

Final Project 1

Code: MGM 496-PMG496

Project Template

Faculty of Management
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The Transformative Impact of Improved Supply Chain Management on Businesses

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Graduation Project – 1

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04/07/2025 – 09

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1. Chapter 1: Introduction

In today's fast-paced and interconnected world, businesses face constant pressure to deliver products and services quickly, efficiently, and reliably. Think of any item you use daily – from your phone to your morning coffee – it has traveled a long journey from raw materials to your hands. This journey is managed by something called the supply chain.

Stage 1: Understanding the Basics – What is a Supply Chain?

Simply put, a supply chain is like a huge, interconnected network that brings everything a business needs and produces together. It covers every step, from finding the original ingredients or parts (sourcing), making the product (manufacturing), storing it (warehousing), moving it around (logistics), and finally getting it to the customer. For a long time, businesses saw this as just a necessary cost, a series of separate tasks.

Stage 2: The Old Way vs. The New Need – Why Improvement Became Crucial

However, the world changed. Global markets opened up, customers started expecting things faster and cheaper. Businesses realized that if one part of this long chain broke, the whole operation could suffer. This highlighted a huge need for a better, smarter way to manage the entire process.

Stage 3: The "Transformation" Begins – What Improved SCM Really Means

This is where Improved Supply Chain Management (SCM) comes in. It's not just about doing the old tasks a little better; it's about a complete "transformation." Improved SCM means connecting all those separate parts of the supply chain, using smart tools and strategies to make them work together seamlessly, like a well-oiled machine.

Stage 4: The Promise of Transformation – What Businesses Gain

The aim of this assignment is to explore exactly how this transformation impacts businesses. We will see that by embracing improved SCM, companies can unlock powerful benefits: they can dramatically reduce costs, become much more efficient, make their customers much happier, build a business that is stronger against challenges (more resilient), and even operate in a way that is better for the planet (more sustainable). In short, improved SCM moves a business from just surviving to truly thriving in the modern era.

1.1. Research Background

How Supply Chains Became So Important

To understand how much better supply chain management (SCM) has become, we first need to look at how businesses used to handle things. In the past, companies often worked in separate departments. The team buying materials didn't always talk much to the team making the products, and neither talked much to the people shipping them. Each group just focused on their own part, trying to save money or work faster in their own area.

For example, the people buying wood for a chair might just try to get the cheapest wood, without thinking about whether that wood would be hard for the factory to use or if the supplier was reliable. Then, the factory would make as many chairs as possible, and these chairs would often sit in big warehouses for a long time, costing money just to store them. Moving these chairs around was usually done without much thought about the whole journey, just getting from one point to the next. This old way of working in silos created lots of hidden problems: wasted time, extra costs, and difficulty knowing exactly where things were or what was going wrong. It was like driving a car where the engine, steering, and brakes were all built by different companies and didn't really connect properly.

Things started to change a lot in the late 1980s and 1990s. The world became more connected, and businesses started buying and selling across different countries. This made everything more complicated. At the same time, new ideas like "Just-in-Time" (making things only when they're needed) showed how powerful it could be to reduce huge stockpiles of goods. Computers also started helping businesses share information better between different departments. People began to realize that all the steps in making and delivering a product – from getting materials to the customer's doorstep – were actually one big "supply chain." The idea was to make all these links work together smoothly, like a single, well-oiled machine, instead of separate parts. This meant thinking about the whole journey, not just individual steps.

The biggest shifts happened in the last 20 years, especially with the rise of the internet and new technologies. The internet made it super easy to talk to anyone, anywhere, instantly. Then came smart sensors, which could track products in real-time, and powerful computer brains (AI and Machine Learning) that could predict what customers would want or spot problems before they even happened. These technologies allowed businesses to see everything happening in their supply chain,

from start to finish. At the same time, customers became much more demanding, wanting faster deliveries and perfect service, thanks to companies like Amazon showing what was possible.

Crucially, major global events also played a huge role. Things like natural disasters, trade disputes, and especially the recent worldwide pandemic, exposed how easily supply chains could break down when relying too much on one supplier or one region. These big disruptions taught businesses a tough lesson: saving a little money by having a fragile supply chain wasn't worth the risk of being unable to deliver anything at all. Companies realized they needed supply chains that were not just cheap, but also strong, flexible, and transparent. This meant moving beyond just cutting costs and focusing on being able to handle shocks, act quickly, and even be good for the environment. So, what started as simple buying and selling has now become a crucial, smart system that can make or break a business. This assignment will explore exactly how these improvements have completely changed the way businesses operate and succeed.

1.2. Research Problem

Even though everyone knows how much better businesses can be with improved supply chain management (SCM), many companies are still having trouble making these improvements happen. They often face big problems like their different departments not sharing information, being slow to use new technologies like smart AI tools, not being able to see what's happening across their entire supply chain, and not building enough strength to handle big global problems. This ongoing difficulty means businesses are missing out on bigger profits, happier customers, and a more stable future, making it really important to figure out why these problems exist and how companies can truly transform their supply chains.

1.2.1. Theoretical Gaps

Theoretical Gaps in Supply Chain Management

Even though experts and researchers create excellent plans and models for how supply chains should ideally work, these theories often have gaps when faced with the real world. A big problem is that many theories assume we have perfect information and that everyone makes perfectly logical decisions, which just isn't true in real business. Also, these theories often struggle to properly deal with unexpected big problems like pandemics or sudden conflicts, as they tend to focus on stable situations. Finally, some theories don't fully consider the complex human relationships and ethical concerns within a supply chain. So, while theories give us a great starting point, they simplify a lot of the real-world messiness, making them hard to apply directly without adjustments.

1.2.2. Practical Gaps

Practical Gaps in Supply Chain Management

Even when businesses understand how to make their supply chains better, actually doing it faces big real-world problems. A huge issue is that different computer systems often don't talk to each other, meaning important information gets stuck in separate departments. This makes it hard for companies to see what's really happening across their whole supply chain, preventing smart decisions. Another major hurdle is people's resistance to change; employees and managers might not want to switch to new ways of working, slowing down progress. There's also a shortage of skilled people who know how to use the latest supply chain technologies like AI. Finally, the high cost of new systems and the difficulty in showing quick financial returns often stop companies from making the big investments needed for

real improvement. All these practical challenges mean that even good plans often struggle to become reality.

Here are a few questions that can be asked to any organization:

- Why do computer systems in different parts of a company often struggle to share information, and how does this stop new supply chain technologies from working well?
- How does a company's culture, especially when people don't like change, affect its ability to use new and better ways to manage its supply chain?
- What are the best ways for businesses to find and keep skilled people who can work with new supply chain tools, like AI and other smart tech?

1.3. Research Significance

This study on how improving Supply Chain Management (SCM) changes businesses is really important. It helps us understand things better in two main ways: for ideas and knowledge (Theoretical Level), and (Empirical Level).

1.3.1. At the theoretical level

Why This Study Matters for Ideas (Theoretical Level)

This research helps fill in the gaps in our current understanding. Think of it like a scientist finding new pieces for a puzzle. While smart people have already created good plans and ideas for how supply chains should work perfectly, these ideas sometimes don't quite fit the messy reality. This study helps by:

- **Making Theories More Realistic:** It shows where our current theories might be too simple, especially when dealing with things like incomplete information, unexpected global problems, or how human decisions (not always logical!) affect things. This can help create better, more realistic theories for the future.

- **Building Better Frameworks:** It helps us create new ways of thinking about supply chains that don't just focus on saving money or being fast. Instead, it looks at how to include other important goals like being strong against problems (resilience), being good for the environment (sustainability), and being fair (ethics).
- **Understanding Change:** It gives us new ideas about how to successfully manage big changes within a supply chain, especially when new technology and complex connections are involved. It helps build theories specific to making SCM transformations work.
- **Guiding Future Research:** By pointing out the real-world problems companies face (like old computer systems or a lack of skilled workers), this study tells other researchers where their efforts are most needed to create truly useful new ideas.

1.3.2. At the practical level

Why This Study Matters for Real-World Results (Empirical Level)

This research also has direct, practical benefits for actual businesses, managers, and even governments. It's about giving them useful tools and insights they can use right away:

- **Giving Practical Advice:** It provides clear, actionable tips for companies. For example, it can show them how to connect their old computer systems, how to get employees on board with new ways of working, or how to find and keep skilled people needed for advanced SCM tools.
- **Showing What Works (and What Doesn't):** The study can act like a guide, showing common challenges and successful solutions that other businesses have found. This helps companies see where they might be going wrong and how to fix specific problems with their operations, money, or people.

- **Helping Businesses Be Stronger:** By showing what makes SCM improvements successful, this research directly helps companies build supply chains that are more efficient, can bounce back faster from problems, and make customers happier. This makes them more competitive, which is super important in today's unpredictable world.
- **Guiding Investments:** The findings can help business leaders decide where to put their money – whether it's in new technology, better infrastructure, or training their staff – by giving them a clearer picture of the real costs and benefits of SCM improvements.
- **Promoting Good Practices:** By showing real examples of how companies are making their supply chains more sustainable and ethical, this research encourages other businesses to follow suit, benefiting both society and the environment.
- In short, this study is important because it doesn't just add to our theoretical knowledge; it also provides concrete, usable information that can help businesses build better, smarter, and more responsible supply chains in the real world.

1.4. Research Questions

This study aims to investigate how improvements in supply chain management transform businesses by addressing the following key questions:

- How do modern technologies (like AI and smart sensors) and better information sharing make supply chains more transparent and efficient for businesses?
- What is the real effect of building a stronger supply chain on a company's ability to recover from major global problems, such as pandemics or trade conflicts?
- How much does better supply chain management improve customer happiness, reduce operational costs, and increase a company's overall profits?

- What are the most effective ways for companies to overcome internal challenges, like employees resisting new methods or not having enough skilled workers, when trying to improve their supply chains?
- How can our academic understanding of supply chains be updated to better match real-world situations, especially when information isn't perfect, people don't always make logical choices, and ethical issues are present?

1.5. Research Objectives

This study aims to achieve the following main goals:

- Understand how new technologies and better information sharing make business supply chains clearer and work better.
- Figure out how much building a stronger supply chain helps companies deal with and recover from big global problems.
- Measure how much better supply chain management leads to happier customers, lower costs, and more profit for businesses.
- Find the best ways for companies to get past internal issues, like employees not wanting change or lacking specific skills, when improving their supply chains.
- Suggest ways to update our academic theories about supply chains so they better match messy real-world situations, including unclear information, human choices, and ethical concerns.
- This version uses more common language and aims for a more conversational tone while still clearly stating the research goals. How does this sound?

1.6. Research Hypotheses

Based on what we want to find out, we expect the following to be true:

- H1: When companies use new tech and share information better, their supply chains will become clearer and work more efficiently.

- H2: A stronger supply chain will help businesses recover much faster from big global problems.
- H3: Better supply chain management will make customers happier, cut down on costs, and increase company profits.
- H4: Companies that manage changes well and train their staff will find it easier to improve their supply chains, even when facing issues like staff resistance or a lack of specific skills.
- This version uses very direct language, almost like plain statements of expectation. How does this simplified version feel?

1.7. Research Model

Imagine our project is like building something. Before we start, we have a simple plan or blueprint. That's what our "Research Model" is. It shows:

- What we put IN: These are the actions or improvements businesses make to their supply chain.
- What we get OUT: These are the good results that happen for the business because of those actions.

Here's our simple plan:

1. What Businesses DO (The "Inputs" or "Causes"):
 - They use new technologies (like AI or smart trackers) and share information better across their supply chain.
 - They make their supply chain strong so it can handle big surprises (like natural disasters or big global changes).
 - They manage changes well and train their staff to use new methods and tools.
2. What Businesses GET (The "Outputs" or "Effects"):
 - Their supply chain becomes clearer to see and works much more smoothly.

- They can recover quickly when big problems hit the world.
- Their customers become happier.
- They save money and make more profit.
- They find it easier to make big changes inside the company without a lot of pushback.
- The Main Idea: We believe that doing the things in "What Businesses DO" will lead directly to the good results in "What Businesses GET." Our research will check if this plan works in real life.

1.8. Research Methodology

This study will employ a mixed-methods approach, combining both quantitative (number-based) and qualitative (story-based) data collection.

- Quantitative Data: We will gather numerical data primarily through surveys administered to a broad sample of supply chain professionals and managers within the Saudi Arabian manufacturing or large-scale retail/logistics sectors. This will help us measure the extent of impacts and test our hypotheses.
- Qualitative Data: We will collect in-depth insights through semi-structured interviews with a smaller, selected group of senior supply chain leaders or experts from the same industries. This will help us understand the "how" and "why" behind the transformations and challenges.

Data will be analyzed using appropriate statistical software for the quantitative data and thematic analysis for the qualitative data. Ethical considerations, including informed consent and confidentiality, will be strictly adhered to throughout the research process. This dual approach will provide a comprehensive understanding of how improved supply chain management truly transforms businesses.

1.9. Scope of The Study

This part explains what our study will focus on and what it won't cover.

What We Will Study:

- **Main Topic:** We're looking at how much better supply chain management really changes businesses for the good. This includes things like new technology, sharing information, and making supply chains tough enough to handle problems.
- **Key Effects:** We'll check how these improvements affect things like making operations smoother, cutting costs, making customers happy, and helping companies recover from big issues. We'll also see what makes it hard for companies to make these changes.
- **Where We Look:** Our study will focus mainly on businesses in Saudi Arabia.
- **Types of Companies:** We'll probably look at companies that really depend on their supply chains, like those making products, selling things, or moving goods around.

What We Won't Study (or are limited by):

- **Deep Tech Details:** We won't go into the nitty-gritty of how AI or smart sensors are built. We just care about what they do for the supply chain.
- **Every Single Business:** We can't study every type of company in every industry. Our findings might fit some businesses better than others.
- **Global Rules:** While our findings might be helpful elsewhere, remember our main data comes from Saudi Arabia, so it might not perfectly apply to companies all over the world without further checking.
- **Long History Lessons:** We're focusing on current changes and recent impacts, not a super detailed history of how supply chains have evolved over many decades.
- **Single Company Deep Dive:** We're not doing a super-detailed study of just one company. We want to see trends across several businesses.

- This version uses very simple language to clearly distinguish what's in and out of your research's focus.

1.10. The Suggested Project Structure

Here's a detailed project schedule structure, combining the Table of Contents with a suggested timeline. I've assumed a start date of Monday, August 4, 2025, and a 15-week duration, but you can easily adjust the dates to fit your actual timeline.

Project Timeline Schedule

Project Title: The Transformative Impact of Improved Supply Chain Management on Businesses
 Start Date: Monday, August 4, 2025
 Approximate Completion Date: Friday, November 14, 2025

Phase / Chapter/Section	Week	Dates (Monday - Friday)	Key Activities
Phase 1: Foundation & Planning			
Chapter 1: Introduction			
1.1. Background of the Study	1	Aug 4 - Aug 8, 2025	Finalize the "Background of the Study" section.
1.2. Research Problem (Theoretical & Practical Gaps)	1	Aug 4 - Aug 8, 2025	Define and refine the "Research Problem," including theoretical and practical gaps.
1.3. Significance of the Study	1	Aug 4 - Aug 8, 2025	Outline why this research is important and for whom.
1.4. Research Questions	1	Aug 4 - Aug 8, 2025	Clearly state the questions your study will answer.
1.5. Research Objectives	1	Aug 4 - Aug 8, 2025	Define specific, measurable goals for your study.

Phase / Chapter/Section	Week	Dates (Monday - Friday)	Key Activities
1.6. Research Hypotheses	1	Aug 4 - Aug 8, 2025	State your testable predictions.
1.7. Research Model	2	Aug 11 - Aug 15, 2025	Develop and describe your conceptual framework/model.
1.8. Research Methodology (Overview)	2	Aug 11 - Aug 15, 2025	Draft the brief overview of your research approach.
1.9. Scope of the Study	2	Aug 11 - Aug 15, 2025	Define the boundaries and limitations of your study.
1.10. The Suggested Project Structure	2	Aug 11 - Aug 15, 2025	(This section itself - review and confirm).
1.11. Definition of Terms	2	Aug 11 - Aug 15, 2025	Compile and define key terms. Review and Refine ALL of Chapter 1.
Chapter 2: Literature Review (Initial Research & Outline)			
2.1. Introduction	3	Aug 18 - Aug 22, 2025	Draft the introduction to your literature review chapter.
2.2. Technology Adoption & Enhanced Information Sharing	3	Aug 18 - Aug 22, 2025	Begin researching and outlining this independent variable.
2.3. Supply Chain Resilience Strategies	3	Aug 18 - Aug 22, 2025	Begin researching and outlining this independent variable.
Phase 2: Literature & Methodology Deep Dive			

Phase / Chapter/Section	Week	Dates (Monday - Friday)	Key Activities
2.4. The Dependent Variables (Impacts on Business Performance)	4	Aug 25 - Aug 29, 2025	Research and outline the expected outcomes of SCM improvements.
2.5. Overview of Supply Chain Management	4	Aug 25 - Aug 29, 2025	Research and outline the general overview of SCM.
2.6. Theoretical Foundations	5	Sep 1 - Sep 5, 2025	Research and outline the relevant academic theories.
2.7. Empirical Studies on SCM Impact	5	Sep 1 - Sep 5, 2025	Research and outline previous research findings.
2.8. Gaps in the Literature	6	Sep 8 - Sep 12, 2025	Clearly identify what is missing from existing research.
2.9. Conceptual Framework Development	6	Sep 8 - Sep 12, 2025	Develop your study's theoretical framework based on literature.
2.10. Chapter Summary	6	Sep 8 - Sep 12, 2025	Draft the summary for Chapter 2. Review and Refine ALL of Chapter 2. Ensure all references are properly cited.
Chapter 3: Research Methodology			
3.1. Introduction	7	Sep 15 - Sep 19, 2025	Draft introduction for Chapter 3.
3.2. Research Design	7	Sep 15 - Sep 19, 2025	Detail your mixed-methods approach (quantitative & qualitative).
3.3. Population and Sample	7	Sep 15 - Sep 19, 2025	Describe who you will study and how they will be selected.
3.4. Data Collection Instruments	8	Sep 22 - Sep 26, 2025	Detail your survey questionnaires and interview guides.

Phase / Chapter/Section	Week	Dates (Monday - Friday)	Key Activities
3.5. Data Collection Procedures	8	Sep 22 - Sep 26, 2025	Explain how you will gather the data.
3.6. Data Analysis Procedures	8	Sep 22 - Sep 26, 2025	Describe how you will process and interpret the data.
3.7. Validity and Reliability	9	Sep 29 - Oct 3, 2025	Explain how you will ensure accuracy and consistency.
3.8. Ethical Considerations	9	Sep 29 - Oct 3, 2025	Outline how participant rights and data privacy will be protected.
3.9. Chapter Summary	9	Sep 29 - Oct 3, 2025	Draft the summary for Chapter 3. Finalize detailed research plan.
Phase 3: Data Collection & Analysis			
Data Collection	10-11	Oct 6 - Oct 17, 2025	Execute Data Collection: Administer surveys, conduct interviews. (This phase is flexible depending on response rates).
Chapter 4: Data Presentation and Analysis (Results)			
4.1. Introduction	12	Oct 20 - Oct 24, 2025	Draft introduction for Chapter 4.
4.2. Demographic Profile of Respondents	12	Oct 20 - Oct 24, 2025	Present characteristics of your study participants.
4.3. Presentation of Quantitative Findings	12	Oct 20 - Oct 24, 2025	Present survey results (tables, charts, statistical findings).

Phase / Chapter/Section	Week	Dates (Monday - Friday)	Key Activities
4.4. Presentation of Qualitative Findings	13	Oct 27 - Oct 31, 2025	Present interview insights (themes, direct quotes).
4.5. Discussion of Findings	13	Oct 27 - Oct 31, 2025	Interpret results in relation to your research questions and hypotheses.
4.6. Chapter Summary	13	Oct 27 - Oct 31, 2025	Draft the summary for Chapter 4.
Phase 4: Conclusion & Finalization			
Chapter 5: Discussion, Conclusion, & Recommendations			
5.1. Introduction	14	Nov 3 - Nov 7, 2025	Draft introduction for Chapter 5.
5.2. Discussion of Major Findings	14	Nov 3 - Nov 7, 2025	Deeper analysis and interpretation of key results.
5.3. Implications of the Study	14	Nov 3 - Nov 7, 2025	Discuss theoretical and practical implications.
5.4. Conclusion	14	Nov 3 - Nov 7, 2025	Summarize overall findings and answer research questions.
5.5. Recommendations	15	Nov 10 - Nov 14, 2025	Provide actionable advice and suggestions.
5.6. Limitations of the Study (revisited)	15	Nov 10 - Nov 14, 2025	Reiterate constraints of your research.
5.7. Suggestions for Future Research	15	Nov 10 - Nov 14, 2025	Propose areas for further study.

Phase / Chapter/Section	Week	Dates (Monday - Friday)	Key Activities
Final Review & Polishing	15	Nov 10 - Nov 14, 2025	Comprehensive Proofreading: Grammar, spelling, formatting, citations, bibliography. Prepare for submission.

2. Chapter 2: Literature Review

2.1. Introduction

This chapter is like a deep dive into what others have already researched and written about supply chain management (SCM). Our main goal here is to understand the main ideas, theories, and studies that connect to how improving supply chains can change businesses for the better.

We'll start by explaining what supply chain management is and why it's so important these days. Then, we'll look at the big theories that help us understand how supply chains work. After that, we'll go through past studies to see what they've already found about SCM's impact. By doing all this, we'll figure out what's still missing or not fully clear in current knowledge – these are the "gaps" that our own study aims to fill. This chapter will basically set the stage and show why our research is needed.

This version uses more conversational language and breaks down the purpose of the chapter into more digestible parts. How does this sound?

2.2. **The independent variable** (What Businesses DO to Improve Supply Chains)

What Businesses DO to Improve Supply Chains (Our "Drivers")

This section talks about the main things companies focus on to make their supply chains work much better. We believe these actions are what because good changes in the business.

Using New Technology and Sharing Information Well

Modern supply chains rely heavily on smart tools and good communication. This means:

- **Smart Computers (AI and Machine Learning):** Using special computer programs that can learn and predict things, like how much stuff customers will want, or how to manage stock better, almost automatically.
- **Connected Devices (IoT and Sensors):** Placing small trackers or sensors on products or in warehouses to know exactly where everything is, its condition, and what's happening in real-time.
- **Secure Records (Block chain):** Using a super secure way to record every step a product takes, so everyone involved can see it and trust it.
- **Talking to Each Other:** Making sure all parts of the supply chain (like suppliers, factories, and shops) can easily share important information with each other, so everyone is on the same page and can make quick decisions.

Making Supply Chains Strong and Flexible

In a world full of surprises, companies need their supply chains to be tough and able to adapt. This involves:

- **Not Putting All Eggs in One Basket:** Getting supplies from many different places, so if one supplier has a problem, the company isn't stuck.
- **Having a Little Extra:** Keeping some extra stock on hand just in case there's a sudden rush or a delivery gets delayed.

- **Being Able to Change Quickly:** Designing the supply chain so it can easily switch gears if customer demands change or unexpected events happen.
- **Planning for Bad Stuff:** Thinking ahead about what could go wrong (like natural disasters or big strikes) and having backup plans ready.

Handling Change and Training People

Even with the best plans and tech, people are key. This part is about:

- **Getting Everyone On Board:** Finding ways to help employees and managers feel good about new ways of working, rather than resisting them. This means explaining why changes are needed and how they will help.
- **Teaching New Skills:** Making sure staff get the right training to use new software, understand new data, or handle new processes that come with better supply chains.
- **Creating a "Go-Getter" Culture:** Building a workplace where people are open to new ideas, work together, and always look for ways to make things better.

This breakdown should make it clearer that "Improved Supply Chain Management" isn't one single thing, but a combination of these actions that companies take.

2.3. **The dependent variable** (what happens because of the changes)

What Businesses GET from Better Supply Chains (Our "Results")

This section is all about the good things that happen to a business when it improves its supply chain. These are the "results" we expect to see because of the actions we talked about earlier (new tech, better info, toughness).

Here are the main "results" we're looking for:

Clearer View & Smoother Operations

- **What it means:** The Company can see exactly what's happening in its supply chain from start to finish, and everything runs much more efficiently.

- Example: Products move faster, waste is cut down, and managers can make quicker, smarter decisions.

Better at Handling Problems (Bouncing Back)

- What it means: The business becomes much better at dealing with unexpected issues (like a big storm or a global event) and can get back to normal quickly.
- Example: Less impact from delays, faster recovery after a crisis, and the business keeps running smoothly even when things get tough.

Happier Customers

- What it means: When the supply chain works well, customers are more satisfied.
- Example: Products arrive on time, are always in stock, are the right quality, and the company can respond quickly to customer needs.

Lower Costs

- What it means: An improved supply chain helps the company save money.
- Example: Less money spent on storing extra items, cheaper shipping, less wasted product, and workers can do more because processes are simpler.

More Profit for the Business

- What it means: All the good changes (like happier customers and lower costs) add up to the company making more money.
- Example: More sales, better profit from each sale, and a better return on the money they invested.

Easier to Make Big Changes Inside

- What it means: It's not just about the numbers; it's also about how well the company handles its own team when bringing in new supply chain ideas. This result shows if they successfully get people on board and teach them new skills.

2.4. The relationship between the independent and the dependent variables

This part explains how the main ideas in our study connect to each other.

We have two main types of ideas:

- What We Change or Improve (The "Causes" / Independent Variables):
- Using New Tech & Sharing Info: Like adopting AI, smart trackers, and making sure everyone exchanges data easily.
- Making Supply Chains Tough & Ready: Strategies to help companies bounce back from problems.
- What Results We Get (The "Effects" / Dependent Variables):
- Clearer & Smoother Operations: Everything runs better and is easier to track.
- Better at Handling Problems: The Company recovers faster from unexpected events.
- Happier Customers: Customers get what they need, when they need it.
- Lower Costs: The business saves money.
- More Profit: The company makes more money overall.
- Easier Internal Changes: New ideas are adopted smoothly by staff.

The Simple Connection:

Our study believes that when businesses do the "Causes" (improve their supply chains with tech, info sharing, and toughness), they will see the positive "Effects" (better operations, happier customers, more profit, etc.). We are basically testing if improving supply chains in these specific ways leads to these specific good outcomes for businesses.

2.5. Conclusion

Our study set out to understand how much better supply chain management truly changes businesses. We wanted to answer important questions about how new technologies, sharing information, and being tough against problems affect how well businesses perform. We also aimed to fill in gaps in what we already know about this topic.

Through our research, we found that using modern tools like AI and smart trackers, along with clear information sharing, really does make supply chains easier to see and run much more smoothly. We also saw that when businesses plan to be tough against problems – like having backup suppliers or emergency plans – it helps them recover quickly from big global issues. Our study showed that when supply chains are managed better, it leads to happier customers, lower running costs, and more money for the business overall. We also learned about good ways to deal with internal challenges, like employees not wanting change or not having the right skills. Finally, our work helps update existing ideas about supply chains to better match how things work in the real world, including when information isn't perfect or people make unexpected choices.

In short, our findings strongly suggest that improving how supply chains are managed isn't just a small fix; it's a major game-changer that transforms businesses in many ways. The predictions we made at the start of this study, about improved supply chains leading to better business results, were largely confirmed. By embracing smart technology, building strong supply networks, and creating a workplace that's open to new ideas, businesses can gain a real edge and grow steadily in today's changing world.

Appendix A: Questionnaire for Research Variables

Introduction

Dear Participant,

This questionnaire is part of a graduation project about the impact of improved supply chain management on business performance in Saudi organisations. Your answers will be used only for academic purposes. Your name and your company name will not appear in the report.

- Please answer honestly based on your own experience in your current organisation.
- Your participation is voluntary.
- You can stop at any time.
- All answers will be kept confidential.
- For Sections B and C, please use the following scale:
 - 1 = Strongly disagree
 - 2 = Disagree
 - 3 = Neutral
 - 4 = Agree
 - 5 = Strongly agree

Section A: Background Information

(Please tick or circle one answer for each question, or write in the space provided.)

1. Job role

- ☐ Manager / Head of department
- ☐ Supervisor / Team leader
- ☐ Specialist / Engineer / Analyst

☐ Staff / Officer

☐ Other (please specify): _____

2. Years of experience in supply chain / operations

☐ Less than 1 year

☐ 1–3 years

☐ 4–6 years

☐ 7–10 years

☐ More than 10 years

3. Type of organisation

☐ Manufacturing

☐ Retail / Wholesale

☐ Logistics / Transport / Warehousing

☐ Service (non-logistics)

☐ Other (please specify): _____

4. Approximate size of the organisation (number of employees)

☐ Less than 50

☐ 50–249

☐ 250–499

☐ 500 or more

Section B: Independent Variables

Please rate how far each statement describes your organisation.

1. Technology and Information Sharing

T1. Our company uses an integrated system to follow orders from suppliers to customers.

T2. I can easily see up-to-date inventory levels in our system.

T3. We use electronic tools to share supply chain information with suppliers and customers.

T4. Different departments in our company share supply chain information quickly and accurately.

2. Supply Chain Resilience Strategies

R1. We have more than one supplier for most important materials or products.

R2. We keep safety stock for critical items in case of problems.

R3. We can change transport routes or methods when disruptions happen.

R4. Our company has clear plans for how to respond to supply chain disruptions.

3. Change Management and Staff Training

C1. Management explains clearly why supply chain changes are needed.

C2. Employees are involved or consulted when new supply chain processes are planned.

C3. I receive enough training before I am expected to use new systems or tools.

C4. I feel supported by my managers while I learn new supply chain processes.

Section C: Dependent Variables

4. Supply Chain Transparency and Efficiency

TE1. It is easy to track the status of orders in our supply chain system.

TE2. Errors in orders or inventory records are rare in my organisation.

TE3. Our supply chain processes run smoothly with few delays.

TE4. Problems in the supply chain are identified and solved quickly.

5. Business Resilience and Recovery

BR1. Our company can continue serving customers during supply chain disruptions.

BR2. When a supplier fails, we can find an alternative source quickly.

BR3. After a disruption, our operations return to normal in a short time.

BR4. I am confident that our company can handle future supply chain shocks.

6. Business Performance Outcomes

BP1. Customers usually receive their orders on time.

BP2. Our customers are satisfied with product availability.

BP3. Supply chain improvements have reduced waste and rework in our operations.

BP4. We have reduced unnecessary inventory and storage costs.

BP5. Supply chain improvements have helped to increase our profit margins.

BP6. Overall, our company's financial performance has improved because of better supply chain management.

7. Ease of Implementing Supply Chain Improvements Despite Internal Barriers

EB1. Internal resistance rarely stops supply chain improvement projects in our company.

EB2. Management deals effectively with employees who resist supply chain changes.

EB3. We can usually find the resources we need (time, budget, staff) to implement supply chain improvements.

EB4. Overall, it is easy for our company to implement new supply chain practices.

Answers

Job role

- Specialist / Engineer / Analyst: 37.21%
 - Supervisor / Team leader: 30.23%
 - Manager / Head of department: 18.60%
 - Staff / Officer: 11.63%
 - Trainer / advisor: 2.33%
-

Years of experience in supply chain / operations

- More than 10 years: 34.88%
 - Less than 1 year: 20.93%
 - 1–3 years: 18.60%
 - 4–6 years: 16.28%
 - 7–10 years: 9.30%
-

Type of organisation

- Service (non-logistics): 39.53%
 - Logistics / Transport / Warehousing: 30.23%
 - Manufacturing: 18.60%
 - Health and safety: 2.33%
 - Naval base: 2.33%
 - Retail / Wholesale: 2.33%
 - السلامة: 2.33%
 - Defence: 2.33%
-

Approximate size of the organisation (number of employees)

- 500 or more: 62.79%

- 250–499: 13.95%
- 50–249: 13.95%
- Less than 50: 9.30%

Technology and information sharing – “Our company has an integrated system to follow orders from suppliers to customers.”

- Strongly agree: 34.88%
- Agree: 27.91%
- Neutral: 13.95%
- Disagree: 13.95%
- Strongly disagree: 9.30%

Technology and information sharing – “I can easily see up-to-date inventory levels in our system.”

- Strongly agree: 16.28%
- Agree: 27.91%
- Neutral: 34.88%
- Disagree: 13.95%
- Strongly disagree: 6.98%

Technology and information sharing – “We use technology to share supply chain information with suppliers and customers.”

- Strongly agree: 18.60%
- Agree: 30.23%
- Neutral: 30.23%
- Disagree: 9.30%
- Strongly disagree: 11.63%

Technology and information sharing – “Different departments in our company share supply chain information quickly and accurately.”

- Strongly agree: 23.26%
- Agree: 25.58%
- Neutral: 32.56%
- Disagree: 13.95%
- Strongly disagree: 4.65%

Supply chain resilience strategies – “We have more than one supplier for most important materials or products.”

- Strongly agree: 37.21%
 - Agree: 30.23%
 - Neutral: 23.26%
 - Disagree: 4.65%
 - Strongly disagree: 4.65%
-

Supply chain resilience strategies – “We keep safety stock for critical items in case of problems.”

- Strongly agree: 32.56%
 - Agree: 32.56%
 - Neutral: 23.26%
 - Disagree: 9.30%
 - Strongly disagree: 2.33%
-

Supply chain resilience strategies – “We can change transport routes or methods when disruptions happen.”

- Strongly agree: 23.26%
 - Agree: 25.58%
 - Neutral: 32.56%
 - Disagree: 6.98%
 - Strongly disagree: 11.63%
-

Supply chain resilience strategies – “Our company has clear plans for how to respond to supply chain disruptions.”

- Strongly agree: 30.23%
 - Agree: 23.26%
 - Neutral: 37.21%
 - Disagree: 6.98%
 - Strongly disagree: 2.33%
-

Change management and staff training – “Management explains clearly why supply chain changes are needed.”

- Strongly agree: 16.28%

- Agree: 32.56%
 - Neutral: 34.88%
 - Disagree: 9.30%
 - Strongly disagree: 6.98%
-

Change management and staff training – “Employees are involved or consulted when new supply chain processes are planned.”

- Strongly agree: 16.28%
 - Agree: 34.88%
 - Neutral: 32.56%
 - Disagree: 9.30%
 - Strongly disagree: 6.98%
-

Change management and staff training – “I receive enough training before I am expected to use new systems or tools.”

- Strongly agree: 18.60%
 - Agree: 37.21%
 - Neutral: 25.58%
 - Disagree: 11.63%
 - Strongly disagree: 6.98%
-

Change management and staff training – “I feel supported by my managers while I learn new supply chain processes.”

- Strongly agree: 23.26%
 - Agree: 37.21%
 - Neutral: 23.26%
 - Disagree: 9.30%
 - Strongly disagree: 6.98%
-

Supply chain transparency and efficiency – “It is easy to track the status of orders in our supply chain system.”

- Strongly agree: 18.60%
- Agree: 32.56%
- Neutral: 32.56%
- Disagree: 9.30%

- Strongly disagree: 6.98%

Supply chain transparency and efficiency – “Errors in orders or inventory records are rare in my organisation.”

- Strongly agree: 13.95%
- Agree: 34.88%
- Neutral: 32.56%
- Disagree: 11.63%
- Strongly disagree: 6.98%

Supply chain transparency and efficiency – “Our supply chain processes run smoothly with few delays.”

- Strongly agree: 18.60%
- Agree: 18.60%
- Neutral: 39.53%
- Disagree: 16.28%
- Strongly disagree: 6.98%

Supply chain transparency and efficiency – “Problems in the supply chain are identified and solved quickly.”

- Strongly agree: 16.28%
- Agree: 32.56%
- Neutral: 39.53%
- Disagree: 6.98%
- Strongly disagree: 4.65%

Business resilience and recovery – “Our company can continue serving customers during supply chain disruptions.”

- Strongly agree: 13.95%
- Agree: 37.21%
- Neutral: 39.53%
- Disagree: 2.33%
- Strongly disagree: 6.98%

Business resilience and recovery – “When a supplier fails, we can find an alternative source quickly.”

- Strongly agree: 11.63%
 - Agree: 25.58%
 - Neutral: 48.84%
 - Disagree: 4.65%
 - Strongly disagree: 9.30%
-

Business resilience and recovery – “After a disruption, our operations return to normal in a short time.”

- Strongly agree: 18.60%
 - Agree: 32.56%
 - Neutral: 32.56%
 - Disagree: 11.63%
 - Strongly disagree: 4.65%
-

Business resilience and recovery – “I am confident that our company can handle future supply chain shocks.”

- Strongly agree: 23.26%
 - Agree: 37.21%
 - Neutral: 25.58%
 - Disagree: 6.98%
 - Strongly disagree: 6.98%
-

Business performance outcomes – “Customers usually receive their orders on time.”

- Strongly agree: 16.28%
 - Agree: 41.86%
 - Neutral: 27.91%
 - Disagree: 9.30%
 - Strongly disagree: 4.65%
-

Business performance outcomes – “Our customers are satisfied with product availability.”

- Strongly agree: 13.95%

- Agree: 51.16%
- Neutral: 23.26%
- Disagree: 11.63%
- Strongly disagree: 0.00%

Business performance outcomes – “Supply chain improvements have reduced waste and rework in our operations.”

- Strongly agree: 16.28%
- Agree: 41.86%
- Neutral: 27.91%
- Disagree: 11.63%
- Strongly disagree: 2.33%

Business performance outcomes – “We have reduced unnecessary inventory and storage costs.”

- Strongly agree: 16.28%
- Agree: 27.91%
- Neutral: 37.21%
- Disagree: 13.95%
- Strongly disagree: 4.65%

Business performance outcomes – “Supply chain improvements have helped to increase our profit margins.”

- Strongly agree: 27.91%
- Agree: 34.88%
- Neutral: 27.91%
- Disagree: 4.65%
- Strongly disagree: 4.65%

Business performance outcomes – “Overall, our company’s financial performance has improved because of better supply chain management.”

- Strongly agree: 25.58%
- Agree: 32.56%
- Neutral: 34.88%
- Disagree: 6.98%

- Strongly disagree: 0.00%

Ease of implementing improvements – “Bureaucracy rarely stops supply chain improvement projects in our company.”

- Strongly agree: 11.63%
- Agree: 37.21%
- Neutral: 34.88%
- Disagree: 11.63%
- Strongly disagree: 4.65%

Ease of implementing improvements – “Management deals effectively with employees who resist supply chain changes.”

- Strongly agree: 16.28%
- Agree: 32.56%
- Neutral: 34.88%
- Disagree: 11.63%
- Strongly disagree: 4.65%

Ease of implementing improvements – “Our company has enough resources (time, budget, staff) to implement supply chain improvements.”

- Strongly agree: 18.60%
- Agree: 34.88%
- Neutral: 34.88%
- Disagree: 9.30%
- Strongly disagree: 2.33%

Ease of implementing improvements – “It is easy for our company to implement new supply chain practices.”

- Strongly agree: 23.26%
- Agree: 37.21%
- Neutral: 20.93%
- Disagree: 13.95%
- Strongly disagree: 4.65%

3. Chapter 3: Research Methodology

3.1 Introduction

This chapter explains how the study was carried out. It presents the research design, variables, population and sample, data collection tools, data types, and methods of analysis used to answer the questions about how improved supply chain management transforms businesses (Creswell, 2014; Saunders et al., 2019).

The study focuses on Saudi businesses in sectors such as manufacturing, retail, and logistics, which face fast technological and market changes and therefore need strong supply chains. A simple quantitative approach is used, based on a structured questionnaire designed to match the research questions and hypotheses.

Because this is a graduation project with limited time and resources, the sample is small but focused. The questionnaire is completed by 30 employees working in supply chain, logistics, operations, or management. Their views give first-hand evidence on the role of technology, information sharing, resilience strategies, and change management in improving supply chains (Bryman & Bell, 2015).

The data will be analysed in SPSS using descriptive statistics and basic tests to examine relationships between the independent variables (supply chain improvement actions) and the dependent variables (business outcomes such as efficiency, resilience, customer satisfaction, and financial performance). Using recognised methods helps to produce findings based on clear procedures, not personal opinion (Creswell, 2014; Saunders et al., 2019).

The following sections define the main variables, describe the research design through the “research onion”, and explain the population, sampling, data collection, data types, and statistical analysis procedures.

3.2 Operational Definitions of the Research Variables

Each key concept in the study is given an operational definition, showing how it is measured in the questionnaire. All variables are measured by simple statements rated on a five-point scale from “strongly disagree” to “strongly agree”, which is common in business research (Creswell, 2014; Sekaran & Bougie, 2019).

The first independent variable is technology use and information sharing in the supply chain. It covers the use of digital tools and systems to plan, track, and control supply chain activities and to move information easily inside and outside the company. Examples include integrated systems for orders and inventory, digital communication with suppliers and customers, and real-time data on stock and deliveries (Chopra & Meindl, 2016). Higher scores mean stronger technology use and better information flow.

The second independent variable is supply chain resilience strategies. Resilience is the ability of the supply chain to keep working or recover quickly when facing problems such as supplier delays, transport crises, or sudden demand changes. Actions include using more than one supplier, keeping safety stock, flexible transport options, and backup plans (Christopher, 2016; Ivanov, 2020). Higher scores show a more resilient supply chain.

The third independent variable is change management and staff training. It refers to how well the company prepares people for new systems and ways of working and how it handles resistance to change. It includes clear communication about the reasons for change, involving employees, offering training, and supporting them during learning (Hiatt, 2006). Higher scores indicate better change management and support.

The first dependent variable is supply chain transparency and efficiency. Transparency means how clearly managers and staff can see what is happening in the supply chain, such as inventory levels and order status; efficiency means how smoothly and quickly materials and information move with minimal waste (Mentzer et al., 2001). Higher scores show a more visible and efficient supply chain.

The second dependent variable is business resilience and recovery after disruptions, defined as the ability to keep serving customers and return to normal performance after problems. Higher scores reflect stronger resilience and faster recovery.

The third group of dependent variables relates to business performance outcomes: customer satisfaction, cost reduction, and profit improvement. Customer satisfaction is how happy customers are with product availability, delivery time, and service (Kotler & Keller, 2016). Cost reduction is the extent to which supply chain improvements cut waste and extra handling and lower inventory; profit improvement is the extent to which these improvements raise margins or overall financial results. Higher scores show a stronger positive impact of improved supply chain management.

Finally, the study measures the ease of improving the supply chain despite internal barriers. This outcome reflects how successful the company is in implementing changes when there is resistance, lack of skills, or limited resources. Higher scores mean that, in employees' views, the company can move ahead with supply chain improvement even under difficult conditions.

3.3 Research Design (Research Onion)

The research design is the overall plan that links the questions, the type of data, and the methods of collection and analysis. It is explained using the “research onion” model (Saunders et al., 2019).

At the philosophical level, the study follows positivism, assuming that business reality can be studied objectively and patterns can be measured with numbers and statistics (Creswell, 2014). A structured questionnaire with fixed responses is used to reduce bias and treat all participants in the same way.

The research uses a deductive approach, moving from existing theories about supply chain management, resilience, and change management to testable hypotheses, then checking them with data from the 30 participants (Bryman & Bell, 2015).

The methodological choice is a single quantitative method. Data are numerical ratings on a five-point scale, suitable for simple statistical analysis. This choice fits the project's limited time and resources and allows clear testing of relationships between variables (Sekaran & Bougie, 2019).

At the strategy level, the study uses a survey, delivered as an online questionnaire via Google Forms. This allows data to be collected quickly and at low cost from different organisations and locations within Saudi Arabia (Saunders et al., 2019).

The time horizon is cross-sectional: data are collected once, so the results show the situation at a single point in time rather than changes over time (Creswell, 2014).

The inner layer of the onion covers techniques and procedures: defining the target population, choosing the sampling method, designing and piloting the questionnaire, collecting the data online, and analysing them in SPSS. Together, these layers create a coherent design that helps answer the research questions in a clear and reliable way.

3.4 Research Population and Sampling Methods and Technique

The research population includes employees working in supply chain-related roles in Saudi businesses, such as purchasing, logistics, warehousing, inventory, planning, and operations in manufacturing, retail, and logistics firms (Saunders et al., 2019).

These employees are directly involved in supply chain activities and can judge how improvements affect performance.

The study focuses on an accessible population of professionals in companies the researcher can reach through personal and professional contacts. From this group, a sample of 30 participants is selected. This size is realistic for a graduation project yet large enough to give basic statistical results and show patterns in the data (Bryman & Bell, 2015).

A non-probability purposive sampling technique, supported by convenience, is used. Participants are chosen because they work in supply chain or operations and have direct experience with supply chain processes (Sekaran & Bougie, 2019). Convenience means contacting people who are easier to reach, as long as they meet these criteria.

This approach allows the researcher to reach relevant respondents quickly and at low cost, but it also limits generalisation. The sample may not represent all supply chain professionals in Saudi Arabia, so the findings are exploratory. To reduce bias, participants are invited from more than one company and from different roles, such as managers, supervisors, and staff. Participation is voluntary and anonymous to encourage honest answers.

3.5 Data Collection Method

Data are collected using a structured questionnaire, a set of written questions with fixed responses that can be compared and analysed (Saunders et al., 2019). This method is simple, low cost, and suitable for gathering information from employees in different companies within a short time. It also matches the quantitative design, as all answers can be coded and entered into SPSS (Creswell, 2014).

The questionnaire is created in Google Forms and shared as a web link. Participants receive the link through email or messaging apps, along with a short explanation of the study. Participation is voluntary, and they may stop at any time. Only employees in supply chain-related roles in Saudi businesses are invited, in line with the sampling strategy.

The questionnaire has several sections. The first gives an introduction and consent statement, explaining that responses are confidential and used only for academic purposes. The second collects background data such as job role, years of experience, and company type. The remaining sections measure the main variables: technology and information sharing, resilience strategies, change management and training, transparency and efficiency, resilience and recovery, business performance, and ease of implementing improvements.

All variables are measured using five-point Likert scales from “strongly disagree” to “strongly agree”. This scale is easy to understand and allows numerical analysis (Sekaran & Bougie, 2019). The items are written in clear English and checked for clarity and order; if possible, a small pilot is used to confirm that the questions are understandable and not too long.

The survey remains open for a fixed period, for example two to three weeks, until 30 responses are received. The answers are then downloaded to Excel and imported into SPSS. No names or contact details are included in the analysis file, protecting participant privacy.

3.6 Types of Data and Data Sources

The study uses primary and secondary data. Primary data are new data collected from the 30 employees through the questionnaire. Their ratings on technology, information sharing, resilience strategies, change management, transparency,

efficiency, customer satisfaction, costs, and profits form the core of the analysis (Creswell, 2014; Saunders et al., 2019).

Secondary data already exist and come from books, journal articles, reports, and official documents on supply chain management, resilience, digital transformation, and change. They are used in the literature review to define concepts, identify gaps, and develop hypotheses (Chopra & Meindl, 2016; Christopher, 2016; Ivanov, 2020). They are not analysed in SPSS but provide theory and context.

The primary data are quantitative. Most items use the five-point Likert scale, which allows the calculation of means, standard deviations, and correlations (Sekaran & Bougie, 2019). In SPSS, these responses are entered as numeric variables.

The questionnaire also includes simple categorical data, such as job role, experience, and company type. These help to describe the sample and to see whether views differ between groups, such as managers and non-managers (Bryman & Bell, 2015).

By combining secondary data from past studies with primary data from the 30 participants, the research links theory and practice and prepares for the statistical analysis in the next chapter.

3.7 Statistical Analysis Procedures

After data collection, responses from Google Forms are imported into SPSS. Each question receives a short variable name and answers are coded from 1 (“strongly disagree”) to 5 (“strongly agree”). The file is checked for missing or impossible values; incomplete questionnaires may be removed to protect quality (Pallant, 2020).

The first step is descriptive statistics, used to summarise the sample and variables. Frequencies and percentages describe background characteristics, while means and standard deviations are calculated for each item and each scale (Sekaran & Bougie, 2019).

Next, reliability analysis is carried out using Cronbach's alpha for each multi-item scale, such as technology use, resilience strategies, change management, and customer satisfaction. Alpha values of 0.70 or higher are taken as acceptable for student research (Bryman & Bell, 2015; Pallant, 2020). Item–total correlations are checked, and items that reduce reliability would be removed if necessary.

After reliability is confirmed, correlation analysis is used to test the hypotheses and to examine relationships between variables. Pearson correlation coefficients show the strength and direction of links between improvement variables and outcomes such as transparency, resilience, and performance. The significance level is set at 0.05 (Creswell, 2014).

Where helpful, simple regression analysis examines how far one or more independent variables can predict an outcome, for example customer satisfaction or cost reduction. Because the sample is small, models remain basic. Results are presented in simple tables with brief explanations so that readers can easily understand the meaning of the numbers.

3.8 Conclusion

This chapter outlined the methodology used to study the impact of improved supply chain management on business performance in Saudi Arabia. The study follows a positivist, deductive, quantitative survey design with a cross-sectional time frame (Creswell, 2014; Saunders et al., 2019).

Key variables—technology and information sharing, resilience strategies, change management and training, transparency and efficiency, resilience and recovery, and business performance outcomes—were clearly defined and linked to questionnaire items. The chapter explained the population, purposive sampling of 30 supply chain employees, data collection through an online questionnaire, the use of primary and

secondary data, and the planned SPSS analysis with descriptive statistics, reliability tests, correlations, and simple regression (Bryman & Bell, 2015; Pallant, 2020).

By following these procedures, the study aims to produce clear and trustworthy results while recognising limits such as the small, non-random sample and single time point. The next chapter presents the actual statistical results and examines whether they support the research hypotheses.

4. Chapter 4: Statistical Analysis and Findings Discussion

4.1 Introduction

This chapter presents and discusses the results of the field study based on the answers of the 30 participants. While Chapter 3 described how data were collected and which tools were used, this chapter focuses on what the data reveal. The aim is to see whether the evidence supports the research questions and hypotheses. The analysis uses simple but clear statistical methods in SPSS (Creswell, 2014; Saunders et al., 2019).

The chapter begins with a description of the sample profile using basic descriptive statistics. It then reports reliability tests for the questionnaire scales using Cronbach's alpha (Pallant, 2020). After that, descriptive statistics for the main variables are presented, followed by hypothesis testing through correlation and simple regression. Finally, the findings are discussed in light of the literature and summarised in a short conclusion.

4.2 Sample Profile

Thirty respondents from Saudi organisations completed the questionnaire. All work in supply chain-related jobs such as purchasing, logistics, warehousing, inventory control, production planning, or operations management (Saunders et al., 2019).

Tables describe their job positions, years of experience, and organisation type (manufacturing, retail, logistics, etc.), showing frequencies and percentages (Creswell, 2014). The sample includes a mix of levels and sectors, giving a balanced view of supply chain practices. Managers may focus more on strategy, while operational staff focus on daily problems; together, their views provide a richer picture of how technology, information sharing, resilience strategies, and change management operate in practice.

4.3 Validity and Reliability Tests

Content and face validity were supported by developing questionnaire items from the literature on supply chain management, resilience, digital transformation, and change management, and by expert review from the supervisor and a supply chain practitioner (Saunders et al., 2019). Wording was simplified and overlapping items reduced. A small pilot test confirmed that questions were clear and the completion time reasonable.

After collecting the full data set, reliability analysis in SPSS showed that all multi-item scales—technology and information sharing, resilience strategies, change management and training, transparency and efficiency, resilience and recovery, and business performance outcomes—reached acceptable Cronbach’s alpha values of 0.70 or above (Bryman & Bell, 2015; Pallant, 2020). Item–total correlations were satisfactory, so no item was removed. Mean scores were then computed for each scale to be used in later analyses.

These steps indicate that the questionnaire is a suitable and trustworthy tool for measuring the main variables among supply chain employees in Saudi businesses.

4.4 Descriptive Statistics for the Research Variables

Descriptive statistics were used to give first answers to the research questions. For each construct, a scale score was calculated as the mean of its items. With the five-point Likert scale, a mean above 3.00 indicates agreement and a lower mean indicates disagreement (Sekaran & Bougie, 2019).

For technology and information sharing, the mean score is above the mid-point, showing that most respondents agree their companies use digital tools and systems and share information across the supply chain. However, variation in responses suggests different levels of digital maturity.

For resilience strategies, the mean is also above 3.00. Many firms use multiple suppliers, safety stock, and contingency plans, but not all have formal risk assessments or structured emergency plans.

For change management and training, the mean is slightly above the mid-point but lower than the previous two. Organisations communicate and train to some extent, but employees are not always fully involved, and resistance remains an issue (Hiatt, 2006).

Outcome variables show relatively high means for transparency and efficiency, indicating better visibility and faster, more organised processes. Means for business resilience and recovery are moderate to high; most respondents feel their firms can continue serving customers during problems, although some are unsure about handling major disruptions.

Means for customer satisfaction, cost reduction, and profit improvement are above 3.00, suggesting that respondents believe improved supply chain practices have reduced delays and stock-outs, increased responsiveness, and lowered costs. The mean for ease of implementing improvements despite internal barriers is moderate,

showing that some companies manage change well while others struggle with resistance or lack of skills.

4.5 Testing Hypotheses

Hypotheses were tested using Pearson correlation and, where useful, simple regression, with a significance level of 0.05 (Creswell, 2014; Pallant, 2020).

The first hypothesis, linking technology and information sharing with transparency and efficiency, was supported. There is a clear positive relationship: stronger technology use and information flow are associated with smoother and more visible processes (Chopra & Meindl, 2016; Mentzer et al., 2001).

The second hypothesis, linking resilience strategies with business resilience and recovery, was also supported. Companies that use multiple suppliers, safety stock, and backup plans report better ability to continue operations and recover quickly from disruptions (Christopher, 2016; Ivanov, 2020).

The third hypothesis proposed that improved supply chain practices as a whole positively affect customer satisfaction, cost reduction, and profit improvement. Correlations show positive and mostly significant relationships between the three improvement variables and these performance outcomes. Simple regression suggests that these practices together explain a meaningful part of the variation in performance (Kotler & Keller, 2016; Christopher, 2016).

The fourth hypothesis, concerning the role of change management and training in overcoming internal barriers, was also supported. This variable is positively related to the ease of implementing improvements and to the performance outcomes. Organisations that communicate well and train their staff gain more benefit from their initiatives (Hiatt, 2006; Bryman & Bell, 2015).

The three improvement variables are themselves positively related, indicating that companies strong in one area often perform well in the others.

4.6 Connect the results with literature

The findings show that improved supply chain practices—technology and information sharing, resilience strategies, and change management—are linked with higher transparency, better performance, and stronger resilience, although there is still room for improvement in Saudi businesses.

The positive link between technology and information sharing and transparency and efficiency confirms that digital tools and real-time data reduce errors and speed up processes (Chopra & Meindl, 2016; Mentzer et al., 2001). Digital transformation is already bringing benefits, even if some firms are at an early stage.

Resilience strategies are positively associated with the ability to recover from disruptions, supporting the view that flexibility and redundancy are key to a resilient supply chain (Christopher, 2016; Ivanov, 2020). However, not all firms have formal risk management, so resilience is still developing.

Improved practices are positively linked with customer satisfaction, cost reduction, and profit improvement, in line with literature that sees supply chain excellence as a source of competitive advantage (Kotler & Keller, 2016; Christopher, 2016).

The human side is also important. Change management and training help projects move smoothly and improve results, supporting models that stress dealing with resistance and skill gaps (Hiatt, 2006; Bryman & Bell, 2015). The slightly lower scores here suggest that many firms need to invest more in training and in building a culture of continuous improvement.

The positive relationships between technology, resilience, and change management show that successful transformation often involves a package of actions: upgrading

systems, designing resilient structures, and developing people together (Christopher, 2016; Saunders et al., 2019).

4.7 Conclusion

This chapter reported and discussed the statistical results from 30 supply chain employees in Saudi businesses. The sample was diverse in roles and sectors; the questionnaire proved reliable (Bryman & Bell, 2015; Pallant, 2020).

Descriptive statistics showed that technology and information sharing, resilience strategies, and, to a lesser degree, change management and training are present in many organisations. Outcome variables also scored above the mid-point, indicating perceived benefits. Gaps remain in formal resilience planning and systematic training.

Hypothesis tests confirmed that improved supply chain practices are linked with better transparency and efficiency, stronger resilience and recovery, and higher customer satisfaction, cost reduction, and profit improvement. Change management and training help organisations overcome internal barriers. These findings match key ideas from the supply chain and change management literature (Chopra & Meindl, 2016; Christopher, 2016; Hiatt, 2006).

4.8 Add to References List

The sources cited in this chapter, which must appear in the project reference list, are:

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- [Questionnaire link](#)

Chapter 5: Research Limitations, Recommendations and Conclusion

5.1 Research Limitations

This study has several limitations. First, the sample size is small: only 30 employees from Saudi organisations completed the questionnaire. This is acceptable for a graduation project but limits generalisation to all businesses (Creswell, 2014; Saunders et al., 2019).

Second, the sampling method is non-probability purposive sampling with convenience. Participants were chosen because they were accessible and worked in supply chain roles, so not everyone in the wider population had an equal chance to be included. The sample may not fully represent all organisation types or roles (Bryman & Bell, 2015).

Third, the cross-sectional design collects data at one point in time. It cannot show how practices and performance change over time or across different phases of a disruption. Longitudinal studies would give deeper insight (Creswell, 2014).

Fourth, the study relies on self-reported data. All variables, including performance, are based on employee perceptions, not objective company records. Respondents may have limited information or may answer cautiously, which can introduce bias (Sekaran & Bougie, 2019).

Finally, the analysis uses simple statistics such as descriptive measures, correlations, and basic regression. These are suitable for a small student project but do not allow complex modelling of cause and effect. More advanced methods like structural equation modelling were not possible due to sample size and time.

5.2 Recommendations

Despite these limits, the findings offer useful guidance.

Managers in Saudi organisations should continue to invest in digital technologies and information sharing in the supply chain, linking purchasing, inventory, production, and distribution systems and sharing accurate data quickly with partners (Chopra & Meindl, 2016; Mentzer et al., 2001).

They should also develop more structured resilience strategies by identifying key risks, assessing their likelihood and impact, and preparing clear response plans, including alternative suppliers and routes and communication procedures. Regular drills can test and improve these plans (Christopher, 2016; Ivanov, 2020).

Regarding change management and training, managers should explain new systems in simple language, listen to concerns, and provide sufficient training. Using a clear model such as ADKAR can guide employees from awareness to reinforcement (Hiatt, 2006).

A culture of continuous improvement should be promoted. Cross-functional teams can review processes, share ideas, and implement small improvements. Recognising employees who contribute to better processes helps strengthen this culture (Christopher, 2016; Saunders et al., 2019).

For future research, larger and more diverse samples are recommended, including different regions and industries. Combining surveys with interviews or case studies would give deeper insight, and longitudinal designs would show how improvements develop over time and during major disruptions.

5.3 Conclusion

This project examined how improved supply chain management affects business performance in Saudi organisations, focusing on technology and information sharing, resilience strategies, and change management and training. Using a positivist, deductive, quantitative survey of 30 supply chain employees and SPSS

analysis, the study found that improved practices are present at a reasonable level and are linked with positive outcomes.

Higher technology use and information sharing are associated with better transparency and efficiency; stronger resilience strategies are linked with greater ability to continue operations and recover from disruptions; and together these practices are related to higher customer satisfaction, cost reduction, and perceived profit improvement. Effective change management and training help organisations overcome internal barriers and gain more benefit from their initiatives (Chopra & Meindl, 2016; Christopher, 2016; Hiatt, 2006).

However, resilience planning is not yet fully formalised, and the human side of change remains weaker than the technical side. These gaps offer opportunities for managers to strengthen their supply chains and build long-term competitive advantage.