happening and then determined what the best process was for us to respond.” P4 noted, “One of the things we did was to identify that we need to have a better agreement for service with third party providers.” In addition, P5 noted, “When the system goes down, we cannot print out any invoices and that puts us behind. If our trucks don’t meet certain times, it is considered a service failure.” When the disruption occurred, P6 stated, “From a performance situation, we had to actually process orders twice instead of processing it once.”

In applying RDT principles to Theme 3, the outcome of the data related to RDT in that large organizations are often in interactive, complex, and tightly coupled supply chains and have more employees involved in managing and communicating with

different departments, suppliers, and customers, which makes it difficult to identify areas of potential vulnerability (Wagner & Neshat, 2012). The survival of an organization is dependent upon its leaders' ability to acquire critical resources on a long-term basis (Wolf, 2014). Disruptions delay needed resources in the network. Participants' responses to identifying and assessing the impact of a disruption are in Table 5.

Table 5

*Identifying and Assessing Impact of Disruption*

Open-ended question	No. of participant responses ( $N = 6$ )	% of participant responses
1	8	30
2	0	0
3	3	11
4	5	19
5	6	22
6	5	19

**Theme 4: Resources Used to Minimize Impact of Disruption**

The fourth emergent theme, based on Interview Question 2, pertained to what type of resources supply chain managers used to minimize the impact of the disruption that occurred. This theme related to RDT in that organizational leaders can link customer and supplier relationships to reduce uncertainty surrounding their operating environment (e.g., Carter & Rogers, 2008). P1 noted, "We used the vendor supply, and where there was greater demand, we used our internal supply." P2 noted, "We used buyers, regulatory sourcing, and alternative supply." In addition, P3 noted, "We try to improve upon the process and previous experience by staying in tune with the news and health of the industry."

Some disruptions occur because of the lack of resources available. Natural resource scarcity is growing and is having a major impact on organizations and the supply chain industry (Bell et al., 2013). Moreover, the growing scarcity of global resources will drive supply chain disruptions, thereby placing all countries under stress (Bleischwitz, Johnson, & Dozler, 2014). When disruptions occur, supply chain managers use people as resources to mitigate the impact of the disruption. P4 noted, “When the disruption occurred, we added two additional employees from another department to manually sort the products.”

P5 noted, “The resource that we needed was not in our actual warehouse. Our IT department at our corporate office worked on the system issue and notified our distribution center when the issue was resolved.” According to documents reviewed related to policy, procedure, and business continuity planning, when a critical component of the distribution center’s information system fails, resulting in the disablement of order processing, the event receives critical priority by the IT support department. Moreover, according to RDT, logistics relationships can control logistics resources in an attempt to manage uncertainty, which leads to higher relationship quality and lower occurrences of disruptions (Chu & Wang, 2012). P6 noted, “We rerouted containers to an East Coast port and also Canada. This contributed to extra functions requiring additional labor to accept those containers.” Participants’ responses to resources that can help to minimize the impact of a disruption are in Table 6.

Table 6

*Resources Used to Minimize Impact of Disruptions*

Open-ended question	No. of participant responses ( $N = 6$ )	% of participant responses
1	3	38

2	1	13
3	1	13
4	1	13
5	1	13
6	1	13

### **Theme 5: Strategies to Mitigate Disruptions**

The fifth emergent theme, based on Interview Questions 10, 11, and 12, pertained to what strategies supply chain managers used successfully to mitigate disruptions. All participants shared experiences of successfully mitigating disruptions by implementing different strategies. P1 noted, “When the disruption occurred at our Jacksonville, Florida, distribution center, we grouped our orders by branch, placed them on a straight truck, and transported them to Atlanta for the sales representative to actually distribute the products to the customers.” P2 noted, “When a disruption occurs, we make the necessary changes to make sure that we make the service every day.” P6 noted, “We moved some of our shipping functions from a distribution center on one coast to a more central distribution center so we could route those outbound shipments through a different avenue to get those out of the country.”

Maintaining capacity flexibility for an organization during noncrisis times can be a difficult and costly decision, but could result in a positive return on investment during times of crisis (Hittle & Leonard, 2011). P1 noted, “We try to keep 6 months of inventory on hand.” P2 noted, “We have a sourcing person who goes out and looks at things from a more global basis than we normally do to determine who else is making the product that we need.” P3 noted, “We keep large quantities of product so that we do not run out of them.” P4 noted, “Outside of the normal mitigation plan, when we know what is going to

happen, such as severe weather, we keep a 6-month supply on hand to deal with foreseen supplier disruptions that we know are going to happen.” Strategic inventory reserves can be an effective supply disruption mitigation policy (Son & Orchard, 2013). P5 stated, “Because everything we ship fits in such a small box, we are able to keep large inventories on hand in a small place.”

Theme 5 related to RDT and NAT in that supply chain disruptions are more likely to occur in complex supply chains, thereby inhibiting organizational leaders’ ability to acquire external resources. According to the NAT, reducing inventory level while eliminating interactive complexity will make problems more visible and lead to fewer disruptions (Marley et al., 2014). Moreover, decreasing the level of interactive complexity under conditions of tight coupling can contribute to an organization being less susceptible to a supply chain disruption (B. Yang & Yang, 2010). Participants’ responses to the strategies used to mitigate disruptions are in Table 7.

Table 7

*Strategies to Mitigate Disruptions*

Open-ended question	No. of participant responses ( $N = 6$ )	% of participant responses
1	14	58
2	2	8
3	2	8
4	4	17
5	1	4
6	1	4

**Theme 6: Supplier Relationships**

The sixth emergent theme, based on Interview Questions 4, 8, and 9, pertained to having supplier relationships within the supply chain to mitigate supply chain disruptions.

Three of the six participants (50%; P1, P2, and P4) shared their views on supplier relationships being effective in mitigating disruptions, and the remaining three participants (50%; P3, P5, and P6) provided no response. P1 noted, “We have two different suppliers that we purchase from. One is a direct manufacturer and the second one is a wholesaler. We want to be good partners to our suppliers and not make them our last supplier.” P2 noted,

When the disruption occurred, we went right back to our suppliers and asked for any information they could provide. We also did research with our sourcing team and our regulatory team. We also went back to our supplier and discussed how long they expected the supply disruption and if there were any cost price changes coming down.

P4 noted, “We depend on them to supply the service to our end customer. Consistent and dependable suppliers are vital in mitigating disruptions.”

Sharing information among supply chain partners can be a deterrent to unethical behavior and foster increased commitment and long-time satisfaction with supplier relationships (Eckerd & Hill, 2012). According to the documents reviewed related to policy, procedure, and business continuity planning for the warehouse distribution center located in Jacksonville, Florida, staff in the purchasing department create and maintain supplier relationships. Employees in the purchasing department conduct an inventory assessment daily and purchase products to ensure service levels from the distribution centers meet or exceed customer expectations. Disruptions affect supply chain relationships.



The results collected from interviews with supply chain managers who routinely work with suppliers indicated successful relationships with suppliers are those that involve collaboration that leads to an inexpensive resumption of operations (Porterfield, Macdonald, & Griffis, 2012). Strategic supplier partnerships can foster a relationship between an effective supply chain strategy and supply chain responsiveness (Qrunfleh & Tarafdar, 2013). Participants' responses to having supplier relationships within the supply chain to mitigate supply disruptions are in Table 8.

Table 8

*Supplier Relationships*

Open-ended question	No. of participant responses ( $N = 6$ )	% of participant responses
1	3	33
2	5	56
3	0	0
4	1	11
5	0	0
6	0	0

**Applications to Professional Practice**

The findings in this study indicated supply chain managers of warehouse distribution centers have a strong need for strategies to mitigate supply chain disruptions. A supply chain disruption is an unexpected occurrence of an event that affects the availability of supply sources and can cause an interruption of the operations of other members in the supply chain (Son & Orchard, 2013). Supply chain disruptions can have a serious financial impact. For example, many companies worldwide had to suspend or halt production because of parts shortages when a tsunami hit Japan in 2011, which resulted in over \$300 billion in property damage and economic loss (Chakravarty, 2013).

A lesson learned through this study was that supply chain managers can use a variety of strategies to mitigate disruptions in the supply chain. Supply chain managers can implement an inventory strategy that encompasses maintaining 6 months of inventory on hand to mitigate supplier disruptions. Moreover, supply chain managers can also develop a strong line of communication among supply chain partners by having frequent meetings. A disruption may occur in a supply chain for various reasons, cause warehouse distribution centers to be unable to meet customer demand, and result in poor performance and loss of profit. Most supply chain managers are aware of the potential impact disruptions may have on performance, but do little to mitigate their impacts (Chopra & Sodhi, 2014). A strong supply chain has disruption and disaster strategies and capabilities (Scholten, Scott, & Fynes, 2014).

The intent of this study was to explore strategies supply chain managers of a warehouse distribution center used successfully to mitigate supply chain disruptions. The themes and shared experiences of the participants might help to increase company sustainability and reduce the impact of supply chain disruptions in other warehouse distribution centers. All participants had experienced success mitigating supply chain disruptions.

This study involved looking at strategies that supply chain managers successfully used at a warehouse distribution center to mitigate disruptions. Based on a wide range of responses, with percentages ranging from 5% to 33%, supply chain managers of warehouse distribution centers could use the findings and recommendations from this study to improve and implement supply chain disruption strategies, such as collaborating

with supply chain partners to minimize the impact of disruptions in the distribution center, using resources to minimize the impact of disruptions, and having supplier relationships within the supply chain to mitigate disruptions. The results of this study may add to the existing body of literature covering topics such as disruptions in supply chains, strategies to mitigate disruptions, and supply chain efficiency.

### **Implications for Social Change**

Supply chains are vulnerable to disruptions, and no organization can operate in a completely secure environment without risks (Jereb et al., 2012). Moreover, the role of supply chain managers has grown into managing more complex supply chains defined by continually changing, expanding, and often uncertain business environments (Manuj & Sahin, 2011). Therefore, it is vital for supply chain managers to be aware of possible strategies they can implement to mitigate supply chain disruptions.

The benefits of social change from implementing the findings in this study may include the opportunity for supply chain managers of warehouse distribution centers to minimize the impact of supply chain disruptions. The results of this study could provide a basis for supply chain managers to develop and implement supply chain disruption strategies that could minimize the negative effects disruptions have on their organization's profitability and performance. Supply chain managers may use the study findings to facilitate mitigation capabilities when a disruption occurs, with the results leading to returning things to a predisruption environment (Hilmola & Lorentz, 2012). In addition, supply chain managers can work with other supply chain partners to minimize the impact disruptions can have on the supply chain, thereby ensuring products will

continue to move through the supply chain processes and ultimately reach the end consumer. Social change can come from business leaders who are able to maintain and sustain their businesses after a supply chain disruption and allocate the right amount of resources to avoid the risks with the greatest probability for disrupting their supply chains that can cause the greatest losses.

### **Recommendations for Action**

Results of this study indicated that supply chain managers can successfully use different strategies to mitigate the impact of supply chain disruptions. These include collaborating with other supply chain members to minimize the impact of disruptions, identify disruption precursors, and use the resources on hand to minimize the impact of disruptions. The business problem addressed in this study was that many supply chain managers in warehouse distribution centers have limited strategies to mitigate disruptions in supply chains. Participants in this study addressed a variety of strategies used to minimize the impact of disruptions that occurred at their distribution center. A review of the findings led to the following recommendations for action:

1. Supply chain managers should cultivate a strong line of communication with internal and external supply chain partners through quarterly meetings and conference calls predisruption and more frequently postdisruption.
2. Supply chain managers should initially identify and assess the impact of a potential disruption and then determine what method and to whom they should disseminate the information to prescribe the appropriate response.

3. Supply chain managers should formulate written protocol regarding policies, procedures, and business continuity planning in the event a supply chain disruption occurs. This protocol should include specific steps to take when a disruption occurs.
4. Supply chain managers should review existing processes and procedures to ensure the mitigation of all potential disruption precursors.
5. Supply chain managers should make use of all available resources, not limited to reserve inventory, to minimize the impact of supply chain disruptions.

Results from this study contribute to the body of knowledge related to supply chain disruptions. I intend to further share the results through publication in peer-reviewed journals related to logistics, such as the *Transportation Journal*, *Journal of Supply Chain Management*, and *Journal of Operations and Supply Chain Management*. I also intend to publish the results of my study on professional logistics websites such as the Council of Supply Chain Management Professionals and Logistics World: The Worldwide Directory of Transportation.

### **Recommendations for Further Study**

In this qualitative exploratory case study, I explored how supply chain managers of a warehouse distribution center successfully employed strategies to mitigate supply chain disruptions. I selected the case study method to collect and analyze qualitative information from supply chain managers of a distribution center. I used a single warehouse distribution center to collect data.

Future supply chain disruption studies could involve comparing or addressing disruption mitigation strategies that were successful with disruption mitigation strategies that were not successful for two different warehouse distribution centers. Participants in subsequent supply chain disruption studies may corroborate theme development beyond telephone interviews used in this study. In addition, researchers should identify methods for identifying disruption precursors in the supply chain. This information could be helpful to supply chain managers, as it might contribute to minimizing supply chain vulnerabilities and possibly result in disruptions occurring less frequently.

### **Reflections**

The focus of this study was exploring strategies supply chain managers of a warehouse distribution center used successfully to mitigate supply chain disruptions. Prior to starting this study, I had no preconceptions regarding the efficacy of strategies to mitigate supply chain disruptions. Although I have worked as an instructor in a supply chain management program, I have no personal or professional experience in developing strategies supply chain managers can use to mitigate disruptions in a warehouse distribution center.

I conducted the research with the intent of refraining from any personal biases. Warehouse distribution managers provided me with names and contact information of potential participants. I sent potential participants an invitation to participate in the study, along with the informed consent form that described the intent of the study. Upon receiving participants' consent to participate in the study, I scheduled interviews, and each participant answered the 12 open-ended interview questions. I transcribed the data

from participant interviews and used Atlas.ti qualitative data analysis software to code data and explore themes from participants' responses. Upon completing the study, I realized supply chain managers of warehouse distribution centers can successfully use different strategies to mitigate the impact of disruptions in the supply chain.

### **Summary and Study Conclusions**

The strategies supply chain managers can use to mitigate supply chain disruptions in warehouse distribution centers come at a time when disruptions are occurring more frequently in changing supply chains. Changes are highly likely in uncertain business environments and contribute to volatile supply chains (Tiwari, Tiwari, & Samuel, 2015). Supply chain disruptions are not completely preventable. However, supply chain managers can take measures to ensure products continue to move through the supply chain and ultimately reach the end consumer.

In this study, I analyzed data from six participants that included two women and four men. In addition, I reviewed company documents related to policy, procedure, and business continuity planning. Six themes emerged from the data. The themes most prevalent were identifying and assessing the impact of disruptions (33%), strategies to mitigate disruptions (29%), and collaborating to minimize the impact of disruptions (13%). The responses from participants, along with documents received related to policy, procedure, and business continuity planning, led me to conclude supply chain managers of warehouse distribution centers can successfully employ strategies to mitigate the impact of disruptions in the supply chain and improve business practice.

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## Appendix A: Interview Protocols

Participants will be emailed a copy of the informed consent form constituting their willingness to participate as an unpaid and uncompensated volunteer. Participants will be given at least 24 hours to review the informed consent form and decide if they want to participate in the study by responding to the email as such. The following steps provide the structure and procedure protocols for the interview:

- 1) Send each participant an invitation letter with calendar days and available times to confirm the face to face interview.
- 2) Prior to starting the interview, ask the participant for permission to begin the audio recording.
- 3) If participant agrees to the audio recording, move on to step 4. If not, move to step 7.
- 4) Begin the audio recording
- 5) Welcome each participant with these opening remarks: *“Hello, My name is Johnny Bowman, Jr. and I am a Doctoral student at Walden University. Thank you so much for volunteering to participate in this study. “The total time for this interview should be about 30-45 minutes.”*
- 6) If the participant decides not to give their permission to do an audio record of the interview: *“Thank you (participant’s name), I respect your decision. I need to take written notes of your responses to capture your perceptions about what strategies you use to mitigate supply chain disruptions. The interview may require*

*an additional time commitment to ensure I write your responses accurately. Are you still willing to participate?"*

- 7) Assure the participant that all responses will be confidential to protect the privacy of the participants and reduce the possibility of identification:  
*"(Participant's name) all of your responses are confidential and the published doctoral study will not include any recognizable information in order to protect your identity."*
- 8) Check to make sure they received an email copy of the written informed consent form. "Did you receive the document? The consent form includes; a) the Walden Institutional Review Board (IRB) number for this study, b) an email address for the Chair of my Doctoral Study Committee, and c) an email contact for the IRB if you have additional questions beyond this interview about the nature and purpose of this study."
- 9) *Are you still willing to participate?"*
- 10) Explain the study's purpose and interview procedure: *"The purpose of this study is to explore strategies supply chain managers in warehouse distribution centers use to mitigate disruptions in supply chains."*
- 11) *"The format for this interview is open ended questions. Please feel free to add clarifying remarks you deem appropriate to express your view."*
- 12) Statement of consent and option to withdraw from the interview process:  
*"(Participant's name) this interview is voluntary and you may decline to answer any question that makes you feel uncomfortable. Additionally, you may withdraw*



*your consent at any time, during this interview (given by you) and all notes, references, and recorded information previously collected enters a destruction process. Your withdrawal does not impose any reprisal or negatively affect your professional standing.”*

- 13) Begin asking the interview questions.
- 14) After participant answers all questions, “Thank you (participant’s name ) again for your willingness to participate in the study.”
- 15) Advise participant that they will receive a copy of the transcribed interpretation of the audio recording. “(Participant’s name), I will send you a copy of the transcribed notes from this audio recording. Once you receive the document, please review it for accuracy, then sign the document, and return it using the email address johnny.bowmanjr@waldenu.edu. Thank you again for your time and sharing your wisdom.”

## Appendix B: Interview Questions

1. Please describe a recent disruption your warehouse distribution center faced.
2. What resources were needed to minimize these disruptions?.
3. Describe how the disruption impacted your warehouse distribution center.
4. Describe how logistics relationships with suppliers impact your warehouse distribution center's performance.
5. What data did you gather from the supply chain disruption as it was occurring?
6. What types of precursors, if any, were identified when the disruption occurred at your warehouse distribution center?
7. How did you respond to the disruption at your warehouse distribution center?
8. What type of collaboration, if any, was used to minimize the disruption?
9. How did the disruption impact your internal and external supply chain relationships?
10. What strategies did you used to mitigate the supply chain disruption you described?
11. What other strategies have you used to mitigate other supply chain disruptions at your warehouse distribution center?
12. What other information (if any) would you like to share concerning how you mitigate supply chain disruptions?

## Appendix C: Informed Consent Form

### INFORMED CONSENT FORM

This study is being conducted by a researcher named Johnny Bowman, Jr., who is a doctoral student at Walden University. You are invited to take part in a research study of understanding strategies for mitigating supply chain disruptions. The researcher is inviting supply chain managers to participate in the study. The inclusion criteria for this study is as follows: Current or past work experience as a manager in a warehouse distribution center, who has experienced success mitigating supply chain disruptions. This form is part of a process called “informed consent” to allow you to understand this study before deciding whether to take part.

#### **Background Information:**

The purpose of this study is to explore strategies for mitigating supply chain disruptions.

#### **Procedures:**

If you agree to be in this study, you will be asked to:

- Interview for approximately one hour and answer interview questions.
- Interviews will be audio recorded.
- Review data collected from interview with the interviewer to ensure what you meant was recorded correctly (member checking).
- A summary of research results will be provided to participants/organization.

#### **Voluntary Nature of the Study:**

This study is voluntary. Everyone will respect your decision whether or not you choose to be in the study. No one in the organization will treat you differently if you decide not to be in this study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

#### **Risks and Benefits of Being in the Study:**

There is no foreseeable risk to you by participating in this research. The results of this study may possibly be beneficial to your organization by providing insight into strategies that can be used to mitigate supply chain disruptions. Being in this study would not pose risk to your safety or wellbeing. If any criminal activity or any illegal information is disclosed during the research procedure, I am obligated to report such information to the proper authorities.

**Payment:**

There is no cost involved in this study for you. I am unable to compensate your efforts, though I appreciate and thank you for participation.

**Privacy:**

Any information you provide will be kept in a locked storage container for 5 years, and then destroyed at the end of the storage period. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept for a period of at least 5 years, as required by the university.

**Contacts and Questions:**

You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone number 904-463-5800 or email at johnny.bowmanjr@waldenu.edu. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 612-312-1210. Walden University's approval number for this study is **IRB will enter approval number here** and it expires on **IRB will enter expiration date.**

The researcher will give you a copy of this form to keep.

**Statement of Consent:**

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By replying to this email with the words "I consent," I understand that I am agreeing to participate in the study and to the terms described above.

## Appendix D: Introductory Letter

Date

[name of person]

[title of person]

[Address of company]

RE: Permission to Conduct Research Study

Dear

I am writing to request permission to conduct a research study with your employees. I am currently enrolled in the doctor of business administration (DBA) program at Walden University, and I am in the process of writing my doctoral thesis. The study is Strategies For Mitigating Supply Chain Disruptions. I hope that you will allow me to recruit 5 individuals from your company to participate in semi-structured interviews (please see attached interview questions). Interested employees, who volunteer to participate, will be given a consent form to be signed (see attached) and returned to me at the beginning of the research process.

The interview process should take no longer than 30-45 minutes. The interview results will be pooled for the thesis project and individual results of this study will remain absolutely confidential. Should this study be published, only pooled results will be documented. No costs will be incurred by either your organization or the individual participants.

Your approval to conduct this study will be greatly appreciated. I will follow up with a telephone call next week and would be happy to answer any questions or concerns that you may have at that time. You may contact me at my email address: xxxxx My chair, Dr. Marilyn K. Simon, can be reached at: xxxxxxxx or through email: xxxxx. You can also contact Walden's IRB at [IRB@waldenu.edu](mailto:IRB@waldenu.edu).

If you agree, kindly complete the PRN form on the next page, in the enclosed self-addressed envelope. Alternatively, kindly submit a signed letter of permission on your institution's letterhead acknowledging your consent and permission for me to recruit employees at your company.

Premises, Recruitment and Name (PRN) Use Permission

I hereby authorize Johnny Bowman,                     , Jr., a doctoral student of Walden University, to recruit subjects for participation in a study entitled Strategies for Mitigating Supply Chain Disruptions.

I hereby authorize Johnny Bowman, Jr., a student of Walden University, to use the premises (facility identified below) to conduct a study entitled Strategies for Mitigating Supply Chain Disruptions.

\_\_\_\_\_  
Signature

  /  /    
Date

\_\_\_\_\_  
Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address of Facility

\_\_\_\_\_

## Appendix E: Interview Guide

This interview guide contains an introduction, set of questions and closing comments.

### **Introduction**

I want to thank you for taking the time to meet with me today. My name is Johnny Bowman, Jr. and I would like to talk to you about your experience using strategies to mitigate supply chain disruptions. Participating in the interview should take approximately one hour. With your permission, I will tape the session so I don't exclude any of your comments. Please be sure to speak clearly and loud enough so that your comments can be understood. All responses will be kept confidential. I will ensure that any information included in the report does not identify you as the respondent. Remember, you don't have to discuss anything you don't want to and you may end the interview any time. Do you have any questions about what I have just explained? Are you willing to continue the interview?

The digital audio recorder will be turned on and I will begin asking the approved interview questions to the participant.

### **Documenting Comments**

[For note taking, comments or questions will be labeled "I" for interviewer and "P" for participant].

### **After the interview**

I will send you a copy to review. Once you have agreed to the accuracy of the transcript, I will begin my analysis. I would like to thank you for your participation in my study. I will provide you with a 1-2 page summary of the results. A 1-2 page

summary of the results will also be provided to the organization. A complete copy of the study will be provided to the organization upon request.