

**Exploring the causes of
delivery delays in a supply
management company in
Gauteng**

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the degree *Master of Business
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University

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DECLARATION

I, Aviwe Veronica Layini, hereby declare that the Mini-dissertation that I am submitting to North-West University in partial fulfillment of the requirements for the Master of Business Administration (MBA) degree is my own original work, that it has been text-edited in accordance with professional communication standards, and that it has not previously been submitted to any other institution for evaluation purposes.

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ABSTRACT

In the dynamic landscape of supply chain management, the ability to deliver products on time is crucial for the success and sustainability of any organisation. This study, employing a case study design, explored the intricate web of factors contributing to delivery delays within Nucleus Supply Management, a prominent supply management company based in South Africa, during a disruptive period. The investigation aimed to identify and analyse the multifaceted causes behind the observed delays, shedding light on the challenges faced by both the organisation in maintaining a seamless supply chain and customers.

The study employed a comprehensive research methodology, namely a qualitative approach to gather data from employees and customers of Nucleus Supply Chain Management. Through interviews with customers and employees, analysis of internal records, and examination of industry trends, the research sought to uncover the root causes of delivery delays during a period characterised by disruptions, such as economic fluctuations, natural disasters, international conflicts, and local challenges.

The findings reveal a myriad of factors contributing to delivery delays of different goods and products in the supply and chain management sector, ranging from international conflicts, natural disasters, and local economic and infrastructure challenges. Furthermore, the case study examines the strategies employed by Nucleus Supply Management to mitigate the impact of these challenges. Through a comparative analysis of successful and unsuccessful interventions, the research identified best practices and lessons learned, providing valuable insights for other supply chain entities grappling with similar disruptions.

The implications of this study extend beyond Nucleus Supply Management, serving as a relevant reference for supply chain professionals, academics, and policymakers grappling with the complexities of managing deliveries in disruptive periods. By understanding the intricate interplay of factors affecting delivery timelines, organisations can develop proactive strategies to enhance their resilience and responsiveness in the face of unforeseen challenges. This research contributes to the growing body of knowledge in supply chain management, offering practical

insights for navigating the complexities of a dynamic and uncertain business environment.

Keywords: Supply chain management, Disruptive period, Delivery delays, Logistics, Customers and Employees, international conflicts, natural disasters, and infrastructure challenges.

TABLE OF CONTENTS

CHAPTER 1: NATURE AND SCOPE OF THE STUDY	1
1.1 Introduction	1
1.2 Background to the Study	1
1.3 Definition of terms	2
1.4 Problem Statement	3
1.5 Research Objectives	4
1.5.1 Primary Objective	4
1.5.2 Secondary Objectives/theoretical objectives	4
1.6 Research questions	5
1.7 Scope of the Study	5
1.7.1 Delimitation	5
1.7.2 Field of the Study	5
1.8 Research Methodology and Design	6
1.8.1 Literature Review	6
1.8.2 Empirical Study	6
1.8.3 Research paradigm	7
1.8.4 Research Approach	7
1.8.5 Research Design	7
1.8.6 Research Methodology	8
1.8.7 Methodological choice	8
1.8.8 Research Strategy	9
1.8.9 Time horizon	9
1.8.10 Study population and sampling	9
1.8.11 Designing the measuring instrument	10
1.8.12 Collection of Data	11
1.8.13 Data Analysis	12
1.9 Trustworthiness	12
1.10. Ethical Considerations	13
1.11 Contributions of the Study	14
1.12 Limitations of the Study	14
CHAPTER 2: LITERATURE REVIEW	16
2.1 Introduction	16
2.2 Supply Chain Management	16
2.3 Supply Chain Management in South Africa	17
2.4 Nucleus Supply Chain Management	19
2.5 What is logistics?	19
2.6 Importance of Logistics	19
2.7 Delivery delays and costs	20
2.8 Delivery Delays in Logistics	21
2.9 Why delays in disruptive times	22
2.10 Causes of delivery delays in disruptive periods	22
2.11 Solutions	29
CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN	30
3.1 Introduction	30
3.2 Empirical Study	30
3.3 Research paradigm	30
3.4 Research Approach	31

3.5 Research Design.....	31
3.6 Research Methodology	31
3.7 Methodological choice.....	32
3.8 Research Strategy	33
3.9 Study population and sampling	33
3.10 Designing the measuring instrument.....	34
3.11 Collection of data	34
3.12 Pilot Interviews	35
3.13 Data Analysis	35
3.14 Trustworthiness.....	36
3.15 Ethical Considerations	36
CHAPTER 4: FINDINGS	38
4.1. Introduction	38
4.2. Demographic information	38
4.2.1. Job level.....	39
4.2.2. Highest qualification	40
4.2.3. Supply chain qualification.....	40
4.2.4. Work experience	41
4.2.5. Supply chain experience	41
4.2.6. Participant profile	41
4.3. Summary of themes	44
Research question	44
Theme.....	44
Sub-themes.....	44
Theme 1:	44
Experiences of delivery delays during this disruptive period	44
COVID-19	44
Ukraine War	44
Transport challenges.....	44
Floods	44
Social unrest	44
Theme 2:	44
The causes of delivery delays during this disruptive period	44
Inconveniences	44
Customer dissatisfaction	44
Theme 3:	44
Strategies to reduce delivery delays.	44
Collaboration.....	44
4.4. Theme 1: The causes of delivery delays during this disruptive period are related to the disruptions experienced.	45
4.4.1. COVID-19	45
4.4.2. Ukraine war	46
4.4.3. Transport challenges.....	47
4.4.4. Social unrests	47
4.4.5 Floods	48
4.5. Theme 2: There are specific challenges that threaten the sustainability of supply chain management.	49
4.5.1. Inconveniences	49
4.5.2. Production and delivery delays	51
4.5.3. Customer dissatisfaction	52

4.6. Theme 3: There are strategies that can reduce delivery delays.....	53
4.6.1. Collaboration.....	53
4.6.2. Diversifying	54
4.6.3. Alternative energy sources.....	55
4.6.4. Streamlining	55
4.6.5. Communication	56
4.6.6. Embracing technology.....	57
4.7. Chapter conclusion	58
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS	60
5.1 Introduction	60
5.2. Methodology.....	60
5.3. Conclusions from the primary study	60
5.3.1. Conclusion 1:	61
5.3.2. Conclusion 2:	61
5.3.3. Conclusion 3:	62
5.3.4. Conclusion 4	63
5.4. Limitation of the study	64
5.5. Recommendations	64
5.6. Conclusion	65
5.7. References.....	66
APPENDICES	75
APPENDIX A: ETHICAL APPROVAL LETTER	75
APPENDIX B: INFORMED CONSENT LETTER TO INTERVIEW PARTICIPANTS	77
APPENDIX C: INFORMED CONSENT TO COMPLETE SURVEY.....	80
APPENDIX D: INTERVIWE PROTOCOL	82

LIST OF TABLES

Table 1: Some restrictions imposed by the government during the COVID-19 pandemic	23
Table 2: Types of supply chain disruptions	28
Table 3: Profiles of participants from Nucleus Supply Chain Management.....	42
Table 4: Summary of themes	42

LIST OF FIGURES

Figure 1: Global Percentage of Ports with Less Shipment Movement, Week 15– Week 29, 2020.....	25
Figure 4.1: Job level of participants.....	39
Figure 4.2: Highest qualification of participants.....	40
Figure 4.3: Years of experience in Supply chain management	41

CHAPTER 1: NATURE AND SCOPE OF THE STUDY

Exploring the causes of delivery delays in a supply management company in Gauteng.

1.1 Introduction

Supply chain companies worldwide have made massive strides in enhancing the efficient and effective operations of the sector. They have tapped into technology to modernise the supply chain sector through initiatives like agile practices, online tracking of the movement of freight vehicles, and automated waybill printing systems, amongst others. However, these initiatives do not immunise supply chain companies against vulnerabilities like disruptions. Supply chain companies experience delivery delays that are accentuated during disruptive periods. This research explores the leading causes of delivery delays during a disruptive period.

1.2 Background to the Study

Supply chain management is responsible for the production, procurement, processing, and timely delivery of goods and materials from suppliers to customers. The rise of the global economy has increased the significance of supply chain management, particularly within companies focused on managing supply chains. Gunasekaran and Ngai (2012:688) suggest that operational management in both manufacturing and service enterprises has undergone significant transformations over the years to address the evolving requirements brought about by globalization. The increase in the volume of goods and materials that move regionally and internationally has pressured supply chain companies to deliver on time without any delays. Gunasekaran *et al*, (2003:689) additionally highlight that the utilization of information technology and the delegation of specific functions within operations management have had a profound impact on the successful and streamlined distribution of goods and materials.

These advancements have led to alterations in the structures of the transportation and logistics sectors. For example, supply chain companies facilitate international trade between countries. Trade between continents is commonplace, causing the shipment

of goods and materials worldwide to not always be efficient and on time (Ballou, 2004). Deliveries are often vulnerable to delays directly or indirectly linked to disruptions. Fundamentally, the globalisation of the global economy has amplified the flow of goods and materials facilitated by Nucleus Supply Chain Management. At the core of transportation and delivery lie logistics and operations management. The skilful merging of marketing, production, supply chain, and financial aspects with the intricacies of logistics, spanning from the supplier to the end consumer, is denoted as logistics management (Langley, 2009:17).

Deliveries conducted by logistics firms, both domestically and globally, don't always proceed without issues. Recent disruptions have clearly shown the vulnerability of supply chains to these disruptions. Research into the causes of delivery delays during disruptive periods is becoming increasingly prevalent.

1.3 Definition of terms

Delivery delays occur when the time taken for a delivery process exceeds the intended timeframe. Such delays frequently stem from factors like traffic congestion, interruptions in the supply chain, and challenges in loading and unloading operations (International Rail Journal, 2020). This term pertains to instances in which a purchaser or client does not receive the purchased goods or services by the mutually agreed-upon deadline.

Disruptive Period- Supply chain disruption management is an organised and continuous process to explore the effects of disruptions across the supply chain and to handle them from where they began to where they ended (Behzad, 2023).

Flexibility is the capacity of a company to adapt to alterations swiftly and effectively. Nevertheless, Winkler (2008:15) puts forward an alternative interpretation of flexibility, indicating it as an organization's capability to both anticipate and react to internal and external environmental influences, while also managing costs, to accommodate fluctuations in customer demand within a specified timeframe.

Logistics management- Logistics management is an element of supply chain management focusing on organising, executing, and regulating the streamlined and

productive transportation, inverse movement, and retention of commodities and services. It also encompasses the exchange of pertinent information between the source and the destination of consumption, aimed at fulfilling customer needs (Stock and Lambert, 2001).

Operations management- The actions, decisions, and responsibilities of managing the resources allocated to creating and delivering products and services are referred to as operations management (Li, 2014). This description encompasses every task associated with the progression from raw materials to finalised items, including assembly, testing, packaging, and maintenance.

Supply chain management - is a set of facilities, suppliers, customers, products, and controlling inventory, purchasing, and distribution methods. A supply chain is the collection of entities involved in developing new products and services, the acquisition of raw materials, their transformation into semifinished and finished goods, and delivering them to end users (Swaminathan, 2015).

Transportation involves the transfer of goods and services from one place to another. It connects any two steps of the logistics process, incorporating all transportation functions and sub-functions into a system of transporting goods.

1.4 Problem Statement

Late deliveries are common. Magagula, Meyer, and Niemann (2020:2–5) indicate that Europe, the Middle East, North Africa, and Asia all experience severe weather conditions as a source of disruption that causes delivery delays. Numerous research papers have emphasised that the commencement of delivery delays frequently originates from disruptions within the organization itself, like labour strikes, or external circumstances, such as natural calamities (Christopher & Peck, 2004:6; Sodhi & Lee, 2007:1430). However, there are constantly new disruptions, causing new kinds of delivery delays during these disruptive periods. These causes need further exploration. A difficulty that logistics firms encounter is their incapability to manage elevated customer requirements and a multitude of delivery demands amidst such a tumultuous period. When businesses fail to tackle delivery delays amid periods of disruption, they often face the prospect of a reduction in sales. Additionally, when

delays cause inconvenience to a customer, the customer's trust in the company will probably diminish. Hence, companies must confront the reasons behind delivery delays in times of disruption. Therefore, this investigation aimed to uncover the factors contributing to delivery delays amid disruptive periods.

Therefore, this study explored the causes of delivery delays in supply management during a disruptive period. This leads us to the following main research question: What causes delays in delivering goods to customers during disruptions?

1.5 Research Objectives

Research objectives are specific, measurable, and achievable goals or aims that guide a research study and articulate the intended outcomes or contributions to knowledge.

1.5.1 Primary Objective

The main aim of this research was to explore the predominant factors that contribute to delays in the transportation of goods to customers within the logistics sector.

1.5.2 Secondary Objectives/theoretical objectives

To comprehend how disruptions contribute to the occurrence of delivery delays by conducting a review of relevant literature.

1.5.3 Empirical objectives

- To empirically explore the causes of delivery delays at a specific logistics company in Gauteng; and
- To recommend ways to reduce delivery delays during disruptive periods.

1.6 Research questions

1. Do you experience delivery delays during this disruptive period?
2. What are the causes of delivery delays during the disruptive period?
3. What are the main disruptive challenges that threaten the sustainability of Supply Chain Management?
4. What are the possible mitigation measures that can be undertaken to reduce delivery delays during a disruptive times?

1.7 Scope of the Study

1.7.1 Delimitation

The study is case-study research. The research was limited to Nucleus Supply Chain and Management Company. The company has moved large quantities of goods and materials since its inception 25 years ago. As the study aimed to provide insight into the reasons for delivery delays, an exploratory design was employed. Therefore, the study focused on gaining insights into the causes of delivery delays at the company and its main customers. The research has been commissioned by the company so that it can use the findings to find alternative ways of mitigating the problem and building solid relationships and trust with its customers.

Adhering to a systematic approach is imperative for the research process. Additionally, it was essential to acknowledge that devising optimal methods to avert delivery delays, drawing from numerous global instances of disruption, fell beyond the study's scope. However, the study delved into the exploration of recommended best practices to mitigate delivery delays as perceived by respondents and subsequently provide recommendations.

1.7.2 Field of the Study

The field of study is supply chain management. The sector that was investigated is the transportation and logistics sector, and the study was carried out geographically in the Gauteng province, where the company and its most important local customers are situated. The company has branches scattered all over the country. Sampling

included, but not be limited to, customers of this company that are spread across South Africa.

1.8 Research Methodology and Design

Research Methodology

Research methodology refers to the systematic and logical framework within which research is conducted. It involves the theoretical analysis of the methods and principles used in the study. The primary purpose of research methodology is to provide a blueprint for conducting research in a structured and organised manner. It helps ensure the reliability and validity of the research findings.

Research Design

Research design is a blueprint or plan that outlines the overall structure and strategy of the research study. It is a framework that helps in achieving the research objectives. The main purpose of research design is to provide a systematic and logical structure for the research process. It helps ensure that the study is well-organised, efficient, and capable of producing meaningful results.

1.8.1 Literature Review

The study started with a literature review to describe the concepts investigated and examine existing studies on the issue under investigation. The researcher conducted a literature review for this research by searching journals, textbooks, newspaper articles, conference papers, Google Scholar, and other accredited academic sources.

1.8.2 Empirical Study

Hox and Boeijs (2005:593) suggest that gathering primary data for a particular issue should involve methods that are most suitable for addressing the research problem. The initial data needed was acquired through an empirical study focused on investigating the underlying reasons for delivery delays within the realm of logistics.

The empirical study's research framework for this investigation encompassed defining the research paradigm, research methodology, methodological selection, research

approach, timeframe, study population, and sampling methodology. It involved the creation of measurement tools, data collection, statistical analysis, and assessments of reliability and validity.

1.8.3 Research paradigm

Chilisa and Kawulich (2012:35) define a research paradigm as a lens through which the world is perceived, framing the focus of a study, and influencing how researchers approach it. A research paradigm can be defined as a methodology used to answer the question of how researchers obtain information about social reality. (Burrell & Morgan, 1979:1). Among the several paradigms available, positivist and interpretive paradigms stand out, particularly in the realm of social sciences. The positivist standpoint asserts that reality exists independently of individuals, guided by unchanging principles that our senses do not mediate. On the other hand, interpretivism is rooted in the belief that a single, verifiable reality does not exist beyond our sensory perception. Grix (2004:82) contends that interpretivism emerged in response to the predominant influence of positivism. For this study, an interpretive approach was adopted.

1.8.4 Research Approach

The research methodology outlines the way the research is conducted. According to Saunders et al. (2012:45), it is crucial to clarify the three main approaches employed in research: whether the study follows an inductive, deductive, and abductive route in its inquiry. In the present study, the investigation into the reasons behind delivery delays in supply management was conducted using the inductive research approach. This approach aligns with the interpretive research paradigm and involves the creation of a new theory by observing reality and collecting primary data, independent of existing theories (Saunders et al., 2016:14).

The research was guided by a qualitative approach.

1.8.5 Research Design

Mouton (2001:56) mentions that a research design is a framework that outlines how researchers plan to execute their research. The classification of the study depends on

whether the research employs empirical or non-empirical methodologies. The research design encompasses the complete research process, starting from defining a problem to crafting the narrative (De Vos, Stydom, Fouche, and Delport, 2005:268). This investigation was conducted utilizing a qualitative research design.

1.8.6 Research Methodology

This study employed a qualitative research approach as its chosen methodology. Qualitative research is built upon the premise that individuals possess profound insights into their societal experiences and employ this understanding to uphold stability and coherence in their daily engagements (Babbie & Mouton, 2001:30). The qualitative research method serves as a tool to delve deeper into the ever-evolving intricacies of human conduct.

Moreover, qualitative research is used to explore into distinctive human values, ideals, cultural inclinations, and norms. It enables the researcher to examine research participants within their personal and contextually meaningful social interactions. Additionally, qualitative research enables the researcher to comprehend reality, offering descriptions and explanations of the social sphere. This method empowers the researcher to formulate models and theories that provide insight. The objective of this qualitative research was to gather responses from diverse respondents regarding how delivery delays have impacted them and their respective companies. The choice of a qualitative approach is rooted in its ability to authentically capture the lived experiences of both customers and logistics companies.

1.8.7 Methodological choice

This research adopted mono-method qualitative research to get sufficient information on this topic to meet the research objectives. Qualitative research was chosen because of its ability to discover broader information by asking follow-up questions to gain more knowledge about the topic under investigation. Creswell (2014:32) explains that qualitative research is a method that is usually employed to investigate and comprehend the issue under study. Collecting primary data about the causes of delivery delays of goods and materials during disruptive periods can be best understood through discussions with people affected by the delays, such as

customers. This makes a qualitative method suitable for the researcher, as it allows the researcher to ask probing questions. (Starman,2013:61-66). Yin (2009) further contends that qualitative research delves deeply into an individual's viewpoint concerning the investigative context, procedures, and associations. In this study, a qualitative method looked deeply into the experiences and perspectives of workers and customers at Nucleus.

1.8.8 Research Strategy

Qualitative research strategies assist in understanding how a target audience behaves and thinks about a particular subject. This research conducted in-depth interviews with Nucleus customers and workers to understand the causes of delivery delays during disruptive periods. Qualitative research is founded on the belief that participants are aware of their lived experiences in societies (Babbie & Mouton, 2001:30).

In-depth interviews allowed for deeper engagement with the participants, allowing the researcher the chance to inquire further with the respondent to acquire specific details.

1.8.9 Time horizon

The time horizon refers to the duration of the future during which a planned action unfolds. In the context of this research, the time horizon signifies the timeframe necessary to conclude this study. Studies generally span either a long-term or short-term period. Research conducted over an extended duration is termed longitudinal, while a study conducted within a brief timeframe is known as a cross-sectional study. Consequently, this study utilised the cross-sectional research.

1.8.10 Study population and sampling

Target population: As stated by Creswell (2014:107), the target population refers to the potential pool of individuals who could be considered for inclusion in the research study. Accordingly, the target population for this investigation were Nucleus customers and employees. Bryman and Bell (2015:23) suggested that this targeted population comprises prospective participants, serving as the foundation for forming a sample to gather data. The selection of participants in this research was based on the service delivery lapses database of Nucleus. The service delivery lapses database of Nucleus

records daily delivery service lapses, including service lapses caused by delivery delays. Out of 40 Nucleus workers who worked in the customer service department and the deliveries and collections department, only 12 were selected. Moreover, out of 60 Nucleus customers who experienced service lapses, only 12 were selected for this research.

Sampling: The sampling technique refers to a system of choosing practical subjects or objects. For this research, a non-probability sampling technique were used. In non-purposive sampling, subjects have no equal chance of being selected. Specifically, in this study, purposive non-probability sampling was used to select participants. Purposive sampling requires the researcher to select participants based on the amount of knowledge they have about the topic. Purposive non-probability sampling was chosen because it permits the researcher to select information-rich participants for an in-depth study (Elfil, 2017:2). The researcher chose participants based on her discretion. The researcher chose participants who experienced delivery delays and are accessible to her for the study. Participants in this study were sampled as follows:

1. Participants must be permanent Nucleus Supply Chain Management employees or customers.
2. Participants must be willing to participate in personal or telephonic interviews.
3. Participants must be customers who experienced delivery delays during a disruptive period.

Sample Size: As per Alvi (2016:21), the sample size can be defined as the complete count of participants chosen through a preferred data-collection sampling method. Twelve participants were sampled from the service-delivery lapse database of Nucleus' customers and workers for this study. The researcher found it reasonable to choose 16 interview participants. However, after conducting twelve interviews, it was decided that saturation had been achieved.

1.8.11 Designing the measuring instrument

A semi-structured, in-depth interview guide were used to formulate the interview questions. The questions were designed specifically for each group of respondents participating in the inquiry. For example, specific questions were designed for Nucleus

customers and different questions for Nucleus employees. Some questions could overlap between these two sample groups. The open-ended and semi-structured interviews enabled respondents to express their experiences and delve into their underlying sentiments regarding the factors contributing to delivery delays within the logistics sector.

1.8.12 Collection of Data

Data collection took two months to complete. The interviews for the study comprised 12 face-to-face interviews and 4 Microsoft Teams meetings. Out of the 16 participants, 8 participants were Nucleus employees and 8 were Nucleus customers. The Microsoft Teams meeting was used where there were geographic constraints. The interviews with Nucleus workers were individually conducted in private at Nucleus's offices. The interviews took between 30 and 45 minutes. Participants were called and asked whether they were willing to participate, and a suitable time was arranged. At the interview, participants were asked to sign consent forms before the start of the interview. The data collection process was a single-stage process. The researcher also interviews 8 selected Nucleus customers. Four interviews took place at coffee shops that are nearest the customer's workplaces and the remaining 4 interviews were done through teams meeting. The interview guide was pre-tested using a pilot study with one participant to explore the chances of making any amendments. After the pilot study, there were no modifications required. The interviews were centred around the participant's experience of delayed deliveries and were audio-recorded on a cell phone for accurate transcription. The researcher also compiled notes on a notepad during the interview. The research participants' facial expressions, feelings, and body movements during the discussion were recorded on the notepad. The data collection process through semi-structured interviews provided research participants with the opportunity to elaborate extensively on the reasons behind delivery delays in supply management amid disruptive phases. According to Boyce and Neal (2006), conducting semi-structured, in-depth interviews grant the researcher flexibility to rephrase questions and probe for enhanced clarity.

The researcher transcribed all interviews. The audio and video recording collected during data collection were stored on the researcher's laptop and phone.

1.8.13 Data Analysis

The process of data analysis empowered the researcher to address inquiries or resolve the research issue. The data acquired from semi-structured interviews was analysed using thematic analysis. The researcher began the analysis by transcribing interviews, then uploading the transcripts to ATLAS.ti. The researcher then identified codes and grouped them. Cresswell (2014:243) asserts that codes are used to summarise the responses of participants and the meaning attached by the researcher. All 16 interview transcripts were individually coded and re-coded by the researcher to ensure that similar codes were grouped. This was done to increase the trustworthiness of the data. Once the individual coding was done, the codes were grouped to identify the main themes. The thematic analysis followed the following seven steps suggested by Yin (2016:220):

1. Data Collection
2. Data Familiarisation
3. Initial code generation
4. Themes Searching
5. Themes Reviewing
6. Naming and defining themes.
7. Writing up the analysis

1.9 Trustworthiness

Ensuring the reliability of data and findings stands as a fundamental pillar within any research endeavour. In this study, the credibility of the research was ensured by cross-referencing responses provided by respondents for consistency. Additionally, each transcript were coded re-coded, and linked to raw data to increase the trustworthiness of the results. The author also referred to the same query with participants twice to measure recurring themes. Validity is the foundation for examining the quality and soundness of research. The researcher also practised reflexivity to reduce research bias, thus improving trustworthiness.

1.10. Ethical Considerations

The researcher obtained the ethical approval to conduct the research from the ethics committee of Northwest University. Ethical considerations in research are a vital component of our everyday existence. They necessitate researchers to consistently uphold and preserve the respect and worth of those participating in the study. Fouka and Mantzourou (2011) also emphasize the importance of researchers ensuring the dignity of their subjects. The selection of the research topic for this study was done with careful consideration to prevent any compromise to the dignity of the research participants. The research topic delves into the factors behind delivery delays in the supply chain sector.

Furthermore, this study employed a qualitative approach. Qualitative research revolves around human interaction, particularly in aspects such as selecting research participants and gathering data. The researcher provided the consent forms. After signing consent forms, the respondents kept their copies. The copies provided evidence that the participants agreed to undertake the research process. Thus, it can be affirmed that the researcher consistently prioritized ethical considerations throughout all stages of the research, from its inception to its completion. The rights of the research participants stated in the attached informed consent form were respected.

During the data collection phase, the researcher initially introduced herself to the research subjects through the initial telephone interaction. The researcher transparently communicated the research's aims and objectives to the participants. This clear communication of the research's purpose provided participants with an understanding of what was anticipated from their involvement. This approach ensured that respondents engage in the research voluntarily.

Moreover, the researcher took responsibility for informing the participants about the confidentiality of their shared views and perspectives during data collection. The identities of the research participants would remain undisclosed when the findings are presented or documented. The data acquired throughout the data collection process was securely stored. Careful attention was given to the publication of the results to

guarantee the protection of participants' privacy and confidentiality, preserving their names and personal experiences undisclosed.

1.11 Contributions of the Study

Currently, there is a lack of compelling evidence to confirm the timely delivery of goods to customers within the supply chain sector during periods of disruption. Consequently, this study aimed to provide a comprehensive understanding of the factors that contribute to delivery delays amidst disruptive periods. By doing so, it intends to bridge the knowledge gap regarding the root causes of delivery delays. The investigation contributes new insights into curtailing delivery delays within the supply chain industry. Moreover, the knowledge produced through this research is beneficial for both the operations and management sectors in enhancing customer service delivery.

The objective of this study was to propose a more practical approach for ensuring the punctual delivery of goods to customers. For instance, only a few transport logistics companies currently communicate with customers regarding delivery delays. This research sought to devise pragmatic methods for effectively notifying customers about any impending delivery delays, potentially through timely messages or phone calls, thereby keeping them informed.

While the prevailing framework for customer deliveries has evolved, the supply chain industry has undergone significant transformation driven by globalization and unforeseen disruptions like the COVID-19 pandemic. This context necessitates a substantial alteration in the practical methods of delivery to mitigate delays effectively.

1.12 Limitations of the Study

In pursuit of discovering new knowledge about the causes of delivery delays, the research came across some hindrances. The chief limitation the researcher encountered is that the topic under study was carried out only with one supply chain company. There are many supply chain companies in South Africa and around the world. Therefore, the causes of delivery delays during disruptive periods experienced by a single company cannot necessarily be generalised to all supply chain companies operating in South Africa. Additionally, Nucleus operates mainly in Africa.

Other limitations, like time constraints, caused the researcher to conduct structured interviews with a limited number of people. Also, the language barrier hindered communication between the researcher and the research participants since they come from different backgrounds and speak other languages. Budget constraints are also another limitation that were experienced by the researcher, especially the money to buy airtime to call the research participants and organise interviews for data collection.

1.13 Layout of the Study Chapters

This inquiry comprised five chapters:

Chapter 1: Nature and Scope of the Study

Chapter 2: Literature Review and Theoretical Framework

Chapter 3: Research Methods and Design

Chapter 4: Presentation of Findings and Analysis

Chapter 5: Conclusion and Recommendations

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Delivery delays during disruptive periods have unintended consequences for both logistics companies and customers. Additionally, delivery delays during disruptive periods can have significant economic, social, and logistical implications. In the context of South Africa, the country continues to face various disruptive events. Moreover, gaining an understanding of the underlying causes of delivery delays during disruptive periods is crucial for implementing effective mitigation strategies.

2.2 Supply Chain Management

According to scholars like Kauffman (2002), and Kathawala and Abdou (2003:141), there appears to be little consensus about the definition of "supply chain management". However, Mentzer, DeWitt, Keebler, Min, Nix, and Smith (2001:18) define supply chain management as the systematic strategic coordination of traditional business functions to improve the long-term performance of individual companies and supply chains. Lu and Swaminathan (2015:3) define supply chain management as a set of entities that are involved in the design of new products and services, procuring raw materials, transforming them into semi-finished and finished products, and delivering them to end customers. The origins of supply chain management can be traced back to the early days of human civilisation when people first began trading goods and services. Globerson (2014:82) indicates that the roots of chain supply management started with the transportation of agricultural goods, which were transported from farms to markets. The early works of Adam Smith in the 18th century, where he discussed the concept of "division of labour" and the importance of efficient production processes, also highlight the historical origins of supply chain management. In the early 20th century, the rise of mass production and the assembly line led to the development of advanced supply chain management techniques and technology. For example, the use of standardised parts, materials management, and the implementation of just-in-time (JIT) inventory systems. The JIT philosophy emphasises the timely and efficient delivery of goods and services. It can be indicated that the concept of "supply chain management" started to get more attention in the 1980s and 1990s as companies started to grasp the necessity of integrating all

aspects of their supply chain operations. For example, from procurement, production, distribution, and delivery in the 1980s and 1990s, the emergence of new technology such as computers and the internet led to the development of new supply chain management systems, such as enterprise resource planning (ERP) software and electronic data interchange (EDI) systems. In the 21st century, the global nature of business and the increasing importance of sustainability have led to the development of new supply chain management practices. For example, in supply chain risk and green supply chain management the concept of "green supply chain management" emerged to mitigate the environmental impacts of supply chain operations. Additionally, e-commerce and digital technologies have been drastically changing traditional supply chain management practices and methodologies. Overall, it can be indicated that the evolution of supply chain management has been shaped by different perspectives and approaches developed by various researchers and practitioners in the field. For example, operations management, logistics, procurement, and information systems

However, it can be noted that the operations of the supply chain and management have not been smooth since their inception. There have been delays in the procurement, production, and delivery of goods and services. There are various causes and reasons behind delays in the supply chain and management sectors. Some delays are caused by natural causes, like floods. It can be indicated that some of the delays are caused by man-made challenges like strikes and civil wars. Additionally, for this research, the researcher explored the causes of delivery delays during disruption times in South Africa.

2.3 Supply Chain Management in South Africa

Supply Chain Management is a relevant topic that is of extreme interest to global companies, researchers, and practitioners. The topic reigns over companies' game plans to increase organisational productivity and profitability. However, SCM is not an easy topic to understand. The topic involves the management of various activities that include different role players; hence, there are many different definitions of the term SCM. Mentzer, DeWitt, Keebler, Min, Nix, Smith, and Sacharia (2001:4) define supply chain management as a set of three or more entities directly involved in the upstream and downstream flows of products, services, finances, and information from a source

to a supplier. From the definitions of SCM, it can be indicated that all the definitions focus on the components within SCM, like transportation, inventory control, and distribution. In essence, supply chain management consists of all parties involved directly or indirectly in processing and fulfilling customer requests.

Vilakazi (2018:388) indicates that South Africa's exports to SADC countries through the supply chain grew from 5% in 2005 to 30% in 2015. It is a critical contributor to the competitiveness of the country. A survey by CSIR (2010) indicates that the global competitiveness of South Africa is dependent on the performance of the logistics and supply chain sectors. South Africa's economy is well developed as compared to other Southern African countries. This has enabled South Africa to supply finished products and materials to African countries through the supply chain (South Africa - Distribution and Sales Channels. Available at <https://www.trade.gov/country-commercial-guides/south-africa-distribution-and-sales-channels>). The supply chain sector of South Africa is connected to many sectors of the economy, especially retail, agriculture, and manufacturing. Without the supply chain sector, it would be difficult to connect suppliers to customers. For example, before the outbreak of COVID-19, the supply chain was operating smoothly at full capacity without hindrances. Supply chain companies were operating with all their workers. There was no limitation on the number of workers in supply chain workplaces in South Africa.

However, the outbreak of COVID-19 disrupted the normal functioning of supply chain companies. As pointed out by Njomane and Telukdarie (2022:3), COVID-19 created massive supply chain disruptions. The function of supply chain companies in South Africa was limited to the distribution of essential goods and services. The government of South Africa introduced measures that limited the movement of both people and goods. Indirectly, it can be argued that the restrictions on the movement of goods affected the delivery time of goods and services to people. The quarantining of goods and people further disrupted the normal delivery times of goods and services in the supply chain (Department of Health Republic of South Africa 2021: Online Resource & News Portal SAcoronavirus. Available at <https://sacoronavirus.co.za/category/regulations/>).

2.4 Nucleus Supply Chain Management

Nucleus Supply Chain Management is a logistics service provider. The company operates in the field of supply chain management. The company's headquarters are in Bryanston, Gauteng Province. Additionally, the company does next-day deliveries if the customers are in the same province where the goods or materials have been bought.

2.5 What is logistics?

Gacuru and Kabare (2015:55) define logistics as the process of planning, implementing, and controlling the movement of goods, services, and information from the point of origin to the point of consumption. It involves many key components like transportation, warehousing, inventory management, and distribution. Historically, logistics has its roots in military operations. The concept of logistics took shape in the 1950s and 1960s as a separate field of study and practice focusing on the efficient movement of goods and materials. Moreover, this period also saw the birth of new technologies such as barcoding and computerisation, which greatly influenced inventory management and logistics operations.

In recent years, logistics have been plagued by several challenges. For example, the growth of e-commerce, the increase in parcel deliveries, the rising costs of transportation, the increasing complexity of global supply chain management, and disruptions in supply chain management.

2.6 Importance of Logistics

Logistics is an integral part of supply chain management. It necessitates the delivery of goods and materials to the right place at the right time. Economies and businesses around the world rely on logistics for the efficient movement of goods and materials from suppliers to customers. Logistics is one of the important parts of SCM, and its functional effectiveness could potentially affect the amount of success of a company (Bowersox, 2013:116). Inventories are managed through logistics to ensure that goods and materials are stored and transported in a manner that maximises efficiency and minimises costs. Additionally, logistics plays a crucial role in the overall supply chain's

performance and customer satisfaction. It can be argued that without logistics, businesses would struggle to meet customer demand and would likely experience delivery delays, stockouts, and other issues that could impact revenue. To achieve success, it is critical to ensure that the company's strategic directions are in line with its logistics capabilities (Morash,1996:209 & Yazdanparast, 2010:27).

In the context of South Africa, logistics plays a crucial role in the country's economic growth and development. For example, Nucleus Supply Chain Management employs about 10,000 people in South Africa. The logistics industry is important for the movement of goods and materials across the country. Which is vital for businesses and industries to function. Nucleus Supply Chain Management transports goods and materials to every corner of South Africa and outside South Africa. South Africa's trade and export activities are supported by the logistics sector. For example, Nucleus Supply Chain Management transports goods and materials to different parts of the world through sea, air, and land transport systems.

Important sectors in South Africa's economy, like agriculture and mining, are dependent on the logistics sector for the transportation of goods and materials from the suppliers to the customers. Logistics helps connect local businesses in South Africa with international markets. For example, agricultural produce like fruits is delivered to international markets like Europe through logistics.

However, the importance of logistics in South Africa comes with its challenges, like delivery delays during disruptive periods. South Africa usually experiences strikes, severe weather conditions like floods, crime, and international conflicts that disrupt the smooth flow of goods and services from supplies to consumers.

2.7 Delivery delays and costs

Delivery delays in logistics can result in significant costs for businesses and the economy. Morash (1996:8) illustrate that an on-time delivery rate correlates with return on sales (ROS) and growth in ROS. Some of the costs associated with delivery delays during disruptive times include:

1. **Lost sales:** When goods and materials do not reach the right place at the right time, customers may choose to change plans and purchase from somewhere else. For example, Nucleus Supply Chain Management experiences lost sales if it delivers goods to customers later than the agreed time, especially if deliveries are to customer sites like construction sites.
2. **Stockouts:** Delays in the delivery of goods and materials can lead to stockouts, which can result in lost sales, customer dissatisfaction, and damage to the company's reputation.
3. **Additional transport costs:** If the delivery of goods is delayed, businesses may need to expedite shipping or find alternative transportation methods, resulting in additional costs.
4. **Increased inventory holding costs:** When delivery of goods is delayed, businesses may need to hold additional inventory to meet customer demands, resulting in increased inventory costs.
5. **Damaged relationships with customers and suppliers:** Delivery delays can damage relationships with customers, leading to a loss of trust and future business opportunities.
6. **Increased Administrative Costs** may need to spend additional resources, such as time and money, to manage and resolve issues caused by delivery delays during disruptive times.

2.8 Delivery Delays in Logistics

Scholarly articles and business reports have indicated various disruptions that the supply chain and management industries face worldwide (World Economic Forum, 2016; Steckle and Kumar, 2003:194, and Sodhi and Lee, 2007:1430). The above-mentioned sources highlight that disruptions in logistics can take place in various locations inside and outside organisations. Delivery delays in logistics refer to any situation where a shipment or package is not delivered on the expected or promised time or date. This can happen for a variety of reasons. For example, there can be challenges with transportation, customs clearance, natural disasters, and inventory management. Delivery delays can have a serious impact on businesses and the public, as they can disrupt supply chains and lead to lost sales or dissatisfied customers.

2.9 Why delays in disruptive times

Craighead, Blackhurst, Rungtusanatham, and Handfield (2007:132) define supply chain management disruption as an unplanned and unanticipated event that ends up disturbing the smooth flow of goods and materials within the supply chain and management environment. During disruptive times, such as the COVID-19 pandemic, strikes, and civil wars, there can be a variety of factors that contribute to delivery delays in logistics. For example, increased demands for goods and services, supply chain disruptions, and changes in transport and distribution patterns. Additionally, disruptions to the normal flow of goods and services can also be caused by changes in government regulations and restrictions, as well as increased safety measures that may slow down the movement of goods.

2.10 Causes of delivery delays in disruptive periods

Delivery delays worldwide are caused by different disruptions. However, in the context of this research, delivery delays in South Africa are caused by various interruptions that are either natural or manmade. For example, the outbreak of the global pandemic, namely COVID-19, interrupted the timely delivery of goods and services around the world. Mohanan and Sonwaney (2020:6255) point out that the imposition of lockdowns in different countries hampered logistics activities. The outbreak of COVID-19 in 2019 crippled the logistics sector around the world. A report by UNICEF (2021) indicates that Africa was heavily affected by COVID-19 as the inter-transportation of goods internally within the country was restricted. Different countries implemented various rules and regulations that interrupted the normal functioning of the logistics sector. For example, in the context of South Africa, only the health supply chain and management sectors were handed licenses to operate, while other sectors like alcohol and cigarette companies were stopped from operating. Luke (2020:2) asserts that due to restrictions on movement in South Africa during COVID-19, many goods were left stranded at ports, yards, and warehouses across the country.

Table 1 Restrictions imposed by the government during the COVID-19 pandemic.

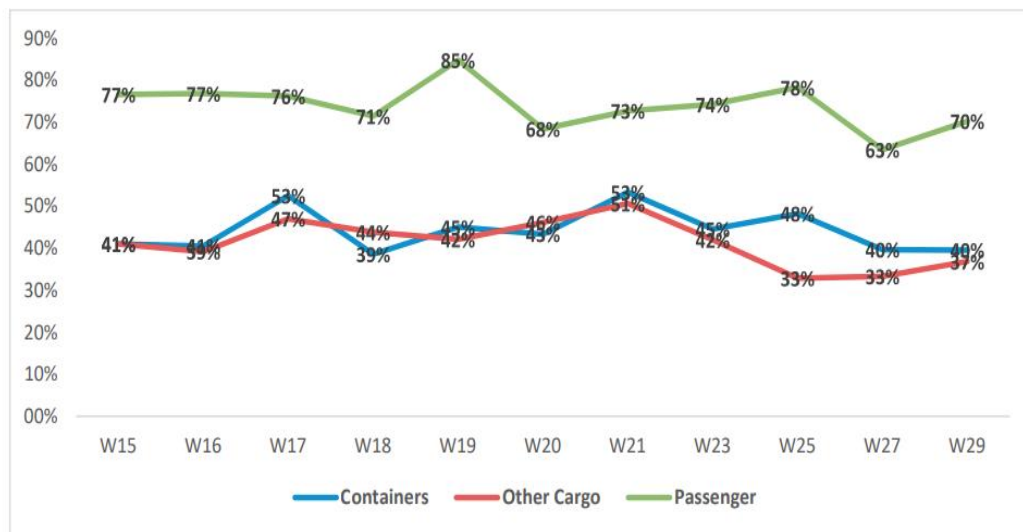
Objectives	Restrictions
International movements of goods	International airports were closed
Movements of goods within South Africa	Movement of goods was only permitted to a specific time
Mandatory protocols when in a public place	Employees were not permitted to perform any duties or enter the employment premises if the employee was not wearing a face mask while performing his or her duties.
Social distancing in the working place	Employees were required to maintain a 1.5 social distance from one another, and tight guidelines regarding health and safety procedures and social distancing measures were forced.
Movement of person	Movement of people was controlled by various levels.
Quarantine of people, goods, and services	- Individuals who tested positive were isolated from others for a period of 14 days from the time of testing positive - Travelers were required to complete part of the quarantine period at home after clinical assessment and testing at a designated quarantine facility. -All imports were required to be quarantined for a certain period of 14 days.

Source: Adapted from Department of Health Republic of South Africa 2021: *Online Resource & News Portal SAcoronavirus*. Available at <https://sacoronavirus.co.za/category/regulations/>.

The delivery of goods and services was also delayed in the logistics sector due to the limited movement of people imposed by the South African government to try and contain the outbreak of COVID-19. Moreover, it can indicate that the international movement of goods and services worldwide was also delayed, limiting the spread of COVID-19. Big logistics companies like Transnet Freight Rail announced an immediate scale-down in operations during the pandemic (International Rail Journal 2020). For example, goods from countries like China that had high COVID-19 outbreak rates were quarantined for some time upon arrival in South Africa to prevent the outbreak of COVID-19. Perkumiene, Osamede, Andriukaitiene, and Beriosovas (2021:460) point out that strict restrictions on imports and exports delayed the deliveries of goods and materials from point A to point B.

According to the COVID-19 Economic Impact Barometer created by the International Association of Ports and Harbors (IAPH), during Week 12 of 2020, around 45% of ports saw a decrease in the number of cargo container movements of more than 5% as compared to a situation of normal conditions (Figure 1 below). Since Week 21, when the unfavourable impact peaked, things have sluggishly improved.

Figure 1: Global Percentage of Ports with Less Shipment Movement, Week 15–Week 29, 2020



Source: Notteboom Theo and Pallis A. Athanasios (2020). IAPH-WPSP COVID-19 Port Economic Impact Barometer. Issue No 11. Antwerp: IAPH-WPSP. July.

The outbreak of international conflicts also disrupts deliveries in the logistics sector. For example, the outbreak of the war between Ukraine and Russia in 2021 caused delivery delays in many countries in the world. The disruption was caused by the blockade of transport routes, like sea transport routes between Russia and Ukraine, like the Black Sea. African countries like South Africa that rely on Ukraine for fertilizer and fuel from Russia were affected by delivery delays. According to a report by the United Nations Development Programme (2022), a war between Ukraine and Russia disrupts trade between South Africa and the two countries. For example, imports from Ukraine will take longer to arrive in South Africa due to disruptions caused by the war. It can be indicated that the disruption in the delivery of fuel to South Africa affected the operating costs in the logistics industry. There were stockouts of fuel, resulting in the price of gasoline and diesel going up. As indicated by Lu and Swaminathan (2015:9), poor supply chain management in disruptive times results in late deliveries and large stock-outs.

It can be indicated that the outbreak of strikes in South Africa contributes to a large percentage of delivery disruptions in South Africa. For example, the July 2021 unrest caused by the imprisonment of the former South African president Jacob Zuma caused massive delivery disruptions countrywide. Deliveries from KwaZulu Natal Province to

the rest of the country were mainly delayed. It can be argued that many customers who were waiting for deliveries from KwaZulu Natal Province during the arrest never got them on time. Many national roads, like N3, were blocked. There was no movement of goods and services to and from KwaZulu Natal. Furthermore, the closure of the Durban harbour, which services Southern Africa, caused delivery delays for the international ships that dock, offload, and load from the harbour. Strikes in the transport sector also delay the delivery of goods and services. In South Africa, strikes in the transport sector are characterised by road blockages and the burning of transport properties. Road blockages during strikes prevent the smooth flow of goods and products from point A to point B. This results in delivery delays of hours or days in some instances. Barloworld Logistics (2015) mentioned that strikes are a major cause of logistics disruption in South Africa.

Road accidents, especially on national roads, are a source of disruption that causes delivery delays in South Africa. For example, accidents on national roads, especially by logistics trucks transporting goods from point A to point B, cause delivery delays. The accidents usually block the national roads. It can be indicated that most accidents result in the spillage of the goods carried by the logistics trucks onto the freeway, thereby blocking the national road either both ways or one way. Additionally, the amount of time it takes for the South African Road Agencies to clear the national road accident scenes also delays deliveries.

Crimes like the hijacking of logistics trucks on the national roads in South Africa are common. A report by Business Tech (2018) highlights that the three biggest crimes at risk in the supply chain sector are hijacking, theft, and malicious damage. The government of South Africa also acknowledges the rise in transport crimes in the country. It responded by launching initiatives like the Arrive Alive campaign (Arrive Alive, 2019). The theft of goods in transit delays the delivery of the goods to their destinations. The amount of time it takes for insurance companies to replace stolen goods also delays the delivery of goods to customers.

Poor roads in South Africa have a significant impact on the logistics industry. Damaged roads with potholes can lead to increased transport costs and delivery times as freight trucks use other alternative routes. This delays the expected delivery time of goods and materials. Ittmann and King (2010:8) point out that, throughout the country,

secondary roads are not well maintained. Additionally, heavily loaded freight vehicles using these badly maintained roads every day cause further decay of these roads. Lalendle, Goedhals-Gerber, and Van Eeden (2021:2) point out that heavy goods vehicles used in logistics come with many negative externalities, like rapidly deteriorating road infrastructure. The effects of these badly damaged roads are felt by supply chain companies, suppliers, and customers through delivery delays. Poor roads make it more expensive for companies to transport goods; for example, increased truck repairs raise the operating costs for logistics companies. It can be argued that traffic congestion on damaged roads delays the delivery of goods to customers in South Africa. Lalendle et al. (2021:3) indicate that freight trucks make up 34% of the traffic on the N3 national road that links Durban and Gauteng.

Table 2: Types of supply chain disruptions

Disruption	Source
Intra-organisational	
Strikes	Barloworld Logistics (2015); Blackhurst, Scheibe and Johnson (2008:144). Langley (2012; Stecke and Kumar (2009:194)
Industrial accidents	Mitroff and Alpaslan (2003:10); Stecke and Kumar (2009:199)
Stock outs	Blackhurst <i>et al.</i> (2005:4068, 2008:143)
Inter-organisational	
Customs delays	Blackhurst <i>et al.</i> (2008:144); Porterfield, Macdonald, and Griffis (2012:410); Stecke and Kumar (2009:194)
Transportation breakdowns	Business Continuity Institute (2014); Mitroff and Alpaslan (2003:10); Sheffi (2015:31); Stecke and Kumar (2009:200)
Hijackings	British Standards Institute (2015); Langley (2012)
Extra-organisational	
Natural disasters	Blackhurst <i>et al.</i> (2008:144); Klibi, Martel and Guitouni (2010:285); Langley (2012)
Government regulations	Business Continuity Institute (2014); Langley (2012); Stecke and Kumar (2009:194)

Source: Adapted from Behdani, B., Adhitya, A., Lukszo, Z. & Srinivasan, R., 2012, 'How to handle disruptions in supply chains: An integrated framework and a review of literature', p.22, viewed 22 March 2016, from http://0-papers.ssrn.com/innopac.up.ac.za/sol3/papers.cfm?abstract_id=2114201.

2.11 Solutions

Despite the enormity of the causes of delivery delays during disruptive times, there is a greater need to mitigate the delays. In the supply chain management industry, initiatives to address disruptions are regarded as supply chain risk management and supply chain disruption management. Logistics companies and supply chain managers often use a variety of tools and techniques to minimise delivery delays and ensure that goods are delivered on time. Daveswar and Rathee (2010:202) propose that supply chain management companies need to communicate effectively and on time with customers and suppliers about when they can expect their deliveries. Based on the current COVID-19 pandemic, there is a greater need for strategic and systematic measures to be taken to avoid future pandemic challenges in the supply chain and management logistics. Subramanya and Kermanshachi (2021) propose that stakeholders, transport agencies, and the government closely work together to build a sustainable and flexible transport system that can cope with pandemics. Delivery delays can be improved by the implementation of different frameworks and approaches. For example, logistics optimisation, logistics network design, and logistics outsourcing can be used as remedies for delivery delays. The use of technology, such as transport management systems, warehouse management systems, and GPS tracking, has become a greater tool for improving delivery to customers. It can be argued that the solution to delivery delays in logistics is going to be solved by the increase in the use of artificial intelligence.

CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN

3.1 Introduction

In this chapter, the study addresses the research paradigm, research design, and methodology, along with the data collection strategy for this study. Additionally, this chapter provides a step-by-step description of where the study was conducted, the study population, the selection of research participants, and the method used in collecting data. It also highlights how the data was analysed. Finally, this study adopted a qualitative research design for data collection, analysis, and presentation.

3.2 Empirical Study

Hox and Boeije (2005:593) indicate that primary data be collected for a specific problem using procedures that best fit the research problem. The preliminary data required was gathered through an empirical investigation of the causes of delivery delays in logistics.

The research design of the empirical investigation for this study includes determining the research paradigm, research approach, methodological choice, research strategy, study population, and sampling, designing the measuring instrument, data collection, statistical analysis, and testing for reliability and validity.

3.3 Research paradigm

A study can be carried out in different ways. It can be either qualitative, quantitative, or mixed methods. Chilisa and Kawulich (2012:35) define a research paradigm as a way of looking at the world that frames a study issue and shapes how researchers approach it. A research paradigm can be described as a method used to answer the question of what procedures researchers use to acquire knowledge about social reality (Burrell & Morgan, 1979:1). Of the various paradigms available to the researcher, positivist and interpretive paradigms are the most dominant. According to the positivist perspective, reality exists apart from people. It contends that unchanging principles guide reality, and our senses do not mediate these principles. Interpretivism is grounded in the notion that no single verifiable reality exists independent of our senses. Grix (2004:82) argues that interpretivism is a response to the over-dominance

of positivism. For this research, an interpretive approach was employed to help explore the causes of delivery delays during disruptive periods.

3.4 Research Approach

The research approach describes how the research is carried out. Saunders *et al.* (2012:45) mention that the three main approaches are supposed to be made clear when pursuing research: whether the study has used an inductive, deductive, or abductive approach to an inquiry. In the current study, the causes of delivery delays during disruptive periods in supply management were explored using the inductive research approach. Inductive research occurs in the interpretivism research paradigm and involves developing a novel theory by observing reality and collecting primary data without consideration of existing theories (Saunders *et al.*, 2016:14).

The research was based on a qualitative approach.

3.5 Research Design

This study sought to understand the causes of delivery delays during disruptive periods in the supply and chain management sector; hence, the research design was qualitative in nature. Mouton (2001:56) mentions that a research design is a framework that outlines how researchers plan to execute their research. To explore the causes of delivery delays during disruptive periods, this study was conducted using a qualitative research design. The qualitative research design was in the form of semi-structured interview questions. As indicated by De Vos, Stydom, Fouche, and Delport (2005:268), the research design is the entire research process, from conceptualising a problem to writing the narrative.

3.6 Research Methodology

This research used a qualitative research method as its research methodology. Qualitative research rests on the idea that people have extensive knowledge of their social lives and use it to maintain stability and order in their daily interactions (Babbie & Mouton, 2001:30). In this study, employees and customers in the supply and management sectors at Nucleus Supply Chain Management Company have extensive knowledge of what causes delivery delays during disruptive periods. The qualitative

research method is a tool that can be used to inquire more about the ever-changing experiences of people who are actively involved in the supply and chain management industry.

Furthermore, qualitative research is used to explore unique human values, ideals, cultural preferences, and norms. It enables the researcher to study the research participants within their individual and meaningful social interactions and situations. In this study, participants who were Nucleus employees were interviewed in their work environment, where they experienced delivery delays during disruptive periods. Additionally, participants in this study who are Nucleus customers were interviewed in places where they felt more comfortable. Moreover, qualitative research allows the researcher to make sense of reality and to describe and explain the social world. In this research, the researcher made sense of the social realities experienced by both employees and customers during delivery delays caused by disruptions. Also, it empowered the researcher to develop explanatory models and theories. The qualitative research aimed to elicit responses from different respondents on how delivery delays have affected them and the company. A qualitative methodology was selected because it best captured the existing experiences of both customers and logistics companies.

3.7 Methodological choice

This research adopted mono-method qualitative research to get sufficient information on this topic to meet the research objectives. Qualitative research was chosen because of its ability to discover broader information about the causes of delivery delays during disruptive periods by asking follow-up questions to gain more knowledge about the topic under investigation. Creswell (2014:32) explains that qualitative research is a method that is usually employed to investigate and comprehend the issue under study. Collecting primary data about the causes of delivery delays during disruptive periods was best understood through discussions with people affected by the delays, such as customers. This made a qualitative method suitable for the researcher, as it allowed the researcher to ask probing questions (Starman, 2013:61-66). Yin (2009) further asserts that qualitative research looks deeply at an individual's perspective on the investigative situation, process, and relationships. In this study, a

qualitative method looked deeply into the delivery delay experiences and perspectives of workers and customers of Nucleus.

3.8 Research Strategy

Qualitative research strategies assist in understanding how a target audience behaves and thinks about a particular subject. This research conducted in-depth interviews with Nucleus customers and workers to understand the causes of delivery delays during disruptive periods. Qualitative research is founded on the belief that participants are aware of their lived experiences in societies (Babbie & Mouton, 2001:30).

In this research, in-depth interviews were used. This approach is entirely conversational and provides the opportunity to probe the respondent for specific information.

3.9 Study population and sampling

Study population: According to Creswell (2014:107), a target population is the number of possible respondents that could be included in the research study. Therefore, the target population for this study was Nucleus customers and workers. Bryman and Bell (2015:23) posited that the targeted population constitutes potential participants (research subjects or objects) that lead to the formulation of a sample to collect data. The selection of participants in this research was based on the service delivery lapses database of Nucleus. The service delivery lapses database of Nucleus records daily delivery service lapses, including service lapses caused by delivery delays. Out of 40 Nucleus workers who work in the customer service department and the deliveries and collections department, only 8 were selected. Moreover, out of 60 Nucleus customers who experienced service lapses, only 8 were selected for this research.

Sampling: The sampling technique refers to a system of choosing practical subjects or objects. For this research, a non-probability sampling technique was used. In non-purposive sampling, subjects have no equal chance of being selected. Specifically, in this study, purposive non-probability sampling was used to select participants. Purposive sampling requires the researcher to select participants based on the amount of knowledge they have about the topic. Purposive non-probability sampling

was chosen because it permits the researcher to select information-rich participants for an in-depth study (Elfil, 2017:2). The researcher chose participants based on her discretion. The researcher chose participants who experienced delivery delays and were accessible to her for the study. In this study, participants were sampled as follows:

1. Participants were permanent employees or customers of Nucleus Supply Chain Management.
2. Participants were willing to participate in personal or telephonic interviews.
3. Participants were customers who had experienced delivery delays during a disruptive period.

Sample Size: According to Alvi (2016:21), sample size can be considered the total number of participants selected using a desirable data-collection sampling technique. Twelve participants were sampled from the service-delivery lapse database of Nucleus' customers and workers for this study. The researcher found it reasonable to choose 16 interview participants.

3.10 Designing the measuring instrument

An interview guide with a semi-structured and in-depth format was utilized to formulate the interview questions. The questions were designed specifically for each group of respondents participating in the inquiry. For example, there were specific questions designed for Nucleus customers and different questions for Nucleus employees. Some questions could overlap between these two sample groups. The use of open and semi-structured interview questions provided an avenue for respondents to share their experiences and delve into their underlying sentiments concerning the factors contributing to delivery delays in the logistics industry.

3.11 Collection of data

Data collection took two months to complete. The interviews for the study comprised 10 face-to-face interviews and 6 Microsoft Teams meetings. The Microsoft Teams meetings were used where there were geographic constraints. The interviews with Nucleus employees were conducted in private at Nucleus's offices, where the 6

selected participants from different departments were interviewed individually and 2 interviews were done through Microsoft Teams meetings. Potential participants were called and asked whether they were willing to participate, and a suitable time was arranged. At the interview, participants were requested to sign consent forms before the start of the interview. The data collection process was a single-stage process. The researcher also interviewed 8 selected Nucleus customers. Four interviews took place at coffee shops that were nearest to the customer's workplaces and 2 interviews were done through Microsoft Teams meetings and. The interviews took 20 to 35 minutes.

3.12 Pilot Interviews

The interview guide went through a pre-test with one participant to explore the chances of making any amendments. After the pre-test there were no modifications required. The interviews centred around the participant's experience of delayed deliveries and were audio-recorded on a cell phone for accurate transcription. The researcher also compiled notes on a notepad during the interview. The research participants' facial expressions, feelings, and body movements during the discussion were recorded on the notepad. The process of gathering data through semi-structured interviews provided research participants with the opportunity to elaborate extensively on the reasons behind delivery delays in supply management during disruptive periods. Boyce and Neal (2006) suggest that semi-structured, in-depth interviews offer the researcher flexibility in terms of rephrasing questions and delving deeper for clarity.

The researcher transcribed all the interviews. The audio and Microsoft Teams recordings recorded during data collection were stored on the researcher's secured laptop and phone.

3.13 Data Analysis

The data analysis conducted in this study facilitated the researcher in addressing inquiries and resolving the research problem. The data extracted from semi-structured interviews in this study underwent thematic analysis. This signifies that the qualitative data revealed themes that emerged from the experiences of research participants concerning service delivery delays in the supply chain management sector. The researcher identified codes and grouped them according to similarity. As supported by

Creswell (2014:243), codes are used to summarise the responses of participants and the meaning attached by the researcher. All 16 interview transcriptions were individually coded and re-coded by the researcher to ensure that similar codes were grouped. This was done to increase the trustworthiness of the data. Once the individual coding was done, the codes were grouped to identify the main themes. Raw data backed up each code identified. The thematic analysis method of data analysis that was followed consisted of the following seven steps (Yin 2016:220):

1. Data Capturing
2. Data Familiarisation
3. Generation of initial codes
4. Themes Searching
5. Themes Reviewing
6. Naming and defining themes
7. Writing up the analysis

3.14 Trustworthiness

The reliability of data and results is a fundamental pillar of any research endeavour. In this study, trustworthiness was established by cross-referencing responses from respondents to identify similarities. Additionally, each transcript was coded, re-coded, and linked to raw data to increase the trustworthiness of the results. The author also referred to the same query to participants twice to measure recurring themes. Validity is the foundation for examining the quality and soundness of research. The researcher also practised reflexivity to reduce research bias, thus improving trustworthiness. The informed consent form was attached to this proposal.

3.15 Ethical Considerations

The research was conducted respectfully and professionally. The researcher ensured that the ethics committee of Northwest University approved the research before data collection. Ethical considerations in research are an essential aspect of our everyday existence. They demand that researchers consistently uphold and ensure the dignity of the participants in the research. In this study, the semi-structured questionnaire had an option for all participants to voluntarily withdraw from the research any time they

felt like doing so. Fouka and Mantzorou (2011) emphasize the significance of upholding the dignity of research subjects. In this study, the chosen research topic has been selected to ensure the preservation of the research subjects' dignity. The research topic focuses on investigating the reasons behind delivery delays within the supply chain industry amidst disruptive periods.

Furthermore, this study followed a qualitative approach. Qualitative research entails direct engagement with human subjects, particularly in the selection of research participants and the process of collecting data. The researcher provided the consent forms for research participants to sign. After signing consent forms, the respondents kept their signed copies. The copies proved that the participants agreed to undertake the research process. Additionally, it can be indicated that the researcher ensured that ethical considerations were always adhered to before, during, and after the research. The rights of the research participants stated in the informed consent form signed by the research participants were always respected, such as the right to withdraw from the study.

During data collection, the researcher introduced herself to the research subjects during the first physical and Microsoft Teams meetings contact. The researcher disclosed the aims and objectives of the research to the research participants. The disclosure of what the study aimed to achieve informed the participants about any expectations from the inquiry. Hence, the respondents participated voluntarily in the research. The researcher assumed the responsibility of informing the participants about the confidentiality measures in place for their shared views and perspectives during data collection. The identities of the research participants will remain undisclosed when the findings are disseminated or presented. The data collected during the data collection phase has been securely stored. Rigorous precautions will be taken when publishing the results to guarantee the preservation of participants' privacy and confidentiality, safeguarding their identities and personal experiences.

CHAPTER 4: FINDINGS

4.1. Introduction

This chapter aims to present the findings of the empirical study conducted. The primary data gathered through semi-structured interviews was analysed and interpreted using an exclusive program by the name ATLAS.ti. The analysis consisted of primary and secondary documents.

This chapter was presented in two sections. Biographical information of the participants was discussed to highlight the education qualification levels of the respondents. This was followed by a discussion of the findings of the data analysis. The presentation of the research findings indicated three common themes that closely corresponds to the three research questions.

Several themes emerged from the interviews. Incidentally, these themes are closely related to the direct questions that were asked to participants during the interviews. Also important is that these themes were relatively identical between customers and employees.

4.2. Demographic information

Employees

To achieve research objectives, strategic biographical data was collected from the participants, especially Nucleus Supply Chain Management employees. The biographical data was essential in facilitating valid and reliable results.

The biographical data collected from Nucleus employees included but was not limited to years of experience, highest qualification, job level and customer service experience.

4.2.1. Job level

85% of the participants who were Nucleus Supply Chain Management employees were middle and bottom management and were actively involved in dealing with customers during delivery disruption periods. A further 15% of the interviewees were involved in tracking Nucleus delivery trucks (see Figure 4.1).

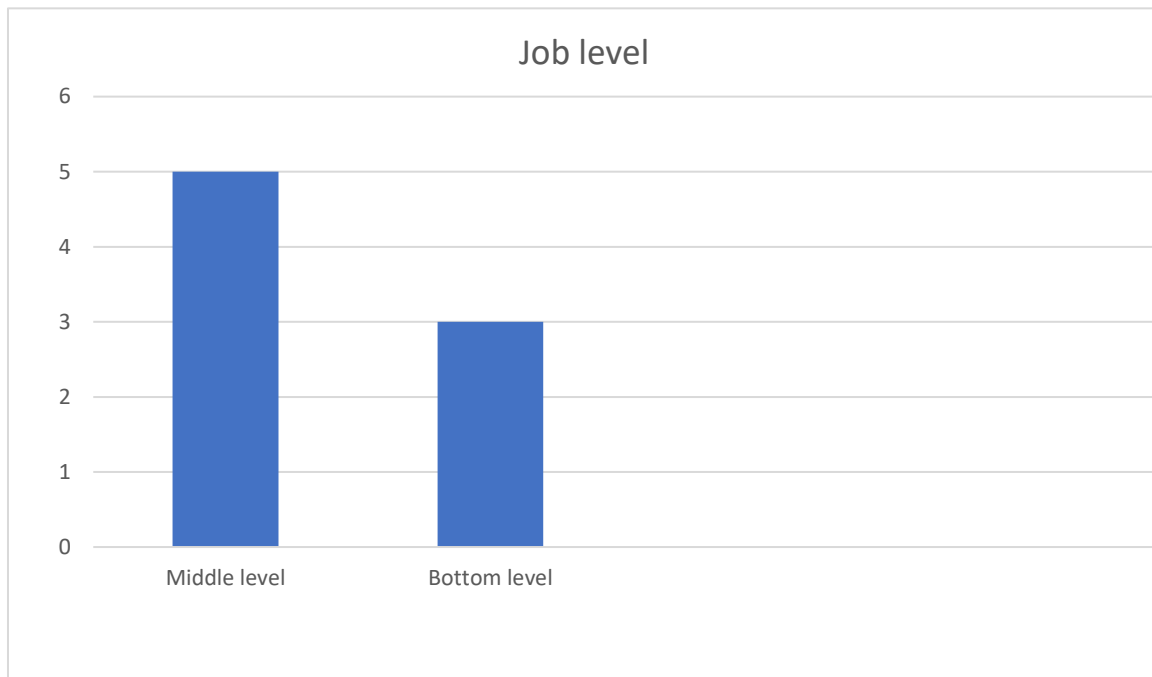


Figure 4.1: Job level of participants

4.2.2. Highest qualification

All Nucleus employees who participated in the interview had post-school education.

60% of the Interviewees from Nucleus Supply Chain Management had a graduate qualification. Mainly their qualifications were in supply chain management, customer service, logistics and transportation and sales and marketing.

The remaining 25% had a Diploma. The other 15% respondents had certificate qualifications in similar disciplines.

4.2.3. Supply chain qualification

The research discovered that 50% of the participants had a formal qualification in supply chain management (see Figure 4.2).

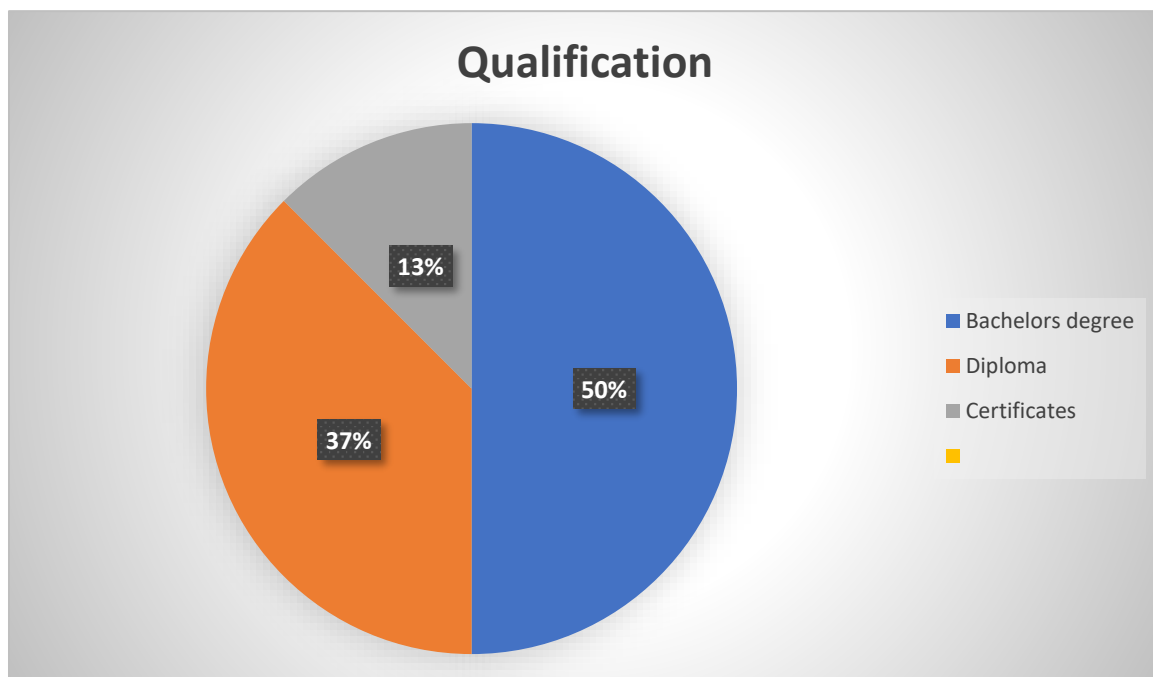


Figure 4.2: Highest qualification of participants

4.2.4. Work experience

It was discovered that the participant population of the Nucleus employees had an average of 9 years of experience working in the supply chain environment. The minimum years of experience in the supply chain environment was 5 years and the maximum was 15 years.

4.2.5. Supply chain experience

Participants were asked to indicate their work experience in supply chain management. Figure 4.3 below indicates the findings.

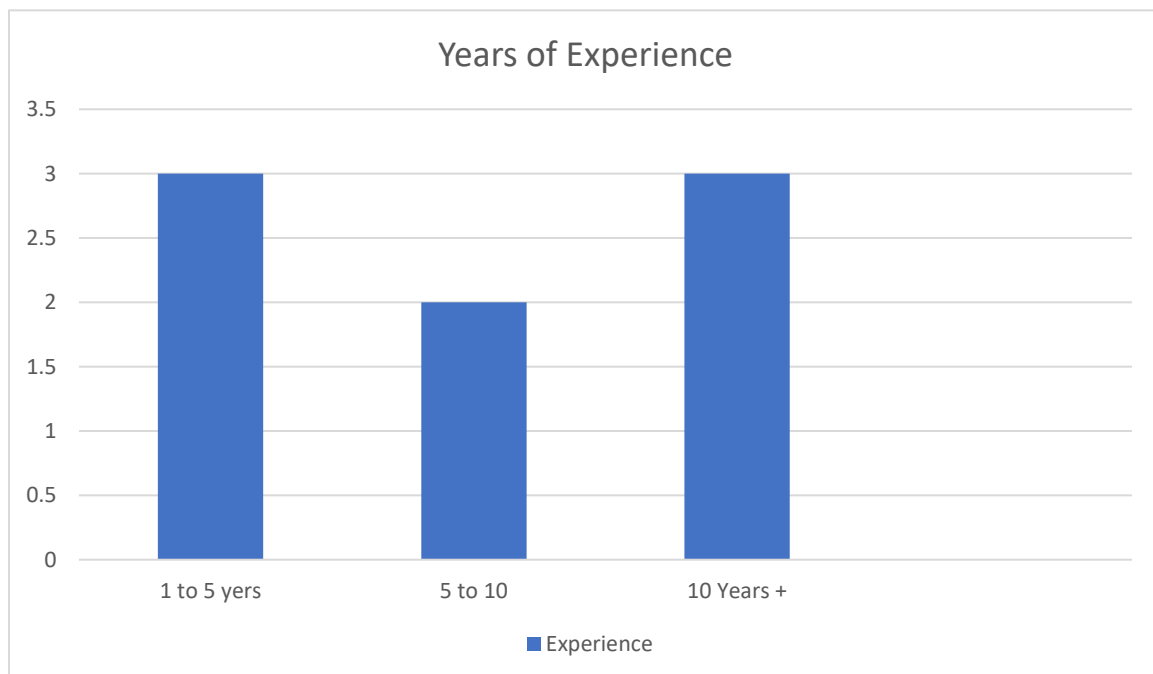


Figure 4.3: Years of experience in Supply chain management

4.2.6. Participant profile

The biographical data above was collected to ensure that the population sample had participants who had a rich knowledge of the causes of delivery delays during disruptive periods. Respondents with in-depth knowledge about delivery delays in the supply chain sector would suggest the best possible solutions to mitigate the challenge.

Table 3: Profiles of participants from Nucleus Supply Chain Management

Participants	Job level	Highest Qualification	SC Qualification	Years of Experience
Employee-1	Bottom	Diploma in supply chain management	Yes	5 years
Employee-2	Middle	Bachelor's degree in supply chain management and logistics management	Yes	7 years
Employee-3	Bottom	Certificate customer service	No	9 years
Employee-4	Bottom	Diploma in Logistics Management	Yes	11 years
Employee-5	Middle	Bachelor's degree in management accounting	Yes	5 years
Employee-6	Middle	Diploma in logistics management	Yes	6 years
Employee-7	Middle	Diploma in logistics management	Yes	15 years
Employee-8	Middle	Bachelor's degree in supply chain and marketing	Yes	7 years

Customers

The Nucleus customers were not selected based on biographical data. However, they were selected based on the number of years that they have been customers of Nucleus. Additionally, they were selected based on the number of delivery delays experienced due to disruptions.

For several years, customers have been using Nucleus for deliveries. It was discovered that the minimum number of years the customer has been using Nucleus for deliveries was 5 years. The maximum number of years a customer was using Nucleus was 10 years. The customer was using Nucleus for sending and delivering their air conditioning orders.

4.3. Summary of themes

The study sought to answer four research questions outlined in table 4.2 below:

Table 4: Summary of themes

Research question	Theme	Sub-themes
Do you experience delivery delays during this disruptive period? What are the causes of delivery delays during the disruptive period?	Theme 1: Experiences of delivery delays during this disruptive period	COVID-19
		Ukraine War
		Transport challenges
		Floods
		Social unrest
What are the main disruptive challenges that threaten the sustainability of Supply Chain Management?	Theme 2: The causes of delivery delays during this disruptive period	Inconveniences
		Production and delivery delays
		Customer dissatisfaction
What are the possible solutions to reduce delivery delays during a disruptive period?	Theme 3: Strategies to reduce delivery delays.	Collaboration
		Diversifying Alternative energy sources
		Streamlining
		Communication
		Embracing technology

4.4. Theme 1: The causes of delivery delays during this disruptive period are related to the disruptions experienced.

The study established that delivery delays were attributed to the Russia/Ukraine war, disruptions in delivery schedule and COVID-19. These findings are presented in the following sub-sections.

4.4.1. COVID-19

The participants indicated that during the peak of COVID-19, the supply chain suffered a breakdown. Although the participants did not specifically indicate the aspects that were affected by COVID-19, a few indicated labour shortages. The shortage of labour means that the organisation was unable to meet its delivery targets. An employee, Participant **8** echoed "*We are affected by global pandemics like COVID-19.*" This view was shared by Customer, Participant **14** who said:

Customer

"I remembered it was very difficult during COVID-19." (P8)

"I have experienced disruptions like the Labour shortage which affected our day-to-day operation, and the production was going down that was a bad experience for the business" (P11)

Based on the statements presented above, it is reasonable to conclude that both the customers and the employees shared similar views that COVID-19's impact on business was monumental as it immobilised employees. The findings are consistent with previous studies (Craighead, Blackhurst, Rungtusanatham, and Handfield, 2007:132) indicating that supply chain management disruption ends up disturbing the smooth flow of goods and materials within the supply chain and management environment. During disruptive times, such as the COVID-19 pandemic, strikes, and civil wars, there can be a variety of factors that contribute to delivery delays in logistics (Blanchard & Pisani-Ferry, 2022:6).

4.4.2. Ukraine war

One of the major global supply chain disruptions that affected the company was the war between Russia and Ukraine. The participants indicated that the war resulted in the closure of several ports and orders were not delivered on time. Other participants added that the war resulted in uncertainties. The participants echoed the following statements:

Employee

The primary disruptive challenges that pose a threat to the sustainability of supply chain management and unpredictability in transportation (P3).

The war between Ukraine and Russia is affecting this business, as an employee I have experienced this: Several ports have been closed and orders are being pulled back because of delays in shipments and the price of oil has increased for this reason as a business was spending more on petrol/diesel (P7)

Customer

These uncertainties impacted the supply chain companies, which caused a sudden shift in consumer demand. These challenges can lead to delays, increased costs, and inefficiencies in the supply chain (P15)

The perceptions presented above indicate that the Russian/Ukraine war had a global impact. The global impact of the supply chain disruption was directly felt by both the employees and customers. The company relied on some supplies whose supply chain was disrupted by the war. As a result of the supply chain disruptions, the local process for goods and services increased, affecting the customers. The Russian war on Ukraine resulted in economic sanctions being imposed on it. The sanctions disrupted the global supply chain for many products (United Nations Development Programme. 2022. The impact of war on sustainable development in South Africa. Available at <http://www.undp.org> (Accessed 11 January 2023).

South Africa, which relies on Russia for many products, was also affected (Blanchard & Pisani-Ferry, 2022). Logistics companies faced challenges in meeting the demand for products such as oil, and cereals, which mainly come from Ukraine and Russia (United Nations Development Programme. 2022. The impact of war on sustainable development in South Africa. Available at <http://www.undp.org> (Accessed 11 January 2023).

4.4.3. Transport challenges

Transport challenges were identified as a local factor that the company has been facing for a long time. The participants indicated that most of their products use road transport. Therefore, road-related delays that they expected were related to traffic congestion, resulting in delivery delays. In addition, they indicated that road repairs sometimes resulted in the closure of usual routes, forcing them to take alternative longer routes. Mechanical faults on the delivery vehicles were also reported to be a frequent challenge. These views were shared by the participants as follows:

Employee

It will have to be transportation (P2)

Roadwork or traffic jams (P6)

Customers

Sometimes the road was shut down because of road work. We also face unpredictable events affecting transportation (P14).

When the driver is stuck in traffic, the customer calls the sales department, and the sales Rep transfers the call to the delivery department (P15).

The transcripts presented above reflected a common transport problem that is associated with the use of roads in South Africa. Based on the findings, the company solely relies on road transport, hence any delays on the road result in service delivery challenges. Both customers and employees were aware of the transport problems affecting service delivery. As a result, delays are bound to happen. An efficient road network is the centre of an effective supply chain (Raj, Mukherjee, de Sousa Jabbour & Srivastava, 2022).

4.4.4. Social unrests

The majority of participants indicated that the social unrest that happened in South Africa in 2021, particularly in Gauteng and KZN hugely affected the supply chain. Most of the participants indicated that due to violence, most transport logistics companies lost their trucks. As a result, some companies pulled out their trucks as a precautionary measure. The impact was a shortage of basic goods and services in most parts of the country.

Employees

Major events or situations like strikes or even unexpected incidents affecting transportation (P1).

The recent one was when there was a strike in KZN, I do have some of my customers, in KZN. So, I couldn't deliver my orders on time (P2).

Customers

We've experienced strike intensity when there is a strike sometimes the road gets blocked and there won't be any movement (P10).

And things like social unrest I have experienced the delay of goods being delivered on time when a group of people decides to protest usually, they close the road so drivers have to use an alternative road which takes a long to arrive at a certain destination for instead the protest "free Zuma protest" that happened 9 July 2021 we could deliver customers product in KZN for several days some of our vehicles were looted (P12).

The statements indicate that civil unrest disrupted the supply chain was disrupted to the riots that occurred in KZN and Gauteng. These protests also affected the transport logistics sector as rioters burnt trucks and blocked roads. The impact of civil unrest on the supply chain is well-documented. The data shows that the employees were directly affected by the protests, but they had far-reaching consequences which was felt by customers. Craighead, Blackhurst, Rungtusanatham, and Handfield (2007:132) found that unanticipated events such as unrest disturb the smooth flow of goods and materials within the supply chain and management environment.

4.4.5 Floods

The participants indicated that the floods that ravaged KZN affected the supply chain management. The floods destroyed infrastructure. As a result, most manufacturers and suppliers were temporarily forced to close down or slow down on business. The

transform sector was also affected by the floods as most roads were impassable. The participants indicated the following:

Employees

Unfortunately, disruptions in delivery schedules have been a recurring issue. These disruptions range from weather-related delays to unexpected logistical challenges (P4).

Customers

We've also experienced floods in KZN when there are floods, so when there are floods our drivers can't move (P10).

When coming to natural disasters like bad weather affect our office's operations. For example, last year, a blackout halted our work for several hours (P12).

Floods left the roads in bad conditions, and we don't know the amount of time that they will take to fix the roads so that we can start operating smoothly again (P15)

The transcripts presented above indicate that floods are the major natural disaster that has affected the supply chain management in South Africa. For employees, the floods destroyed some critical infrastructure and for employees, they felt the ripple effect of the supply chain disruption. The participants specifically pointed to the floods that affected KZN and the Western Cape provinces. The floods blocked roads and forced manufacturers and suppliers to close down. As a result, there were shortages of supplies and delivery delays.

4.5. Theme 2: There are specific challenges that threaten the sustainability of supply chain management.

4.5.1. Inconveniences

Supply chain disruptions have an obvious effect on the sustainability of the supply chain. The participants indicated that the disruptions were resulting in inconveniences. These inconveniences affected both the company as well as the customers. The inconveniences varied but mostly they were related to delays in delivering products to

customers and losing customers due to failure to provide service on time. The employees and customers highlighted the following:

Employees

It inconveniences us because we cannot manufacture products that we need to send out, resulting in us not being able to send out our products to our customers. I would say if maybe if the air conditioners are not delivered to our customers, it's simply as good as we didn't make any sale (P2).

Well, sometimes when, let's say a customer wants to install air conditioners to finish a site building. Now if there are two delays in the delivery of an item sometimes the customers, just end up cancelling the order and looking for another supplier. So, I'm saying that delivery delays negatively affect my business (P3).

Customers

Since we are in the air con business where they need to install it, size they've ended up now carrying extra costs, their staff being seated doing nothing and waiting for the product to be delivered to them (P6)

They have disrupted our plans and caused inconvenience to our customers (P8).

Delivery delays during disruptive periods have affected us by causing inconvenience and frustration. There were instances where we had to reschedule plans or make alternative arrangements due to delayed deliveries (P11).

The sentiments presented above reflect that supply chain disruptions affect many stakeholders in the supply chain. The suppliers failed to fulfil delivery schedules. Therefore, customers were the ones who were affected by the delivery delays from suppliers. As a result, some customers had to look elsewhere for the service. Therefore, the company lost potential revenue. On the other hand, the customers were short-changed. Overall, this affected the company's profitability as customers were forced to look for service elsewhere. The inconveniences caused by delivery delays result in poor demand forecasting. Demand forecasting entails establishing an organization's typical output to guarantee that there is no underproduction or overproduction (Rathipriya, Rahman, Dhamodharavadhani, Meero, & Yoganandan, 2022:1946). Demand forecasting, when done correctly, can help to reduce stockouts (Sukati, Sanyal, & Ba Awaain, 2020:210).

4.5.2. Production and delivery delays

A combination of local and international factors affecting the supply chain resulted in production and delivery delays. The majority of the participants were of the view that the local and international supply chain disruptions resulted in production and delivery delays. The participants echoed the following sentiments:

Employees

The disruptions in the delivery schedule have been a recurring issue. So, these disruptions range from weather-related delays due to unexpected logistical challenges (P1).

These disruptions have at times caused delays in our production timeline, affecting our ability to meet customer demands on schedule (P4)

Delays in receiving necessary components can lead to bottlenecks in our assembly line, impacting our production output and overall operational efficiency (P5).

Customers

Such disruptions have led to delays in our production timelines and challenges in meeting customer demands (P7).

These challenges can threaten the smooth operation of the supply chain, basically impacting sustainability efforts as well (P8).

Uh, this has resulted in the company experiencing revenue losses, thereby a reduction in our salaries and also its slow growth in the market share of their customers (P13).

The findings show that both the customers and employees agreed about the effect of disruptions on logistics and the supply chain. Some delays were weather-related, while others were human-related. The delays in the organisation's production line were a result of unexpected logistical challenges. Overall, the effect of the delays is revenue loss due to customer dissatisfaction and flight. As the literature reflects, delivery delays in South Africa are caused by various interruptions that are either natural or manmade (UNICEF, 2021). COVID-19 and the riots were the major disrupters of the supply chain in the last three years. (Mohanani & Sonwaney, 2020:6255).

4.5.3. Customer dissatisfaction

As briefly highlighted in the previous section, the delivery delays and disruption to the supply chain affected the customers who were the end users. The participants expressed those delays resulted in customer dissatisfaction, which in turn resulted in the company losing valuable customers. The effect of the delivery delays changed the customers' perceptions of the company's reputation. In addition, the delivery delays resulted in customer dissatisfaction as they were short-changed. The reactions of customers and employees are presented below:

Employees

Delivery delays during disruptive periods affected us by causing customer dissatisfaction due to late deliveries and impacting our reputation in the market (P5).

Well, we've ended up with very unhappy customers asking us where their orders are. Sometimes we are forced to answer those difficult questions (P6).

Customers

Once, we ordered some components to replace one of the aircon for our customer, and due to a weather-related delay, it arrived a week late. It was disappointing to miss the on-the-deal line, and it made me realise the importance of timely deliveries (P7).

When we are having delays, customers, tend to complain, and, when a product or service is rendered late, it means also we are going to receive a late payment that will be affecting the business (P9).

Delays can lead to dissatisfaction, lowered trust, and potentially loss of future business (P11).

Disruptions affect the delivery schedule of customers and affect customer satisfaction (P14).

Based on the sentiments presented above, it is reasonable to conclude that production and delivery delays were a major setback for both the company and customers. For employees, they understood the impact the delays on the attitude of the customers. The delays disrupted the good relationship that existed between the company and its customers. Therefore, the customers were dissatisfied, and others decided to look for services from other players. Research indicates that customer factors that contribute

to customer dissatisfaction include delivery delays. Delivery delays force some customers had to look for service elsewhere (Lalendle et al., 2021:3).

4.6. Theme 3: There are strategies that can reduce delivery delays.

4.6.1. Collaboration

To address the current supply chain challenges, both customers and employees emphasised that there is a need to strengthen collaboration among suppliers. The collaboration would assist in important aspects such as information sharing. In addition, the participants added that the organisation should consider collaborating with local authorities as they influence the supply of products such as electricity and water as well as the provision of a safe and convenient road network. The participants also suggested partnerships with local delivery services. This would assist the supplier in ensuring efficient delivery services. The participants expressed the following sentiments:

Employees

The company should look at options like collaborating with the local authorities (P1).

Opportunities for continuous improvement lie in enhancing supplier collaboration through shared data and forecasts. Collaborate closely with suppliers to enhance their agility and invest in warehouse automation to expedite order processing (P3).

Customers

I think they should explore partnerships with local delivery services to ensure smoother operations during disruptive times. They can also look at collaborating with suppliers on innovation (P7).

And I can say collaboration with suppliers and the development of contingency plans can be effective solutions. Uh, yeah, I'd recommend close collaboration with Logistics partners and efficient inventory management to enhance customer satisfaction (P8).

The findings reveal that collaborations are increasingly very important in modern business as the businesses are interdependent. For example, as suggested by the participants, collaborating with local authorities ensures that the company has contacts

when it needs electricity, and water and faces challenges regarding the road network. Both employees and customers shared similar views, stressing that collaborating at an innovative level was also useful in teaming up with other organisations to find solutions to supply chain challenges. Supplier cooperation is essential for addressing supply chain challenges, according to many supply chain studies (Tarigan, Siagian, & Jie, 2021; Lee & Joo, 2020). Supplier relationships help organisations overcome supply chain volatility, according to the research (Lee & Joo, 2020). Additionally, supplier collaboration helps a company, and its suppliers build confidence (Tarigan et al., 2021; Lee & Joo, 2020).

4.6.2. Diversifying

The current supply chain challenges could be addressed by diversifying logistical solutions. The participants indicated that transport delays could be addressed by diversifying transport solutions. In addition, the company could also look at diversifying suppliers to ensure that they do not depend on one supplier. The participants highlighted:

Employees

I think it is important to think about diversifying transportation options could also help ensure smoother operations (P1).

The delivery challenges that are caused by a shortage of products can be solved by diversifying suppliers (P2).

Customers

I suggest diversifying sourcing strategies to reduce dependency on a single region (P14).

The perceptions presented above by both employees and customers indicate that they share the same views on how the company can address delivery disruptions. Diversifying was presented as playing a role in providing several options that the company can rely on for supply and delivery and other supply chain-related aspects causing delivery delays. According to the findings of various supply chain studies, supplier variety is critical in managing supply chain difficulties since there are always alternative sources (Tarigan, Siagian, & Jie, 2021; Lee & Joo, 2020). This assists the organisation in mitigating supply chain unpredictability (Lee & Joo, 2020).

4.6.3. Alternative energy sources

The participants were all in agreement that South Africa is facing a serious electricity crisis. The crisis was limiting the company's productivity potential. The participants highlighted that the frequent load shedding was resulting in low production levels. As a result, the company was failing to meet its supply targets. To address the delivery delays caused by load shedding, the participants suggested alternative energy sources such as solar and generators. They said:

Employees

I think for example, if Nucleus can open hubs in different provinces. For example, if an order is supposed to be delivered to the customer by next week, let it be delivered earlier and stay in the closest hub and only be delivered on the delivery day to avoid delivery delays (P4).

I would say that power outages, maybe, by investing in other means of power supply, getting solar as a backup plan (P6).

Customers

I think it will be wise for us to have other warehouses rather than where we are right now. So maybe having more than one warehouse will help us to deliver and to avoid such destructions (P9).

Then also maybe investing in solar energy (P13).

The perceptions presented above show that employees and customers were aware that the current load-shedding challenges experienced in South Africa could be addressed if the company resorted to solar or generators. This would ensure that there is no stoppage in production.

4.6.4. Streamlining

The delivery delays that the company was experiencing were partly caused by unnecessary bottlenecks in the supply chain. The participants suggested that streamlining the supply chain would address the delivery delays. They suggested streamlining processes would assist in reducing time lost and promote efficiency. They also suggested streamlining communication at all stages of the supply chain. The participants expressed the following sentiments:

Employees

I think streamlined processes would contribute to smoother operations (P1).

Customers

Addressing these issues could involve simplifying supply chain processes through lean principles (P11).

Continuous improvement opportunities along the value chain could include streamlining communication between different stages of the supply chain (P14).

Based on the perceptions presented above, the bottom line of streamlining activities in the supply chain was improved delivery. The findings revealed that streamlining services limits time wastage in navigating different processes and stages. Therefore, the overall benefit of streamlining was timely product delivery.

4.6.5. Communication

In the case of late delivery of their orders, most of the customers indicated that Nucleus made a satisfactory effort to inform them about the challenges. However, they suggest ways in which communication can be enhanced across the entire supply chain. Several communication solutions were suggested. These included communicating with clients on time so that they could manage their expectations and employ different communication channels to reach out to their diverse clients.

Employees

Nucleus can enhance flexibility by establishing robust communication channels. I would strongly recommend Nuclear have more channels or more platforms where they can be reachable if you can't reach them by email (P2).

Nucleus Supply Chain Management should consider enhancing its customer communication channels and implementing a proactive approach to address delivery delays, such as offering alternative delivery options (P5).

If they can invest maybe another more effective form of communication with us, I think that can improve way by advising the customers in advance that this is the situation we are experiencing and giving them you see alternatives (P6).

To address delivery delays, Nucleus could improve its communication strategy. Providing timely updates on potential delays and offering alternative delivery options during disruptions would improve customer experience (P7).

Customers

Nucleus Supply Chain management can communicate with customers as soon as possible shipping delays are identified by our team, so it's essential to reach out to the customer as soon as possible through direct communication for example with email the email we should apologize for the inconvenience and the reason(s) and also, we should tell them how we are going to handle the situation (P12).

The transcripts presented above indicate that timely communication with customers was important as it helped them to anticipate delivery delays. The customers were of the view that diversifying communication challenges was seen as a way to broaden the reach to the customers. According to research, communication and information sharing are critical in the supply chain's dependence during economic shocks (Lee & Joo, 2021). Communication procedures that incorporate information exchange can assist petrochemical companies in responding swiftly to developments and mitigating risks or supply chain interruptions. Several studies have investigated the value of information sharing in improving supply chain resilience (Ahmad & Zailani, 2007; Nazifa & Ramachandran, 2019).

4.6.6. Embracing technology

Embracing technology was seen as an unavoidable solution to the delivery delays and overall supply chain challenges that were affecting the organisation. More specifically, the participants identified technologies such as real-time tracking systems, data analytics, and artificial intelligence (AI). The participants thus suggested:

Employees

To tackle delivery delays, companies could invest in real-time tracking systems. Adopting just-in-time inventory strategies to minimize excess stock. Continuous improvement opportunities include integrating AI and machine learning for more accurate demand forecasts (P7).

Customers

I think leveraging data and analytics for demand-focusing and sustainable sourcing strategies is essential for enhancing the value chain (P8).

Utilising real-time tracking technology could be beneficial. Embracing technologies like blockchain for transparent and secure information sharing across the supply chain (P11).

Nucleus Supply Chain Management could involve building real-time tracking. Possible solutions could involve investing in advanced predictive analytics to better anticipate and prepare for disruptions and exploring automation and robotics to enhance efficiency (P14).

The data shows that the future of the supply chain is technology-driven. As such, both employees and customers suggested that Nucleus should speed up the adoption of technologies such as blockchain to enhance efficiency and real-time tracing systems for monitoring the delivery of products. The transcripts suggest that using technology can lead to enhanced monitoring systems and more efficient product delivery. Since technology has a significant impact on an organization's development and performance, it is advocated that the company invest in cutting-edge supply chain technologies like artificial intelligence (AI) and machine learning (Dubey, Gunasekaran, Childe, Papadopoulos, Blome, and Luo, 2019). Lead times, waste management, and manufacturing speed and accuracy would all rise with the use of this cutting-edge technology. Additionally, it would support the value chain in terms of distribution and warehousing of medical supplies (Omar, Debe, Jayaraman, Salah, Omar & Arshad, 2022).

4.7. Chapter conclusion

The chapter presented the main findings from the data. The findings were aligned with the research questions. To that end, the key ideas raised in the findings were COVID-19, the Russia/Ukraine war, the lack of real-time tracking systems, and transport challenges as the main causes of delivery delays. The effect of these delays were customer dissatisfaction, inconveniences and production and delivery delays. The

findings presented the strategies that could be used to promote product delivery. Collaboration, enhanced communication, diversification, streamlining and alternative energy sources could address the delivery delays affecting Nucleus company.

The next chapter presents the conclusions and recommendations. The main findings for each of the research objectives are presented and reviewed. This allows the research to demonstrate the research contribution.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This is the concluding chapter of the research journey which brings together the key research questions and the key findings. In addition, the chapter presents the recommendations for the supply chain sector. By demonstrating how the research questions were answered, the chapter presents the contribution of the study to knowledge and supply chain management practice.

5.2. Methodology

The study utilised an interpretive approach to help explore the causes of delivery delays during disruptive periods. Data was collected from population consisting of employees and customers of a logistics company, Nucleus company. 12 participants were interviewed using semi-structured interviews. The data was analysed using thematic analysis. Atlas.ti qualitative data analysis software version 23 was used to analyse the data. The research objectives that the study sought to address are as follows.

- To comprehend how disruptions contribute to the occurrence of delivery delays by conducting a review of relevant literature.
- To empirically investigate the causes of delivery delays at a specific logistics company in Gauteng; and
- To recommend ways to reduce delivery delays during disruptive periods.

The next section presents the key findings from the primary study.

5.3. Conclusions from the primary study

The study sought to answer the research objectives and the findings are presented as follows:

5.3.1. Conclusion 1:

- **There were severe delivery delays during this disruptive period.**

This conclusion follows from the first theme that was identified during the study. The study found that delivery delays were experienced by the Nucleus company as well as the customers. These delays were mainly experienced during disruptive periods namely, natural disasters, social unrest, and traffic delays. The evidence on this conclusion was given in chapter 4, table of themes.

5.3.2. Conclusion 2:

- **The disruptions were directly responsible for delivery delays during the disruptive period.**

COVID-19: Relating this objective, the study found that several factors contributed to the delivery delays experienced by both the company and customers. Firstly, COVID-19 disrupted business due to the travel lockdowns that were introduced. The lockdowns affected the logistics sector as they experienced labour shortages as a result of lockdowns and COVID-19-related challenges such as fear, illness and death.

Russia/Ukraine war: Another result of Russia's war on Ukraine was the increase in expenses and logistical issues. The study's findings revealed that the Russian conflict in Ukraine affected the company's access to supplies. As a result, the company faced challenges in meeting its delivery obligations.

Transport challenges: The findings revealed that South Africa mainly relies on the road network. However, the network faced several challenges such as traffic congestion and disruptions caused by road repairs. As a result of the disruptions, deliveries were sometimes delayed.

Social unrest: The study's findings revealed that the social unrest that occurred in KZN and Gauteng had a significant impact on the logistics. During the strikes, protesters burned trucks which were delivering supplies. As a result of the violence, the transporters stopped deliveries. This resulted in shortages and delivery delays. The rioters also destroyed warehouses from where most supplies were taken. As a

result, production stopped and there was a shortage of supply for many goods and services.

Floods: KZN suffered a major natural disaster in 2021 when floods destroyed infrastructure, including roads and industries. Due to these disruptions, logistics were affected as the road network was destroyed, and most factories were destroyed. The result of the floods was a shortage of goods and services and delivery delays.

5.3.3. Conclusion 3:

- **Several challenges threaten the sustainability of Supply Chain Management?**

The disruptive events of the Russian/Ukraine war, social unrest, COVID-19, floods in KZN and transport delays threatened the sustainability of the supply chain management in several ways.

Inconveniences: The study found that the supply chain disruptions resulted in inconveniences. The inconveniences varied but mostly they were related to delays in delivering products to customers and losing customers due to failure to provide service on time.

Production and delivery delays: As indicated earlier, the floods and social unrest hugely affected the industries. Most manufacturers and suppliers lost property during the riots, thus reducing their production capacity. As a result, the trickle-down effect of the low production levels was felt by the consumers. In addition, transport logistics companies were forced to suspend service due to violent riots. This affected the delivery of goods to different areas across the country.

Customer dissatisfaction: The delivery delays and disruption to the supply chain affected the customers who were the end users. According to the study, delays caused consumer unhappiness, which resulted in the firm losing important clients. Customers' impressions of the company's reputation were altered as a result of the delivery delays. Furthermore, the delivery delays caused consumer unhappiness since they were short-changed.

5.3.4. Conclusion 4

- **Solutions exist to reduce delivery delays during a disruptive period?**

Collaboration: The study found that supply chain collaboration helps the organisations and stakeholders in the supply chain to depend on one another's strengths and in turn enhance sustainability. Various areas of collaboration were identified that include communication, innovation, transport logistics transport and technology.

Diversifying sources of goods and services: The study found that reliance on one or few suppliers contributed to the supply chain challenges the suppliers sometimes failed to meet their supply obligations. This would in turn affect the entire supply chain. To address this problem, the study found that diversifying logistical solutions helps to provide alternatives in the event of delays.

Alternative energy sources: The loading challenges facing South Africa affected the production capacity of manufacturers who had no alternative energy solutions. Therefore, the study found that using solar energy and generators as alternatives helped to close the electricity void. This would ensure that productivity is not disrupted.

Streamlining: The study found that streamlining was crucial in removing unnecessary bottlenecks that resulted in delivery delays. Services that could be streamlined are communication at all stages of the supply chain. This would enhance efficiency in the supply chain.

Communication: The study found that communication with customers helps to ensure that they are kept aware of the supply chain processes. In the event of delays, the study found that early communication with customers was crucial to ensure that they managed their expectations. Various communication channels were found to be important in disseminating information to a broad customer base.

Embracing technology: Embracing technology was seen as a strategy to enhance the future of the supply chain. Such technologies were adopting black chain, AI, and real-time tracing systems.

5.4. Limitation of the study

Although the study makes a valuable contribution to knowledge and supply chain management, there were notable limitations. Firstly, the study population was limited to customers and employees of a single company. This limited the study from gaining diverse views and experiences of stakeholders in the supply chain. In addition, focusing on several geographical areas would have provided experiences relating to delivery delays from different contexts.

5.5. Recommendations

Given the importance of technology in an organization's development and performance, it is suggested that the organisation invest in more advanced supply chain technologies such as artificial intelligence (AI) and machine learning. This novel technology would enhance production speed and precision, as well as petrochemical input material wait times.

Nucleus cannot compete with suppliers and other supply chain participants in isolation. Collaborations, both internal and external, are important to the company's success. As a result, it is recommended that Nucleus identify ways to collaborate and share resources which will lead to and hence cut costs. A strategic supplier relationship is advised because it would allow suppliers to build collaborative strategies that might result in long-term, sustainable performance and customer satisfaction, translating into increased productivity, sales, and profits.

Management should think about information-sharing practices like vendor-managed inventory (VMI), which can provide manufacturers with more accurate information, contributing to production and inventory control efficiency by producing accurate forecasts to inform production. For the supply chain to run smoothly and effectively, information from internal and external stakeholders is required.

5.6. Conclusion

The aim of the study was to investigate the predominant factors that contribute to delays in the transportation of goods to customers within the logistics sector during disruptive period. The investigation was segmented into five chapters as follows:

Chapter 1: The chapter presented key background information that motivated the study and presentation of the research problem. Aspects that guide the study included defining key terms, outlining research objectives, research questions and scope of the study. In addition, the chapter presented the delimitation of the study field of the study and methodological processes and decisions taken in the study.

Chapter 2: The chapter was dedicated to a review of literature, focusing on previous studies on supply chain disruptions. The chapter defines the term 'supply chain management, then describes nucleus supply chain management and logistics. Literature on the causes of supply chain delays as well as the strategies to address the delays is provided.

Chapter 3: The chapter presented the research methodology in greater detail. The choice for the interpretivist paradigm and the inductive qualitative research. The research methodology comprising the population, sample and sample size, data collection, data analysis and ethical considerations were discussed.

Chapter 4: Findings-This chapter follows the thematics analysis process done in Atlas. Ti. The codes, categories and themes were exported to Microsoft excel to assist in presenting the findings. The findings were aligned to each of the research questions. The chapter: Conclusions and recommendations- This chapter presented the conclusions and recommendations. The conclusions indicated that delivery delays were experienced as a result of the Russian/Ukraine war, social unrest, floods in KZN and transport challenges. The chapter presented strategies that could be used to address delivery obstacles, focusing on communication, technology adoption, collaboration, diversification of supply chain sources, streamlining and alternative energy sources and enhanced communication.

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APPENDICES

APPENDIX A: ETHICAL APPROVAL LETTER



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Senate Committee for Research Ethics

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Feziwe.Mseleni@nwu.ac.za

19 September 2023

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Economic and Management Sciences Research Ethics Committee (EMS-REC)** on, 25/08/2023 the Economic and Management Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-REC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Exploring causes of delivery delays in a supply management company in Gauteng

Study Leader/Supervisor (Principal Investigator)/Researcher: Dr J Jordaan

Student: A Layini (44552297)

N W U - 0 0 6 9 7 - 2 3 - A 4

Institution Study Number Year Status
Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type:

Commencement date: 19/09/2023

Expiry date: 19/09/2024

Risk: Minimal

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

•

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- The study leader/supervisor (principle investigator)/researcher must report in the prescribed format to the EMS-REC:
 - annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and
 - without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.
 - The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the EMS-REC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.
 - Annually a number of studies may be randomly selected for an external audit.
 - The date of approval indicates the first date that the study may be started.
- In the interest of ethical responsibility, the NWU-SCRE and EMS-REC reserves the right to:*

- request access to any information or data at any time during the course or after completion of the study;
- to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;
- withdraw or postpone approval if:
 - any unethical principles or practices of the study are revealed or suspected;
 - it becomes apparent that any relevant information was withheld from the EMS-REC or that information has been false or misrepresented;
 - submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or
 - new institutional rules, national legislation or international conventions deem it necessary.

The EMS-REC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the EMS-REC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely,

**Mark
Rathbone**

Digitally signed by Mark Rathbone
DN: cn=Mark Rathbone, o=North-
West University, ou=Business
management,
email=mark.rathbone@nwu.ac.za,
c=ZA
Date: 2023.09.21 12:04:50 +02'00'

Prof Mark Rathbone
Chairperson: NWU Economic and Management Sciences Research Ethics Committee

APPENDIX B: INFORMED CONSENT LETTER TO INTERVIEW PARTICIPANTS



5 February 2023

DEAR PARTICIPANT

INFORMED CONSENT LETTER TO INTERVIEW PARTICIPANTS

You are invited to participate in a research study that forms part of a Master of Business Administration (MBA) degree. Please note that the views that you will express during the interview are particularly your own and they do not represent the view of the company you are working for. Also, your participation is entirely voluntary, and you are free to say no to participating. You can also withdraw from the study at any point.

This study has been approved by the NWU Economic and Management Sciences Research Ethics Committee (EMS-REC). It will be conducted according to the ethical guidelines and principles of the North-West University and other international ethical guidelines applicable to this study.

Title of the project: Exploring the causes of delivery delays in a supply management company in Gauteng

Institution: NWU Business School

Ethics Reference Number: NWU-00697-23-A4

Names and contact details of project staff.

	Supervisor	Researcher
Title, name & surname	Dr. Johan Jordaan	Ms. Aviwe Veronica Layini
Full Names	Johan Jordaan	Aviwe Veronica
Function in Project	Principle Investigator	Researcher
Telephone	071 366 2262	073 87 16673

What is this research study all about?

The study explores the causes of delivery delays during disruptive periods from the views of customers and supply chain companies. Also, the study aims to understand the role of disruptions in causing delivery delays.

The research will also recommend ways to reduce delivery delays during disruptive periods.

Nucleus Supply Chain Management was chosen because of its experience in the supply chain sector. The study will entail interviews with employees and customers of Nucleus Supply Chain Management.

Why have you been invited to participate?

You have been invited to participate in this research study because you fall into at least one of the following categories:



Potchefstroom Campus: (+27) 18 299 1406

Mahikeng Campus: (+27) 18 389 2095

Vanderbijlpark Campus: (+27) 16 910 3011

- You have been invited to participate in this research because you have experience and knowledge about delivery delays during disruptive periods at Nucleus Supply Chain Management.

What will be expected of you?

You will be expected to:

- Participate in a 45 – 60min semi-structured interview with the researcher at a suitable time and private area without interruptions that is convenient for both parties via an online platform. The researcher will schedule this once the NWU ethics committee approves this.
- Respond to the questions openly and honestly.
- Inform the supervisor should you feel or experience any discomfort or distress during the research process and inform the supervisor if you sometimes feel the need to terminate your involvement in the research process.

Will you gain anything from taking part in this research?

This research study will give you a voice to reveal, explain and reflect on your experiences with the causes of delivery delays during disruptive periods. No monetary reward shall be made available for participation in the study. You will, however, be furnished with a two-page communique on the study's outcomes that you can utilize to understand the causes of delivery delays during disruptive periods.

Are there risks involved in participating in this research, and what will be done to prevent them?

Participation in this study does not create any physical risk to you as the study does not involve any physical activities or experiments. We, however, have identified certain ethical principles that shall always be maintained to prevent any damage to you. These principles will focus on protecting your dignity and keeping all records provided private and confidential.

How will we protect your confidentiality, and who will see your findings?

You will be assigned a unique participant ID. Our interview will be recorded and saved regarding the ID. Still, data collected shall be regarded as confidential and not be shared with any 3rd party not directly involved in the research process. Personal details of participants and their direct input to the research study shall not be made public. All research records shall be kept for a retention period and destroyed by an appropriate means. The study's findings will be made public but contain no raw data that might incriminate specific individuals.

What will happen with the findings or samples?

The findings concluded in the study will be for academic purposes and will only be utilized to add to the current body of available knowledge.

How will you know about the results of this research?

Participants in the study, should they require, will be made aware of the research results through a two-page communique, employing electronic mail. The final electronic version of the dissertation will also be made available if requested.

Will you be paid to participate in this study, and are there any costs for you?

Participation in this study will not yield monetary value to you. There is no cost envisaged to you except the time you spend participating in this study. The researcher himself will fund this study.

Is there anything else that you should know or do?

You may contact the supervisor, Dr. Johann Jordaan, on 071 366 2262 if you have further questions or problems. You will receive a copy of this information and consent form for your own purposes.



DECLARATION**Declaration by participant**

By signing below, I (PARTICIPANT ID) agree to take part in the research study titled: **Exploring the causes of delivery delays in a Supply management company in Gauteng.**

I declare that:

I have read this information/it was explained to me by a trusted person in a language I am fluent in. The research was clearly explained to me. I have had a chance to ask questions to both the person getting the consent from me and the researcher, and all my questions have been answered. I understand that participating in this study is voluntary and I have not been pressured to participate. I may choose to leave the study at any time and will not be handled negatively if I do so. I may be asked to leave the study before it has finished if the researcher feels it is in the best interest or if I do not follow the agreed-upon study plan.

Signed at: _____

On: _____

Signature of participant

Signature of witness

Declaration by researcher

I, Awiwe Veronica Layini, declare that:

- I explained the information in this document to (PARTICIPANT ID)
- I did/did not use an interpreter
- I encouraged them to ask questions and took adequate time to answer them, or I was available should they want to ask any further questions.
- I am satisfied that they adequately understand all aspects of the research, as described above.
- I am satisfied that they had time to discuss it with others if they wished to do so.

Signed at: Randburg

On: 21 February 2023

Signature of researcher

Signature of supervisor

A. V. Layini



APPENDIX C: INFORMED CONSENT TO COMPLETE SURVEY



NWU Business School
North-West University
Private Bag x6001
Potchefstroom, 2520
<http://commerce.nwu.ac.za/business-school>

26 November 2023

DEAR PARTICIPANT

INFORMED CONSENT TO COMPLETE SURVEY

You are invited to take part in a research study that forms part of a Master of Business Administration (MBA) degree. Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved.

This study has been approved by the NWU Economic and Management Sciences Research Ethics Committee (EMS-REC) and will be conducted according to the ethical guidelines and principles of the North-West University and other international ethical guidelines applicable to this study.

Title of the project: *Exploring the Causes of delivery delays in a disruptive period in supply management company South Africa: A case study of Nucleus Supply Management.*

Institution: NWU Business School

Ethics Reference Number: NWU-00697-23-A4

Names and contact details of project staff.

Supervisor		Researcher
Title, name & surname		Ms Aviwe Veronica Layini
Full Names		Aviwe Veronica
Function in Project	Principle Investigator	Researcher
Telephone		073 87 16673



Potchefstroom Campus: (+27) 18 299 1406

Mahikeng Campus: (+27) 18 389 2095

Vanderbijlpark Campus: (+27) 16 910 3011

What is this research study all about?

My name is Aviwe Layini. I am a master's in business administration student at Northwest University doing research entitled: Exploring the causes of delivery delays in a supply management company in Gauteng Province.

The main objective is a qualitative analysis of the causes of delivery delays during disruptive periods. This will enable me to fulfill my Masters' Degree requirement. Having identified you as a semi-structured interview member may you please participate in the interview. A semi-structured interview was chosen because it will create a platform for interaction. The semi-structured interview will allow employees and customers of Nucleus Supply Management to discuss what causes delivery delays during disruptive periods and opportunities for improvement. Confidentiality and anonymity are guaranteed. There will be no psychological or physical harm because of the study.

DECLARATION

This study forms part of a mini dissertation to be submitted in partial fulfillment of the Master of Business Administration requirements at the North-West University Business School.

Adherence to strict ethical standards is a prerequisite to conducting this research. A non-probability purposive sampling method was used to select participants in this research. The following procedures will be adhered to during the interview session.

1. The Protection of Personal Information Act (POPI Act) and Promotion of Access to Information Act (PAIA Act) will always be adhered to.
2. The procedure to be followed is a qualitative research design, using semi-structured interview questions whereby the participants can communicate their views on the noted topic.
3. The estimated completion time for the interview will be approximately 30 to 45 minutes.
4. If, at any point during the interview, the participant should feel uncomfortable, the participant will have the opportunity to make their discomfort known and immediately end their participation.
5. The interview will be voice-recorded for transcripts purposes and with the consent of the participant. The participant's name will not be recorded. At any time, the participant may request to see or hear the information collected. The interviewer will take notes. This is done for data analysis purposes. The recording will be transcribed by the interviewer and kept confidential in a password-protected computer. The transcripts and recordings will be destroyed after three years.

6. All individual identification will be removed from the hard copy of the transcript. Participant identity will be concealed, and confidentiality will be maintained using coding procedures. Please note that excerpts from the interview may be included in the final dissertation report or other later publications. However, under no circumstances will your name or identifying characteristics appear in these writings.

7. It should also be emphasised that participation in this study is voluntary and with the participant's consent without any form of coercion.

8. The confidentiality, anonymity, and privacy of participants are guaranteed.

9. A summarised copy of the final report will be made available to the participant on request.

I hereby declare that I have read and understood the content of the Informed Consent Statement and give my full consent to Aviwe Layini to use the information gathered in his subsequent research.

Researcher: Aviwe Layini

E-mail: aviwe.layini@gmail.com

Supervisor: Dr. JA Jordaan

Email: jordan.johan@nwu.ac.za

Date.....

Participant code.....

Participant signature.....

APPENDIX D: INTERVIEW PROTOCOL

INTERVIEW QUESTIONS

*Exploring causes of delivery delays in a disruptive period in supply management company
South Africa: A case study of Nucleus Supply Management.*

SECTION A: DEMOGRAPHIC INFORMATION

1. Please indicate if you are a Nucleus Supply Management employee or customer indicate with a tick.

Employee	Customer
☐	☐

2. How long have you been an employee/customer of Nucleus Supply Management?

3. In which department or role are you employed within Nucleus Supply Management?

SECTION B: QUESTIONS BASED ON DELIVERY DELAYS IN A DISRUPTIVE PERIOD IN THE SUPPLY MANAGEMENT COMPANY



Questions to employees

	Questions
There have been a series of supply chain disruptions in recent years (Covid, Ukraine war, Floods, Riots). These questions are about your experience of the disruptions	- What type of disruptions have you experienced? - Which main areas in your organisation were affected by these disruptions?
These questions are about possible delivery delays during disruptions.	- Did you experience delivery delays during the disruption periods? If so, how often? - How are you made aware of delivery delays during the disruptive period? - How have delivery delays during the disruptive period affected you? - What do you think can be done to reduce delivery delays during disruptive periods? - What are the benefits of reducing delivery delays during disruptive periods?
These questions are about the long-term effects of delivery delays.	- What are the main disruptive challenges that threaten the sustainability of Supply Chain Management? - What are possible solutions to your mentioned problems? - What are the opportunities for continuous improvement along the value chain to ensure the sustainability of the supply <u>chain</u> management? - What would you recommend for Nucleus Supply Chain Management can do to address the delivery <u>delays</u> experienced by customers?

Questions for customers

	Questions
These questions are about the nature of your relationship with the Nucleus Supply Company	• Please describe the nature of your relationship with Nucleus Supply Management. • Do you use Nucleus to send or receive products? • What types of deliveries do you send with / receive from Nucleus?
There have been a series of supply chain disruptions in recent years (Covid, Ukraine war, Floods, Riots). These questions are about your experience of the disruptions	• What type of disruptions have you experienced? • Which main areas in your organisation were affected by these disruptions?
These questions are about possible delivery delays during disruptions.	• Did you experience delivery delays during the disruption periods? If so, how often? • How are you made aware of delivery delays during the disruptive period? • How have delivery delays during the disruptive period affected you? • What do you think can be done to reduce delivery delays during disruptive periods? • What are the benefits of reducing delivery delays during disruptive periods?
These questions are about the long-term effects of delivery delays.	• What are the main disruptive challenges that threaten the sustainability of Supply Chain Management? • What are possible solutions to your mentioned problems? • What are the opportunities for continuous improvement along the value chain to ensure the sustainability of the supply <u>chain</u> management? • What would you recommend for Nucleus Supply Chain Management can do to address the delivery <u>delays</u> experienced by customers?