Arab American University
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Ph.D. Program in Strategic Management

The Impact of Digital Supply Chains on Sustainable Competitive Advantage in Palestinian Food Manufacturing Companies: The Moderating Role of Supplier Trust

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This Dissertation Was Submitted in Partial Fulfilment of the Requirements for the Doctor of Philosophy (Ph.D.) Degree in Strategic Management

Palestine, 2/2025

Arab American University
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Dissertation Approval

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Palestine, 2/2025

Declaration

I declare that, except where explicit reference is made to the contribution of others, this dissertation is substantially my own work and has not been submitted for any other degree at the Arab American University or any other institution.

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Date of Submitting the Final Version of the Dissertation: 17.3.2025

Dedication

This dissertation is dedicated to my beloved family, whose unwavering support, encouragement, and sacrifices have been the cornerstone of my academic journey. I also thank my parents for their endless love and prayers and my spouse and children for their patience and understanding throughout this process.

I also dedicate this work to the Palestinian people; whose resilience and determination inspire me daily.

Hasan M Rabaia

Acknowledgments

I would like to express my heartfelt gratitude to my supervisors, Dr. Marwan Al-Shammari, Dr. John Lipinski, and Dr. Ayman Alarmoty, for their invaluable guidance, insights, and encouragement throughout this research journey. Their expertise and constructive feedback were instrumental in shaping the direction and depth of this dissertation.

I am also deeply thankful to my colleagues and peers in the Ph.D. Program in Strategic Management at the Arab American University of Palestine for their collaborative spirit and intellectual discussions that enriched this study.

Special thanks to the Faculty of Graduate Studies and the Department of Strategic Management for providing the necessary resources and support to complete this research.

I extend my gratitude to the Palestinian food manufacturing companies and their representatives who participated in this study, for their cooperation and valuable insights.

Finally, I acknowledge the unwavering support and sacrifices of my family, whose belief in me has been my source of strength throughout this journey.

Hasan M Rabaia

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Abstract

The purpose of this research is to examine the influence of digital supply chains for attaining sustainable competitive advantage in Palestinian food manufacturing firms concerning supplier trust as a moderator. The study was conducted in Palestine in 2024, where food manufacturing companies were used as the subject of the study. Primary data was collected through a structured questionnaire that was administered to a representative sample.

Further, the conceptual background incorporates strategic management and supply chain theories, digital supply chain concepts, operations, networks, and logistics flows. Some of the conclusions drawn regarding such digital supply chains are that it enhances sustainability and competitive advantage specifically where the management of supplier trust is accomplished. Additionally, the study emphasizes the necessity for establishing trust-based relationships with suppliers and implementing digital technologies to minimize costs in supply chain integration and efficiency.

Overall, the contributions of this study to the field of strategic management are substantial in its ability to fill the gap in knowledge about how digital supply chains and supplier trust come together to create sustainable competitive advantage. This study presents a model encompassing theoretical insight on the one side, and practical implications on the other, but it provides food manufacturing companies in Palestine, with actionable strategy to reach better operational and competitive performance.

In light of these conclusions, the study suggests that in order to preserve competitive advantage, attention be paid to the integration of more effective digital technologies and long-term, trust-based partnerships with the major suppliers.

Keywords**:** Digital supply chains, sustainable competitive advantage, supplier trust, Palestinian food industry, strategic management.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Definitions of Abbreviations

Abbreviations	Title
SC	Supply Chain
SCM	Supply Chain Management
DSC	Digital Supply Chain
CA	Competitive Advantage
SCMP	Supply Chain Management Process
DT	Digital Technology
SSCM	Sustainable Supply Chain Management
RBV	Resource-Based View
CT	Contingency Theory
NRBV	Natural Resource-Based Theory
TBL	Triple Bottom Line
FMGC	Fast-Moving Consumer Goods

Chapter One: Background of the Study

1.1 Introduction

In today's fast-paced and highly competitive business environment, industrial companies are constantly seeking ways to gain a competitive advantage (Mentzer et al., 2019). One area that has emerged as a key driver of success is supplier trust and the strategic relationship between suppliers and the implementation of digital supply chains (Eisenhardt &Martin, 2018). Digital supply chains refer to the integration of digital technologies and processes throughout the supply chain, from procurement to delivery (Haris &Samuel, 2018). This integration allows for real-time visibility, collaboration, and data-driven decision-making (Warner, 2019).

By leveraging digital technologies, industrial companies can streamline their supply chain operations, reduce costs, improve efficiency, and enhance customer satisfaction (Ivanov & Dolgui, 2021).

One of the key benefits of digital supply chains is the ability to establish strategic relationships with suppliers, traditionally supplier relationships were transactional in nature, with little collaboration or communication beyond the immediate purchase. However, with digital supply chains, Food manufacturing companies can establish closer ties with their suppliers, leading to improved collaboration, trust, and mutual understanding (Kim et al., 2019).

Traditionally, SRM has focused on transactional purchasing and short-term cost reductions. However, according to Cao and Zhang (2011), leading organizations now aim to build supplier trust and long-term, collaborative relationships with their suppliers. This shift in focus is driven by the realization that suppliers can provide more value than just low prices. By working closely with suppliers, organizations can tap into their expertise, innovation, and ability to deliver high-quality products and services.

Supplier trust is a crucial aspect of modern business operations. By integrating major suppliers into product development, forecasts, and production plans, companies can harness synergies across the supplier ecosystem. This integration is achieved through coordination and information sharing, as highlighted by Lawrence et al. (2015).

Through digital platforms and tools, industrial companies can share real-time information with their suppliers, such as demand forecasts, production schedules, and quality requirements (Liu et al., 2018). This enables suppliers to better align their operations with the needs of the industrial companies, resulting in improved responsiveness, reduced lead times, and increased product quality.

Furthermore, digital supply chains enable industrial companies to gain a deeper understanding of their suppliers' capabilities, performance, and reliability (Reyes et al., 2021). industrial companies can identify high-performing suppliers and develop long-term strategic partnerships. These partnerships can lead to cost savings, innovation, and a competitive edge in the market (Barreto et al., 2017).

Integrating sustainability practices into digital supply chain (DSC) offers significant opportunities for businesses to gain a competitive edge (Deloitte (2021). Consumers are increasingly demanding transparency and eco-friendly practices, making sustainability a key differentiator. Embracing sustainable practices within DSCM can yield benefits likec Cost reduction, and Enhanced brand reputation.

Proactive sustainability efforts can mitigate risks associated with resource scarcity, regulatory changes, and climate disruptions, ensuring long-term business resilience. Innovation opportunities. Focusing on sustainability encourages creativity and innovation, leading to the development of new products, services.

By strategically managing supplier trust and supplier relationships within a digitally-enabled supply chain, companies can amplify these benefits. Collaborating with suppliers on sustainability initiatives, such as carbon footprint reduction or ethical sourcing practices, can create a more robust and responsible ecosystem. Accenture (2020).

Supplier trust and SRM and plays a crucial role in the success of DSCs. In today's digital era, supply chains have become increasingly complex and interconnected. Effective management of supplier relationships is essential for companies to optimize their supply chain operations and gain a sustainable competitive advantage.

By understanding the impact of digital supply chains on the supplier trust, companies can identify areas for improvement and implement strategies to enhance collaboration and efficiency.

The emerging digital supply chain environment necessitates a shift in focus from operational to strategic SRM, by embracing digital technologies and upgrading SRM capabilities, organizations can unlock new opportunities for growth, efficiency, and resilience in their supply chains. It is imperative for companies to recognize the strategic importance of SRM and invest in the necessary resources and capabilities to stay ahead in today's digital age. (Ivanov & Dolgui, 2021).

The study's focus on Food manufacturing companies in Palestine is significant Industrial companies often have intricate supply chains involving multiple suppliers and stakeholders. The supplier trust is particularly crucial in this context, as it directly affects the quality, cost, and timeliness of the products or services delivered.

This study will explore the impact of digital supply chains on Sustainable competitive advantage in Palestinian Food manufacturing companies: The moderating role of supplier trust

1.1.1 Sustainable Competitive Advantage

Sustainable competitive advantage is defined as a company's ability to maintain its competitive advantages over its competitors in order to achieve superior financial performance continuously over time. This advantage arises from attributes that allow a firm to perform better than its competitors, such as superior technology, market positioning, or skilled resources, and it must be difficult for competitors to imitate or replicate (Porter, 1985).

Sustainable competitive advantage is the unique strength or characteristic that an organization possesses that enables it to outperform its competitors in the long term. This advantage is sustainable because it is difficult to replicate or erode by competitors, allowing the company to maintain its superior position in the market.

Its primary sources of origin are many, the most important of which are proprietary technology, strong brand recognition, economies of scale, unique business processes, exclusive access to resources, or a highly skilled workforce. A characteristic of sustainable competitive advantage is its durability and ability to withstand competitive pressures, which leads to continued profitability and success for the company (Sachitra, 2019),

It allows a company to differentiate itself from competitors, attract customers, and achieve superior performance in the market. Whether through differentiation, cost leadership, or focus strategy, companies must strive to develop and leverage their unique capabilities and

resources to gain a competitive edge. By doing so, they can position themselves as industry leaders and thrive in today's highly competitive business environment. (Sodhi & Tang, 2021).

Sustainable competitive advantage refers to a company's ability to outperform its competitors consistently over a long period of time through unique resources, capabilities, or strategies that are difficult for rivals to replicate (Sumarliah and Al-hakeem, 2022). Guimarães et al. (2017) emphasize that sustainable competitive advantage entails surpassing competitors in terms of return on assets, return on investment, operating costs, and overall performance.

This concept has been explored by various scholars such as Pratono et al. (2019) and other researchers who have investigated the relationship between sustainable supply chain management and business competitive performance.

According to Sun et al. (2022), the primary source of sustainable competitive advantage is the successful implementation of sustainable supply chain strategies. These strategies not only address the direct practical needs of companies, but also have an environmental and social purpose that is larger in scope, which is increasingly pertinent in the global market.

Luthra and Mangla (2018) state that the implementation of sustainable supply chain management in emerging economies is essential to maintaining a competitive advantage. These methods facilitate companies in meeting the increasing requirements of global standards for sustainability and social responsibility.

Sumarliah and Al-hakeem (2023) indicate that sustainable competitive advantage is typically achieved by maintaining superior performance in comparison to other companies over a long period of time. This can be measured by indicators like the return of investment, profitability, market share, cost efficiency, and customer commitment.

Key Performance Indicators (KPIs) that are used to assess sustainable competitive advantage:

- **Return on Investment (ROI):** The evaluation of the effectiveness of different investments of the company that are undertaken to understand which initiatives or resources have the greatest effect on the company's competitive position.
- **Market Share:** The percentage of a market that is controlled by a particular company, which is indicative of the degree to which it is influential relative to its competitors.

- **Profit Margins:** High profit margins are indicative of a significant competitive advantage, as they suggest that the company can charge higher prices or manage costs more effectively than other companies.
- **Customer Loyalty and Retention Rates:** High rates of customer retention or loyalty suggest an advantage in the competitive landscape through service, quality, or brand name that is more powerful than competitors.
- **Efficiency of Cost:** superior cost management that leads to lower costs of operation compared to rivals, this directly contributes to profitability and competitiveness.
- **Innovation RATE:** The frequency and magnitude of new product releases or process enhancements can also be used to gauge a company's ability to stay ahead of the competition through innovation.

These metrics are frequently combined to provide a comprehensive description of a company's lasting competitive advantage. A mixture of these metrics helps in determining the long-term competitive advantage of a company, considering both market and internal metrics of performance.

According to Sun et al. (2022), the measurement of sustainable competitive advantage involves analyzing the various performance metrics that demonstrate the degree to which a company has incorporated and capitalized on sustainable practices in the supply chain in order to outdo competitors.

The investigation utilized a composite measurement methodology that involved scales that incorporated digital technology, enhanced efficiency in processes, increased collaboration, and increased flexibility in the supply chain.

These indicators serve as a collective measurement of the degree to which sustainable supply chain strategies help a company to achieve a competitive advantage. Additionally, they underline the significance of reliability and validity in their measurement model, which ensures that the scales employed are accurate representation of the intended constructs. This intricate method of measurement provides a solid basis for other researchers and professionals wishing to assess the sustainable advantage of competition.

One of the key ways to achieve competitive advantage is by focusing on cost. This involves minimizing costs throughout the value chain, from sourcing raw materials to delivering the final product or service. By reducing costs, a company can offer its products or services at a lower price than it is competitors, attracting price-sensitive customers and gaining

market share (Wang, Lin & Chu, 2011), focusing on cost is crucial for businesses to achieve competitive advantage.

By minimizing costs throughout the value chain, companies can offer their products or services at a lower price, attracting price-sensitive customers and gaining market share. Cost reduction strategies such as streamlining operations, improving efficiency, and leveraging economies of scale are essential for businesses to remain competitive in today's global marketplace.

Cost leadership is a strategy that aims to become the lowest-cost producer in the industry. By achieving economies of scale, streamlining operations, and leveraging efficient processes, a company can offer its products or services at a lower cost than its competitors can.

This allows the company to attract price-conscious customers and gain a competitive advantage (Sachitra, 2016), cost leadership is a strategy that can provide numerous benefits to a company. By becoming the lowest-cost producer in the industry, a company can attract price-conscious customers, withstand price competition, and invest in areas that can help it maintain its competitive edge. A strategy should be considered by any company looking to gain a competitive advantage in the market.

Differentiation is another strategy for achieving competitive advantage. It involves creating a unique and valuable product or service that sets a company apart from its competitors by offering something that is perceive as superior or distinctive, a company can command a premium price and attract customers who are willing to pay for the added value (Dirisu, Iyiola & Ibidunni, 2013).

Differentiation is a strategy that allows companies to create a unique and valuable product or service that sets them apart from their competitors. By offering, something that perceived as superior or distinctive, companies can attract customers who are willing to pay a premium price. Differentiation is not easy, but when done right, it can lead to competitive advantage and long-term success.

Responsiveness is the ability of a company to quickly adapt and respond to changes in the market. By being agile and flexible, a company can seize opportunities and address customer needs more effectively than its competitors. This allows the company to stay ahead of the curve and maintain a competitive advantage (Abu-Radi & Al-Hawajreh, 2013),

Responsiveness is a critical factor for success in today's business world. Companies that are agile and flexible can seize opportunities, address customer needs, and stay ahead of the competition. By prioritizing responsiveness, companies can position themselves for long-term growth and profitability.

Flexibility is closely related to responsiveness and refers to the ability of a company to adjust its operations and strategies in response to changing market conditions. By being adaptable and open to new ideas, a company can better meet customer demands and stay competitive in a rapidly evolving business environment (Maximova, 2017).

Flexibility is a critical attribute for companies operating in today's dynamic business environment. By being adaptable, open-minded, and responsive to change, companies can better meet customer demands, seize opportunities, and stay competitive. Embracing flexibility is not only a key to survival but also a pathway to long-term success.

Suppliers play a critical role in a company's competitive advantage. By developing strong relationships with reliable and efficient suppliers, a company can ensure a steady supply of high-quality inputs at competitive prices. This can help reduce costs, improve product quality, and enhance customer satisfaction (Scully & Höbig, 2019).

Suppliers are crucial for a company's competitive advantage. By developing strong relationships with reliable and efficient suppliers, companies can reduce costs, improve product quality, and enhance customer satisfaction. Therefore, it is essential for companies to invest in building and maintaining strong supplier relationships to stay ahead in the competitive business landscape.

Supplier trust emphasizes the mutually beneficial cooperative partnership between the company and its suppliers, and is characterized by a long-term perspective, common goals, and open communication. In such relationships, the two parties work closely together to create value, improve efficiency, reduce costs, and innovate (Maximova, 2017).

The main characteristics of supplier trust and strategic relationships with suppliers include long term orientation, Mutual trust and transparency, Solve problems collaboratively, risk sharing, continuous improvement, and Supplier development, companies invest in developing supplier capabilities and processes to ensure a more robust and reliable supply chain. This may include providing training or transfer of technology (Kharub, Mor, & Sharma (2019).

1.1.2 Supplier Trust

Abdullah and Musa (2014) define trust as the party's belief in the dependability and honor of its partners, they emphasize the importance of trust in order to enhance the commitment to relationships in the supply chain management field. Gualandris and Kalchmidt (2015) define buyer-supplier trust (referred to as goodwill trust or TR) as the confidence of one party in the reliability and integrity of the other party in an exchange relationship.

They state that this trust is derived from the belief that cooperation will occur, both the buyer and the supplier believe each other to be honest or benevolent. This understanding decreases the probability of opportunistic behavior in ambiguous environments and facilitates complex exchanges (Moorman et al., 1992; Morgan and Hunt, 1994; Benton and Maloni, 2005).

Supplier trust is referred to as a buyer's trust that the supplier is capable and reliable to perform their obligations within the cooperation relationship. This trust consists of expectations regarding the supplier's honesty, credibility, honesty and transparency (Tarigan et al., 2020).

Supplier trust is considerably associated with company's profitability (Henke et al., 2014). Flynn et al. (2010) mention that trust is crucial to the successful integration of supply chains and has a significant impact on performance, it suggests that there is a complex relationship between trust and other elements like supply chain integration.

Trust is crucial to the dynamic of relationship between partners who are trading, this trust facilitates more efficient and smoother interactions. This involves the belief that the supplier will act favorably or at least not negatively towards the buyer, despite the fact that this cannot be monitored or controlled (Abdullah & Musa, 2014; Hartono et al., 2015).

Also, trust is considered a social resource that is embedded in relationships and is based on shared goals and mutual understanding, all of which can be easily overthrown by reckless behavior (Hartono et al., 2015). Additionally, it is associated with three primary components: capacity, benevolence, and integrity, all of which contribute to the sustainability and resilience of supplier relationships (Minguela-Rata et al., 2014).

This multifaceted nature of trust underscores its essential role in creating cooperative and mutually beneficial relationships with supplier trust that enhance the efficiency of organizations and performance.

Hartono's et al. (2015) suggest that supplier trust has the effect of improving the quality of the product, decreasing the lead time, and lowering costs. They focus on the crucial importance of trust in improving the performance of supplier trust through the design of products and increasing the capacity for sales between buyers and supplier trust.

Lee et al. (2011) discuss the way trust affects supplier performance via its association with buyer companies regarding efficiency of the supply chain and quality management, this affects the organization's performance.

1.1.3 Supplier Trust and Sustainability

Trust can function as a buffer that amplifies the impact of SSM on supplier trust' environmental and social attributes. This is significant in the context of SSCM, as trust can facilitate a greater environmental and social benefit from environmentally sustainable practices (Simpson et al., 2007). The investigation of buyer-supplier trust in sustainable supply chain management (SSCM) is considered limited, but it is still evolving.

Earlier investigations like Carter and Jennings (2004) depict trust as a result of sustainable supply management (SSM), they indicate that corporate social responsibility during the purchasing process can lead to increased trust in supplier trust. Sharfman et al. (2009) recommend trust as a precursor to SSM, which affects the degree to which companies participate in external environmental practices.

Parmigiana et al. (2011) claim that trust in the supply chain increases as a result of social and environmental forces from the stakeholders, this facilitates the transmission of knowledge and performance that is consistent with the buyer's expectations. These perspectives highlight the importance of trust as a crucial component that can also serve as a buffer, which would increase the effects of SSM on supplier trust' environmental and social behavior.

In the literature, supplier trust is considered to be crucial to the sustainability of supply chains. Trust between consumers and supplier trust promotes long term relationships that are essential for maintaining sustainable business practices, this encourages collaboration, resource sharing, and mutual assistance (Tarigan et al., 2020).

This foundational trust promotes the sharing of information and innovation, which in turn facilitates the achievement of the sustainability goals of the supply chain by improving efficiency and reducing waste (Lee et al., 2011; Hartono et al., 2015). Additionally, trust

promotes the alignment of corporate social responsibility goals between the parties, this promotes environmental conservation and social benefit (Zhu et al., 2013).

Also, trust helps to reduce the risk associated with sustainability initiatives, investments typically require significant time and resources before they provide a return (Abdallah et al., 2017). By promoting a consistent, cooperative environment, supplier trust has a significant impact on enhancing the steadfastness and long-term viability of supply chains.

According to Tarigan et al. (2020), supplier trust is measured using various metrics that assess different aspects of the supplier's trust and reliability from the buyer's perspective. Integrity is determined by the supplier's compliance with morality and ethics, consistency in behavior, and devotion to pledges made. credibility is the supplier's reputation for being truthful and dependable, this is indicative of their consistency in fulfilling their promises.

Honesty is the degree to which the supplier is truthful and straightforward in their interactions and transactions. Transparency is measured by the degree to which the supplier is publicly aware of the information, processes, and decisions that are relevant to the buyer, this facilitates a transparent understanding of the operations and practices of the supplier. These metrics are quantified through surveys or questionnaires sent to consumers, who evaluate the supplier trust' trustworthiness on these dimensions using a scale of Likert.

In their study, Gualandris and Kalchmidt (2015) point out that trust in the supplier is important in the organizational operations, it is typically assessed through surveys or questions to determine the procurement and supply chain management teams. Common metrics assessed include reliability, openness, fairness, competence, and benevolence.

These factors are assessed using a Likert scale, where respondents indicate their agreement or disagreement with statements pertaining to these factors. This method facilitates a reproducible measurement of trust, which can be followed over time and contrasted between different supplier relationships.

This is crucial for managing and enhancing relationships with supplier trust, especially in contexts that are strategic in nature. In these situations, collaboration and long-term partnerships are both goals. Through the evaluation of these traits, organizations can more effectively manage and enhance their relationships with supplier trust.

Trust between a supplier and a company can be assessed through several different lenses, including commitment, reliability, communication quality, and ethical behavior

(Morgan and Hunt, 1994). These components have a significant role in the development and maintenance of trust, which in turn, has an effect on the overall efficiency and profitability of the supply chain.

Robustness, which is the capacity of a supplier to produce products and services as intended, is one of the most important measures of trust (Handfield and Bechtel, 2002). In Gilham's (2023) research, this aspect could be attributed to the way minimum stock quantities are maintained, which prevents supply from disrupting production timelines. Constant compliance with orders is indicative of the supplier's dependability and creates faith over time.

Another important aspect is transparency in communication, this involves actively sharing critical information regarding supply chain issues (Lambert & Schwieterman, 2012). Effective communication is crucial to managing expectations and resolving disputes, these are both important aspects of maintaining trust. Gilham (2023) mentions that trust is profoundly affected by the way information regarding stock levels and wait times is managed and communicated.

Commitment to shared goals is also considered an important indicator of trust. Supplier trust that are dedicated to their client's business objectives are considered more trustworthy. This commitment can be illustrated through financial investments in dedicated resources or agreement to the partner's business strategies (Sako, 1998).

The behavior of the supplier must be ethical and responsible, this is crucial to maintaining faith (Carter and Jennings, 2004). Ethical practices diminish the perceived dangers associated with supplier commitment and reliability; this increases trust.

1.1.4 Digital Supply Chains

A digital supply chain is a supply chain that leverages digital technologies and data analytics to guide decision-making, optimize performance, and quickly respond to changing conditions (Helo & Hao, 2019).

The key benefits of digital supply chains is the ability to collect and analyze vast amounts of data in real-time. This allows organizations to gain valuable insights into their supply chain operations and make data-driven decisions. For example, by analyzing customer demand patterns, organizations can better forecast demand and optimize inventory levels, reducing costs and improving customer satisfaction (Ageron, Bentahar & Gunasekaran, 2020).

1.1.5 Supply Chain Management (SCM)

Is a critical aspect of modern business operations, It encompasses a range of activities aimed at efficiently managing the flow of goods, services, and information from the point of origin to the point of consumption (Ageron, Bentahar & Gunasekaran, 2020).

The key benefits of DSCM is improved visibility and transparency across the entire supply chain. With the use of advanced technologies such as RFID, IoT, and block chain, companies can track and trace products at every stage of the supply chain. This not only helps in identifying bottlenecks and inefficiencies but also enables quick response to disruptions and enhances overall supply chain resilience.

1.1.6 Supply Chain Management Components

The components of SCM include suppliers, manufacturers, distributors, retailers, and customers. Suppliers provide the necessary raw materials or components, while manufacturers transform these inputs into finished products. Distributors and retailers play a crucial role in ensuring the products reach the end customers (Kumar& Nambirajan, 2018).

The components of supply chain management are interconnected and dependent on each other. Effective coordination and integration of these components are crucial for the smooth flow of goods and services from suppliers to customers. By understanding the importance of each component and their role in the supply chain, businesses can optimize their operations and achieve greater efficiency and customer satisfaction (Sodhi & Tang, 2021).

1.1.7 Supply Chain Management Processes

SCM processes involve planning, sourcing, making, delivering, and returning. Planning involves forecasting demand, setting production schedules, and determining inventory levels. Sourcing entails selecting suppliers, negotiating contracts, and managing relationships. Making refers to the actual production or assembly of goods. Delivering involves logistics and transportation to ensure timely delivery.

Returning deals with reverse logistics, including product returns, repairs, or recycling (Chen, Daugherty & Roath ,2019). SCM processes are vital for organizations to achieve operational excellence and gain a competitive edge. By effectively managing planning, sourcing, making, delivering, and returning, organizations can optimize their supply chain, reduce costs, improve customer satisfaction, and drive overall success.

1.1.8 Supply Chain Network Structure

The SCM network structure refers to the configuration of suppliers, manufacturers, distributors, and retailers. It can be a traditional linear structure or a more complex network involving multiple tiers of suppliers and distributors. The network structure should been designed to optimize efficiency, minimize costs, and enhance customer satisfaction (Wu & Birge, 2014), a well-structured SCM network enables companies to respond quickly to changes in demand and market conditions.

It allows for flexibility and agility, which are essential in today's dynamic business environment. By having multiple suppliers and distributors, companies can mitigate risks and ensure continuity of supply. In addition, an optimized SCM network structure can lead to improved customer satisfaction. By reducing lead times and ensuring product availability, companies can meet customer demands more effectively. This can result in increased customer loyalty and repeat business (Kumar & Nambirajan, 2013).

1.1.9 Supply Chain Flows

SCM flows encompass the physical, information, and financial flows within the supply chain. Physical flows involve the movement of goods from suppliers to customers. Information flows include the exchange of data and communication between various supply chain partners. Financial flows encompass the payment and settlement processes between suppliers, manufacturers, and customers (Scully & Höbig, 2019).

SCM flows are the lifeblood of a well-functioning supply chain. By optimizing physical, information, and financial flows, companies can enhance efficiency, reduce costs, and improve collaboration among supply chain partners. Embracing technology and implementing best practices in SCM flows will enable businesses to stay competitive in today's dynamic and global marketplace.

1.1.10 Food Manufacturing Companies in Palestine

The food manufacturing industry is significant to the Palestinian economy, it contributes significantly to the gross national product (GNP), and it provides jobs (Palestinian Investment Promotion Agency PIPA, 2017).

The food manufacturing industry in Palestine has a significant impact on the national economy by increasing food security, creating jobs, and contributing to the gross national product (GNP). The FAO (2021) estimates that the sector contributes to around one-third of

the GNP derived from economically significant activities, this is significant. Additionally, it accommodates approximately 24,000 jobs in the local economy, primarily in small-scale enterprises, this indicates the importance of the sector in terms of employment generation (Marzin, Uwaidat, and Sourisseau, 2019).

Additionally, the progression of this sector is crucial to the attainment of a sustainable food system in Palestine. The National Investment Plan for Food and Agriculture Security and Sustainable Agriculture 2020-2022 focuses on the need for concerted policy and financial commitment to augment the capacity of the agri-food sector to address food security and social issues (FAO, 2021).

This strategic approach is dedicated to unleashing the potential of the food system to promote economic stability and reduce poverty, particularly in rural areas where agriculture is primarily conducted. Additionally, the agriculture sector's association with the larger economic framework is essential to the Palestine's economic diversification and structural transformation. This integration promotes the mitigation of external consequences and promotes a more stable economic climate (FAO, 2021).

Companies in this sector participate in planning processes that involve first defining the corporate strategy, then assessing the internal and external environments, and finally setting goals that are long-term in nature (Baker, 2003). These strategies are specifically designed to navigate the complex and often-constrictive business environment of Palestine.

The strategic direction of these corporations is often dedicated to improving quality and expanding markets, both of local and international scope, in order to mitigate the effects of competition and limitations in the market (Martin, 2010). However, the food manufacturing sector in Palestine has significant difficulties including a limited market size, competition from Israeli products, and government restrictions that hinder the sector's performance and development (Ghattas et al., 2015). This has prompted a strategic approach that focuses on overcoming these obstacles through creative and evolving strategies. This study seeks to investigate the impact of digital supply chain on achieving sustainable competitive advantage in Palestinian food manufacturing companies.

The Impact of Technology on Supply Chain and Competitive Advantage Worldwide

Alabdali and Salam (2022) investigated the effects of digital transformation (DT) on the supply chain procurement process (SCMP) and its role in providing a competitive advantage (CD) in Saudi Arabia. The investigation employed a quantitative research methodology, which involved taking data from 221 supply chain professionals through LinkedIn.

The survey was evaluated using a partial least squares-based structural equation model (PLS-SEM) that was implemented via the Smart PLS software. The sample included professionals from various industries, this gave a broad understanding of the topic. The results showed that DT has a significant effect on SCP, which in turn, positively affects CAD.

Additionally, SCP has a significant role in the middle of the relationship between DT and CAD, which suggests that digital transformation of the procurement process can have a significant impact on competitive advantage. This research demonstrates the value of digitalizing the processes of procurement in the supply chain in order to maintain a significant competitive advantage in the market.

Sumarliah and Al-hakeem (2022) investigated the effects of digital innovations and sustainable supply chain management on business performance following COVID-19. The purpose of the study was to explore the effects of Green Entrepreneurial Preference (GEP) and Sustainable Supply Chain Management (SSCM) on Business Competitive Performance (BCP), with a specific focus on the way digital technologies like Artificial Intelligence and Big Data Analytics (AIBD) influence these relationships.

The sample included 245 food companies that are Halal in Yemen, this provides a large amount of data that can be analyzed. The approach used was structural equation modeling (SEM), which enabled the evaluation of the connections between the components of the proposed research framework. The theoretical foundation was derived from the dynamic capability's theory, this theory included constructs like GEP, SSCM, and BCP, with AIBD serving as a mediator. The results of the study showed that GEP had a significant impact on SSCM and thus on BCP.

The investigation also showed that SSCM serves as the mediator between GEP and BCP, and that digital innovations like AIBD have a positive effect on the association between GEP and SSCM, this increases the capacity of companies to implement effective supply chain practices following COVID-19. These findings demonstrate the crucial role of digital

technology in enhancing the firm's resilience and competitive performance in the face of global crises like the COVID-19 pandemic.

Shahadat et al. (2022) investigated the impact of digital technologies on enhancing the performance of the supply chain in the ready-made clothing industry in Bangladesh and achieving a sustainable advantage. The study utilized a quantitative methodology that involved a survey of 150 supply chain executives and managers from various RMG companies.

The survey sought to understand the impact of digital technology on supply chain abilities and advantages. The investigation was conducted across multiple sites in Bangladesh that manufactured RMGs, this represented a diversity of perspectives in the industry.

The primary instrument employed for data collection was a pre-tested and thoroughly reviewed structured questionnaire, which was designed to be reliable and lucid. The results of the study showed that digital technology had a significant effect on improving the supply chain abilities of RMG companies.

The integration of digital technologies was observed to have a direct effect on supply chain performance by increasing both agility and flexibility in the supply chain. This, in turn, had a positive effect on the companies' competitive advantage, which was in line with the research's goal of exploring the benefits of digital technology in complex, dynamic business environments. These findings demonstrate the strategic significance of digital technology in improving supply chain performance and obtaining a competitive advantage in the RMG industry.

Baqleh and Alateeq (2023) examined the role of Big Data Analytics (BDA) on supply chain management practices (SCMPs) and competitive advantage in Jordanian manufacturing companies. The study employed a quantitative approach. The data were collected from 156 companies via hierarchical linear regression. The theoretical framework revolved around the impact of BDA on enhancing the efficiency of SCMPs in order to achieve a significant advantage.

The results showed that while certain SCMPs like information quality and sharing had a positive effect on competitive advantage, other SCMPs like strategic partnerships with supplier trust and customer management had no effect. Interestingly, BDA had no significant effect on the SCMPs' ability to gain an advantage, contradicting the supposition that it is

generally beneficial. The research had a significant impact on the understanding of SCM in the Jordanian context, specifically regarding the practical application of large data analytics.

Maqbool et al. (2014) studied the effect of ICTs on superior performance via strategic alliances with supplier trust in supply chain management. The objective of the investigation was to investigate how ICTs could be incorporated into supply chain management to enhance organizational productivity and maintain a competitive advantage.

The methodology used in the research was a comprehensive Literature Review that was supported by Case Studies that examined the role and impact of ICT in the company's supply chain. The primary tool employed for data collection is the analysis of existing literature and case studies from different companies.

The theoretical foundation of the study was the Resource-Based View (RBV) of the company, which believes that a company's advantage over competitors is derived from the resources and capabilities that are uncommon, valuable, non-substitutable, and difficult to imitate.

The results of the study showed that ICT had a significant effect on the efficiency and effectiveness of supply chain management, it supported more effective decision making, and it had a significant effect on the relationship with supplier trust, all of which contributed to a sustainable advantage.

Fung et al. (2022) investigated how digitalization in supply chains impacts organizational performance and competitiveness and how supplier trust trusts one another. The sample comprised 202 manufacturing corporations that represent various segments of Pakistani manufacturing.

It utilized a mixed-method design which combined qualitative insights from unstructured interviews with 41 industry professionals with quantitative data from surveys sent to the larger corporation sample. This robust methodological framework allowed a deep dive in to the empirical and perceptual dimensions of digital supply chain management. The theoretical framework grounded the research in resource-based perspective (RBV) along with relational view theories.

These viewpoints highlight the importance of strategic resources and relationships for any competitive advantage. Digital supply chain capabilities have been framed as strategic resources and supplier trust was conceptualized as a crucial relational element. Findings

revealed that digital supply chains improve operational and financial performance and foster sustainable competitive advantage. More importantly, results revealed that supplier trust moderates these relationships.

High trust amongst supplier trust was associated with enhanced communication, collaboration and information sharing which amplify the positive outcomes of digital supply chains. These results highlight that creating and maintaining confidence with supplier trust is crucial in the digital era and that confidence is a lever for using strategic advantages of digital supply chain investments.

Ning and Yao (2023) examined the effects of digital transformation on supply chain functionality and sustainable competitive advantage. The data utilized in the study stemmed from a structured survey of 255 respondents from diverse Chinese industries. The study employed structural equation modeling (SEM) to assess the data, with the environmental uncertainty moderating effect was controlled.

The theoretical framework was grounded by contingency theory, which posits that there is a direct linkage between effectiveness of an organization's strategy and the external environment in which it operates. The study found that digital transformation is highly effective in developing supply chain capabilities that positively and significantly affects the sustainable competitive performance of the organization. The research additionally revealed that supply chain capacities partially link digital transformation with competitive advantage, stressing such capacity as sharing information details, cooperation, and speedy responsiveness. The effects of environmental uncertainty highlight the advantage of digital transformation as it produces greater benefits in uncertain environments.

1.1.11 The Impact of Technology on Supply Chain and Competitive Advantage in Palestine

Within the Palestinian context, Abdullah (2012) intended to create a framework for supply chain management that would be applicable to other organizations and that would help them to gain a competitive advantage and improve their overall performance.

The investigation targeted a sample of 40 manufacturing companies across 6 different industries: plastics, marble and stone, food, pharmaceuticals, chemicals, and engineering. A mixed methods approach was employed, which combined both qualitative and quantitative research methods.

The data was collected through an online survey that had a response rate of 53.3%, along with individual interviews. The theoretical framework of the study revolved around combining various supply chain activities in order to increase organizational effectiveness, this was demonstrated by the proposal of a new general framework for supply chain management.

The results showed significant flaws in the current supply chain management methods within the sample, particularly in regards to the integration of supply chain strategies with competitive advantages, supplier relations, and customer relations. These findings suggested the necessity of a strategic re-assessment and the adoption of more extensive, integrated logistics practices.

Awad (2023) investigated the effects of large data technology on the competitive advantage of Palestinian dairy companies. The investigation concerned the dairy industry in Palestine, using a descriptive and interpretive approach in order to achieve its goals.

A comprehensive survey was distributed to five largest facilities in Palestine engaging in dairy production. These companies were Al-Junaidi, Al-Jabrini, Candia, and a dairy facility associated with the Arab Project Company in Jericho. Awad designed a questionnaire to collect the necessary information, which was processed using the SPSS software.

The theoretical framework employed the VRIO model, which facilitated the analysis of how to better collect and analyze data in order to gain a competitive advantage. The model helped the company understand the market and consumers' needs more concretely and monitored competitors more actively.

The results showed that, while data collection and analysis were crucial to gaining an advantage, no dairy company had a dedicated department that utilized modern methods. Additionally, there was a general lack of awareness among employees regarding the value of big data technology in increasing competitive advantage and enhancing market share. Dwikat et al. (2023) investigated the impacts of competent human capital (CHC), strategic flexibility (SF) along with a turbulent environment (TE) on the long-term performance (LPN) of MSEs in the manufacturing business in Palestine.

The investigation sample comprised 380 randomly selected SMEs of which 245 completed questionnaires had been effective. The theoretical basis was the Triple Bottom Line (TBL), Contingency Theory (CT) and Natural Resource Based Theory (NRBV) that discuss how sustainability concepts relate to businesses 'sustainable performance.

Using Partial Least Squares Structural Equation Modeling (PLS-SEM) for information analysis with Smart PLS 4.0 software, the research identified crucial elements in managerial leadership which include TE, SF, and CHC which will impact the sustainable performance of SMEs.

The findings revealed that human resource investments, flexible tactics in addition to environmental analysis all contribute to the businesses 'sustainability and that governmental assistance and initiatives aiming to enhance these aspects would contribute more to the businesses 'sustainability in such complicated political and financial environments.

By the information in the research, it is able to be realized that highly effective supply chain management in addition to trust between the supplier and the buyer can result in increased effectiveness of operations, cost reduction in addition to quality of the product that are crucial to the sustainable success of small enterprises.

1.2 Significance of the Study

This study stands out from other studies in the field due to its unique focus on the impact of digital supply chains on achieving sustainable competitive advantage through strategic supplier relationships in food industry companies. By conducting a thorough review of previous literature, the researchers have identified a gap in knowledge that this study aims to fill.

What sets this study apart is its comprehensive approach to examining the dimensions of the variables involved, the researchers have considered the various dimensions of sustainable competitive advantage, and this holistic perspective allows for a more nuanced understanding of how digital supply chains can contribute to gaining a sustainable competitive advantage.

Furthermore, this study goes beyond simply examining the concept of digital supply chains, it delves into the specific components, processes, network structure, and flows of supply chain management that are impacted by digitization. By considering these various aspects, the researchers can provide a more comprehensive analysis of the subject matter.

This study will provide some key ideas in the field of strategic management for adopting digitalization in food industry companies. It will fill the gap regarding food industry companies' adoption of digitization and forging strategic relationships with their suppliers to achieve sustainable competitive advantage by investigating the incompatible drivers that these companies face during digital transformation.

Another reason is that previous research found that there is still a need to enhance the adoption of digitization in supply chains through its components that were focused on in the model of this study and to build strategic relationships with suppliers to achieve sustainable competitive advantage, as the adoption rate of this topic in food manufacturing companies was lower.

It is desirable because of the unorganized approach and for this reason, food industry companies must strive to overcome and move forward with traditional work to be innovative and achieve success and thus sustainable competitive advantage.

As many researchers have indicated, the internal structure of food industry companies is limited in terms of administrative issues in adopting and implementing digitalization in supply chains This constitutes an incentive for me to research deeply into such a topic and try to find a solution to these issues through scientific proof.

Despite previous research on the relationship of digital supply chains with achieving sustainable competitive advantage in food industry companies, there is still a limited understanding of the risks and dilemmas that companies face if they do not adopt these transformations and how the strategic relationship with suppliers for these companies can help food industry companies reach to sustainable competitive advantage.

To the best of my knowledge, this is the first research that investigates and researches through the components of the complex model of this study that links the components of digital supply chains through establishing a strategic relationship with suppliers and thus achieving a sustainable competitive advantage for food industry companies.

It is expected that this research will contribute to developing a framework for food industry companies to adopt digitization related to supply chains to achieve a sustainable competitive advantage, and it is expected that many stakeholders, decision-makers, and researchers will find this study interesting, especially managers of food industry companies.

This research is important due to the acceleration of information exchange and is well justified because it will contribute to the field of strategic management by providing an experimental solution. The study's conclusions will provide valuable insight into how food industry companies can effectively overcome the challenges they face from digital transformation in supply chains and thus achieve a sustainable competitive advantage.

1.3 Problem Statement

One of the main issues with traditional SRM approaches is the lack of visibility and coordination across the entire supply chain network. With dispersed tier-1, tier-2, and tier-3 suppliers, it becomes difficult to track and manage the flow of materials and information. This can result in demand distortion, where inaccurate information about customer demand is passed along the supply chain, leading to inefficiencies and excess inventory (Kim et al., 2015).

Furthermore, poor coordination among suppliers can lead to delays, disruptions, and quality issues. Without a holistic view of the supply chain, organizations struggle to identify and address potential risks and bottlenecks. This lack of transparency upstream can have a significant impact on the overall performance and profitability of the organization (Lee et al., 2017).

To address these challenges, organizations need to adopt a more strategic and collaborative approach to supplier relationship management. This includes implementing technologies and systems that enable real-time visibility, data sharing, and collaboration across the entire supply chain network. By doing so, organizations can improve coordination, reduce risks, and enhance overall supply chain performance.

By adopting a holistic view of the supply chain and leveraging technology, organizations can overcome the inefficiencies caused by demand distortion, poor coordination, and lack of transparency upstream. This will ultimately lead to improved performance and competitiveness in the global marketplace.

1.4 Objectives of the Study

The research aims to demonstrate the impact of digital supply chains in their dimensions (SC management components, SC management processes, SC network structure, SC flows) in achieving sustainable competitive the moderating role of supplier trust in Palestinian Food manufacturing companies.

1. To demonstrate the impact of management components in digital supply chains in achieving sustainable competitive advantage the moderating role of supplier trust in Palestinian Food manufacturing companies.
2. To demonstrate the impact and processes of management in digital supply chains in achieving competitive advantage the moderating role of supplier trust in Palestinian Food manufacturing companies.
3. To demonstrate the impact of the network structure in digital supply chains in achieving sustainable competitive advantage the moderating role of supplier trust in Palestinian Food manufacturing companies.
4. To demonstrate the impact of flows in digital supply chains in achieving sustainable competitive the moderating role of supplier trust in Palestinian Food manufacturing companies.

1.5 Research Questions

This study aims to answer the following research questions:

Main Research Question: What is the impact of digital supply chains in their dimensions (SC management components, SC management processes, SC network structure, SC flows) in achieving sustainable competitive advantage through the strategic relationship of suppliers in Food manufacturing companies?

To further clarify the research question and guide the study, the following sub questions can have been considered:

- **Q1:** What is the impact of management components in digital supply chains in achieving Sustainable competitive advantage the moderating role of supplier trust in Palestinian Food manufacturing companies?

- **Q2:** What is the impact and processes of management in digital supply chains in achieving Sustainable competitive advantage the moderating role of supplier trust in Palestinian Food manufacturing companies?
- **Q3:** What is the impact of the network structure in digital supply chains in achieving Sustainable competitive advantage through the strategic relationship of suppliers in Palestinian Food manufacturing companies?
- **Q4:** What is the impact of flows in digital supply chains in achieving Sustainable competitive advantage the moderating role of supplier trust in Palestinian Food manufacturing companies?

1.6 Research Hypothesis

This study postulates the following hypotheses:

H1: There is a positive relationship between management components in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

H2: There is a positive relationship between processes of management in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

H3: There is a positive relationship between the network structure in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

H4: There is a positive relationship between flows in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

H5: There is a positive relationship between management components in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

H6: There is a positive relationship between processes of management in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

H7: There is a positive relationship between the network structure in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

H8: There is a positive relationship between flows in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

1.7 Scope and Limitations of the Study

Digital supply chains have become increasingly important in today's business landscape, as companies strive to gain a competitive advantage through the strategic relationship of suppliers. However, it is important to acknowledge that there are potential limitations that may arise when studying the impact of digital supply chains on achieving this advantage.

One potential limitation is the availability of data; in order to conduct a comprehensive study, researchers need access to accurate and reliable data from various sources. However, companies may be hesitant to share sensitive information about their supply chain operations, which can limit the scope and depth of the study.

Another limitation is the complexity of digital supply chains. These supply chains involve multiple stakeholders, including suppliers, manufacturers, distributors, and customers. Understanding the intricacies of these relationships and their impact on competitive advantage can be challenging, and may require a significant amount of time and resources.

Additionally, the dynamic nature of digital supply chains can pose a challenge. Technology is constantly evolving, and innovations can quickly render existing strategies and practices obsolete. This can make it difficult to draw definitive conclusions about the long-term impact of digital supply chains on competitive advantage.

While studying the impact of digital supply chains on achieving sustainable competitive advantage is important, it is crucial to recognize and address potential limitations. By acknowledging these limitations and taking steps to mitigate them, researchers can ensure that their findings are accurate, reliable, and applicable to real-world business scenarios.

1.8 Conceptual and Operational Definitions

- **Digital Supply Chain:**

Conceptual Definition:

Digital supply chain can be defined as a supply chain that uses digital technologies and related data to make decisions, perform optimally and respond to change early (Helo & Hao, 2019).

Operational Definition:

The researcher conceptualises a digital supply chain as the use of digital technologies in the processes involved in food manufacturing companies in Palestine to optimise supply chain activities, increase effectiveness, and attain sustainable competitive edge as well as maintaining trust with suppliers.

- **Supply Chain:**

Conceptual Definition:

A supply chain involves all activities that are involved in the creation and delivery of products and services including suppliers, manufacturers, distributors and customers (Scully & Höbig, 2019).

Operational Definition:

Supply Chain can be described by the researcher as the web of interrelated supply chain partners within the Palestinian food manufacturing industry including suppliers, manufacturers, distributors and retailers who want to maximize the utilization of resources in order to satisfy customers need.

- **Supply Chain Management Processes:**

Conceptual Definition:

Supply chain management activities encompass sourcing, making, delivering, and returning either goods or services to achieve supply chain efficiency (Chen, Daugherty & Roath, 2019).

Operational Definition:

In this context, the researcher defines supply chain management processes as a set of processes that are coordinated and implemented by the Palestinian food manufacturing firms

to manage the business and enhance its operations through the application of digital technology and the development of the supplier's trust in order to gain the competitive advantage.

- **Supply Chain Components:**

Conceptual Definition:

A supply chain is defined by the organizations that function in it such as the suppliers, manufacturers, distributors, retailers, and customers all of which have important parts to play in guaranteeing the goods and services chain (Kumar & Nambirajan, 2018).

Operational Definition:

The researcher posits supply chain components as the notion that identifies a number of actors in the supply chain of food manufacturing companies in Palestine, whose cooperation, enabled by digital technologies, is necessary to obtain competitive advantage and supplier trust.

- **Supply Chain Processes:**

Conceptual Definition:

Supply chain processes can be defined as the series of activities, which glucocorticoids planning, acquiring, creating, delivering and managing of returns in the supply chain (Chen, Daugherty & Roath, 2019).

Operational Definition:

Supply chain processes are defined by the researcher as the special activities undertaken by the Palestinian food manufacturing firms in order to improve their technological applications, operation effectiveness and supplier relations for the creation of competitive advantage.

- **Supply Chain Network Structure:**

Conceptual Definition:

The network structure of supply chain management was defined as the composite configuration of suppliers, manufacturers, distributors and retailers to achieve most optimization and responsiveness in effective supply of products (Wu et al., 2014).

Operational Definition:

In this study, the researcher deliberates the supply chain network structure as the construction of supply chain members regarding the Palestinian food manufacturing industry with an emphasis in the use of digital tools to improve partnership and trust among suppliers.

Chapter Two: Literature Review

2.1 Introduction

This chapter presents the literature review, theoretical framework, previous studies, concluding remarks, and gap of literature on the impact of digital supply chains on sustainable competitive advantage in general and in Palestine in particular.

2.2 Literature Review

2.2.1 Digital Supply Chain

The digital supply chain is defined as the utilization of digital technology to enhance the effectiveness and efficiency of processes in the supply chain. According to Agrawal and Narain (2018), the digital supply chain involves the utilization of cutting-edge technological innovations that alter the traditional way of conducting business like planning, execution, and interaction with stakeholders.

According to Alabdali and Salam (2022), the concept of a digital supply chain involves the utilization of digital technologies to improve performance and gain a competitive edge in supply chain operations.

Digital supply chain technologies include cloud computing, 3D printing, and the Internet of Things, all of which are capable of improving collaboration between supply chain participants and promoting new business models (Agrawal and Narain, 2018).

The digital supply chain encompasses the incorporation of various technologies, including automation, e-commerce enablement, networking, and data analytics, into conventional supply chain processes. The primary objective of this integration is to enhance transparency, speed, and overall efficiency (Alabdali and Salam, 2022).

Digital supply chain is characterized by the capacity to handle large quantities of information and give partners the ability to collaborate and communicate across digital media platforms (Agrawal and Narain, 2018). Hoberg's team (2015) define digital transformation in supply chain management as a process of organizational change that involves the use of digital technology to alter the way a company creates value, interacts with partners and customers, and competes with other companies in the global market.

This alteration is accomplished through careful management and a comprehensive approach that takes into consideration multiple organizational and technological components (Agrawal & Narain, 2018; Hoberg et al., 2015).

Several benefits of digital supply chain management are exhibited in different ways. According to Agrawal and Narain (2018), the utilization of digital technologies increases the transparency of the supply chain, which in turn increases the capacity for decision-making. This increased awareness of operations facilitates more informed decisions that are both quick and accurate.

Additionally, digital supply chain management promotes more just-in-time procurement methods, which lead to a significant reduction in unnecessary inventory and associated costs. This not only facilitates the optimization of resources, but also minimizes the financial expenditure associated with overstock.

Other than operational benefits, digital technology has a significant role in enhancing customer comprehension. Through the utilization of advanced analytics and demand-sensing technologies, companies are better equipped to understand and predict customer needs, which leads to an increase in service levels and a boost in customer satisfaction.

The integration of digital technologies into supply chain management also increases flexibility and responsiveness, this enables companies to respond to changes in the market more quickly and with greater flexibility, a capability (Farahani et al., 2015a).

Increased efficiency and cost reduction are additional benefits of digitalizing the supply chain. By streamlining processes and reducing waste, companies can reduce costs and improve efficiency overall, as mentioned by Agrawal and Narain (2018).

Additionally, increased digital visibility of the supply chain is another significant benefit of digital technology. Farahani et al. (2015b) recommend that increased visibility leads to superior tracking and management of resources and processes, this leads to improved logistics.

The combination of digital technology in the supply chain operations increases their effectiveness and efficiency.

Kosmol's et al. (2019) demonstrate the crucial role of digital processes for purchasing goods and information in enhancing the flow of goods and information across supply chains.

This digital transformation not only facilitates operations, but also reduces expenses and provides a response to market shifts.

Further developed on this idea, Hallikas et al. (2021) investigate the overall effects of digital technology on supply chain performance. Their research shows that digital technology can greatly enhance the process of decision-making, increase transparency, and promote greater collaboration between supply chain partners. These enhancements are essential for companies that want to maintain or increase their competitive advantage in complex markets.

Ultimately, the utilization of digital technology in supply chain management can lead to a long-term competitive advantage. This is accomplished through increased operational efficiency and enhanced customer interaction, which positions companies closer to their markets and facilitates long-term success. Through these various enhancements, digital supply chain management not only improves current processes, but also sets the stage for future improvements and innovations in the industry (Agrawal & Narain, 2018).

According to Agrawal and Narain (2018), digital supply chain performance can be assessed using multiple metrics, including integration, collaboration, technology adoption, supply chain visibility, flexibility, customer satisfaction, operational efficiency, and innovation. The levels of integration and collaboration include the number of integrated systems, the frequency and quality of communication, and the effectiveness of partnerships with supplier trust and customers.

The adoption and utilization of technology include the Return on Investment (ROI), the frequency of use, and the satisfaction of users. Supply chain visibility quantifies the capacity to follow and trace goods and information, while flexibility and responsiveness assess the speed of new products, response to supply chain issues, and cost reduction. Customer satisfaction is measured by the speed, accuracy, and personalization of orders.

Efficiency metrics that are operational include the number of cycles, the frequency of inventory changes, and the cost of goods sold. Innovation and the development of a business model are important metrics. Establishing specific metrics for these areas will assist organizations in measuring and managing their digital supply chain effectively.

2.2.2 Sustainable Competitive Advantage

Sustainable competitive advantage is defined as a company's ability to maintain its competitive advantages over its competitors in order to achieve superior financial performance

continuously over time. This advantage arises from attributes that allow a firm to perform better than its competitors, such as superior technology, market positioning, or skilled resources, and it must be difficult for competitors to imitate or replicate (Porter, 1985).

Sustainable competitive advantage refers to a company's ability to outperform its competitors consistently over a long period of time through unique resources, capabilities, or strategies that are difficult for rivals to replicate (Sumarliah and Al-hakeem, 2022). Guimarães et al. (2017) emphasize that sustainable competitive advantage entails surpassing competitors in terms of return on assets, return on investment, operating costs, and overall performance.

This concept has been explored by various scholars such as Pratono et al. (2019) and other researchers who have investigated the relationship between sustainable supply chain management and business competitive performance.

According to Sun et al. (2022), the primary source of sustainable competitive advantage is the successful implementation of sustainable supply chain strategies. These strategies not only address the direct practical needs of companies, but also have an environmental and social purpose that is larger in scope, which is increasingly pertinent in the global market.

Luthra and Mangla (2018) state that the implementation of sustainable supply chain management in emerging economies is essential to maintaining a competitive advantage. These methods facilitate companies in meeting the increasing requirements of global standards for sustainability and social responsibility.

Sumarliah and Al-hakeem (2023) indicate that sustainable competitive advantage is typically achieved by maintaining superior performance in comparison to other companies over a long period of time. This can be measured by indicators like the return of investment, profitability, market share, cost efficiency, and customer commitment.

Key Performance Indicators (KPIs) that are used to assess sustainable competitive advantage:

- **Return on Investment (ROI):** The evaluation of the effectiveness of different investments of the company that are undertaken to understand which initiatives or resources have the greatest effect on the company's competitive position.

- **Market Share:** The percentage of a market that is controlled by a particular company, which is indicative of the degree to which it is influential relative to its competitors.
- **Profit Margins:** High profit margins are indicative of a significant competitive advantage, as they suggest that the company can charge higher prices or manage costs more effectively than other companies.
- **Customer Loyalty and Retention Rates:** High rates of customer retention or loyalty suggest an advantage in the competitive landscape through service, quality, or brand name that is more powerful than competitors.
- **Efficiency of Cost:** superior cost management that leads to lower costs of operation compared to rivals, this directly contributes to profitability and competitiveness.
- **Innovation RATE:** The frequency and magnitude of new product releases or process enhancements can also be used to gauge a company's ability to stay ahead of the competition through innovation.

These metrics are frequently combined to provide a comprehensive description of a company's lasting competitive advantage. A mixture of these metrics helps in determining the long-term competitive advantage of a company, taking into account both market and internal metrics of performance.

According to Sun et al. (2022), the measurement of sustainable competitive advantage involves analyzing the various performance metrics that demonstrate the degree to which a company has incorporated and capitalized on sustainable practices in the supply chain in order to outdo competitors.

The investigation utilized a composite measurement methodology that involved scales that incorporated digital technology, enhanced efficiency in processes, increased collaboration, and increased flexibility in the supply chain.

These indicators serve as a collective measurement of the degree to which sustainable supply chain strategies help a company to achieve a competitive advantage. Additionally, they underline the significance of reliability and validity in their measurement model, which ensures that the scales employed are accurate representation of the intended constructs. This intricate method of measurement provides a solid basis for other researchers and professionals wishing to assess the sustainable advantage of competition.

2.2.3 Supplier Trust

Abdullah and Musa (2014) define trust as the party's belief in the dependability and honor of its partners, they emphasize the importance of trust in order to enhance the commitment to relationships in the supply chain management field. Gualandris and Kalchmidt (2015) define buyer-supplier trust (referred to as goodwill trust or TR) as the confidence of one party in the reliability and integrity of the other party in an exchange relationship.

They state that this trust is derived from the belief that cooperation will occur, both the buyer and the supplier believe each other to be honest or benevolent. This understanding decreases the probability of opportunistic behavior in ambiguous environments and facilitates complex exchanges (Moorman et al., 1992; Morgan and Hunt, 1994; Benton and Maloni, 2005).

Supplier trust is referred to as a buyer's trust that the supplier is capable and reliable to perform their obligations within the cooperation relationship. This trust consists of expectations regarding the supplier's honesty, credibility, honesty and transparency (Tarigan et al., 2020).

Supplier trust is considerably associated with company's profitability (Henke et al., 2014). Flynn et al. (2010) mention that trust is crucial to the successful integration of supply chains and has a significant impact on performance, it suggests that there is a complex relationship between trust and other elements like supply chain integration.

Trust is crucial to the dynamic of relationship between partners who are trading, this trust facilitates more efficient and smoother interactions. This involves the belief that the supplier will act favorably or at least not negatively towards the buyer, despite the fact that this cannot be monitored or controlled (Abdullah & Musa, 2014; Hartono et al., 2015).

Also, trust is considered a social resource that is embedded in relationships and is based on shared goals and mutual understanding, all of which can be easily overthrown by reckless behavior (Hartono et al., 2015). Additionally, it is associated with three primary components: capacity, benevolence, and integrity, all of which contribute to the sustainability and resilience of supplier relationships (Minguela-Rata et al., 2014).

This multifaceted nature of trust underscores its essential role in creating cooperative and mutually beneficial relationships with supplier trust that enhance the efficiency of organizations and performance.

Hartono's et al. (2015) suggest that supplier trust has the effect of improving the quality of the product, decreasing the lead time, and lowering costs. They focus on the crucial importance of trust in improving the performance of supplier trust through the design of products and increasing the capacity for sales between buyers and supplier trust.

Lee et al. (2011) discuss the way trust affects supplier performance via its association with buyer companies regarding efficiency of the supply chain and quality management, this affects the organization's performance.

2.2.4 Supplier Trust and Sustainability

Trust can function as a buffer that amplifies the impact of SSM on supplier trust' environmental and social attributes. This is significant in the context of SSCM, as trust can facilitate a greater environmental and social benefit from environmentally sustainable practices (Simpson et al., 2007). The investigation of buyer-supplier trust in sustainable supply chain management (SSCM) is considered limited, but it is still evolving.

Earlier investigations like Carter and Jennings (2002) depict trust as a result of sustainable supply management (SSM), they indicate that corporate social responsibility during the purchasing process can lead to increased trust in supplier trust. Sharfman et al. (2009) recommend trust as a precursor to SSM, which affects the degree to which companies participate in external environmental practices.

Parmigiani et al. (2011) claim that trust in the supply chain increases as a result of social and environmental forces from the stakeholders, this facilitates the transmission of knowledge and performance that is consistent with the buyer's expectations. These perspectives highlight the importance of trust as a crucial component that can also serve as a buffer, which would increase the effects of SSM on supplier trust' environmental and social behavior.

In the literature, supplier trust is considered to be crucial to the sustainability of supply chains. Trust between consumers and supplier trust promotes long term relationships that are essential for maintaining sustainable business practices, this encourages collaboration, resource sharing, and mutual assistance (Tarigan et al., 2020).

This foundational trust promotes the sharing of information and innovation, which in turn facilitates the achievement of the sustainability goals of the supply chain by improving efficiency and reducing waste (Lee et al., 2011; Hartono et al., 2015). Additionally, trust

promotes the alignment of corporate social responsibility goals between the parties, this promotes environmental conservation and social benefit (Zhu et al., 2013).

Also, trust helps to reduce the risk associated with sustainability initiatives, investments typically require significant time and resources before they provide a return (Abdallah et al., 2017). By promoting a consistent, cooperative environment, supplier trust has a significant impact on enhancing the steadfastness and long-term viability of supply chains.

According to Tarigan et al. (2020), supplier trust is measured using various metrics that assess different aspects of the supplier's trust and reliability from the buyer's perspective. Integrity is determined by the supplier's compliance with morality and ethics, consistency in behavior, and devotion to pledges made. credibility is the supplier's reputation for being truthful and dependable, this is indicative of their consistency in fulfilling their promises.

Honesty is the degree to which the supplier is truthful and straightforward in their interactions and transactions. Transparency is measured by the degree to which the supplier is publicly aware of the information, processes, and decisions that are relevant to the buyer, this facilitates a transparent understanding of the operations and practices of the supplier. These metrics are quantified through surveys or questionnaires sent to consumers, who evaluate the supplier trust' trustworthiness on these dimensions using a scale of Likert.

In their study, Gualandris and Kalchmidt (2015) point out that trust in the supplier is important in the organizational operations, it is typically assessed through surveys or questions to determine the procurement and supply chain management teams. Common metrics assessed include reliability, openness, fairness, competence, and benevolence.

These factors are assessed using a Likert scale, where respondents indicate their agreement or disagreement with statements pertaining to these factors. This method facilitates a reproducible measurement of trust, which can be followed over time and contrasted between different supplier relationships.

This is crucial for managing and enhancing relationships with supplier trust, especially in contexts that are strategic in nature. In these situations, collaboration and long term partnerships are both goals. Through the evaluation of these traits, organizations can more effectively manage and enhance their relationships with supplier trust.

Trust between a supplier and a company can be assessed through several different lenses, including commitment, reliability, communication quality, and ethical behavior

(Morgan and Hunt, 1994). These components have a significant role in the development and maintenance of trust, which in turn, has an effect on the overall efficiency and profitability of the supply chain.

Robustness, which is the capacity of a supplier to produce products and services as intended, is one of the most important measures of trust (Handfield and Bechtel, 2002). In Gilham's (2023) research, this aspect could be attributed to the way minimum stock quantities are maintained, which prevents supply from disrupting production timelines. Constant compliance with orders is indicative of the supplier's dependability and creates faith over time.

Another important aspect is transparency in communication, this involves actively sharing critical information regarding supply chain issues (Lambert & Schwieterman, 2012). Effective communication is crucial to managing expectations and resolving disputes, these are both important aspects of maintaining trust. Gilham (2023) mentions that trust is profoundly affected by the way information regarding stock levels and wait times is managed and communicated.

Commitment to shared goals is also considered an important indicator of trust. Supplier trust that are dedicated to their client's business objectives are considered more trustworthy. This commitment can be illustrated through financial investments in dedicated resources or agreement to the partner's business strategies (Sako, 1998).

The behavior of the supplier must be ethical and responsible, this is crucial to maintaining faith (Carter and Jennings, 2004). Ethical practices diminish the perceived dangers associated with supplier commitment and reliability; this increases trust.

2.2.5 Food Manufacturing Companies in Palestine

The food manufacturing industry is significant to the Palestinian economy, it contributes significantly to the gross national product (GNP), and it provides jobs (Palestinian Investment Promotion Agency PIPA, 2017).

The food manufacturing industry in Palestine has a significant impact on the national economy by increasing food security, creating jobs, and contributing to the gross national product (GNP). The FAO (2021) estimates that the sector contributes to around one-third of the GNP derived from economically significant activities, this is significant. Additionally, it accommodates approximately 24,000 jobs in the local economy, primarily in small-scale

enterprises, this indicates the importance of the sector in terms of employment generation (Marzin, Uwaidat, and Sourisseau, 2019).

Additionally, the progression of this sector is crucial to the attainment of a sustainable food system in Palestine. The National Investment Plan for Food and Agriculture Security and Sustainable Agriculture 2020-2022 focuses on the need for concerted policy and financial commitment to augment the capacity of the agrifood sector to address food security and social issues (FAO, 2021).

This strategic approach is dedicated to unleashing the potential of the food system to promote economic stability and reduce poverty, particularly in rural areas where agriculture is primarily conducted.

Additionally, the agriculture sector's association with the larger economic framework is essential to the Palestine's economic diversification and structural transformation. This integration promotes the mitigation of external consequences and promotes a more stable economic climate (FAO, 2021).

Companies in this sector participate in planning processes that involve first defining the corporate strategy, then assessing the internal and external environments, and finally setting goals that are long-term in nature (Baker, 2003). These strategies are specifically designed to navigate the complex and often-constrictive business environment of Palestine.

The strategic direction of these corporations is often dedicated to improving quality and expanding markets, both of local and international scope, in order to mitigate the effects of competition and limitations in the market (Martin, 2010).

However, the food manufacturing sector in Palestine has significant difficulties including a limited market size, competition from Israeli products, and government restrictions that hinder the sector's performance and development (Ghattas et al., 2015). This has prompted a strategic approach that focuses on overcoming these obstacles through creative and evolving strategies.

This study seeks to investigate the impact of digital supply chain on achieving sustainable competitive advantage in Palestinian food manufacturing companies.

2.3 Theoretical Framework

This study seeks to adopt four theories, namely, Resource-Based View (RBV) by Barney (1991), Process Theory of Supply Chain Integration by Flynn et al. (2010), network theory by Borgatti and Foster (2003), Logistics and Supply Chain Management Theory by Christopher (1994) each theory will be used to answer each research question as indicated in Table 2.1 below:

Table 2.1 Theoretical Framework

Theory	Research Questions
Resource-Based View (RBV) by Barney (1991)	Q1: What is the impact of management components in digital supply chains in achieving Sustainable competitive advantage through supplier trust in Palestinian Food manufacturing companies?
Process Theory of Supply Chain Integration by Flynn et al. (2010)	Q2: What are the impact and processes of management in digital supply chains in achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies?
network theory by Borgatti and Foster (2003)	Q3: What is the impact of the network structure in digital supply chains in achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies?
Logistics and Supply Chain Management Theory by Christopher (1994)	Q4: What is the impact of flows in digital supply chains in achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies?

2.3.1 Resource-Based View (RBV) by Barney (1991)

Resource-Based View (RBV) of the company is a primary theoretical framework in strategic planning which concentrates on the role of company-specific resources and abilities in competitive advantage. Ever since its formal introduction by Barney in 1991, RBV is extensively talked about and developed by scholars to better understand how organizations can exploit unique assets to sustain profitability in competitive markets.

Barney (1991) initially defined the RBV as "valuable, unusual, non-substitutable and inimitable (VRIN) resources of a business could give a foundation for a long-term competitive advantage." Value is based on the capability of a resource to exploit opportunities or even neutralize threat, while rarity signifies precisely how limited a resource is among present and prospective rivals.

Inimitability implies that a resource can't be replicated by other people due to special historical problems, causal ambiguity, or social complexity. Non-substitutability emphasizes that there could be no strategically equivalent valuable resources which are not rare or inimitable (Barney, 1991).

The RBV has been refined and elaborated in many studies. For instance, Peteraf (1993) expanded Barney's work by including the resource heterogeneity and immobility concepts, suggesting that these qualities can help firms retain resource uniqueness as time passes. Wernerfelt (1984), in his precursor to Barney's, stressed that resources are also both strengths and weaknesses and that appropriate management of resources entails not just exploitation but also development and protection.

The application of RBV in organizations is empirically demonstrated. For instance, Newbert (2007) found that aligned resources for a firm and its company strategy improves performance outcomes. Helfat & Peteraf (2003) proposed the dynamic capabilities framework, which extends RBV by considering how the firm can adapt its resource base to accommodate changing environments.

The application of the Resource Based View (RBV) in food manufacturing shows precisely how internal capabilities and resources drive competitive benefits in a sector extremely competitive with complex regulatory requirements. Scholars have dealt with various dimensions of RBV in this particular context and cited the importance of unique organizational

resources like proprietary production technologies, specialized knowledge and effective supply chain management.

Ray, et al. (2004) demonstrate that proprietary manufacturing processes can offer long-term competitive advantages that allow firms to produce less expensively or with differentiated products. Hall (1993) also points to tacit knowledge and skills that rivals cannot duplicate and which are vital to innovation in food processing methods.

Mena et al. (2013) and Galbreath (2005) argue that firms which properly leverage intangible resources (brand reputation and consumer loyalty) alongside their operational abilities are better positioned to compete in the food manufacturing industry. Together these results show that intangible and tangible resources are crucial for a sustainable competitive edge in food manufacturing, in line with RBV core concepts.

Nonetheless, RBV is not without limitations. Priem & Butler (2001) find RBV tautological in its description of what makes resources valuable and rare, and question the theory's falsifiability. Others like Kraaijenbrink et al. (2010) criticize RBV as static, ignoring the dynamic aspects of competitive environments and the evolutionary processes which change resource values as time passes.

Despite these critiques RBV remains a helpful instrument for understanding competitive advantage of companies. It has an impact beyond theoretical discussions on practical strategic decisions across sectors. For instance, in the technology sector, Apple along with Google leverage unique intellectual properties and unique innovative abilities that are rare and unique to maintain their market positions (Teece, 2007). In the hospitality sector, distinctive cultural and service-oriented resources are shown to underpin competitive strategies (Enz, 2009).

Lastly, the Resource-Based View offers a sound framework for analyzing strategic resources within companies. It has evolved and been critiqued through the years but its fundamental premises have influenced academic considerations and practical application in strategic management.

The Resource-Based View emphasizes the role of a firm’s internal capabilities and resources in gaining a competitive advantage. Management components in digital supply chains can be considered unique resources that contribute to enhancing efficiency, responsiveness, and sustainability.

2.3.2 Process Theory of Supply Chain Integration by Flynn et al. (2010)

The Theory of the Processes of Supply Chain Integration, as proposed by Flynn, Huo, and Zhao (2010), describes the strategic coordination of internal and external processes in order to increase the overall value of the supply chain (Flynn, Huo, and Zhao, 2010).

This theory suggests that cohesive integration is not only important within a company, but also across the entire network of associated businesses, this is essential to gaining a competitive advantage in today's global market (Flynn et al., 2010).

Supply Chain Integration (SCI) according to Flynn et al. (2010) involves collaboration between supplier trust and customers, consistent information flow, and harmonious logistics, all of which are intended to facilitate the efficient management of the supply chain as a single entity instead of as separate entities.

Flynn et al. (2010) differentiate integration into three different aspects: internal, supplier, and customer integration. Internal integration is the practice of teamwork that is functional and involves the alignment of strategies and operations within a company. The integration of supplier trust and customers involves practices such as joint product development, shared systems, and information sharing that is based on trust, this increases responsiveness and efficiency (Flynn et al., 2010).

One of the primary features of this theory is its focus on process-oriented approaches, which suggests that the integration of supply chain processes leads to increased performance benefits like faster responses, increased flexibility, and enhanced quality (Flynn, Huo, & Zhao, 2010). Another aspect is the alignment of strategies and practical operations, which promotes a more dynamic and responsive supply chain.

The benefits of applying the Theory of Supply Chain Integration to the process include increased organizational productivity, enhanced competition, and increased customer satisfaction (Flynn et al., 2010). It results in decreased waste and inefficiencies by combining the goals and methods of different departments and companies.

However, the cons are associated with the complexity of implementation, the potential for resistance to change within and across organizations, and the initial costs associated with integrating systems and processes (Flynn, Huo, and Zhao, 2010). Additionally, achieving true

integration is dependent on cultivating and maintaining high levels of trust and reciprocity, these are both difficult and time-consuming (Flynn et al., 2010).

In general, the Theory of Supply Chain Integration has been employed to promote collaboration and efficiency across organizations. For instance, organizations have utilized this theory to simplify operations, enhance information sharing, and synchronize production processes with demand for the market, this has led to an improvement in operational performance and customer satisfaction (Flynn et al., 2010).

In the food manufacturing industry, SCI is of paramount importance due to the perishability of products, the stringent safety regulations, and the varying supply and demand (Flynn et al., 2010). The integration processes facilitate a better forecast of demand, increased coordination with raw material supplier trust, and more efficient distribution methods that minimize waste and ensure the freshest products reach consumers (Flynn et al., 2010).

For example, integrated supply chains can respond more quickly to recalls or safety concerns by tracing products back through the supply chain in an efficient manner (Flynn, Huo, & Zhao, 2010).

This theory centers on the procedures that companies utilize to integrate and manage their supply chains. It is important to understand the way digital methods of supply chain management enhance collaboration and integration with supplier trust, this leads to advantages in competition.

2.3.3 Network Theory by Borgatti and Foster (2003)

Network Theory, as described by Borgatti and Foster (2003), is a comprehensive framework that describes the patterns of association between entities within a particular system, the purpose of this theory is to understand the behavior and performance of organizations.

This theory goes beyond the simple interorganizational relationships, it focuses on the nodes (individuals) and ties (interactions) that comprise the networks that are essential to both social and economic interactions (Borgatti and Foster, 2003). Borgatti and Foster (2003) define Network Theory as the investigation of the effect of network structure on the behavior of entities and the overall benefit of the network.

Key metrics include the density of the network, the centrality measures, and the clustering coefficient, which assess the frequency and degree of interaction within the network, the importance of specific nodes, and the tendency of nodes to cluster (Borgatti & Foster, 2003).

The utilization of Network Theory has numerous benefits, including a greater understanding of how resources are flowed in, a more efficient communication, and increased innovation through optimized network structures (Borgatti & Foster, 2003).

However, the theory also has issues like the potential for over-centralization in the center, this can lead to vulnerabilities and problems in the network. Also, dense networks can lead to extra costs and inefficiency in communication (Borgatti & Foster, 2003).

Overall, Network Theory has been employed to enhance project management, improve strategic alliances, and improve the design of organizations. For example, Provan et al. (2007) discuss the beneficial effects of network structures in regards to community health systems by increasing cooperation and resource sharing among various organizations. Additionally, Ahuja (2000) states that companies that have a better network configuration have a higher rate of innovation because information and resources are more effectively transmitted.

In the food manufacturing industry, Network Theory has had a significant impact on improving supply chain management and enhancing cooperation between different stakeholders. For instance, the integration of supplier trust, distributors, and retailers within a structured network reduces delays and improves the efficiency of the supply chain (Borgatti & Foster, 2003).

Additionally, Uzzi (1997) demonstrates how densely connected network ties can enhance trust and cooperation between food supplier trust, which is essential to maintaining the quality and safety of food.

Network Theory is employed to analyze the composition and evolution of relationships between entities within a network, such as the digital distribution of goods. Understanding the network's structure, including the way companies interact with their supplier trust, can lead to paths to significant advantages.

2.3.4 Logistics and Supply Chain Management Theory by Christopher (1994)

The theory of logistics and supply chain management, as pioneered by Martin Christopher in his influential 1994 book, provides a framework for understanding and improving the processes that are involved in the efficient transmission of goods, information, and finances across a supply chain. Christopher (1994) emphasized the importance of

integrating essential business processes across the supply chain in order to take advantage of the competitive advantage and to better serve customers.

Christopher (1994) describes logistics and supply chain management (SCM) as the procedure of planning, implementing, and oversight of the efficient, cost-effective movement and storage of raw materials, in process inventory, finished goods, and other information regarding the origin and destination of goods for the purpose of meeting customer requirements. This theory is based on the principles of integration, responsiveness, agility, and flexibility within the supply chain that are intended to respond to changes in the market and demand from consumers (Christopher, 1994).

One unique aspect of Christopher's theory is its emphasis on the "total cost approach" and the "service improvement" via logistics optimization and supply chain coordination. It focuses on reducing logistical deadlines and increasing the dependability of supply processes in order to increase overall customer satisfaction and improve company performance (Christopher, 1994). The theory also emphasizes the value of utilizing technology and information sharing across the supply chain in order to increase transparency and coordination.

The advantages of applying Christopher's Theory of Logistics and SCM include increased efficiency in operation, reduced costs, enhanced customer service, and increased responsiveness to market conditions (Christopher, 1994). However, the focus on complete integration can also pose issues, these include high costs associated with setup and maintenance of collaboration systems, the complexity of managing supply chain relationships, and the potential difficulty of achieving uniformity across different global operations (Christopher, 1994).

Typically, organizations have followed the Christopher's SCM principles in order to simplify operations, reduce inventory, and improve performance, all of which lead to increased customer satisfaction and a higher profit. For example, Mentzer et al. (2001) demonstrate examples of companies that have embraced SCM methods to reduce costs associated with supply chain management and improve service, this will allow them to differentiate themselves from their competitors.

In the food manufacturing industry, Christopher's theory is of particular importance because of the critical nature of demand predictions, inventory freshness, and distribution efficiency. Effective logistics and supply chain management reduces waste, ensures product quality, and reduces delays, all of which are crucial to dealing with perishable goods.

Ellram and Cooper (1993) discuss the importance of SCM in the food industry to improve the relationship with supplier trust and to have more effective strategies for procurement, these strategies are crucial to maintaining the integrity and safety of food products.

This theory studies the flow of goods, information, and finances throughout supply chains and how these flows help to achieve efficiency and competitive advantage. It is particularly important in the analysis of how optimized flows in a digital environment support strategic alliance.

1.4 Conceptual Framework

The rapidly changing landscape of global commerce has led to a shift towards digital supply chains, these supply chains utilize cutting-edge digital technology and data analysis to improve the efficiency of supply chain management (SCM). These digital chains of supply enable organizations to take advantage of real-time information and analytics, this enhances decision making, improves performance, and is quick to respond to changes in the market (Helo and Hao, 2019).

By utilizing technologies like RFID, the Internet of Things, and blockchain, companies can access information and transparency regarding their supply chains that enables the identification of inefficiencies and responses to disruptions (Ageron, Bentahar, and Gunasekaran, 2020). As these digital transformations alter the traditional way companies source supplies, they also necessitate a reconsideration of how they manage their relationships with supplier trust in order to maintain a competitive advantage. The following Figure (2.1) presents the conceptual model of the study:

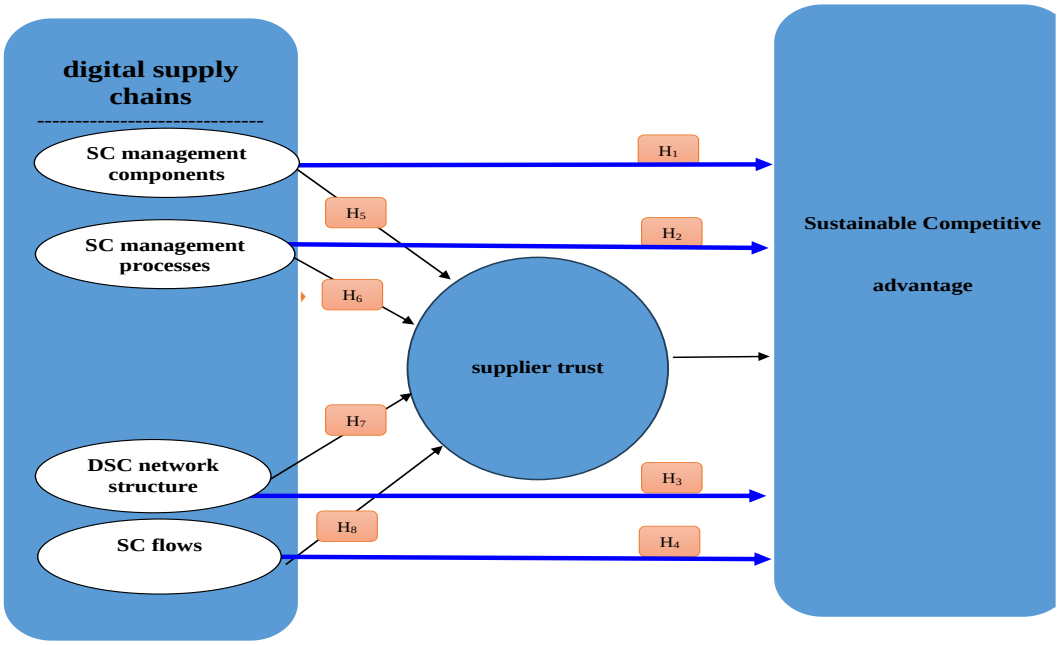

Figure (2.1) Conceptual Model

The Independent Variable: Digital Supply Chain. This includes all of the components, processes, network structures, and flows associated with managing a supply chain that employs digital technology to improve operations and increase decision-making power.

The Mediating Variable: Supplier Trust. This variable demonstrates how strategic alliances and partnerships with supplier trust can mitigate the effects of digital supply chain management in order to achieve a sustainable advantage. Essentially, it emphasizes the significance of strong partnerships in the utilization of all of the benefits of a digital transformation in the supply chain.

The proposed model explains how effectively managing the various aspects of the digital supply chain can help an organization to have a significant competitive advantage. This advantage is primarily attributed to the strategic relationships companies have with their supplier. these relationships can significantly enhance the company's capacity to innovate and respond to market demands (Fawcett, Magnan, and McCarter, 2018).

As companies continue to rely on these strategic alliances, they not only improve the efficiency of their supply chain processes, but also create a long-term framework for achieving success in the competitive market. As a result, by taking a strategic approach to digital supply chain management, companies can achieve a sustainable competitive advantage that is difficult for rivals to replicate or undermine (Sodhi & Tang, 2021).

Strategic relationships with supplier and other industry players can also contribute to a company's competitive advantage. By forming alliances, partnerships, or collaborations, a company can access resources, knowledge, and capabilities that it may not possess internally.

This can enhance its competitive position and create value for customers (Kharub, Mor, & Sharma (2019), strategic relationships with supplier trust and other industry players can be a powerful driver of competitive advantage. By leveraging external resources, knowledge, and capabilities, companies can enhance their competitive position, drive innovation, and create value for customers. In today's interconnected business landscape, strategic relationships are no longer a luxury but a necessity for companies seeking sustainable growth and success.

2.5 Hypotheses Development

In this study eight hypotheses are postulated to examine the impact of digital supply chains on Sustainable competitive advantage in Palestinian Food manufacturing companies and the moderating role of supplier trust.

The Relationship Between Management Components in Digital Supply Chains and Achieving a Sustainable Competitive Advantage in Palestinian Food Manufacturing Companies

The association of digital technology with supply chains is increasingly considered to be a significant component of a manufacturing sector's sustainable advantage, this advantage is associated with the food industry in Palestine.

This literature review investigates the relationship between digital components of supply chains and their impact on maintaining competitive advantage, supported by empirical evidence and theoretical frameworks.

Digital supply chain management (DSCM) involves the utilization of digital technology to enhance the efficiency and responsiveness of supply chain processes. Shahadat et al. (2023) states that digital supply chain abilities have the effect of increasing operational agility and

flexibility, these properties are crucial to firms' ability to respond to market shifts and customer demands quickly.

The resource-based view (RBV) supports this perspective by considering digital technology as being valuable, uncommon, and unique resources that give companies advantages in competition (Barney, 1991). Similarly, Chen (2019) and others have found that the default rates of subordinate females increase during the breeding season. (2022) states that the agility and flexibility of digital technologies directly contribute to increased supply chain performance, which underpins a company's competitive advantage.

Empirical research further supports the importance of digital technology in enhancing supply chain capabilities. Oliveira-Dias et al. (2022) discover that digital technology has a positive impact on supply chain agility, this enables companies to more effectively deal with unexpected situations in business operations. This agility is crucial to maintaining a competitive advantage in complex business environments, as rapid adaptation to market conditions is necessary for maintaining business growth and profitability.

Empirical research further supports the importance of digital technology in enhancing supply chain capabilities. Oliveira-Dias et al. (2022) discover that digital technology has a positive impact on supply chain agility, this enables companies to more effectively deal with unexpected situations in business operations. This agility is crucial to maintaining a competitive advantage in complex business environments, as rapid adaptation to market conditions is necessary for maintaining business growth and profitability.

Research involving different geographic regions and industries that are diverse in their context provides a greater understanding of the effectiveness of digital chains of supply. For example, studies of the pre-made clothing industry in Bangladesh have a comparative nature that is pertinent to the food manufacturing industry in Palestine (Jahed et al., 2022). These investigations demonstrate how digital strategies for supply chain can be implemented in different industries to improve supply chain performance and to position oneself positively.

Therefore, based on the evidence from these studies, it can be hypothesized that:

H1: There is a positive relationship between management components in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

The Positive Relationship Between Processes of Management in Digital Supply Chains and Achieving Sustainable Competitive Advantage in Palestinian Food Manufacturing Companies

The relationship between digital processes in supply chains and the pursuit of sustainable competitive advantage in companies is comprehensively documented in the referenced literature.

This hypothesis is backed by multiple scientific findings that suggest that the use of information technology (IT) in supply chains has a significant effect on competitive advantage via enhanced flexibility, consistency, and agility, often referred to as the triple A's framework by Lee (2004).

First, the ability to adapt in digital supply chains is pivotal in responding to market shifts and keeping up with competition. Studies have demonstrated that IT promotes flexibility by allowing companies to respond to external changes quickly by changing their strategies, operations, and technologies (Lee, 2004).

For example, Lee (2004) notes that the capabilities of adaptation, augmented by IT, allow companies to evolve in response to market demands, this will lead to a competitive advantage. This is additionally backed by Swafford's team. (2008), which talks about the importance of IT in order to enable supply chains to capitalize on unforeseen market opportunities by improving their flexibility.

Secondly, alignment, which is the process of combining and coordinating actions across the supply chain in order to achieve a single goal, is increased by IT. Studies have demonstrated that IT alignment has the potential to lead to increased performance by facilitating improved collaboration and integration between supply chain partners (Lee, 2004).

Olhager (2012) defines IT as a crucial supporter of supply chain integration, this in turn positively affects operational performance, which contributes to a long-term competitive advantage. Ultimately, agility, which is the capacity of the supply chain to respond to short term changes in demand or supply, is another important component that is achieved through effective digital technology in the supply chain (Lee, 2004).

Lee (2004) and Swafford et al. (2008) both advocate the importance of IT in increasing the responsiveness of supply chains, making them more proactive in response to market shifts and thus maintaining a competitive advantage in complex environments.

Therefore, based on the evidence from these studies, it can be hypothesized that:

H2: There is a positive relationship between processes of management in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

The Positive Relationship Between the Network Structure in Digital Supply Chains and Achieving Sustainable Competitive Advantage in Palestinian Food Manufacturing Companies

The association between network structure in digital supply chains and achieving superior competitive advantage is supported by literature, this association demonstrates a significant link between digital transformation and enhanced supply chain capabilities that ultimately affect competitive performance.

Ning and Yao (2023) state that digital transformation has a significant impact on supply chain capabilities, these capabilities are crucial to maintaining a competitive advantage in a dynamic market environment. They advocate that digital transformation has the potential to directly affect the sustainable competitive performance of companies (Ning & Yao, 2023).

This is in line with previous studies that have found that advanced digital infrastructure and capabilities in logistics can lead to increased efficiency in operation and a more competitive position (Barney, 1991; Eisenhardt & Martin, 2000).

Additionally, environmental uncertainty serves as a catalyst for this process. Ning and Yao (2023) claim that in the context of increasing market variability, digitally altered supply chains have superior performance because of their increased ability to navigate ambiguity (Ning and Yao, 2023). This theory, called the contingency theory, believes that the value of specific resources and capabilities can be altered by the external environment (Miller and Friesen, 1983).

Additionally, the study suggests that the supply chain's role in digital transformation and competitive performance is mediating. According to Ning and Yao (2023), digital transformation has a positive effect on competitive performance via its influence on multiple aspects of supply chain capabilities.

This mediation is of great importance because it demonstrates the way digital technology facilitates the utilization of internal and external resources and information, this is essential to maintaining competitive advantage (Porter, 1985; Lei and Chen, 2015).

These findings are significant for organizations that want to increase their competitive advantage through digital chains of supply. They propose that investments in digital transformation have both direct and indirect benefits on competitive performance, additionally, they increase the structural power of the supply chain network, which is important for achieving and maintaining competitive advantage in an increasingly complex market environment.

Therefore, based on the evidence from these studies, it can be hypothesized that:

H3: There is a positive relationship between the network structure in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

The Positive Relationship Between Flows in Digital Supply Chains and Achieving Sustainable Competitive Advantage in Palestinian Food Manufacturing Companies

The hypothesis that there is a positive relationship between flows in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies is supported by several findings in the research conducted by Tripathi and Joshi (2019).

The incorporation of digital technologies into supply chains— identified as dynamic capabilities within the study— fosters a company's adaptability, responsiveness, and innovation. These lead to sustainable competitive advantage; the study specifies various dynamic capabilities such as knowledge generation and absorptive capacity (KG-AC), demand-orientation (D-O), innovative ability (I-A), renovation ability (R-A), and social network enhancement ability (SNE-A) which play pivotal roles in enhancing supply chain efficiency and performance on the triple bottom line as identified earlier.

The hypothesis is further supported by literature identified by Tripathi and Joshi (2019). Digital evolution of supply chains leads to generation of capabilities— which facilitate the stakeholder demand response and operationalization of environmental changes owing to the development. Several studies (Pagell and Wu, 2009; Gimenez et al., 2015) exemplify how sustainable supply chain practices driven through digital spheres impact significantly on a firm's competitive position, leading towards operational, social and environmental performance.

In the arena of digital supply chains, however, certain capabilities play particular roles: enhanced coordination plus real-time analytics and decision-making processes. These help firms in resource optimization as well as waste reduction through costal workflows with major

ICT areas that ensure effective delivery systems for products developed at any organization—key components sustaining competitiveness.

Moreover, the adoption of an industry-driven focus on digital integration underscores participation within emerging industrial revolutions like Industry 4.0 where automation coupled with manufacturing technologies ensures data exchange for decision making: these have implications towards competitive sustainability advantage.

This is how the research backs the hypothesis that effective control and strategic use of digital flows within supply chains are among the major keys in obtaining sustainable competitive advantage which in turn strengthens the significance of technological innovation as well as capability development for today's supply chain strategies.

Therefore, based on the evidence from these studies, it can be hypothesized that:

H4: There is a positive relationship between flows in digital supply chains and achieving Sustainable competitive advantage in Palestinian Food manufacturing companies.

The Positive Relationship Between Management Components in Digital Supply Chains and Achieving Sustainable Competitive Advantage Through of Supplier Trust in Palestinian Food Manufacturing Companies

Achieving sustainable competitive advantages is now widely recognized as a crucial objective in supply chain management, and the incorporation of digital technologies is seen as a key strategy to accomplish this. In their recent study, Stroumpoulis and Kopanaki (2022) delve into the significance of digital transformation in sustainable supply chain management (SSCM), emphasizing its ability to enhance control, reduce operational costs, and improve monitoring throughout the supply chain.

Birkel and Muller (2021) further support this notion by highlighting the essential role of digital transformation in integrating environmental, social, and economic goals into supply chain practices, thus promoting a holistic approach to sustainability.

The integration of Internet of Things (IoT) and Big Data Analytics has a profound impact on improving decision-making and operational efficiency in supply chains. According to Kilibarda et al. (2020), these advanced technologies facilitate real-time data analysis, resulting in heightened transparency and responsiveness.

This is particularly crucial in the intricate networks of the food manufacturing sector. Likewise, Verhoef et al. (2021) delve into the transformative potential of Blockchain technology in enhancing transparency and trust. Its ability to maintain an immutable record aids in combating fraud and enhancing product traceability throughout the entire production and consumption process.

The incorporation of digital technologies has the potential to yield significant economic advantages, as it allows for the optimization of supply chain expenses and the enhancement of overall efficiency. According to Stroumpoulis and Kopanaki (2022), these technologies not only streamline business operations but also strengthen market presence by enabling firms to quickly respond to market trends and consumer demands.

This viewpoint is supported by Hart and Miller (2020), who emphasize that digital integration not only improves operational effectiveness but also promotes economic sustainability through the cultivation of long-lasting supplier partnerships and the enhancement of customer contentment.

IoT and Big Data Analytics play a pivotal role in the realm of environmental conservation by allowing companies to effectively monitor and reduce their impact on the environment. A study conducted by Birkel and Muller (2021) provides evidence supporting the notion that these technologies are instrumental in promoting efficient waste management and optimal energy usage, both of which are essential for maintaining environmental sustainability.

Moreover, digital technologies enable transparency and accountability, thereby fostering stakeholder trust and corporate social responsibility, as highlighted in the research conducted by Chan et al. (2018).

Therefore, based on the evidence from these studies, it can be hypothesized that:

H5: There is a positive relationship between management components in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

The Positive Relationship Between Processes of Management in Digital Supply Chains and Achieving Sustainable Competitive Advantage Through the Supplier trust in Palestinian Food Manufacturing Companies

The relationship between digital supply chain management processes and competitive advantage via strategic supplier relationships is a significant field of study in the supply chain management field. The association of Information and Communication Technology (ICT) in supply chains has been recognized as crucial to improving competitive advantage, this is because it enables more effective and efficient management processes (Christiaanse & Kumar, 2000).

One important aspect of digital supply chain management is the utilization of ICT to facilitate integration across all parts of the supply chain, this has been associated with a better competitive position in the market for companies (Rungtusanatham et al., 2003).

ICTs facilitate the transmission of information and enhance the communication between supplier trust, this is crucial to quickly responding to market shifts and customer demands, this will lead to a competitive advantage (Martin et al., 2003).

Studies have demonstrated that strategic alignment of supply chain processes with ICT can lead to significant enhancements in performance. The Resource-Based View (RBV) of the company suggests that ICT resources, when incorporated into the organization's operations, can lead to a long-term competitive advantage (Barney, 1991). This perspective is backed by empirical evidence that indicates that organizations with advanced ICT resources in their supply chains have a tendency to perform better than organizations that have less advanced ICT resources (Li, 2006).

Additionally, strategic alliances with supplier trust are pivotal in taking advantage of ICT in supply chains. These associations facilitate the sharing of information and the coordination of activities, both of these are essential to achieving operational efficiency and market responsiveness (Cooper, Lambert, and Pagh, 1997).

The integration of supplier trust into digital supply chain processes not only facilitates the flow of goods and information, but also increases the competitive advantage of the participating companies (Kemppainen and Vepsäläinen, 2003).

Ultimately, the literature supports the theory that there is a positive association between the processes of digital supply chain management and the pursuit of sustainable competitive advantage via strategic supplier relationships. This alliance is primarily facilitated by the strategic utilization of ICT resources, these resources enhance the efficiency and effectiveness of supply chain processes (Barney, 1995; Li, 2006).

Therefore, based on the evidence from these studies, it can be hypothesized that:

H6: There is a positive relationship between processes of management in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

The Positive Relationship Between the Network Structure in Digital Supply Chains and Achieving Sustainable Competitive Advantage Through the Supplier trust in Palestinian Food Manufacturing Companies

The achievement of sustainable competitive advantage through strategic supplier relationships is closely tied to the network structures of digital supply chains. This connection is supported by a strong theoretical and empirical framework.

A study conducted by Fu et al. (2022) emphasizes the importance of strategic supply chain management (SSCM) in driving business performance, especially when aligned with overall business strategies. By integrating SSCM with broader business goals, organizations can not only enhance operational and financial performance but also make significant strides towards sustainability in today's business landscape.

Developing a sustainable competitive advantage in Strategic Supply Chain Management (SSCM) requires a comprehensive approach that emphasizes the importance of strategic relationships with supplier trust. According to the literature, maximizing these relationships relies heavily on an efficient network design within the supply chain (Adebanjo et al., 2018).

These designs are crucial for facilitating the smooth flow of information and materials, aligning with long-term sustainability objectives, and ultimately fostering a resilient and competitive business model.

A sustainable competitive advantage can be achieved through the implementation of Supply Chain Network Design (SCND).

Research indicates that effective SCND plays a crucial role in aligning organizational structures and processes with market demands and changes, thus promoting sustainability (Jin et al., 2017; Eskandarpour et al., 2015). By strategically positioning supplier trust within these networks, the supply chain becomes more agile and efficient, resulting in enhanced competitive performance.

The implementation of cutting-edge information systems in supply chains reinforces the claim that network structures have the potential to generate long-lasting competitive benefits. These information systems enable the smooth flow of data throughout the supply chain, improving visibility and collaboration among key partners, which is crucial for staying competitive in a rapidly changing market landscape (Vonderembse et al., 2006; Qrunfleh & Tarafdar, 2014).

The effectiveness of a well-structured supply chain network is greatly influenced by the organizational structure. According to Cao et al. (2015), companies that implement adaptable and cohesive structures are more capable of capitalizing on strategic partnerships with supplier trust, resulting in improved competitive advantages that can be maintained over time.

To sum up, extensive research in the field consistently confirms the theory that a direct correlation exists between the configuration of digital supply chain networks and the attainment of a sustainable competitive edge via strategic alliances with supplier trust.

This connection is influenced by various factors, including proficient management of the supply chain, meticulous design of the network, utilization of cutting-edge information systems, and the implementation of adaptable organizational frameworks. Each of these elements plays a pivotal role in enhancing overall business performance and ensuring the long-term viability of operations (Fu et al., 2022; Abbas & Sağsan, 2019).

Therefore, based on the evidence from these studies, it can be hypothesized that:

H7: There is a positive relationship between the network structure in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

The Positive Relationship Between Flows in Digital Supply Chains and Achieving Sustainable Competitive Advantage Through the Supplier trust in Palestinian Food Manufacturing Companies

The work of Alabdali and Salam (2022) explores the effects of digital transformation (DT) on supply chain procurement (SCP) to create a competitive advantage (CAD). In their study, the authors suggest that incorporating digital technologies effectively into supply chain can lead organizations to take up a more strategic position by bringing innovation into

procurement processes through modernization and identifying supplier relationships at a strategic level.

The hypothesis is consistent with the previous researches which support that digitalization within supply chains — particularly in procurement — helps achieve high performance, resilience, and resource-based strategic advantages (Kwak et al., 2018; Bowersox et al., 2005).

A quantitative research methodology was utilized by Alabdali and Salam (2022)— specifically structural equation modeling— in order to validate their assertions. Their findings show a positive connection between digital transformation and improved supply chain procurement, which fosters competitiveness.

Hallikas et al. (2021) support this idea: they believe that digital procurement systems contribute to strategic decision-making since such systems improve data quality and availability, an important precursor for decision making at the top management level. Similarly, Bienhaus and Haddud (2018) also point out that going digital in procurement would support strategic operations through ensuring transparency and efficiency; two essential features that can help retain long-term supplier relations as well as competitive advantage derived indirectly from such relationships over time.

The intermediary position of SCP in the link between DT and CAD not only underlines the strategic importance of procurement functions within supply chains but also stresses that just adopting digital tools is insufficient unless these tools foster the procurement processes. And what do they bring? Competitive strategies to (Kosmol et al., 2019)— like advanced analytics aiding better supplier selection and procurement information management that helps improve responsiveness while cutting costs (Croom & Johnson, 2000). These sustained competitive advantages are achieved through their indirect contribution towards other business operations even when they don't directly participate in creating value.

Digital technology integration with the supply chain is thus seen as a significant step to merging procurement processes. And this — coupled with strategic supplier relationships — leads to sustainable competitive advantages: evidenced based on Alabdali and Salam (2022) and other related works like Teece et al. (1997) and Barney (1991).

The positive correlation between digital flows in supply chains and competitive advantages has been confirmed, which was our main thesis supported by empirical evidence.

Such an integration not only makes the procurement more straightforward but also designs it strategically: sufficing to keep pace in competitiveness due to resource demands amidst today's highly digital world.

Therefore, based on the evidence from these studies, it can be hypothesized that:

H8: There is a positive relationship between flows in digital supply chains and achieving Sustainable competitive advantage through the supplier trust in Palestinian Food manufacturing companies.

2.6 Previous Studies

This section discusses the extensive research studies that have been conducted between 2012 and 2024 regarding the influence of technology on supply chain management and the way it can help to gain a competitive advantage in different global contexts.

The investigations explore the way digital transformation, large data, and other technological advances affect the procurement process, enhance organizational performance, and promote sustainable competitive advantage in industries including manufacturing, pharmaceuticals, and other areas. These include Saudi Arabia, Yemen, Bangladesh, Jordan, Palestine, and the UK.

By combining quantitative and qualitative methods of research, these studies demonstrate the essential role of technology in enhancing the functionality of supply chains and improving the relationship between buyers and supplier trust, this enables businesses to prosper in complex, often turbulent environments.

2.6.1 The Impact of Technology on Supply Chain and Competitive Advantage Worldwide

Alabdali and Salam (2022) investigated the effects of digital transformation (DT) on the supply chain procurement process (SCP) and its role in providing a competitive advantage (CD) in Saudi Arabia. The investigation employed a quantitative research methodology, which involved taking data from 221 supply chain professionals through LinkedIn. The survey was evaluated using a partial least squares-based structural equation model (PLS-SEM) that was implemented via the SmartPLS software. The sample included professionals from various industries, this gave a broad understanding of the topic. The results showed that DT has a significant effect on SCP, which in turn, positively affects CAD. Additionally, SCP has a significant role in the middle of the relationship between DT and CAD, which suggests that

digital transformation of the procurement process can have a significant impact on competitive advantage. This research demonstrates the value of digitalizing the processes of procurement in the supply chain in order to maintain a significant competitive advantage in the market.

Sumarliah and Al-hakeem (2022) investigated the effects of digital innovations and sustainable supply chain management on business performance following COVID-19. The purpose of the study was to explore the effects of Green Entrepreneurial Preference (GEP) and Sustainable Supply Chain Management (SSCM) on Business Competitive Performance (BCP), with a specific focus on the way digital technologies like Artificial Intelligence and Big Data Analytics (AIBD) influence these relationships. The sample included 245 food companies that are Halal in Yemen, this provides a large amount of data that can be analyzed. The approach used was structural equation modeling (SEM), which enabled the evaluation of the connections between the components of the proposed research framework. The theoretical foundation was derived from the dynamic capability's theory, this theory included constructs like GEP, SSCM, and BCP, with AIBD serving as a mediator. The results of the study showed that GEP had a significant impact on SSCM and thus on BCP. The investigation also showed that SSCM serves as the mediator between GEP and BCP, and that digital innovations like AIBD have a positive effect on the association between GEP and SSCM, this increases the capacity of companies to implement effective supply chain practices following COVID-19. These findings demonstrate the crucial role of digital technology in enhancing the firm's resilience and competitive performance in the face of global crises like the COVID-19 pandemic.

Shahadat et al. (2022) investigated the impact of digital technologies on enhancing the performance of the supply chain in the ready-made clothing industry in Bangladesh and achieving a sustainable advantage. The study utilized a quantitative methodology that involved a survey of 150 supply chain executives and managers from various RMG companies. The survey sought to understand the impact of digital technology on supply chain abilities and advantages. The investigation was conducted across multiple sites in Bangladesh that manufactured RMGs, this represented a diversity of perspectives in the industry. The primary instrument employed for data collection was a pre-tested and thoroughly reviewed structured questionnaire, which was designed to be reliable and lucid. The results of the study showed that digital technology had a significant effect on improving the supply chain abilities of RMG companies. The integration of digital technologies was observed to have a direct effect on supply chain performance by increasing both agility and flexibility in the supply chain. This, in turn, had a positive effect on the companies' competitive advantage, which was in line with

the research's goal of exploring the benefits of digital technology in complex, dynamic business environments. These findings demonstrate the strategic significance of digital technology in improving supply chain performance and obtaining a competitive advantage in the RMG industry.

Baqleh and Alateeq (2023) examined the role of Big Data Analytics (BDA) on supply chain management practices (SCMPs) and competitive advantage in Jordanian manufacturing companies. The study employed a quantitative approach. The data were collected from 156 companies via hierarchical linear regression. The theoretical framework revolved around the impact of BDA on enhancing the efficiency of SCMPs in order to achieve a significant advantage. The results showed that while certain SCMPs like information quality and sharing had a positive effect on competitive advantage, other SCMPs like strategic partnerships with supplier trust and customer management had no effect. Interestingly, BDA had no significant effect on the SCMPs' ability to gain an advantage, contradicting the supposition that it is generally beneficial. The research had a significant impact on the understanding of SCM in the Jordanian context, specifically regarding the practical application of large data analytics.

Maqbool et al. (2014) studied the effect of ICTs on superior performance via strategic alliances with supplier trust in supply chain management. The objective of the investigation was to investigate how ICTs could be incorporated into supply chain management to enhance organizational productivity and maintain a competitive advantage. The methodology used in the research was a comprehensive Literature Review that was supported by Case Studies that examined the role and impact of ICT in the company's supply chain. The primary tool employed for data collection is the analysis of existing literature and case studies from different companies. The theoretical foundation of the study was the Resource-Based View (RBV) of the company, which believes that a company's advantage over competitors is derived from the resources and capabilities that are uncommon, valuable, non-substitutable, and difficult to imitate. The results of the study showed that ICT had a significant effect on the efficiency and effectiveness of supply chain management, it supported more effective decision making, and it had a significant effect on the relationship with supplier trust, all of which contributed to a sustainable advantage.

Fung et al. (2022) investigated how digitalization in supply chains impacts organizational performance and competitiveness and how supplier trust trust one another. The sample comprised 202 manufacturing corporations that represent various segments of Pakistani

manufacturing. It utilized a mixed-method design which combined qualitative insights from unstructured interviews with 41 industry professionals with quantitative data from surveys sent to the larger corporation sample. This robust methodological framework allowed a deep dive in to the empirical and perceptual dimensions of digital supply chain management. The theoretical framework grounded the research in resource-based theory (RBV) along with relational view theories. These viewpoints highlight the importance of strategic resources and relationships for any competitive advantage. Digital supply chain capabilities have been framed as strategic resources and supplier trust was conceptualized as a crucial relational element. Findings revealed that digital supply chains improve operational and financial performance and foster sustainable competitive advantage. More importantly, results revealed that supplier trust moderates these relationships. High trust amongst supplier trust was associated with enhanced communication, collaboration and information sharing which amplify the positive outcomes of digital supply chains. These results highlight that creating and maintaining confidence with supplier trust is crucial in the digital era and that confidence is a lever for using strategic advantages of digital supply chain investments.

Ning and Yao (2023) examined the effects of digital transformation on supply chain functionality and sustainable competitive advantage. The data utilized in the study stemmed from a structured survey of 255 respondents from diverse Chinese industries. The study employed structural equation modeling (SEM) to assess the data, with the environmental uncertainty moderating effect was controlled. The theoretical framework was grounded by contingency theory, which posits that there is a direct linkage between effectiveness of an organization's strategy and the external environment in which it operates. The study found that digital transformation is highly effective in developing supply chain capabilities that positively and significantly affects the sustainable competitive performance of the organization. The research additionally revealed that supply chain capacities partially link digital transformation with competitive advantage, stressing such capacity as sharing information details, cooperation, and speedy responsiveness. The effects of environmental uncertainty highlight the advantage of digital transformation as it produces greater benefits in uncertain environments.

2.6.2 The Impact of Technology on Supply Chain and Competitive Advantage in Palestine

Within the Palestinian context, Abdullah (2012) intended to create a framework for supply chain management that would be applicable to other organizations and that would help them to gain a competitive advantage and improve their overall performance. The investigation targeted a sample of 40 manufacturing companies across 6 different industries: plastics, marble and stone, food, pharmaceuticals, chemicals, and engineering. A mixed methods approach was employed, which combined both qualitative and quantitative research methods. The data was collected through an online survey that had a response rate of 53.3%, along with individual interviews. The theoretical framework of the study revolved around combining various supply chain activities in order to increase organizational effectiveness, this was demonstrated by the proposal of a new general framework for supply chain management. The results showed significant flaws in the current supply chain management methods within the sample, particularly in regards to the integration of supply chain strategies with competitive advantages, supplier relations, and customer relations. These findings suggested the necessity of a strategic re-assessment and the adoption of more extensive, integrated logistics practices.

Awad (2023) investigated the effects of large data technology on the competitive advantage of Palestinian dairy companies. The investigation concerned the dairy industry in Palestine, using a descriptive and interpretive approach in order to achieve its goals. A comprehensive survey was distributed to five largest facilities in Palestine engaging in dairy production. These companies were Al-Junaidi, Al-Jabrini, Candia, and a dairy facility associated with the Arab Project Company in Jericho. Awad designed a questionnaire to collect the necessary information, which was processed using the SPSS software. The theoretical framework employed the VRIO model, which facilitated the analysis of how to better collect and analyze data in order to gain a competitive advantage. The model helped the company understand the market and consumers' needs more concretely and monitored competitors more actively. The results showed that, while data collection and analysis were crucial to gaining an advantage, no dairy company had a dedicated department that utilized modern methods. Additionally, there was a general lack of awareness among employees regarding the value of big data technology in increasing competitive advantage and enhancing market share.

Dwikat et al. (2023) investigated the impacts of competent human capital (CHC), strategic flexibility (SF) along with a turbulent environment (TE) on the long-term performance (LPN) of MSEs in the manufacturing business in Palestine. The investigation sample comprised 380 randomly selected SMEs of which 245 completed questionnaires had been effective. The theoretical basis was the Triple Bottom Line (TBL), Contingency Theory (CT) and Natural Resource Based Theory (NRBV) that discuss how sustainability concepts relate to businesses 'sustainable performance. Using Partial Least Squares Structural Equation Modeling (PLS-SEM) for information analysis with Smart PLS 4.0 software, the research identified crucial elements in managerial leadership which include TE, SF, and CHC which will impact the sustainable performance of SMEs. The findings revealed that human resource investments, flexible tactics in addition to environmental analysis all contribute to the businesses 'sustainability and that governmental assistance and initiatives aiming to enhance these aspects would contribute more to the businesses 'sustainability in such complicated political and financial environments. By the information in the research it is able to be realized that highly effective supply chain management in addition to trust between the supplier and the buyer can result in increased effectiveness of operations, cost reduction in addition to quality of the product that are crucial to the sustainable success of small enterprises.

2.6.3 The Role of Supply Chain Management and Supplier Trust

Narain and Singh (2012) examined the role of consumer-supplier relationships and trust in enhancing organizational performance. Their investigation, which was conducted through a survey of 54 Indian manufacturing companies, utilized correlation and regression techniques to analyze the data gathered. The primary instrument employed was a structured questionnaire, which was specifically designed to observe the various aspects of buyer-supplier interactions. The theoretical framework of the study centered around the importance of trust and effective communication in order to promote strong relationships between consumers and supplier trust, which in turn have an effect on the organization. Key findings from the study indicated that direct communication (face-to-face) and the treatment of supplier trust by buyers that are both fair and respectful promote the development of trust. This trust also enables the supplier trust to be ready to devote resources to the buyer's specific requirements, which will lead to an enhanced performance of the supplier trust and an overall improvement in the organization. These findings demonstrate the value of strategic alliances between buyers and supplier trust

as they have a significant impact on improving the efficiency and competitiveness of organizations.

Abdel Mohsen (2014) examined the effect of buyer-supplier partnerships on the agility of supply chains in the Fast-Moving Consumer Goods (FMCG) industry using a grounded theory approach. The investigation concerned Unilever in the North Africa-Middle East region as the example, the data was gathered from staff in managerial positions at Unilever's main clusters in the Middle East, as well as from five core supplier trust. A qualitative approach was used; interviews were conducted that were semi-structured, documents were analyzed, and observations were made as the primary means of data collection. The theoretical framework was derived from the principles of Grounded Theory, as described by Strauss and Corbin (1990-1998), which participated in the process of iterative data collection and analysis. Abdel Mohsen's findings indicate that the association between Unilever (Northeast Africa) and its supplier trust has a significant impact on supply chain flexibility. This association was facilitated by the effective utilization of information technology, which functioned as a catalyst for the interactions between buyer-supplier attributes and supply chain efficiency. This research emphasized the crucial attributes of supply chain agility in the FMCG industry and described how buyer-supplier partnerships can help achieve this agility.

Tarigan, et al. (2020) studied how supplier trust, supplier innovation and buyer-supplier interactions impact supplier performance in death service companies in Surabaya, Indonesia. The research utilized a causal study design and information was collected through questionnaires sent to 52 industry supplier trust of different services. Method for research has been Partial Least Square (PLS) Structural Equation Modeling (SEM). The theoretical framework was rooted in supply chain management theories with a specific emphasis on collaboration and trust among vendors and buyers as drivers of better performance. The main instrument for data collection was a structured questionnaire containing Likert scale numbers. Findings showed positive relationships across almost all hypotheses indicating that supplier trust positively influences supplier innovation and the buyer-supplier relationship. These two variables impact supplier performance. This research plays a role in the literature by illustrating exactly how innovation and trust within the buyer-supplier relationships can influence performance results for service businesses in Indonesia.

Sun et al. (2022) examined the impact of a sustainable supply chain strategy on a sustainable competitive advantage in the pharmaceutical industry in Pakistan, the focus of the

study was on the way that sustainability could be achieved through sustainable supply chain practice and the way that inhibitors of sustainability could be used. Their research was quantitative and involved collecting data through surveys from 180 employees in different pharmaceutical companies. The theoretical framework blended concepts from sustainable supply chain management, it emphasized the strategic relevance of sustainable practices in order to enhance competitive advantage. Their findings demonstrate a positive association between a sustainable supply chain strategy and a sustainable competitive advantage, this is primarily attributed to sustainable supply chain practices. Additionally, inhibitors of sustainability were observed to enhance the association between practical sustainable strategies and their theoretical counterparts, this suggests that addressing these inhibitors can augment the efficacy of practical strategies. This research helps to understand the principles of sustainability within supply chains, specifically in regards to their application to the pharmaceutical industry in developing countries.

Gilham (2023) addressed the relationship between customer satisfaction and trust in the global supply chain in the automotive industry of the northeast of the U.S. This post facto study that utilized quantitative data from 121 archived records from an automotive facility, these records were obtained from the Elsevier Research Database. The analysis utilized multiple linear regression, this demonstrated a significant association between the independent variables (customer satisfaction and trust) and the dependent variable (profitability). Specifically, customer satisfaction, indicated by the average wait time, and customer trust, indicated by the minimum amount of stock, were both significant in predicting profitability. This research demonstrates that effective inventory management and wait time management are crucial to increasing customer trust and satisfaction, this will in turn lead to increased profitability. The results indicate that automotive business leaders should concentrate on improving the supply chain to achieve customer expectations and maintain their trust, this will in turn, increase the profitability of the business.

Chen and Lewis (2024) investigated the interactions between supply chain management and buyer-supplier trust within buyer-supplier relationships, specifically regarding the effects of relational standards and structural power on both trust and distrust in the United Kingdom. The sample included (258) managers recruited via Qualtrics who participated in a scenario-based role-playing experiment that intended to replicate the interactions between buyers and supplier trust. The investigation utilized structural equation modeling to interpret the results of the experimental methodology. The theoretical framework revolved around the concept of trust

and distrust as separate, but associated constructs that exist in organizations, utilizing the trust-distrust literature to explore their distinct origins and mutual association. The results showed that while relational norms had a positive impact on supplier trust, indicating that benevolent behavior from the buyer promotes trust, power asymmetry had a significant negative impact on the supplier, suggesting that structural power dynamics within the buyer-supplier relationship tend to cause distrust instead of trust.

2.7 Concluding Remarks

The variety of studies considered underscores the significant role of digital transformation and cutting-edge technology in enhancing supply chain management and providing competitive advantages in multiple industries and regions.

Alabdali and Salam (2022) demonstrate that digital transformation has a significant impact on the procurement processes in Saudi Arabia, this suggests that the benefits of digital transformation are also applicable to other markets that share similar cultural and linguistic characteristics.

Similarly, Sumarliah and Al-hakeem (2022) explain that digital technology promotes sustainability in the food industry during global crises like the COVID-19 pandemic, they highlight the significance of technology in maintaining consistency and survival in an uncertain environment.

Additionally, the study explores the impact of large data analytics and ICT on supply chain efficiency and strategic advantage. Baqleh and Alateeq (2023) explain the Jordanian manufacturing sector in depth, the data indicates a mixed result, which necessitates a deeper examination of the context that affects the adoption of technology.

In contrast, Maqbool et al. (2014) emphasize the transformative effects of ICTs on the supply chain and decision-making processes, underscoring the crucial importance of digital skills in modern business environments.

The studies together demonstrate that while technology has a general effect on efficiency in operation and a competitive position, the benefits are often dependent on the specifics of the industry, the region, and the way they are implemented. The results from Shahadat et al. (2022) and Ning and Yao (2023) advocate the necessity of industries adopting

digital strategies that are not only relevant to their operational concerns, but also take into account external environmental factors.

Ultimately, these investigations provide powerful evidence that digital technologies and data analysis are essential tools for modern supply chains, this leads to significant increases in efficiency, agility, and a competitive advantage. They also suggest that ongoing research should be conducted to further refine the integration of these technologies in different industrial and cultural environments in order to maximize the benefits of these technologies across the global economic landscape.

2.8 Summary

The current investigation aims to address a significant lack of existing literature by taking a look at the intersection of digital supply chain management, sustainable advantage, and the role of supplier trust in the specific context of Palestinian food manufacturing.

Previous studies have focused on the various aspects of technology's influence on supply chains and a distinct lack of interest in how these dynamics are manifested in the unique political and economic environment of Palestine, specifically in the food manufacturing sector.

Previous investigations like those by Alabdali and Salam (2022) and Ning and Yao (2023) have demonstrated the significant influence of digital transformation on processes in the supply chain in different industries and regions.

However, these studies have largely disregarded the way in which these transformations interact with the subtlety of supplier trust, specifically in regions with complicated political and economic issues like Palestine. For example, Alabdali and Salam (2022) discuss digital transformation in the context of the Arab Kingdom without specifically discussing the role of trust between supplier trust and companies, this can be a significant factor in less stable environments.

Additionally, while Sumarliah and Al-hakeem (2022) discuss the importance of digital technology in enhancing food industry resilience and performance during global crises, their scope doesn't specifically address the way political conflicts and economic impediments affect supply chain dynamics, which is a commonplace reality for Palestinian businesses.

The Palestinian context is unique due to its distinct difficulties, including restricted access to markets and resources, these difficulties can adversely affect the effectiveness of digital supply chain innovations and the importance of supplier trust.

The current investigation also bears its own distinguishing feature by focusing on the role of supplier trust, a variable that is significant in environments that have political instability and economic uncertainty, these factors increase the likelihood of supply chain disruptions.

This component of the research is derived from the research of Fung et al. (2022), who advocate that supplier trust can have a significant impact on the benefits of digital supply chains by improving communication and collaboration.

However, in the Palestinian context, the nature of trust may differ significantly due to external forces and the need for increased adaptability and crisis management, these aspects are less evident in the studies previously reviewed.

In general, this research aims to expand our understanding of digital supply chain management to a context that is characterized by both external instability and internal necessity for trust and collaboration, this will provide new insight into how digital technology and strategic alliances can be utilized to gain a sustainable advantage in difficult environments.

This research aims to fill the existing research gap by providing a comprehensive description of these processes in a setting that has been previously underserved, this will provide significant knowledge to the field of supply chain management and competitive strategy.

Chapter Three: Study Methodology

3.1 Introduction

This chapter explains the methodology followed by the researcher in preparing the field aspect of her study, by specifying the method used to achieve the study objectives, stating its community and sample and how it was selected, as well as explaining the tool used to collect the data for this study, and the mechanism for testing its validity and reliability indicators. In addition to explaining the steps followed and the statistical methods used to reach the desired results.

3.2 Study Approach

This study relied on the descriptive analytical approach because it is the most appropriate approach to test hypotheses and achieve the study's objectives, as this approach is based on studying the variables related to the research problem and determining their relationship and influence on each other.

3.3 Data Collection

The researcher used two sources of data to prepare the theoretical and field aspects of the study, which are:

1- Primary sources: A questionnaire was prepared and developed as a main tool for collecting information directly from sample members.
2- Secondary sources: Previous studies and theoretical backgrounds that dealt with digital supply chains, sustainable competitive advantage, and supplier trust were reviewed.

3.4 Research Population and Sample

The study population included employees in (47) Palestinian food manufacturing companies (Palestinian Food Industries Union, 2024). In food manufacturing companies, product traceability is vital to ensure food safety. Digital supply chains enable products to be traced from source to end consumer. A simple random sample was selected to represent the study population. The researcher developed the study tool, designed an electronic version by Google forms, and distributed it using email to food manufacturing companies and social media

to reach the largest number of employees with different demographic variables and geographical locations. About (398) questionnaires were retrieved, all of which were valid for statistical analysis.

3.5 Analysis Unit

The study sample was selected from employees in food manufacturing companies within the job titles: Director of Department, Head of Division, and Employee. Their roles in the companies are: management, operations, logistics, IT, and marketing. The following tables show the distribution of the sample according to its demographic characteristics.

3.5.1 According to Role within the Company

Table 3.1 Distribution of the Sample according to Role within the Company

Variable	Categories	Freq.	Percentage%
Role within the company	Management	63	15.8
	Operations	102	25.6
	Logistics	70	17.6
	IT	84	21.1
	Marketing	79	19.8
Total		**398**	**100%**

The results of Table (3.1) indicated that the largest percentage of employees were in operations, with a percentage of 102(25.6%), followed by employees in the IT department, which amounted to 84(21.1%). The lowest percentage was for employees in management, with a percentage of 63(15.8%).

3.5.2 According to Job Title

Table 3.2 Distribution of the Sample according to Job Title

Variable	Categories	Freq.	Percentage%
Job Title	Director of Department	76	19.1
	Head of Division	109	27.4
	Employee	213	53.5
Total		**398**	**100%**

The results of Table 3.2 indicated that the largest percentage of employees were employees, with a percentage of 213(53.5%), followed by head of division, which amounted to 109(27.4%). While the lowest percentage was for director of department, with a percentage of 76(19.1%).

3.5.3 According to the Number of Employees in the Company

Table 3.3 Distribution of the Sample according to the Number of Employees in the Company

Variable	Categories	Freq.	Percentage%
Number of employees in the company	Less Than 10 Employee	98	24.6
	From 11 to 30 Employee	107	26.9
	From 31 to 50 Employee	136	34.2
	More Than 51 Employee	57	14.3
Total		**398**	**100%**

The results of Table 3.3 indicated that the largest percentage of employees was between (31-50) employees, at a percentage of 136 (34.2%) employees, followed by the number of employees (11-30) employees, which amounted to (). Meanwhile, the percentage of employees fewer than 10 was 57(14.3%) employees.

3.5.4 According to the Age

Table 3.4 Distribution of the Sample according to Age

Variable	Categories	Freq.	Percentage%
Age	Less Than 25 years old	85	28.5
	From 26 to 35 years old	153	51.3
	From 36 to 45 years old	117	39.3
	More Than 46 years old	43	14.4
Total		**398**	**100%**

It is clear from Table 3.4 that the majority of respondents were between the ages of from (26 to 35 years old) with a percentage of 153(51.3%), while the number of employees

between the ages of (From 36 to 45 years old) reached 117(39.3%). while the lowest percentage was for those aged (More Than 46 years old) years or over, amounting to 43(14.4%).

3.5.5 According to Gender

Table 3.5 Distribution of the Sample according to Gender

Variable	Categories	Freq.	Percentage%
Gender	Male	283	71.1
	Female	115	28.9
Total		**398**	**100%**

The results of Table (3.5) showed that the majority of respondents were males at a percentage of 283(71.1%), while the number of females reached 115(28.9%).

3.5.6 According to Educational Degree

Table 3.6 Distribution of the Sample according to Educational Degree

Variable	Categories	Freq.	Percentage%
Educational degree	Diploma Degree	58	14.6
	Bachelor’s Degree	227	57.0
	Higher Diploma	30	7.5
	Master’s Degree	64	16.1
	Others	19	4.8
Total		**398**	**100%**

The results of Table 3.6 indicated that the majority of respondents were holders of a bachelor's degree at a percentage of 227(57%), followed by holders of a diploma degree at a percentage of 58(14.6%), while the lowest percentage was for holders of others degree at 19(4.8%).

3.6 Study Instrument

This study relied on the questionnaire as the main tool for collecting data, as it is the means that helps in collecting new information and is derived directly from the source. The questionnaire paragraphs were developed by referring to previous related studies. The following table shows the questionnaire sections and the references that were referred to.

Table 3.7 Questionnaire Sections and Study Variables

Part One: Questions Related to Personal Variables			
Questions		**Categories No#**	**References**
Role within the Company		5	
Job Title		3	
Number of Employees		4	
Age		4	
Gender		2	
Educational Degree		5	
Part Two: Independent, Dependent and Moderating Variables			
Variables	**Items Sequence**	**Item No#**	
Independent Variable: Digital Supply Chains	**1-45**	**45**	
SC management components	1-9	`9	
SC management processes	10-18	10	
DSC network structure	19-30	12	
SC flows	31-45	15	
Moderating Variable: Supplier Trust	**46-48**	**3**	
Dependent Variable: Sustainable Competitive Advantage	**49-60**	**12**	
Organizational Levers and Competitive Advantage	49-51	3	
Strategic Management and Resource Allocation	52-56	5	
Innovation and Market Orientation	57-58	2	
Global Strategy and Operations	59	1	
Sustainability and Long-Term Orientation	60	1	

To enable the respondents to express their opinion on the questionnaire items, the researcher used the five-point Likert scale to measure the attitudes of the respondents and assigned each alternative a numerical weight for statistical analysis purposes as follows: (1 = strongly disagree), (2 = disagree), (3 = neutral), (4 = agree), (5 = strongly agree). To evaluate the respondents' attitudes, the values of the arithmetic means were classified into three levels: (high, medium, and low), based on the following equation:

Range = (highest value on the scale - lowest value on the scale) / 3

Accordingly, the range value is (5-1)/3 = 1.33, and therefore, the range for each level is as follows:

- Low level: Mean values are less than 2.34
- Medium level: Mean values range between (2.34 - less than 3.68)
- High level: Mean values are 3.68 or higher.

3.7 Instrument Validity

Before applying the questionnaire to the study sample, its validity and reliability indicators must be tested. Therefore, the researcher verified:

- **Content validity:** The questionnaire in its initial form was presented to specialists and experts in the field of business administration from faculty members at Palestinian universities to provide any modifications or suggestions they deemed appropriate for developing the questionnaire. These modifications included adding some items, deleting, or rephrasing others. The researcher modified the questionnaire based on these changes, and thus the questionnaire consisted of (60) items.
- **Convergent validity:** To verify that the questionnaire items and their variables have convergent validity, the values of the factor loadings were extracted, which must be greater than (0.60). Additionally, the values of the average extracted variance for the study's variables and dimensions must be greater than (0.60) (Hair et al., 2011). The following graph shows the values of the factor loadings for the tool's items.

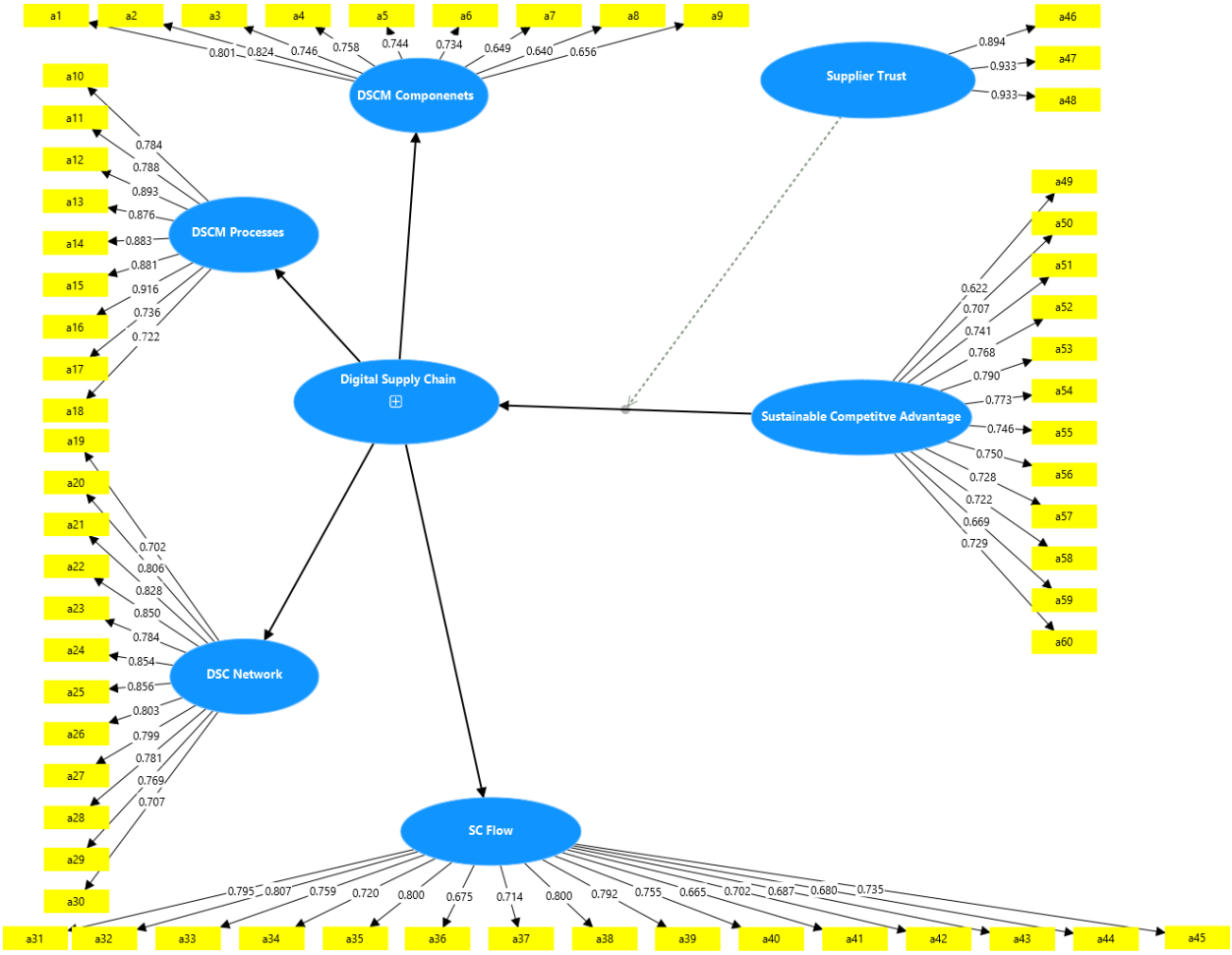

Figure 3.1: Factor Loading values

Upon reviewing the results of the previous figure, it is evident that all the factor loading values are greater than (0.05), which is the minimum statistically acceptable limit. Thus, the first condition for assessing the convergent validity of the tool is met. Below are the values of the average extracted variance for assessing the convergent validity of the tool.

Table 3.8 Average Variance Extracted (AVE)

Variables	**Average Variance Extracted (AVE)**
SC management components	0.534
SC management processes	0.668
DSC network structure	0.634
SC flows	0.548
Moderating Variable: Supplier Trust	0.847

Dependent Variable: Sustainable Competitive Advantage	0.533

After reviewing the results of the previous table, it is evident that all the extracted variance values are greater than (0.5), with values ranging between (0.533-0.847). Based on the results of the previous table, which presented the factor loading values, it can be concluded that the study tool has convergent validity.

- **Discriminant validity:** To test the discriminant validity of the study tool, the cross-loadings matrix for all dimensions (Heterotrait-Monotrait Ratio (HTMT) Matrix) was extracted, where the correlation values must be less than (0.90) (Yusoff et al., 2020).

Table 3.9 Heterotrait-Monotrait Ratio (HTMT) Matrix

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**
SC management components	0.745						
SC management processes	0.751	0.657					
DSC network structure	0.710	0.849	0.703				
SC flows	0.793	0.671	0.680	0.627			
Supplier Trust	0.501	0.676	0.669	0.785	0.779		
Sustainable Competitive Advantage	0.420	0.609	0.633	0.667	0.640	0.678	

After reviewing the results of the previous table, it is clear that all the cross-loadings values were less than (0.90), and thus it can be concluded that the study tool has discriminant validity. Additionally, the cross-loadings for all dimensions were extracted using the Fornell-Larcker Matrix, where it is required that all the loadings be less than the average extracted variance (AVE), as shown in the following table.

3.8 Instrument Reliability

To test the reliability of the questionnaire, the internal consistency coefficient (Cronbach's Alpha) and the composite reliability coefficient for the study variables and dimensions (Composite Reliability) were calculated, which must be greater than (0.70) to assess the reliability of the tool (Hair et al., 2011). The following table shows the values of these coefficients.

Table 3.10 Reliability Indicators

Variables	Cronbach's Alpha	Composite Reliability
Digital Supply Chains	**0.976**	**0.978**
SC management components	0.890	0.895
SC management processes	0.934	0.938
DSC network structure	0.947	0.948
SC flows	0.941	0.944
Supplier Trust	**0.920**	**0.922**
Sustainable Competitive Advantage	**0.910**	**0.912**

Considering the values of the Cronbach's Alpha internal consistency coefficients, which ranged between (0.890-0.976) for the study variables and dimensions, and the composite reliability values, which ranged between (0.895-0.978) for the study variables and dimensions, all of these values are greater than (0.70). Therefore, it can be concluded that the study instrument has reliability.

3.9 Ethical Considerations

The researcher obtained permission to distribute the questionnaire from the Arab American University of Palestine. The study's objectives were explained, and participants were given complete freedom to participate, with the option to withdraw at any time. To ensure the confidentiality of the information collected, the questionnaires were encrypted, and no names or personal identifiers were included. All data was stored on a laptop computer, accessible only to the researcher and the supervisor.

3.10 Statistical Treatments

Using the statistical analysis programs (SPSS) and (AMOS), several statistical treatments were applied, as follows:

1. To verify convergent validity, factor loadings and the values of the average extracted variance were calculated.
2. To verify discriminant validity, the cross-loadings for all dimensions were extracted using the Heterotrait-Monotrait Ratio (HTMT) Matrix and the Fornell-Larcker Matrix.

3. To test the reliability of the study tool, the internal consistency coefficient (Cronbach's Alpha) and the composite reliability coefficient (Composite Reliability) for the study variables and dimensions were calculated.
4. To test the study hypotheses, Structural Equation Modeling (SEM) was applied.

Chapter Four: Results

4.1 Introduction

This chapter outlines the findings and analysis of the study, emphasizing critical insights derived from the evaluation of both the measurement and structural models. It includes a descriptive analysis and an evaluation of the measurement model to confirm the constructs' reliability and validity. Additionally, the chapter presents hypothesis testing performed using PLS-SEM and SPSS, providing a comprehensive overview of the data analysis procedures.

4.2 Characteristics of Respondents

Table 4.1 provides a comprehensive analysis of the demographic characteristics of the 398 respondents. The survey included participants from diverse **job roles**, with the highest representation in Operations (25.6%), followed by IT (21.1%), Marketing (19.8%), Logistics (17.6%), and Management (15.8%). In terms of **job titles**, more than half of the respondents were Employees (53.5%), while Heads of Division accounted for 27.4%, and Directors of Departments represented 19.1%. **Firms** surveyed varied in size, with 34.2% employing 31 to 50 individuals, 26.9% having 11 to 30 employees, 24.6% with fewer than 10 employees, and 14.3% employing more than 51 individuals.

The **age** distribution of respondents showed that 38.4% were aged 26 to 35 years, 29.4% were between 36 and 45 years, 21.4% were under 25 years, and 10.8% were over 46 years. **Gender** representation revealed a male majority (71.1%) compared to females (28.9%). Regarding **educational qualifications**, the majority held a bachelor's degree (57.0%), followed by master's degrees (16.1%), diploma degrees (14.6%), higher diplomas (7.5%), and other qualifications (4.8%). This demographic profile reflects a diverse sample of respondents in terms of job roles, organizational sizes, age groups, gender distribution, and educational backgrounds, offering valuable insights into the population surveyed.

Table 4.1 Demographic Variables of Respondent's Analysis

Variables	Options	Frequency	Valid Percentage%
Job Role	IT	84	21.1%
	Logistics	70	17.6%
	Management	63	15.8%
	Marketing	79	19.8%
	Operations	102	25.6%
Job Title	Director of Department	76	19.1%

	Employee	213	53.5%
	Head of Division	109	27.4%
Employee Number	From 11 to 30 Employee	107	26.9%
	From 31 to 50 Employee	136	34.2%
	Less Than 10 Employee	98	24.6%
	More Than 51 Employee	57	14.3%
Age	From 26 to 35 years old	153	38.4%
	From 36 to 45 years old	117	29.4%
	Less Than 25 years old	85	21.4%
	More Than 46 years old	43	10.8%
Gender	Female	115	28.9%
	Male	283	71.1%
Educational Degree	Bachelor’s Degree	227	57.0%
	Diploma Degree	58	14.6%
	Higher Diploma	30	7.5%
	Master's Degree	64	16.1%
	Others	19	4.8%

4.3 Descriptive Statistics

The analysis utilized a 5-point Likert scale, where scores from 1 to 2.9 represented a "low" level of agreement, 3 to 3.9 indicated a "moderate" level, and 4 to 5 signified a "high" level of agreement. Tables (4.2 to 4.7) present the descriptive statistics for the constructs examined in this study, including their mean values, standard deviations, and the distribution of responses categorized as negative, neutral, or positive.

4.3.1 Management Components (MC)

Table 4.2 provides a detailed statistical analysis of the dimensions and indicators for the Management Components (MC). The overall MC construct demonstrated a high mean score of 4.554 (Std. = 1.062), with 87% positive responses and only 8.7% negative responses, reflecting significant agreement among respondents.

For the **Strategy (MC-S)** dimension, the mean scores ranged from 4.500 to 4.746, reflecting strong agreement. Specifically, Q1 had the highest mean of 4.746 (Std. = 0.770) and the highest positive response rate (93.5%), with only 3.8% negative responses. Q2 and Q3 also exhibited high mean scores of 4.613 and 4.500, with positive response rates of 87.2% and 87.2%, respectively.

The **Employees (MC-E)** dimension showed high levels of agreement, with mean scores between 4.480 and 4.545. Q6 had the highest mean (4.545, Std. = 1.051) and positive response rate (87.9%), while Q4 (Mean = 4.480, Std. = 1.174) showed slightly lower positive responses (84.4%) and higher negative responses (10.6%).

For the **Initiation of Business Transactions (MC-I)** dimension, mean scores ranged from 4.467 to 4.603. Q9 had the highest mean (4.603, Std. = 0.988) and positive response rate (88.2%). Q7 had the lowest mean score (4.467, Std. = 1.174) and positive response rate (83.7%), with 11.3% of responses categorized as negative.

Overall, all indicators across the three dimensions demonstrated high levels of agreement, with positive response rates ranging from 83.7% to 93.5%, indicating strong alignment among respondents regarding the Management Components construct.

Table 4.2 Management Components Dimensions and Indicators: Mean, Standard Deviation, and Percentage

Construct	Q.#	Mean	Std.	% of Negative response	% of Neutral	% of Positive response	Level of Agreement
MC-S	Q1	4.746	0.770	3.8%	2.8%	93.5%	High
	Q2	4.613	0.942	5.3%	7.5%	87.2%	High
	Q3	4.500	1.216	11.1%	1.8%	87.2%	High
	Overall	4.620	0.976	6.7%	4.0%	89.3%	High
MC-E	Q4	4.480	1.174	10.6%	5.0%	84.4%	High
	Q5	4.500	1.174	11.8%	2.8%	85.4%	High
	Q6	4.545	1.051	8.5%	3.5%	87.9%	High
	Overall	4.508	1.133	10.3%	3.8%	85.9%	High
MC-I	Q7	4.467	1.174	11.3%	5.0%	83.7%	High
	Q8	4.535	1.066	8.8%	5.8%	85.4%	High
	Q9	4.603	0.988	7.5%	4.3%	88.2%	High
	Overall	4.535	1.076	9.2%	5.0%	85.8%	High
MC		4.554	1.062	8.7%	4.3%	87.0%	High

4.3.2 Management Processes (MP)

The construct MP mean score was 4.566 and (Std. = 1.051) as presented in Table 4.3. All MP indicators recorded a high level of agreement, with positive response rates consistently exceeding 81%.

The **Integration and Alignment (MP-IA)** dimension showed strong agreement, with mean scores ranging from 4.573 to 4.583. Q12 had the highest mean score of 4.583 (Std. = 1.027) and a positive response rate of 88.2%. Q11 followed closely with a mean of 4.573 (Std. = 0.995) and 86.7% positive responses, while Q10 exhibited a mean of 4.580 (Std. = 1.022) and 88.4% positive responses.

For the **Purchasing Process (MP-PR)** dimension, Q13 recorded the highest mean score of 4.606 (Std. = 1.071) and the highest positive response rate of 88.7%. Q15 had a mean of 4.573 (Std. = 1.062) with 87.4% positive responses, while Q14 had a slightly lower mean of 4.492 (Std. = 1.113) and a positive response rate of 83.9%.

The **Responsiveness and Compliance (MP-RC)** dimension demonstrated notable variability. Q17 achieved the highest mean score of 4.691 (Std. = 0.862) and a positive response rate of 90.2%, reflecting the strongest agreement. Q18 followed with a mean of 4.590 (Std. = 1.053) and 88.2% positive responses. However, Q16 had the lowest mean of 4.407 (Std. = 1.258) and the lowest positive response rate of 81.2%, with 13.1% negative responses.

In summary, all dimensions and indicators of the Management Processes construct exhibited high levels of agreement, with positive response rates ranging from 81.2% to 90.2%. These results highlight strong consensus among respondents regarding the effectiveness of management processes.

Table 4.3 Management Processes: Mean, Standard Deviation, and Percentage

Construct	Q.#	Mean	Std.	% of Negative response	% of Neutral	% of Positive response	Level of Agreement
MP-IA	Q10	4.580	1.022	8.5%	3.0%	88.4%	High
	Q11	4.573	0.995	7.0%	6.3%	86.7%	High
	Q12	4.583	1.027	9.0%	2.8%	88.2%	High
	Overall	4.579	1.015	8.2%	4.0%	87.8%	High
MP-PR	Q13	4.606	1.071	9.0%	2.3%	88.7%	High
	Q14	4.492	1.113	9.8%	6.3%	83.9%	High
	Q15	4.573	1.062	7.8%	4.8%	87.4%	High

	Overall	4.557	1.082	8.9%	4.4%	86.7%	High
MP-RC	Q16	4.407	1.258	13.1%	5.8%	81.2%	High
	Q17	4.691	0.862	6.8%	3.0%	90.2%	High
	Q18	4.590	1.053	7.8%	4.0%	88.2%	High
	Overall	4.563	1.058	9.2%	4.3%	86.5%	High
MP		4.566	1.051	8.8%	4.2%	87.0%	High

4.3.3 Management Structure (MS)

Table 4.4 presents a comprehensive analysis of the descriptive statistics for the Management Structure (MS) construct, which includes three dimensions: Digital Capability (MS-DC), Supply Chain Resilience (MS-SCR), and Supply Chain Agility (MS-SCA). The MS mean score was 4.557 and the standard deviation was 1.040 and a positive response rate of 86.5%.

The **MS-DC** dimension exhibited strong agreement, with mean scores ranging from 4.497 to 4.570. Q20 recorded the highest mean score of 4.570 (Std. = 0.954) and a positive response rate of 86.9%. Q19 followed closely with a mean of 4.565 (Std. = 0.993) and 87.7% positive responses. However, Q21 had a slightly lower mean score of 4.497 (Std. = 1.097) and the lowest positive response rate within this dimension at 81.7%, with 9.8% neutral responses.

The **MS-SCR** dimension reflected varying levels of agreement. Q22 had the highest mean score of 4.686 (Std. = 0.869) and the strongest positive response rate of 90.7%. Q24 had a mean score of 4.528 (Std. = 1.126) with 86.7% positive responses, while Q23 had the lowest mean in this dimension (4.462, Std. = 1.165) and 82.7% positive responses.

The **MS-SCA** dimension demonstrated robust agreement across all indicators. Q29 recorded the highest mean score of 4.676 (Std. = 0.851) with a positive response rate of 90.5%. Q30 followed closely with a mean of 4.618 (Std. = 1.014) and 88.7% positive responses. Q27 had a mean score of 4.583 (Std. = 1.015) with 87.9% positive responses, while Q28 had the lowest mean within the dimension (4.477, Std. = 1.183) but still maintained a high positive response rate of 84.4%.

The Management Structure construct showed consistently high levels of agreement across all dimensions and indicators, with positive response rates ranging from 81.7% to 90.7%. The strong positive responses highlight the significance of digital capability, supply chain resilience, and agility in achieving effective management structures.

Table 4.4 Management Structure Dimensions and Indicators: Mean, Standard Deviation, and Percentage

Construct	Q.#	Mean	Std.	% of Negative response	% of Neutral	% of Positive response	Level of Agreement
MS-DC	Q19	4.565	0.993	8.5%	3.8%	87.7%	High
	Q20	4.570	0.954	6.3%	6.8%	86.9%	High
	Q21	4.497	1.097	8.5%	9.8%	81.7%	High
	Overall	4.544	1.015	7.8%	6.8%	85.4%	High
MS-SCR	Q22	4.686	0.869	6.5%	2.8%	90.7%	High
	Q23	4.462	1.165	10.3%	7.0%	82.7%	High
	Q24	4.528	1.126	10.1%	3.3%	86.7%	High
	Overall	4.559	1.053	9.0%	4.4%	86.7%	High
MS-SCA	Q25	4.523	1.103	9.5%	4.5%	85.9%	High
	Q26	4.538	1.154	10.6%	2.8%	86.7%	High
	Q27	4.583	1.015	8.3%	3.8%	87.9%	High
	Q28	4.477	1.183	12.6%	3.0%	84.4%	High
	Q29	4.676	0.851	5.5%	4.0%	90.5%	High
	Q30	4.618	1.014	7.3%	4.0%	88.7%	High
	Overall	4.569	1.053	9.0%	3.7%	87.4%	High
MS		4.557	1.040	8.6%	4.9%	86.5%	High

4.3.4 Management Flows (MF)

Table 4.5 outlines the descriptive statistics for the Management Flows (MF) construct, which includes five dimensions: Blockchain Technology (MF-BT), Social Internet of Things (MF-IoT), Artificial Intelligence (MF-AI), Supply-Chain Traceability (MF-SCTRC), and Supply-Chain Transparency (MF-SCTRN). The mean score is 4.551 (Std. = 1.059), and the positive response rate is 86.4%. All indicators demonstrated high levels of agreement, with positive responses exceeding 80%.

The **MF-BT** dimension displayed strong agreement across its indicators. Q31 recorded the highest mean score of 4.618 (Std. = 0.923) and a positive response rate of 88.7%, while Q32 had a mean of 4.550 (Std. = 1.063) with 85.9% positive responses.

The **MF-IoT** dimension exhibited consistently high agreement. Q35 achieved the highest mean score of 4.606 (Std. = 0.982) with 89.2% positive responses. Q33 had a mean of 4.595 (Std. = 0.973) and 88.9% positive responses, while Q34 showed the lowest mean of 4.497 (Std. = 1.166) with 85.2% positive responses.

The **MF-AI** dimension also demonstrated strong agreement. Q37 recorded the highest mean score of 4.631 (Std. = 0.992) and a positive response rate of 88.9%. Q38 followed with a mean of 4.573 (Std. = 1.035) and 85.9% positive responses, while Q36 had a mean of 4.540 (Std. = 1.051) with 85.9% positive responses.

The **MF-SCTRC** This dimension reflected varying levels of agreement. Q41 had the highest mean score of 4.608 (Std. = 1.034) with 87.4% positive responses. Q39 and Q42 recorded means of 4.538 and 4.525, with 84.4% and 85.9% positive responses, respectively. Q40 had the lowest mean score of 4.364 (Std. = 1.317) and the lowest positive response rate (80.7%), with 13.1% negative responses.

The **MF-SCTRN** dimension showed consistently high agreement. Q45 recorded the highest mean of 4.593 (Std. = 1.001) with 87.7% positive responses. Q44 had a mean of 4.545 (Std. = 1.075) and 86.2% positive responses, while Q43 had the lowest mean in this dimension (4.399, Std. = 1.243) with 81.9% positive responses and the highest proportion of negative responses (13.3%).

The Management Flows construct demonstrated strong positive agreement across all dimensions, with positive response rates ranging from 80.7% to 89.2%. These results highlight the respondents' strong alignment on the importance of technologies like Blockchain, IoT, AI, and supply-chain-related measures in management flows.

Table 4.5 Management Flows Dimensions and Indicators: Mean, Standard Deviation, and Percentage

Construct	Q.#	Mean	Std.	% of Negative response	% of Neutral	% of Positive response	Level of Agreement
MF-BT	Q31	4.618	0.923	6.3%	5.0%	88.7%	High
	Q32	4.550	1.063	10.1%	4.0%	85.9%	High

	Overall	4.584	0.993	8.2%	4.5%	87.3%	High
MF-IoT	Q33	4.595	0.973	7.5%	3.5%	88.9%	High
	Q34	4.497	1.166	10.8%	4.0%	85.2%	High
	Q35	4.606	0.982	7.0%	3.8%	89.2%	High
	Overall	4.566	1.040	8.5%	3.8%	87.8%	High
MF-AI	Q36	4.540	1.051	9.8%	4.3%	85.9%	High
	Q37	4.631	0.992	7.5%	3.5%	88.9%	High
	Q38	4.573	1.035	8.3%	5.8%	85.9%	High
	Overall	4.581	1.026	8.5%	4.5%	86.9%	High
MF-SCTRC	Q39	4.538	1.051	8.3%	7.3%	84.4%	High
	Q40	4.364	1.317	13.1%	6.3%	80.7%	High
	Q41	4.608	1.034	7.3%	5.3%	87.4%	High
	Q42	4.525	1.115	10.6%	3.5%	85.9%	High
	Overall	4.509	1.129	9.8%	5.6%	84.6%	High
MF-SCTRN	Q43	4.399	1.243	13.3%	4.8%	81.9%	High
	Q44	4.545	1.075	12.3%	1.5%	86.2%	High
	Q45	4.593	1.001	7.5%	4.8%	87.7%	High
	Overall	4.513	1.106	11.1%	3.7%	85.3%	High
MF		4.551	1.059	9.2%	4.4%	86.4%	High

4.3.5 Supplier Trust (ST)

Table 4.6 presents the descriptive statistics for the Supplier Trust (ST) construct, including a mean score of 4.520 and a standard deviation of 1.096 with a positive response of 85.2%. All indicators demonstrated a high level of agreement, with positive response rates exceeding 83%.

Q46 recorded a mean score of 4.518 (Std. = 1.108), with 86.2% of responses categorized as positive, 4.3% as neutral, and 9.5% as negative. This reflects a strong level of agreement among respondents regarding this indicator.

Q47 showed the highest mean score within the dimension at 4.565 (Std. = 1.038), with 85.4% positive responses, 7.5% neutral responses, and 7.0% negative responses.

Q48 exhibited the lowest mean score of 4.477 (Std. = 1.141) but still maintained a high positive response rate of 83.9%. Negative responses for this indicator accounted for 11.1%, the highest within the dimension.

The Supplier Trust construct demonstrated consistently high levels of agreement, with positive response rates ranging from 83.9% to 86.2%. Despite some variability in the percentage of negative responses, the overall results highlight the respondents' strong trust in suppliers as a critical component of their management processes.

Table 4.6 Supplier Trust Indicators: Mean, Standard Deviation, and Percentage

Construct	Q.#	Mean	Std.	% of Negative response	% of Neutral	% of Positive response	Level of Agreement
ST	Q46	4.518	1.108	9.5%	4.3%	86.2%	High
	Q47	4.565	1.038	7.0%	7.5%	85.4%	High
	Q48	4.477	1.141	11.1%	5.0%	83.9%	High
	Overall	4.520	1.096	9.2%	5.6%	85.2%	High

4.3.6 Sustainable Competitive Advantage (SCA)

Table 4.7 provides an analysis of the Sustainable Competitive Advantage (SCA) construct, encompassing three dimensions: Organizational Levers (SCA-OL), Strategic Management (SCA-SM), and Innovation (SCA-I). The mean of the SCA score was 4.579 and the standard deviation was 1.010. All indicators demonstrated a high level of agreement, with positive response rates exceeding 84%.

For the **SCA-OL** dimension, Q49 recorded the highest mean score of 4.636 (Std. = 0.909) with 90.2% positive responses, while Q50 followed closely with a mean of 4.621 (Std. = 0.922) and the highest positive response rate of 90.5%. Q52 had a mean of 4.573 (Std. = 1.073) with 88.4% positive responses, and Q51 had the lowest mean in the dimension (4.528, Std. = 1.040) with 85.2% positive responses.

In the **SCA-SM** dimension, Q53 recorded the highest mean score (4.633, Std. = 0.948) and 88.7% positive responses, followed by Q56 with a mean of 4.616 (Std. = 0.955) and 87.9% positive responses. Q54 showed a mean of 4.543 (Std. = 1.119) with 87.4% positive responses, while Q55 had the lowest mean in this dimension (4.487, Std. = 1.119) and 84.7% positive responses, alongside the highest negative response rate (12.8%).

The **SCA-I** dimension showed robust agreement, with Q57 recording a mean of 4.578 (Std. = 0.987) and 85.9% positive responses, and Q58 closely following with a mean of 4.575 (Std. = 1.030) and 87.4% positive responses.

Overall, the SCA construct reflected strong agreement across all dimensions, with positive response rates ranging from 84.7% to 90.5%. These results underscore the importance of organizational levers, strategic management, and innovation in achieving sustainable competitive advantage.

Table 4.7 Sustainable Competitive Advantage Dimensions and Indicators: Mean, Standard Deviation, and Percentage

Construct	Q.#	Mean	Std.	% of Negative response	% of Neutral	% of Positive response	Level of Agreement
SCA-OL	Q49	4.636	0.909	5.8%	4.0%	90.2%	High
	Q50	4.621	0.922	7.5%	2.0%	90.5%	High
	Q51	4.528	1.040	8.0%	6.8%	85.2%	High
	Q52	4.573	1.073	9.3%	2.3%	88.4%	High
	Overall	4.589	0.986	7.7%	3.8%	88.6%	High
SCA-SM	Q53	4.633	0.948	6.8%	4.5%	88.7%	High
	Q54	4.543	1.119	10.1%	2.5%	87.4%	High
	Q55	4.487	1.119	12.8%	2.5%	84.7%	High
	Q56	4.616	0.955	6.3%	5.8%	87.9%	High
	Overall	4.570	1.035	9.0%	3.8%	87.2%	High
SCA-I	Q57	4.578	0.987	6.3%	7.8%	85.9%	High
	Q58	4.575	1.030	8.0%	4.5%	87.4%	High
	Overall	4.577	1.009	7.2%	6.2%	86.7%	High
SCA		4.579	1.010	7.9%	4.6%	87.5%	High

4.4 Evaluation of the Study Model

The researcher analyzed the study model using an assessment of data normality and a two-step approach: evaluating the measurement model and assessing the structural model to test the research hypotheses. The evaluation of the measurement model comprised three main stages: internal consistency reliability, convergent validity, and discriminant validity. The

structural model evaluation involved four key steps: examining indicator multicollinearity, determining the coefficient of determination (R^2), evaluating predictive relevance (Q^2), and analyzing effect size (f^2).

4.1.1 Data Normality Evaluation

To evaluate normality, skewness, and kurtosis values were examined. According to Kim (2013), skewness values within ±2.0 and kurtosis values below 7.0 are considered acceptable for normality. However, the Kolmogorov-Smirnov test revealed significant deviations from normality across all variables ($P < 0.05$).

Despite these test results, most variables exhibited skewness and kurtosis values within acceptable ranges. For example, "MC-S Q1" showed a skewness of -3.49 and a kurtosis of 12.151, indicating a notable deviation from normality, while other indicators such as "MC-E Q4" (skewness: -2.128, kurtosis: 3.083) fell within acceptable thresholds. Similarly, "MP-IA Q10" (skewness: -2.472, kurtosis: 4.926) demonstrated moderate adherence to normality.

The Shapiro-Wilk test further validated these findings, as all variables showed significant deviations from normality ($P < 0.05$). For instance, "MS-SCR Q22" exhibited a Shapiro-Wilk statistic of 0.409, and "MF-AI Q36" reported a statistic of 0.492, both indicating non-normal data distributions as shown in Appendix (A).

In summary, while skewness and kurtosis values for most indicators fell within acceptable limits, the Kolmogorov-Smirnov and Shapiro-Wilk tests consistently indicated significant deviations from normality. These results suggest that data distribution may not conform to normality assumptions, which should be accounted for when interpreting the findings and selecting analytical methods.

4.4.1 Internal Consistency Reliability

In evaluating the study model, the researcher assessed internal consistency reliability as part of the measurement model. Table 4.8 summarizes the results of the construct reliability analysis, including Cronbach's alpha (α) and Composite Reliability (CR) values for first-order, second-order, and third-order constructs. Both Cronbach's alpha and CR values consistently meet or exceed the recommended threshold of 0.70, indicating strong internal consistency reliability across constructs.

For the **first-order constructs**, Cronbach's alpha values ranged from 0.690 to 0.984, and CR values ranged from 0.842 to 0.985. Constructs such as Dynamic Supply Chain (DSC)

(α = 0.984, CR = 0.985), Management Flows (MF) (α = 0.957, CR = 0.961), and Management Processes (MP) (α = 0.928, CR = 0.940) demonstrated particularly high reliability. Within the dimensions of MF, Blockchain Technology (MF-BT) (α = 0.855, CR = 0.932) and Supply-Chain Traceability (MF-SCTRC) (α = 0.852, CR = 0.900) showed strong internal consistency. In MP, dimensions such as Integration and Alignment (MP-IA) (α = 0.774, CR = 0.869) and Purchasing Process (MP-PR) (α = 0.835, CR = 0.901) were similarly robust. For Management Components (MC), dimensions like Employees (MC-E) (α = 0.801, CR = 0.884) and Initiation of Business Transactions (MC-I) (α = 0.831, CR = 0.899) also demonstrated reliability. While lower values were observed for Strategy (MC-S) (α = 0.719, CR = 0.842) and Innovation and Market Orientation (SCA-I) (α = 0.690, CR = 0.866), they still met acceptable reliability thresholds.

For the **second-order constructs**, Cronbach's alpha values ranged from 0.925 to 0.985, and CR values ranged from 0.841 to 0.938. Constructs such as Management Structure (MS) (α = 0.967, CR = 0.938) and Sustainable Competitive Advantage (SCA) (α = 0.925, CR = 0.870) demonstrated exceptional reliability, with dimensions such as Digital Capability (MS-DC) (α = 0.825, CR = 0.896) and Supply Chain Resilience (MS-SCR) (α = 0.729, CR = 0.847) contributing to the overall robustness.

At the **third-order level**, the construct Dynamic Supply Chain (DSC) achieved the highest reliability, with Cronbach's alpha at 0.975 and CR at 0.979, reflecting exceptional internal consistency and strong alignment across all dimensions.

These findings indicate that the constructs in the study model, including MC, MP, MS, MF, ST, and SCA, exhibit robust internal consistency reliability. The strong reliability across dimensions such as MF-BT, MP-IA, MS-SCA, and SCA-OL highlights the effectiveness of the measurement model in capturing the intended constructs and their associated dimensions. This solid foundation provides confidence in the validity of the study's structural model and subsequent hypothesis testing.

Table 4.8 Construct Reliability Analysis

Construct	**α**	**CR**
→ First Order		
DSC	0.984	0.985
MC	0.921	0.935
MC-E	0.801	0.884

MC-I	0.831	0.899
MC-S	0.719	0.842
MF	0.957	0.961
MF-AI	0.771	0.867
MF-BT	0.855	0.932
MF-IoT	0.808	0.887
MF-SCTRC	0.852	0.900
MF-SCTRN	0.832	0.900
MP	0.928	0.940
MP-IA	0.774	0.869
MP-PR	0.835	0.901
MP-RC	0.837	0.902
MS	0.943	0.951
MS-DC	0.825	0.896
MS-SCA	0.875	0.906
MS-SCR	0.729	0.847
SCA	0.940	0.949
SCA-I	0.690	0.866
SCA-OL	0.875	0.915
SCA-SM	0.877	0.916
ST	0.845	0.907
→ Second Order		
DSC	0.985	0.841
MC	0.931	0.879
MF	0.953	0.843
MP	0.928	0.874
MS	0.967	0.938
SCA	0.925	0.870
→ Third Order		
DSC	0.975	0.979

4.4.2 Convergent Validity

According to Hair Jr et al. (2014), convergent validity is "the extent to which a measure correlates positively with other measures of the same construct." To evaluate convergent validity in this study, the researcher applied two key tests: outer loading and average variance extracted (AVE).

4.4.3 Outer Loading

The outer loadings assess the strength of the relationship between constructs and their respective indicators. Outer loading values exceeding 0.70 are generally considered acceptable, while values closer to or above 0.80 indicate strong contributions to their constructs (Hair Jr et al., 2017). The results highlight variations in indicator loadings across first- and second-order constructs.

Table 4.9 presents the outer loadings of the indicators for the constructs evaluated in the study, reflecting the strength of each indicator's relationship with its respective latent variable. This analysis encompasses first-order, second-order, and third-order constructs.

4.4.3.1 First-Order Constructs

For Management Components (MC), all dimensions demonstrated strong outer loadings. Indicators for Strategy (MC-S) had outer loadings ranging from 0.727 (Q1) to 0.838 (Q3). The Employees (MC-E) dimension exhibited particularly high loadings, with Q4 achieving 0.912, the highest among all MC dimensions. Initiation of Business Transactions (MC-I) indicators also showed robust outer loadings, with Q7 at 0.879 and Q8 at 0.875.

In Management Processes (MP), indicators for Integration and Alignment (MP-IA) ranged from 0.794 to 0.881, while Purchasing Process (MP-PR) and Responsiveness and Compliance (MP-RC) exhibited strong loadings, such as 0.899 for Q16 (MP-RC).

For Management Structure (MS), indicators for Digital Capability (MS-DC) ranged from 0.825 (Q19) to 0.894 (Q21), and Supply Chain Resilience (MS-SCR) had moderate loadings, such as 0.773 (Q22). Supply Chain Agility (MS-SCA) indicators showed more variability, with Q27 having the lowest loading (0.726) and Q28 the highest (0.896).

In Management Flows (MF), Blockchain Technology (MF-BT) exhibited exceptionally high outer loadings of 0.933 (Q31) and 0.936 (Q32). Similarly, Supply-Chain Traceability (MF-SCTRC) had loadings ranging from 0.790 to 0.872, while Supply-Chain Transparency (MF-SCTRN) demonstrated strong relationships, with Q43 reaching 0.927.

The Supplier Trust (ST) construct also showed strong outer loadings, with Q48 achieving the highest at 0.917. Sustainable Competitive Advantage (SCA) dimensions such as Organizational Levers (SCA-OL) had loadings from 0.791 to 0.887, while Strategic Management (SCA-SM) and Innovation (SCA-I) showed consistently high values, such as 0.899 (Q54) and 0.874 (Q57, Q58).

4.4.3.2 Second-Order Constructs

For second-order constructs, Management Components (MC) exhibited strong relationships with its dimensions, with loadings of 0.928 (MC-S), 0.944 (MC-E), and 0.941 (MC-I). Similarly, Management Processes (MP) demonstrated strong loadings, such as 0.939 for Integration and Alignment (MP-IA). Management Structure (MS) achieved the highest loading among second-order constructs, with 0.972 for Supply Chain Agility (MS-SCA). Management Flows (MF) and Sustainable Competitive Advantage (SCA) also demonstrated robust relationships, with loadings such as 0.957 for Supply-Chain Traceability (MF-SCTRC) and 0.941 for Organizational Levers (SCA-OL).

4.4.3.3 Third-Order Constructs

At the third-order level, Dynamic Supply Chain (DSC) demonstrated extremely high outer loadings with its second-order constructs: Management Components (MC) (0.983), Management Processes (MP) (0.986), Management Structure (MS) (0.961), and Management Flows (MF) (0.977). These results underscore the strong contributions of these second-order constructs to the overall DSC construct.

The outer loadings across all constructs and dimensions consistently meet or exceed acceptable thresholds, with most indicators demonstrating strong contributions to their respective constructs. The results validate the robustness of the measurement model and highlight the reliability of the indicators in capturing the latent variables of the study. This provides a strong foundation for subsequent structural model evaluation and hypothesis testing.

Table 4.9 Outer Loading of Indicators

Construct	Questions	Outer Loading
→ First Order		
MC		
MC-S	Q1	0.727
	Q2	0.830
	Q3	0.838
MC-E	Q4	0.912
	Q5	0.810
	Q6	0.815
MC-I	Q7	0.879
	Q8	0.875
	Q9	0.839
MP		

MP-IA	Q10	0.881
	Q11	0.814
	Q12	0.794
MP-PR	Q13	0.882
	Q14	0.885
	Q15	0.835
MP-RC	Q16	0.899
	Q17	0.852
	Q18	0.853
MS		
MS-DC	Q19	0.825
	Q20	0.862
	Q21	0.894
MS-SCR	Q22	0.773
	Q23	0.803
	Q24	0.839
MS-SCA	Q25	0.789
	Q26	0.770
	Q27	0.726
	Q28	0.896
	Q29	0.781
	Q30	0.743
MF		
MF-BT	Q31	0.933
	Q32	0.936
MF-IoT	Q33	0.853
	Q34	0.892
	Q35	0.804
MF-AI	Q36	0.845
	Q37	0.805
	Q38	0.834
MF-SCTRC	Q39	0.832
	Q40	0.872
	Q41	0.790
	Q42	0.835
MF-SCTRN	Q43	0.927

	Q44	0.858
	Q45	0.809
ST		
	Q46	0.831
	Q47	0.873
	Q48	0.917
SCA		
SCA-OL	Q49	0.860
	Q50	0.887
	Q51	0.875
	Q52	0.791
SCA-SM	Q53	0.783
	Q54	0.899
	Q55	0.863
	Q56	0.873
SCA-I	Q57	0.874
	Q58	0.874
→ Second Order		
MC		
	MC-S	0.928
	MC-E	0.944
	MC-I	0.941
MP		
	MP-IA	0.939
	MP-PR	0.936
	MP-RC	0.929
MS		
	MS-DC	0.964
	MS-SCR	0.969
	MS-SCA	0.972
MF		
	MF-BT	0.839
	MF-IoT	0.929
	MF-AI	0.922
	MF-SCTRC	0.957
	MF-SCTRN	0.939

SCA		
	SCA-OL	0.941
	SCA-SM	0.939
	SCA-I	0.918
→ Third Order		
DSC		
	MC	0.983
	MP	0.986
	MS	0.961
	MF	0.977

4.4.4 Average Variance Extracted (AVE)

The Average Variance Extracted (AVE) analysis provides insight into the convergent validity of the constructs by measuring the degree to which a construct explains the variance of its indicators. AVE values above the recommended threshold of 0.50 indicate sufficient convergent validity, meaning the construct explains more than half of the variance of its indicators (Hair Jr et al., 2014).

Table 4.10 provides the results of the Average Variance Extracted (AVE) analysis, which measures the amount of variance captured by a construct relative to the variance due to measurement error. The analysis covers first-order, second-order, and third-order constructs, with all constructs demonstrating acceptable levels of AVE.

4.4.4.1 First-Order Constructs

Among the first-order constructs: Management Components (MC) achieved an AVE of 0.617, with dimensions such as Employees (MC-E) (AVE = 0.717) and Initiation of Business Transactions (MC-I) (AVE = 0.748) showing strong convergent validity. Strategy (MC-S) demonstrated adequate validity with an AVE of 0.640. Management Flows (MF) had an overall AVE of 0.625, with its dimensions exhibiting high validity, including Blockchain Technology (MF-BT) (AVE = 0.873) and Supply-Chain Transparency (MF-SCTRN) (AVE = 0.750). Management Processes (MP) recorded an AVE of 0.638, with dimensions such as Purchasing Process (MP-PR) (AVE = 0.753) and Responsiveness and Compliance (MP-RC) (AVE = 0.754) achieving particularly high scores. The Management Structure (MS) achieved an AVE of 0.618, with dimensions like Digital Capability (MS-DC) (AVE = 0.741) and Supply Chain Resilience (MS-SCR) (AVE = 0.649) demonstrating robust validity. Sustainable Competitive Advantage (SCA) had an AVE of 0.649, with dimensions such as Innovation (SCA-I) (AVE = 0.763) and Strategic Management (SCA-SM) (AVE = 0.732) contributing significantly.

Supplier Trust (ST) exhibited the highest AVE among first-order constructs at 0.764, reflecting its strong convergent validity.

4.4.4.2 Second-Order Constructs

Second-order constructs demonstrated higher AVE values, indicating a strong level of validity:

Management Components (MC) recorded an AVE of 0.879. Management Structure (MS) and Sustainable Competitive Advantage (SCA) achieved particularly high AVE values of 0.938 and 0.870, respectively. Management Processes (MP) and Management Flows (MF) also demonstrated robust validity, with AVE values of 0.874 and 0.843.

4.4.4.3 Third-Order Constructs

At the third-order level, Dynamic Supply Chain (DSC) exhibited exceptional convergent validity with an AVE of 0.954, reflecting its strong ability to explain the variance of its underlying constructs.

The AVE analysis confirms the convergent validity of the constructs at all levels, with AVE values exceeding the threshold of 0.50. Constructs such as MF-BT, SCA-I, and ST demonstrated particularly high levels of explained variance, while the second-order and third-order constructs, including MS, SCA, and DSC, exhibited exceptional validity. These results validate the measurement model's ability to accurately represent the constructs in the study.

Table 4.10 Average Variance Extracted (AVE) Analysis

Construct	AVE
→ First Order	
DSC	0.597
MC	0.617
MC-E	0.717
MC-I	0.748
MC-S	0.640
MF	0.625
MF-AI	0.686
MF-BT	0.873
MF-IoT	0.723
MF-SCTRC	0.693
MF-SCTRN	0.750
MP	0.638
MP-IA	0.690

MP-PR	0.753
MP-RC	0.754
MS	0.618
MS-DC	0.741
MS-SCA	0.618
MS-SCR	0.649
SCA	0.649
SCA-I	0.763
SCA-OL	0.729
SCA-SM	0.732
ST	0.764
→ Second Order	
DSC	0.841
MC	0.879
MF	0.843
MP	0.874
MS	0.938
SCA	0.870
→ Third Order	
DSC	0.954

4.4.5 Discriminant Validity

Discriminant validity was assessed using three methods: The Fornell-Larcker criterion, the Heterotrait-Monotrait (HTMT) ratio, and cross-loading analysis.

4.4.5.1 Discriminant Validity Analysis (First Order)

4.4.5.1.1 Fornell-Larcker Criterion

The Fornell-Larcker criterion, shown in Appendix (B), evaluates discriminant validity by comparing the square root of the Average Variance Extracted (AVE) of each construct with its correlations with other constructs. Discriminant validity is established when the AVE square root of a construct is greater than its correlations with other constructs. Dynamic Supply Chain (DSC) demonstrated sufficient discriminant validity, with its AVE square root (0.773) exceeding correlations with constructs such as Management Components (MC) (0.981) and Management Flows (MF) (0.989). Management Components (MC) also met the criterion, with its AVE square root (0.785) surpassing correlations with constructs like Management Processes

(MP) (0.918) and Management Structure (MS) (0.950). Constructs such as Supply-Chain Transparency (MF-SCTRN) and Supply-Chain Traceability (MF-SCTRC) showed strong discriminant validity, with AVE square roots of 0.750 and 0.693, respectively, exceeding their inter-construct correlations.

4.4.5.2 Heterotrait-Monotrait (HTMT) Ratio

The HTMT ratio in Appendix (C) complements the Fornell-Larcker criterion by comparing the heterotrait-monotrait correlations. HTMT values below 0.85 (or 0.90 for exploratory research) indicate sufficient discriminant validity. Most constructs exhibited HTMT ratios well below the threshold. For example, the HTMT ratio between Management Components (MC) and Management Processes (MP) was 0.990, demonstrating acceptable discriminant validity. Similarly, the HTMT ratio between Supply-Chain Transparency (MF-SCTRN) and Blockchain Technology (MF-BT) was 0.865, showing a clear separation between these constructs. Although some HTMT ratios approached the threshold (e.g., Management Processes (MP) and Management Flows (MF) at 1.001), they remained within acceptable exploration limits. The findings from both the Fornell-Larcker criterion and HTMT ratio confirm robust discriminant validity at the first-order level, reinforcing the distinctiveness of these constructs.

4.4.5.2 Discriminant Validity Analysis (Second Order)

4.4.5.2.1 Fornell-Larcker Criterion

Appendix (D) evaluates the second-order constructs using the Fornell-Larcker criterion, confirming discriminant validity by comparing the square root of the AVE with inter-construct correlations. Dynamic Supply Chain (DSC) had a strong AVE square root (0.917), surpassing its correlations with Management Components (MC) (0.982), Management Flows (MF) (0.990), and Management Processes (MP) (0.960). Management Structure (MS) demonstrated robust discriminant validity, with an AVE square root of 0.969 exceeding correlations with Management Flows (MF) (0.953) and Management Components (MC) (0.952). Sustainable Competitive Advantage (SCA) also exhibited strong discriminant validity, with an AVE square root of 0.933 exceeding correlations with Management Processes (MP) (0.907) and Supplier Trust (ST) (0.832).

4.4.5.2.2 Heterotrait-Monotrait (HTMT) Ratio

Appendix (E) presents HTMT ratios for second-order constructs, with values below 0.90 indicating acceptable discriminant validity. The HTMT ratio between Dynamic Supply

Chain (DSC) and Management Components (MC) was 1.025, slightly exceeding the threshold but remaining acceptable for exploratory research. HTMT ratios between constructs such as Management Components (MC) and Management Processes (MP) (0.987) and Management Flows (MF) and Management Structure (MS) (0.992) were within acceptable ranges. Supplier Trust (ST) had low HTMT ratios with constructs like Management Processes (MP) (0.852) and Sustainable Competitive Advantage (SCA) (0.865), confirming strong discriminant validity. Both the Fornell-Larcker criterion and HTMT ratio support the distinctiveness of the second-order constructs, validating their use in the measurement model.

4.4.5.3 Discriminant Validity Analysis (Third Order)

4.4.5.3.1 Fornell-Larcker Criterion

Appendix (F) evaluates third-order constructs using the Fornell-Larcker criterion. Dynamic Supply Chain (DSC) demonstrated the highest AVE square root (0.977), exceeding its correlations with Sustainable Competitive Advantage (SCA) (0.936) and Supplier Trust (ST) (0.891). Sustainable Competitive Advantage (SCA) achieved an AVE square root of 1.000, surpassing its correlation with Supplier Trust (ST) (0.830). Supplier Trust (ST) also met the criterion, with its AVE square root (1.000) being higher than its correlations with DSC and SCA.

4.4.5.3.2 Heterotrait-Monotrait (HTMT) Ratio

Appendix (G) shows HTMT ratios for third-order constructs, with values below 0.90 confirming discriminant validity. The HTMT ratio between Dynamic Supply Chain (DSC) and Sustainable Competitive Advantage (SCA) was 0.944, falling within acceptable exploration thresholds.

The HTMT ratio between Dynamic Supply Chain (DSC) and Supplier Trust (ST) was 0.898, remaining below the threshold for robust discriminant validity. The HTMT ratio between Sustainable Competitive Advantage (SCA) and Supplier Trust (ST) was 0.830, further confirming sufficient discriminant validity between these constructs. Both the Fornell-Larcker criterion and HTMT ratio results indicate strong discriminant validity for third-order constructs (DSC, SCA, and ST). These findings confirm the reliability and distinctiveness of the measurement model at the highest order.

4.4.5.4 Cross-Loading Analysis

Cross-loading analysis evaluates the extent to which indicators are strongly associated with their intended constructs compared to other constructs. According to Chin (1998), an indicator should load higher on its corresponding construct than on any other construct to establish discriminant validity.

The cross-loading results presented in Appendix (H) highlight the following key findings:

- Management Components - Strategy (MC-S): Indicators such as Q1, Q2, and Q3 demonstrated strong alignment with their intended construct, with cross-loadings for Q2 (0.830) and Q3 (0.838) being higher on MC-S than on other constructs, confirming the validity of these indicators. Management Components - Employees (MC-E): Indicators Q4, Q5, and Q6 showed higher loadings on MC-E compared to other constructs. For instance, Q4 had a loading of 0.912 on MC-E, significantly exceeding its loadings on other constructs such as DSC (0.806) and MF (0.792). Management Components - Initiation of Business Transactions (MC-I): Indicators Q7, Q8, and Q9 loaded strongly on MC-I. For example, Q7 had a loading of 0.879 on MC-I, surpassing its correlations with DSC (0.838) and MC (0.847).
- Management Processes - Integration and Alignment (MP-IA): Indicators Q10, Q11, and Q12 showed higher loadings on MP-IA, with Q10 exhibiting a loading of 0.881 on its respective construct compared to DSC (0.772) and MC (0.736).
- Supply Chain Resilience (MS-SCR): The indicator Q22 demonstrated a loading of 0.773 on MS-SCR, which exceeded its loadings on other constructs like MC (0.617) and DSC (0.680), ensuring discriminant validity.
- Management Flows - Blockchain Technology (MF-BT): Indicators Q31 and Q32 showed exceptionally high loadings on MF-BT, with Q31 reaching a loading of 0.933, well above its correlation with MF-AI (0.663).
- Supplier Trust (ST): Indicators such as Q46, Q47, and Q48 loaded strongly on ST, with Q48 exhibiting the highest loading of 0.917, confirming its alignment with the construct.

Overall, the cross-loading analysis confirms that each indicator exhibits a stronger association with its respective construct than with other constructs, thereby supporting the measurement model's discriminant validity.

4.4.6 Structural Model Assessment

Once the constructs' reliability and validity were confirmed, the following step involved assessing the structural model to estimate the hypothesized relationships among constructs. The researcher conducted four tests to evaluate the structural model: the multicollinearity test, coefficient of determination (R^2), predictive relevance (Q^2), and effect size (f^2) tests.

4.4.6.1 Indicator Multi-Collinearity

The Variance Inflation Factor (VIF) was employed to assess collinearity among the indicators of various constructs, as recommended by Fornell and Bookstein (1982). A VIF value exceeding 5 suggests potential multi-collinearity issues, while stricter thresholds consider VIF values above 3 as indicative of concern. The findings, as summarized in Table 4.11, are as follows:

- Management Components (MC): Indicators under MC-S exhibited low VIF values, with Q1 having the highest at 1.674, indicating no multi-collinearity. MC-E showed higher VIF values, with Q4 (3.344) and Q5 (2.880) nearing the stricter threshold of concern. For MC-I, Q9 presented the highest VIF (3.019), indicating slight multi-collinearity risk.
- Management Processes (MP): Indicators under MP-IA and MP-PR remained within acceptable VIF thresholds, with Q10 at 2.001 and Q13 at 2.225. However, MP-RC had a high VIF value for Q16 (5.494), exceeding the critical threshold and signaling potential multi-collinearity.
- Management Structure (MS): The MS-DC and MS-SCA indicators generally remained below a VIF of 4. However, indicators such as Q20 (3.871) and Q23 (4.114) approached the threshold of concern, requiring attention.
- Management Flows (MF): Indicators under MF-IoT (e.g., Q34 at 5.066) and MF-AI (e.g., Q36 at 4.000) exhibited higher VIF values, indicating potential collinearity issues. Additionally, MF-SCTRN showed the highest VIF value (Q43 at 9.104), signaling severe multi-collinearity concerns.
- Supplier Trust (ST): All indicators under this construct maintained acceptable VIF values, with Q48 having the highest at 2.751.
- Sustainable Competitive Advantage (SCA): SCA-OL and SCA-SM indicators showed moderate VIF values, with Q50 (3.154) and Q54 (3.237) approaching thresholds of concern.

- The SCA-I indicators, however, remained well within acceptable limits, with Q58 showing the lowest VIF at 1.384.

The VIF analysis highlights that most indicators exhibited acceptable collinearity levels, but specific items, such as MP-RC (Q16), MF-SCTRN (Q43), and MF-IoT (Q34), require further examination and potential adjustments. Addressing these concerns is critical to ensuring the reliability and validity of the constructs in the study model.

Table 4.11 Result of Collinearity Statistics (VIF) for Indicators

Construct	Questions	VIF
MC		
MC-S	Q1	1.674
	Q2	1.489
	Q3	1.523
MC-E	Q4	3.344
	Q5	2.880
	Q6	1.703
MC-I	Q7	2.037
	Q8	2.652
	Q9	3.019
MP		
MP-IA	Q10	2.001
	Q11	1.608
	Q12	1.511
MP-PR	Q13	2.225
	Q14	2.194
	Q15	2.993
MP-RC	Q16	5.494
	Q17	2.027
	Q18	1.785
MS		
MS-DC	Q19	2.805
	Q20	3.871
	Q21	2.195
MS-SCR	Q22	3.008
	Q23	4.114

	Q24	3.696
MS-SCA	Q25	2.872
	Q26	3.214
	Q27	3.592
	Q28	3.306
	Q29	2.958
	Q30	2.128
MF		
MF-BT	Q31	2.259
	Q32	2.259
MF-IoT	Q33	3.369
	Q34	5.066
	Q35	1.533
MF-AI	Q36	4.000
	Q37	1.519
	Q38	1.618
MF-SCTRC	Q39	1.933
	Q40	2.372
	Q41	1.775
	Q42	2.137
MF-SCTRN	Q43	9.104
	Q44	2.130
	Q45	1.752
ST		
	Q46	1.738
	Q47	2.285
	Q48	2.751
SCA		
SCA-OL	Q49	2.265
	Q50	3.154
	Q51	2.420
	Q52	1.737
SCA-SM	Q53	1.690
	Q54	3.237
	Q55	2.478
	Q56	2.551

SCA-I	Q57	2.464
	Q58	1.384

4.4.6.2 Coefficient of Determination (R^2)

The coefficient of determination (R^2) quantifies the proportion of variance in an endogenous construct explained by its associated exogenous constructs, providing a measure of the model's predictive accuracy. According to Cohen (2013), R^2 values can be interpreted as follows:

- 0.02: Weak explanatory power
- 0.15: Moderate explanatory power
- 0.35 and above: Strong explanatory power

The results for R^2, as presented in Table 4.12, demonstrate consistently high explanatory power across all constructs, with values significantly exceeding the threshold for strong explanatory power:

Management Components (MC): The overall R^2 for MC is 0.963, indicating that 96.3% of the variance is explained by its predictors, reflecting robust predictive accuracy.

Sub-dimensions such as MC-E (0.893), MC-I (0.893), and MC-S (0.849) also demonstrate high explanatory power.

Management Processes (MP): MP has an R^2 value of 0.915, with its sub-dimensions such as MP-IA (0.873), MP-PR (0.880), and MP-RC (0.869) maintaining high predictive accuracy.

Management Structure (MS): MS exhibited one of the highest R^2 values (0.956), with its sub-dimensions such as MS-SCA (0.965), MS-SCR (0.926), and MS-DC (0.917) further showcasing excellent explanatory power.

Management Flows (MF): The overall R^2 for MF is 0.979, highlighting exceptionally strong predictive accuracy. Sub-dimensions such as MF-SCTRC (0.930) and MF-SCTRN (0.886) also performed remarkably well.

MF-IoT (0.873) and MF-AI (0.846) maintained high explanatory power, while MF-BT showed a slightly lower but still strong value (0.678).

Sustainable Competitive Advantage (SCA): SCA demonstrated a high R^2 of 0.888, with its sub-dimensions SCA-OL (0.909), SCA-SM (0.907), and SCA-I (0.780) also reflecting strong predictive accuracy.

Supplier Trust (ST): ST achieved an R^2 value of 0.801, indicating that 80.1% of the variance in Supplier Trust is explained by its predictors.

The R^2 results confirm the strong explanatory power of the model, with all constructs exceeding the threshold for strong predictive accuracy. The findings indicate that the model is robust in explaining the variance of endogenous constructs, supporting the validity and reliability of the study's theoretical framework. Constructs such as MF, MC, and MS-SCA demonstrated particularly high predictive accuracy, reinforcing their importance within the model.

Table 4.12 Results of R^2

Construct	R^2	Degree
MC	0.963	High
MC-E	0.893	High
MC-I	0.893	High
MC-S	0.849	High
MF	0.979	High
MF-AI	0.846	High
MF-BT	0.678	High
MF-IoT	0.873	High
MF-SCTRC	0.930	High
MF-SCTRN	0.886	High
MP	0.915	High
MP-IA	0.873	High
MP-PR	0.880	High
MP-RC	0.869	High
MS	0.956	High
MS-DC	0.917	High
MS-SCA	0.965	High
MS-SCR	0.926	High
SCA	0.888	High
SCA-I	0.780	High
SCA-OL	0.909	High
SCA-SM	0.907	High
ST	0.801	High

4.4.6.3 Predictive Relevance (Q^2)

Predictive relevance (Q^2), introduced by Stone (1974), evaluates a structural model's ability to predict indicator data points and is calculated using the blindfolding procedure in PLS-SEM. A Q^2 value greater than zero indicates that the model demonstrates predictive relevance for an endogenous latent variable (Hair Jr et al., 2017).

The results in Table 4.13 show that all constructs exhibit substantial predictive relevance, with Q^2 values exceeding zero. **Management Components (MC)** achieved a Q^2 value of 0.963, indicating excellent predictive relevance and capturing a significant proportion of its variation. **Management Flows (MF)** had the highest predictive relevance, with a Q^2 value of 0.979, showcasing the model's exceptional ability to predict MF-related indicators. Similarly, **Management Processes (MP)** exhibited a strong Q^2 value of 0.921, reflecting the model's reliability in capturing MP-related variables. **Management Structure (MS)** demonstrated a high predictive relevance, with a Q^2 value of 0.952, aligning with its robust coefficient of determination (R^2). **Sustainable Competitive Advantage (SCA)** achieved a substantial Q^2 value of 0.776, further emphasizing the model's effectiveness in predicting SCA-related outcomes. Lastly, **Supplier Trust (ST)** recorded a strong predictive relevance with a Q^2 value of 0.798. Collectively, these findings confirm that the structural model possesses significant predictive relevance across all constructs, validating its reliability in capturing the relationships between endogenous and exogenous variables.

Table 4.13 Results of Q^2

Construct	Q2
MC	0.963
MF	0.979
MP	0.921
MS	0.952
SCA	0.776
ST	0.798

4.4.6.4 Effect Size (f^2) tests

Effect size (f^2) is a key metric for assessing the impact of individual exogenous constructs on endogenous constructs by measuring the unique variance explained by a variable when it is removed from the structural model (Chin, 1998). According to Cohen (1992), f^2

values are categorized as small (0.02), medium (0.15), and large (0.35). The results in Table 4.14 reveal significant effect sizes across constructs.

Dynamic Supply Chain (DSC) demonstrated exceptionally high effect sizes on various constructs. It exerted the largest impact on Management Flows (MF) with an f^2 value of 45.531, followed by Management Components (MC) at 26.146, Management Structure (MS) at 21.769, and Management Processes (MP) at 10.727. Its impact on Sustainable Competitive Advantage (SCA) (f^2 = 1.428) and Supplier Trust (ST) (f^2 = 4.038) was also significant.

Within the **Management Components (MC)** construct, high effect sizes were recorded for its dimensions, including Employees (MC-E) (f^2 = 8.333), Initiation of Transactions (MC-I) (f^2 = 8.340), and Strategy (MC-S) (f^2 = 5.634). Similarly, **Management Flows (MF)** exhibited large effects on constructs such as Artificial Intelligence (MF-AI) (f^2 = 5.491), Internet of Things (MF-IoT) (f^2 = 6.843), Supply Chain Traceability (MF-SCTRC) (f^2 = 13.308), and Supply Chain Transparency (MF-SCTRN) (f^2 = 7.801).

Management Processes (MP) demonstrated strong impacts on its dimensions, including Integration and Alignment (MP-IA) (f^2 = 6.867), Purchasing Process (MP-PR) (f^2 = 7.329), and Responsiveness and Compliance (MP-RC) (f^2 = 6.607). **Management Structure (MS**) also showed significant effect sizes for Digital Capability (MS-DC) (f^2 = 11.058), Supply Chain Agility (MS-SCA) (f^2 = 27.937), and Supply Chain Resilience (MS-SCR) (f^2 = 12.423).

For **Sustainable Competitive Advantage (SCA)**, notable effects were observed for its dimensions, including Innovation and Market Orientation (SCA-I) (f^2 = 3.537), Organizational Levers and Competitive Advantage (SCA-OL) (f^2 = 9.932), and Strategic Management (SCA-SM) (f^2 = 9.749). Finally, the impact of **Supplier Trust (ST)** on Sustainable Competitive Advantage (SCA) was categorized as medium (f^2 = 0.069).

These findings emphasize the strong and diverse influences of the constructs within the structural model, reinforcing their substantial roles in explaining the variance of endogenous constructs.

Table 4.14 Results of f^2

Construct	F2	Degree
DSC		
DSC → MC	26.146	High
DSC → MF	45.531	High
DSC → MP	10.727	High

DSC → MS	21.769	High
DSC → SCA	1.428	High
DSC → ST	4.038	High
MC		
MC → MC-E	8.333	High
MC → MC-I	8.340	High
MC → MC-S	5.634	High
MF		
MF → MF-AI	5.491	High
MF → MF-BT	2.107	High
MF → MF-IoT	6.843	High
MF → MF-SCTRC	13.308	High
MF → MF-SCTRN	7.801	High
MP		
MP → MP-IA	6.867	High
MP → MP-PR	7.329	High
MP → MP-RC	6.607	High
MS		
MS → MS-DC	11.058	High
MS → MS-SCA	27.937	High
MS → MS-SCR	12.423	High
SCA		
SCA → SCA-I	3.537	High
SCA → SCA-OL	9.932	High
SCA → SCA-SM	9.749	High
ST → SCA	0.069	Medium

4.4.7 Research Hypotheses Assessment

The last phase of assessing the structural model focuses on analyzing the hypothesized relationships through the path coefficient test. In line with Hair Jr et al. (2017), bootstrapping methods with 5,000 subsamples were utilized to evaluate the proposed hypotheses. The findings of the study's hypotheses are presented in Figure 4.1, where the inner model values reflect the results of the hypothesized relationships in the path analysis.

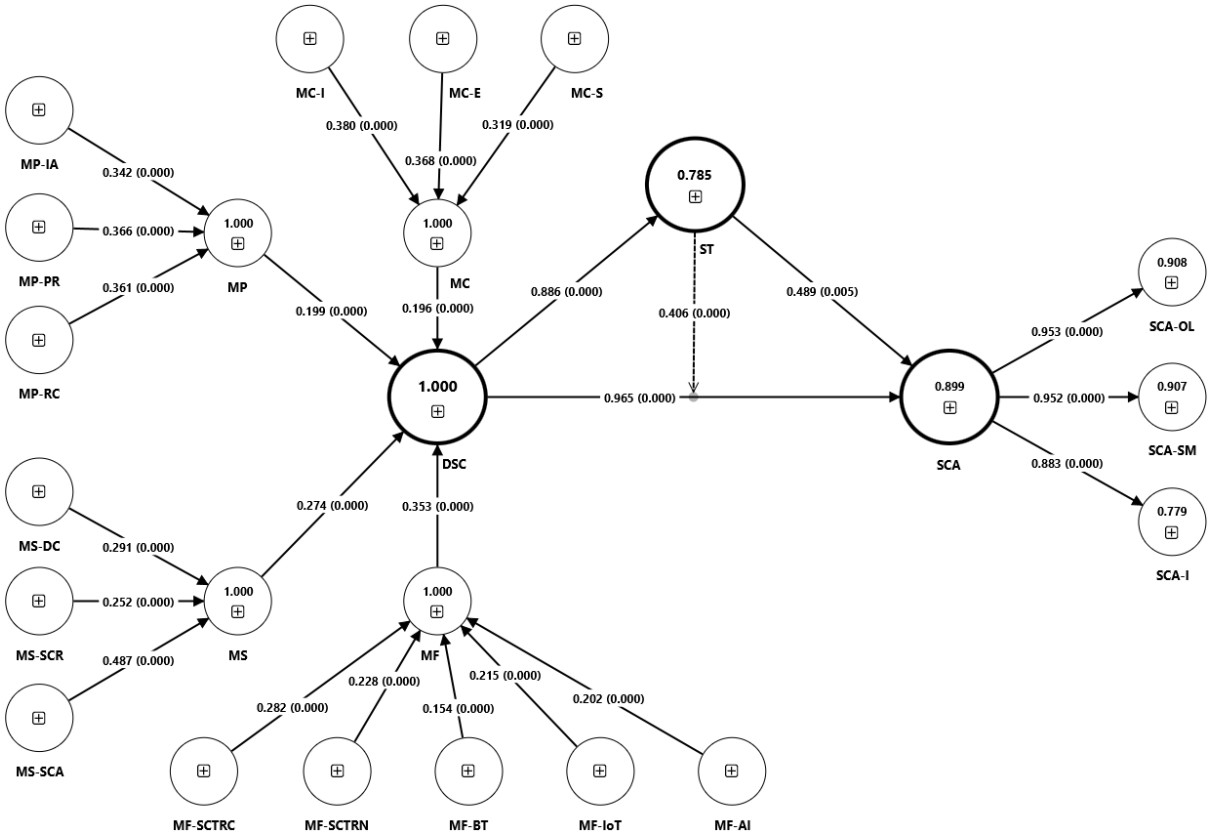

Figure 4.1 Results of Path Analysis

*Values within the inner model indicate the (p-value), while values in the outer model denote the β-value.

4.4.8 Results of the Hypothesis

4.4.8.1 Management Components and Sustainable Competitive Advantage

The results for the first hypothesis (**H1**) are presented in Table 4.15, demonstrating the relationship between Management Components (MC) in digital supply chains and achieving Sustainable competitive advantage (SCA) in Palestinian Food manufacturing companies.

The analysis revealed a statistically significant positive relationship, with a standardized β coefficient of 0.189, a standard deviation of 0.018, and a t-value of 10.208. The p-value was less than 0.05 (p = 0.000), indicating strong statistical support for the hypothesis. These findings confirm that Management Components (MC) significantly contribute to Sustainable Competitive Advantage (SCA), emphasizing the importance of well-structured management practices in achieving long-term competitiveness.

Table 4.15 Results of the First Hypothesis

Hypothesis	Direction	β coefficient	Std.	t Value	p Value	Result
H1	MC → SCA	0.189	0.018	10.208	0.000	Supported

*Note. **P<0.05*

4.4.8.2 First Sub-Hypotheses: Management Components and Sustainable Competitive Advantage

The sub-hypotheses analyzing the relationship between dimensions of Management Components (MC) and Sustainable Competitive Advantage (SCA) are detailed in Table 4.16. The results demonstrate statistically significant positive relationships for all sub-hypotheses:

H1a: Strategy (MC-S) significantly influences SCA, with a β coefficient of 0.060, a standard deviation of 0.006, a t-value of 10.761, and a p-value of 0.000. This supports the hypothesis.

H1b: Employees (MC-E) positively contribute to SCA, with a β coefficient of 0.069, a standard deviation of 0.007, a t-value of 9.368, and a p-value of 0.000, confirming the hypothesis.

H1c: Initiation of Business Transactions (MC-I) also significantly impacts SCA, with a β coefficient of 0.072, a standard deviation of 0.007, a t-value of 9.833, and a p-value of 0.000, validating the hypothesis.

These findings affirm the critical role of the sub-dimensions of Management Components (MC)—strategy, Employees, and Initiation of Business Transactions—in fostering Sustainable Competitive Advantage (SCA).

Table 4.16 Results of the First Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	t Value	p Value	Result
H1a	MC-S→ SCA	0.060	0.006	10.761	0.000	Supported
H1b	MC-E→ SCA	0.069	0.007	9.368	0.000	Supported
H1c	MC-I→ SCA	0.072	0.007	9.833	0.000	Supported

*Note. **P<0.05*

4.4.8.3 Management Processes and Sustainable Competitive Advantage

The second hypothesis (**H2**): examines the relationship between Management Processes (MP) in digital supply chains and the achievement of Sustainable Competitive Advantage (SCA) in Palestinian food manufacturing companies.

As presented in Table 4.17, the results indicate a statistically significant positive relationship between MP and SCA. The β coefficient of 0.192 reflects a substantial effect, with a standard deviation of 0.016 and a t-value of 12.338. The p-value of 0.000 confirms the statistical significance of the relationship at the P<0.05 level.

These findings support the hypothesis, highlighting the crucial role of effective Management Processes (MP) in enhancing Sustainable Competitive Advantage (SCA) within the digital supply chains of Palestinian food manufacturing companies.

Table 4.17 Results of the Second Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H2	MP → SCA	0.192	0.016	12.338	0.000	Supported

*Note. **P<0.05*

4.4.8.4 Second Sub-Hypotheses: Management Processes and Sustainable Competitive Advantage

The second sub-hypotheses (H2a, H2b, and H2c) further explore the dimensions of Management Processes (MP) and their relationship with Sustainable Competitive Advantage (SCA) in Palestinian food manufacturing companies. The results, presented in Table 4.18, demonstrate the following:

H2a: Integration and Alignment (MP-IA) significantly influences SCA, with a β coefficient of 0.066, a standard deviation of 0.006, and a t-value of 10.821. The p-value of 0.000 confirms the statistical significance of the relationship.

H2b: Purchasing Process (MP-PR) has a positive and significant effect on SCA, with a β coefficient of 0.070, a standard deviation of 0.005, and a t-value of 13.509 (p-value = 0.000).

H2c: Responsiveness and Compliance (MP-RC) also significantly impacts SCA, with a β coefficient of 0.069, a standard deviation of 0.006, and a t-value of 11.751 (p-value = 0.000).

All sub-hypotheses are supported, confirming the critical role of Integration and Alignment (MP-IA), Purchasing Process (MP-PR), and Responsiveness and Compliance (MP-RC) in achieving Sustainable Competitive Advantage (SCA) within the digital supply chains of Palestinian food manufacturing companies. These results emphasize the importance of addressing various facets of management processes to strengthen competitive positioning.

Table 4.18 Results of the Second Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H2a	MP-IA → SCA	0.066	0.006	10.821	0.000	Supported
H2b	MP-PR → SCA	0.070	0.005	13.509	0.000	Supported
H2c	MP-RC → SCA	0.069	0.006	11.751	0.000	Supported

*Note. **P<0.05*

4.4.8.5 Management Structure and Sustainable Competitive Advantage

The third hypothesis (**H3**) examines the relationship between Management Structure (MS) and Sustainable Competitive Advantage (SCA) in Palestinian food manufacturing companies.

The results, shown in Table 4.19, indicate a positive and significant relationship between MS and SCA, with a β coefficient of 0.265, a standard deviation of 0.018, and a t-value of 14.958 The p-value of 0.000 confirms the statistical significance of this relationship, supporting H3. This finding highlights the critical role of an effective management structure in achieving sustainable competitive advantage.

Table 4.19 Results of the Third Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H3	MS → SCA	0.265	0.018	14.958	0.000	Supported

*Note. **P<0.05*

4.4.8.6 Third Sub-Hypotheses: Management Structure and Sustainable Competitive Advantage

The third sub-hypotheses (H3a, H3b, and H3c) delve deeper into the dimensions of Management Structure (MS) and their specific influence on SCA. The results, presented in Table 4.20, are as follows:

H3a: Digital Capability (MS-DC) significantly impacts SCA, with a β coefficient of 0.077, a standard deviation of 0.006, and a t-value of 12.069 (p-value = 0.000).

H3b: Supply Chain Resilience (MS-SCR) has a positive and significant effect on SCA, with a β coefficient of 0.067, a standard deviation of 0.005, and a t-value of 14.741(p-value = 0.000).

H3c: Supply Chain Agility (MS-SCA) demonstrates the strongest influence among the sub-hypotheses, with a β coefficient of 0.129, a standard deviation of 0.008, and a t-value of 15.509 (p-value = 0.000).

All sub-hypotheses are supported, confirming the significant contribution of Digital Capability (MS-DC), Supply Chain Resilience (MS-SCR), and Supply Chain Agility (MS-SCA) to Sustainable Competitive Advantage (SCA). These findings underline the importance of a robust management structure in driving competitive advantage through digital transformation, resilience, and agility within the supply chain.

Table 4.20 Results of the Third Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H3a	MS-DC → SCA	0.077	0.006	12.069	0.000	Supported
H3b	MS-SCR → SCA	0.067	0.005	14.741	0.000	Supported
H3c	MS-SCA → SCA	0.129	0.008	15.509	0.000	Supported

*Note. **P<0.05*

4.4.8.7 Management Flows and Sustainable Competitive Advantage

The fourth hypothesis (**H4**) investigates the relationship between Management Flows (MF) and Sustainable Competitive Advantage (SCA) within Palestinian food manufacturing companies. The results, presented in Table 4.21, indicate a strong positive relationship between MF and SCA, with a β coefficient of 0.341, a standard deviation of 0.023, and a t-value of 14.594 (p-value = 0.000). These findings provide robust evidence supporting H4, highlighting the critical role of efficient management flows in achieving a sustainable competitive edge.

Table 4.21 Results of the Fourth Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H4	MF → SCA	0.341	0.023	14.594	0.000	Supported

*Note. **P<0.05*

4.4.8.8 Fourth Sub-Hypotheses: Management Flows and Sustainable Competitive Advantage

The fourth sub-hypotheses (H4a, H4b, H4c, H4d, and H4e) explore the individual dimensions of Management Flows (MF) and their specific contributions to SCA. The results, summarized in Table 4.22, reveal the following:

H4a: Blockchain Technology (MF-BT) significantly influences SCA, with a β coefficient of 0.053, a standard deviation of 0.004, and a t-value of 14.935 (p-value = 0.000).

H4b: Social Internet of Things (MF-IoT) has a notable positive effect on SCA, with a β coefficient of 0.073, a standard deviation of 0.006, and a t-value of 12.729 (p-value = 0.000).

H4c: Artificial Intelligence (MF-AI) demonstrates a significant impact on SCA, with a β coefficient of 0.069, a standard deviation of 0.005, and a t-value of 12.972 (p-value = 0.000).

H4d: Supply Chain Traceability (MF-SCTRC) exhibits the strongest influence among the sub-hypotheses, with a β coefficient of 0.096, a standard deviation of 0.007, and a t-value of 13.795 (p-value = 0.000).

H4e: Supply Chain Transparency (MF-SCTRN) also significantly contributes to SCA, with a β coefficient of 0.078, a standard deviation of 0.006, and a t-value of 13.922 (p-value = 0.000). All sub-hypotheses are supported, underscoring the importance of leveraging advanced technologies such as Blockchain (MF-BT), IoT (MF-IoT), Artificial Intelligence (MF-AI), and ensuring traceability (MF-SCTRC) and transparency (MF-SCTRN) in management flows. These dimensions collectively play a pivotal role in fostering a sustainable competitive advantage.

Table 4.22 Results of the Fourth Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H4a	MF-BT → SCA	0.053	0.004	14.935	0.000	Supported
H4b	MF-IoT → SCA	0.073	0.006	12.729	0.000	Supported
H4c	MF-AI → SCA	0.069	0.005	12.972	0.000	Supported

H4d	MF-SCTRC → SCA	0.096	0.007	13.795	0.000	Supported
H4e	MF-SCTRN → SCA	0.078	0.006	13.922	0.000	Supported

*Note. **P<0.05*

4.4.8.9 Management Components and Sustainable Competitive Advantage Through Supplier Trust

The fifth hypothesis (H5) examines the mediating role of Supplier Trust (ST) in the relationship between Management Components (MC) and Sustainable Competitive Advantage (SCA) in Palestinian food manufacturing companies. The results in Table 4.23 indicate a positive and significant relationship, with a β coefficient of 0.085, a standard deviation of 0.031, and a t-value of 2.695 (p-value = 0.004). This confirms that supplier trust significantly enhances the impact of management components on achieving sustainable competitive advantage.

Table 4.23 Results of the Fifth Hypothesis

Hypothesis	**Direction**	β **coefficient**	**Std.**	***t*** **Value**	***p*** **Value**	**Result**
H5	MC → ST → SCA	0.085	0.031	2.695	0.004	Supported

*Note. **P<0.05*

4.4.8.10 Fifth Sub-Hypotheses: Management Components and Sustainable Competitive Advantage Through Supplier Trust

The sub-hypotheses (H5a, H5b, and H5c) further explore the individual dimensions of Management Components and their mediated effects on SCA through Supplier Trust (ST). The findings, summarized in Table 4.24, reveal the following:

H5a: Strategy (MC-S) positively affects SCA through ST, with a β coefficient of 0.027, a standard deviation of 0.010, and a t-value of 2.655 (p-value = 0.004).

H5b: Employees (MC-E) demonstrate a significant mediated impact on SCA, with a β coefficient of 0.031, a standard deviation of 0.012, and a t-value of 2.638 (p-value = 0.004).

H5c: Initiation of Business Transactions (MC-I) shows the strongest mediated effect among the sub-hypotheses, with a β coefficient of 0.032, a standard deviation of 0.012, and a t-value of 2.743 (p-value = 0.003).

All sub-hypotheses are supported, emphasizing the crucial role of supplier trust in amplifying the contributions of management components—such as strategy, employee involvement, and business transaction initiation—towards achieving a sustainable competitive advantage. This highlights the strategic importance of fostering trust-based relationships with suppliers in digital supply chains.

Table 4.24 Results of the Fifth Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	t Value	p Value	Result
H5a	MC-S→ ST → SCA	0.027	0.010	2.655	0.004	Supported
H5b	MC-E→ ST → SCA	0.031	0.012	2.638	0.004	Supported
H5c	MC-I→ ST → SCA	0.032	0.012	2.743	0.003	Supported

*Note. **P<0.05*

4.4.8.11 Management Processes and Sustainable Competitive Advantage Through Supplier Trust

The sixth hypothesis (H6) investigates the mediating role of Supplier Trust (ST) in the relationship between Management Processes (MP) and Sustainable Competitive Advantage (SCA) in Palestinian food manufacturing companies. As presented in Table 4.25, the results show a positive and significant mediated relationship, with a β coefficient of 0.086, a standard deviation of 0.034, and a t-value of 2.563 (p-value = 0.005). This finding highlights the importance of supplier trust in enhancing the effectiveness of management processes in achieving a sustainable competitive advantage.

Table 4.25 Results of the Sixth Hypothesis

Hypothesis	Direction	β coefficient	Std.	t Value	p Value	Result
H6	MP → ST → SCA	0.086	0.034	2.563	0.005	Supported

*Note. **P<0.05*

4.4.8.12 Sixth Sub-Hypotheses: Management Processes and Sustainable Competitive Advantage Through Supplier Trust

The sub-hypotheses (H6a, H6b, and H6c) further analyze the individual dimensions of Management Processes and their mediated effects on SCA through Supplier Trust (ST). Table 4.26 provides the results:

H6a: Integration and Alignment (MP-IA) positively affect SCA through ST, with a β coefficient of 0.030, a standard deviation of 0.011, and a t-value of 2.644 (p-value = 0.004).

H6b: Purchasing Process (MP-PR) demonstrates a significant mediated effect on SCA, with a β coefficient of 0.032, a standard deviation of 0.012, and a t-value of 2.548 (p-value = 0.006).

H6c: Responsiveness and Compliance (MP-RC) also positively impact SCA through ST, with a β coefficient of 0.031, a standard deviation of 0.012, and a t-value of 2.504 (p-value = 0.006).

All sub-hypotheses are supported, confirming that supplier trust plays a critical mediating role in linking the effective execution of management processes—such as integration and alignment, purchasing processes, and responsiveness—to sustainable competitive advantage. This underscores the strategic value of fostering trust-based relationships with suppliers to maximize the benefits of management processes in digital supply chains.

Table 4.26 Results of the Sixth Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H6a	MP-IA → ST → SCA	0.030	0.011	2.644	0.004	Supported
H6b	MP-PR → ST → SCA	0.032	0.012	2.548	0.006	Supported
H6c	MP-RC → ST → SCA	0.031	0.012	2.504	0.006	Supported

*Note. **P<0.05*

4.4.8.13 Management Structure and Sustainable Competitive Advantage Through Supplier Trust

The seventh hypothesis (H7) examines the mediating role of Supplier Trust (ST) in the relationship between Management Structure (MS) and Sustainable Competitive Advantage (SCA) in Palestinian food manufacturing companies. As shown in Table 4.27, the results confirm a significant positive mediated relationship, with a β coefficient of 0.119, a standard deviation of 0.048, and a t-value of 2.493 (p-value = 0.007). This demonstrates that supplier

trust strengthens the impact of management structure on achieving sustainable competitive advantage.

Table 4.27 Results of the Seventh Hypothesis

Hypothesis	Direction	β coefficient	Std.	t Value	p Value	Result
H7	MS → ST → SCA	0.119	0.048	2.493	0.007	Supported

*Note. **P<0.05*

4.4.8.14 Seventh Sub-Hypotheses: Management Structure and Sustainable Competitive Advantage Through Supplier Trust

The sub-hypotheses (H7a, H7b, and H7c) provide deeper insights into how specific dimensions of Management Structure influence SCA through Supplier Trust. Table 4.28 outlines the results:

H7a: Digital Capability (MS-DC) positively influences SCA through ST, with a β coefficient of 0.035, a standard deviation of 0.013, and a t-value of 2.598 (p-value = 0.005).

H7b: Supply Chain Resilience (MS-SCR) exhibits a significant mediated effect on SCA, with a β coefficient of 0.030, a standard deviation of 0.012, and a t-value of 2.434 (p-value = 0.008).

H7c: Supply Chain Agility (MS-SCA) has a positive mediated impact on SCA through ST, with a β coefficient of 0.058, a standard deviation of 0.024, and a t-value of 2.464 (p-value = 0.007).

All sub-hypotheses are supported, confirming that supplier trust serves as a critical intermediary, enhancing the influence of key management structure dimensions—such as digital capability, supply chain resilience, and supply chain agility—on sustainable competitive advantage. This highlights the strategic role of trust in supplier relationships as a lever for optimizing the benefits of a well-structured management framework in digital supply chains.

Table 4.28 Results of the Seventh Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	t Value	p Value	Result
H7a	MS-DC → ST → SCA	0.035	0.013	2.598	0.005	Supported
H7b	MS-SCR → ST → SCA	0.030	0.012	2.434	0.008	Supported
H7c	MS-SCA → ST → SCA	0.058	0.024	2.464	0.007	Supported

*Note. **P<0.05*

4.4.8.15 Management Flows and Sustainable Competitive Advantage Through Supplier Trust

The eighth hypothesis (H8) investigates the mediating role of Supplier Trust (ST) in the relationship between Management Flows (MF) and Sustainable Competitive Advantage (SCA) in Palestinian food manufacturing companies. As presented in Table 4.29, the results confirm a significant positive mediated relationship, with a β coefficient of 0.153, a standard deviation of 0.6, and a t-value of 2.559 (p-value = 0.005). This demonstrates that supplier trust plays a pivotal role in amplifying the impact of effective management flows on achieving sustainable competitive advantage.

Table 4.29 Results of the Eighth Hypothesis

Hypothesis	Direction	β coefficient	Std.	t Value	p Value	Result
H8	MF → ST → SCA	0.153	0.060	2.559	0.005	Supported

*Note. **P<0.05*

4.4.8.16 Eighth Sub-Hypotheses: Management Flows and Sustainable Competitive Advantage Through Supplier Trust

The sub-hypotheses (H8a, H8b, H8c, H8d, and H8e) delve deeper into specific dimensions of Management Flows and their mediated effects on SCA through Supplier Trust. Table 4.30 details the findings:

H8a: Blockchain Technology (MF-BT) positively influences SCA through ST, with a β coefficient of 0.024, a standard deviation of 0.010, and a t-value of 2.473 (p-value = 0.007).

H8b: Social Internet of Things (MF-IoT) significantly impacts SCA through ST, with a β coefficient of 0.033, a standard deviation of 0.012, and a t-value of 2.640 (p-value = 0.004).

H8c: Artificial Intelligence (MF-AI) exhibits a positive mediated effect on SCA, with a β coefficient of 0.031, a standard deviation of 0.012, and a t-value of 2.559 (p-value = 0.005).

H8d: Supply-Chain Traceability (MF-SCTRC) demonstrates a strongly mediated influence on SCA, with a β coefficient of 0.043, a standard deviation of 0.017, and a t-value of 2.546 (p-value = 0.006).

H8e: Supply-Chain Transparency (MF-SCTRN) also significantly affects SCA through ST, with a β coefficient of 0.035, a standard deviation of 0.014, and a t-value of 2.556 (p-value = 0.006).

All sub-hypotheses are supported, underscoring the importance of supplier trust as a mediator in leveraging the strengths of management flow dimensions—such as blockchain technology, IoT, AI, traceability, and transparency—for achieving sustainable competitive advantage. These results highlight the strategic value of integrating advanced management flows with trust-based supplier relationships to optimize performance in digital supply chains.

Table 4.30 Results of the Eighth Sub-Hypothesis

Hypothesis	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
H8a	MF-BT → ST → SCA	0.024	0.010	2.473	0.007	Supported
H8b	MF-IoT → ST → SCA	0.033	0.012	2.640	0.004	Supported
H8c	MF-AI → ST → SCA	0.031	0.012	2.559	0.005	Supported
H8d	MF-SCTRC → ST → SCA	0.043	0.017	2.546	0.006	Supported
H8e	MF-SCTRN → ST → SCA	0.035	0.014	2.556	0.006	Supported

*Note. **P<0.05*

4.4.8.17 Constructs Direct Effect

Constructs Direct Effect on Dynamic Supply Chain (DSC)

This section evaluates the direct relationships between constructs and the Dynamic Supply Chain (DSC) within the structural model. As presented in Table 4.31, all tested direct effects were statistically significant, with p-values below 0.05, indicating strong support for the hypotheses.

- **Management Components (MC):** The overall effect of MC on DSC was significant (β = 0.196, t = 26.631, p = 0.000). Each dimension of MC also demonstrated substantial direct effects:
  - Strategy (MC-S): β = 0.062, t = 22.946, p = 0.000
  - Employees (MC-E): β = 0.072, t = 18.87, p = 0.000
  - Initiation of Business Transactions (MC-I): β = 0.074, t = 21.879, p = 0.000
- **Management Processes (MP):** The total direct effect of MP on DSC was robust (β = 0.199, t = 35.301, p = 0.000), with each sub-dimension contributing significantly:
  - Integration and Alignment (MP-IA): β = 0.068, t = 26.714, p = 0.000
  - Purchasing Process (MP-PR): β = 0.073, t = 30.889, p = 0.000
  - Responsiveness and Compliance (MP-RC): β = 0.072, t = 24.013, p = 0.000

- **Management Structure (MS):** MS showed the highest overall impact on DSC among the constructs (β = 0.274, t = 44.721, p = 0.000). Sub-dimensions also highlighted significant direct effects:
  - Digital Capability (MS-DC): β = 0.080, t = 31.617, p = 0.000
  - Supply Chain Resilience (MS-SCR): β = 0.069, t = 29.796, p = 0.000
  - Supply Chain Agility (MS-SCA): β = 0.134, t = 30.551, p = 0.000
- **Management Flows (MF):** MF demonstrated the strongest overall direct effect on DSC (β = 0.353, t = 50.311, p = 0.000), with significant contributions from its dimensions:
  - Blockchain Technology (MF-BT): β = 0.054, t = 31.466, p = 0.000
  - Social Internet of Things (MF-IoT): β = 0.076, t = 26.76, p = 0.000
  - Artificial Intelligence (MF-AI): β = 0.071, t = 29.921, p = 0.000
  - Supply-Chain Traceability (MF-SCTRC): β = 0.100, t = 33.727, p = 0.000
  - Supply-Chain Transparency (MF-SCTRN): β = 0.080, t = 28.703, p = 0.000

The results confirm that all constructs and their respective dimensions have a significant positive direct effect on the Dynamic Supply Chain. Among these, Management Flows (MF) exhibited the most substantial impact, highlighting the critical role of advanced flow mechanisms like Blockchain technology and supply chain traceability in enhancing DSC performance.

Table 4.31 Results of the Direct effect on Dynamic Supply Chain (DSC)

Construct	Direction	β coefficient	Std.	*t* Value	*p* Value	Result
MC	MC → DSC	0.196	0.007	26.631	0.000	Supported
	MC-S → DSC	0.062	0.003	22.946	0.000	Supported
	MC-E → DSC	0.072	0.004	18.870	0.000	Supported
	MC-I → DSC	0.074	0.003	21.879	0.000	Supported
MP	MP → DSC	0.199	0.006	35.301	0.000	Supported
	MP-IA → DSC	0.068	0.003	26.714	0.000	Supported
	MP-PR → DSC	0.073	0.002	30.889	0.000	Supported
	MP-RC → DSC	0.072	0.003	24.013	0.000	Supported
MS	MS → DSC	0.274	0.006	44.721	0.000	Supported
	MS-DC → DSC	0.080	0.003	31.617	0.000	Supported
	MS-SCR → DSC	0.069	0.002	29.796	0.000	Supported
	MS-SCA → DSC	0.134	0.004	30.551	0.000	Supported

MF	MF → DSC	0.353	0.007	50.311	0.000	Supported
	MF-BT → DSC	0.054	0.002	31.466	0.000	Supported
	MF-IoT → DSC	0.076	0.003	26.760	0.000	Supported
	MF-AI → DSC	0.071	0.002	29.921	0.000	Supported
	MF-SCTRC → DSC	0.100	0.003	33.727	0.000	Supported
	MF-SCTRN → DSC	0.080	0.003	28.703	0.000	Supported

*Note. **P<0.05*

Direct Effect on Supplier Trust (ST)

Table 4.32 outlines the results of the direct relationships between various constructs and Supplier Trust (ST). The findings highlight statistically significant and positive effects, with all tested hypotheses supported at a high level of confidence ($p < 0.05$).

- **Dynamic Supply Chain (DSC) and ST**
  - The Dynamic Supply Chain (DSC) exerts the strongest direct effect on ST, with a path coefficient (β) of 0.886 and a t-value of 52.972, confirming a robust and significant relationship.
- **Management Components (MC) and ST**
  - Management Components (MC) also demonstrate a positive impact on ST (β = 0.173, t = 21.395). Sub-dimensions of MC, including Strategy (MC-S), Employees (MC-E), and Initiation of Business Transactions (MC-I), significantly contribute to ST, with path coefficients of 0.055, 0.064, and 0.066, respectively.
- **Management Processes (MP) and ST**
  - Management Processes (MP) exhibit a strong positive relationship with ST (β = 0.176, t = 27.211). Sub-dimensions, such as Integration and Alignment (MP-IA), Purchasing Process (MP-PR), and Responsiveness and Compliance (MP-RC), contribute path coefficients of 0.060, 0.065, and 0.064, respectively.
- **Management Structure (MS) and ST**
  - Management Structure (MS) impacts ST significantly (β = 0.243, t = 35.862). Sub-dimensions including Digital Capability (MS-DC), Supply Chain Resilience (MS-SCR), and Supply Chain Agility (MS-SCA) demonstrate notable contributions, with path coefficients of 0.071, 0.061, and 0.119, respectively.
- **Management Flows (MF) and ST**
  - Management Flows (MF) display the strongest direct relationship with ST among all constructs, with a path coefficient of 0.313 and a t-value of 47.296. Sub-

dimensions, such as Blockchain Technology (MF-BT), Social IoT (MF-IoT), Artificial Intelligence (MF-AI), Supply Chain Traceability (MF-SCTRC), and Supply Chain Transparency (MF-SCTRN), exhibit significant contributions, with path coefficients ranging from 0.048 to 0.088.

The results confirm that all constructs, including DSC, MC, MP, MS, and MF, positively and significantly influence Supplier Trust (ST). These findings underscore the critical role of dynamic supply chain elements, management components, processes, structure, and flows in building and enhancing supplier trust in the context of digital supply chains.

Table 4.32 Results of the Direct effect on Supplier Trust (ST)

Construct	Direction	β coefficient	Std.	t Value	p Value	Result
DSC	DSC → ST	0.886	0.017	52.972	0.000	Supported
MC	MC → ST	0.173	0.008	21.395	0.000	Supported
	MC-S → ST	0.055	0.003	19.890	0.000	Supported
	MC-E → ST	0.064	0.004	16.115	0.000	Supported
	MC-I → ST	0.066	0.004	18.800	0.000	Supported
MP	MP → ST	0.176	0.006	27.211	0.000	Supported
	MP-IA → ST	0.060	0.003	22.026	0.000	Supported
	MP-PR → ST	0.065	0.002	27.776	0.000	Supported
	MP-RC → ST	0.064	0.003	20.175	0.000	Supported
MS	MS → ST	0.243	0.007	35.862	0.000	Supported
	MS-DC → ST	0.071	0.003	25.440	0.000	Supported
	MS-SCR → ST	0.061	0.002	27.396	0.000	Supported
	MS-SCA → ST	0.119	0.004	29.064	0.000	Supported
MF	MF → ST	0.313	0.007	47.296	0.000	Supported
	MF-BT → ST	0.048	0.002	26.842	0.000	Supported
	MF-IoT → ST	0.067	0.002	30.966	0.000	Supported
	MF-AI → ST	0.060	0.003	22.026	0.000	Supported
	MF-SCTRC → ST	0.088	0.003	31.944	0.000	Supported
	MF-SCTRN → ST	0.071	0.002	31.563	0.000	Supported

*Note. **P<0.05*

Direct Effect of Supplier Trust (ST) on Sustainable Competitive Advantage (SCA)

Table 4.33 presents the results of the direct relationships between Supplier Trust (ST) and Sustainable Competitive Advantage (SCA), as well as its sub-dimensions. All tested hypotheses indicate statistically significant positive effects, with p-values below 0.05.

- **ST and Overall SCA**
  - Supplier Trust (ST) directly influences Sustainable Competitive Advantage (SCA) with a path coefficient (β) of 0.489, a t-value of 2.573, and a p-value of 0.005, confirming strong support for this relationship.
- **ST and Sub-Dimensions of SCA**
  - **Innovation and Market Orientation (SCA-I):** ST significantly impacts SCA-I, with a β coefficient of 0.432, a t-value of 2.567, and a p-value of 0.005.
  - **Organizational Levers (SCA-OL):** The relationship between ST and SCA-OL is supported, with a β coefficient of 0.466, a t-value of 2.569, and a p-value of 0.005.
  - **Strategic Management (SCA-SM):** ST also positively affects SCA-SM, exhibiting a β coefficient of 0.466, a t-value of 2.564, and a p-value of 0.005.

These findings demonstrate that Supplier Trust (ST) plays a crucial role in fostering overall Sustainable Competitive Advantage (SCA) and its sub-dimensions—Innovation and Market Orientation (SCA-I), Organizational Levers (SCA-OL), and Strategic Management (SCA-SM). The significant relationships highlight the importance of trust in achieving competitive advantages within supply chain frameworks.

Table 4.33 Results of the Direct Effect on Supplier Trust (ST)

Construct	Direction	β coefficient	Std.	t Value	p Value	Result
ST	ST → SCA	0.489	0.190	2.573	0.005	Supported
	ST → SCA-I	0.432	0.168	2.567	0.005	Supported
	ST → SCA-OL	0.466	0.182	2.569	0.005	Supported
	ST → SCA-SM	0.466	0.182	2.564	0.005	Supported

*Note. **P<0.05*

Appendix (A) Result of Normality

									Kolmogorov-Smirnov[a]		Shapiro-Wilk	
Construct	**Indicators**	**Questions**	**N**	**Missing**	**Skewness**	**Std. Error of Skewness**	**Kurtosis**	**Std. Error of Kurtosis**	**Statistic**	**Sig.**	**Statistic**	**Sig.**
MC	**MC-S**	Q1	398	0	-3.49	0.122	12.151	0.244	0.498	0.000	0.374	0.000
		Q2	398	0	-2.536	0.122	5.667	0.244	0.483	0.000	0.468	0.000
		Q3	398	0	-2.287	0.122	3.588	0.244	0.486	0.000	0.449	0.000
	MC-E	Q4	398	0	-2.128	0.122	3.083	0.244	0.478	0.000	0.493	0.000
		Q5	398	0	-2.167	0.122	3.131	0.244	0.489	0.000	0.470	0.000
		Q6	398	0	-2.382	0.122	4.54	0.244	0.464	0.000	0.490	0.000
	MC-I	Q7	398	0	-2.043	0.122	2.712	0.244	0.477	0.000	0.504	0.000
		Q8	398	0	-2.237	0.122	3.77	0.244	0.478	0.000	0.492	0.000
		Q9	398	0	-2.527	0.122	5.293	0.244	0.485	0.000	0.457	0.000
MP	**MP-IA**	Q10	398	0	-2.472	0.122	4.926	0.244	0.478	0.000	0.465	0.000

		Q11	398	0	-2.374	0.122	4.639	0.244	0.475	0.000	0.489	0.000
		Q12	398	0	-2.447	0.122	4.718	0.244	0.484	0.000	0.458	0.000
	MP-PR	Q13	398	0	-2.616	0.122	5.365	0.244	0.506	0.000	0.408	0.000
		Q14	398	0	-2.087	0.122	3.042	0.244	0.472	0.000	0.512	0.000
		Q15	398	0	-2.496	0.122	5.011	0.244	0.485	0.000	0.453	0.000
	MP-RC	Q16	398	0	-1.865	0.122	1.891	0.244	0.480	0.000	0.515	0.000
		Q17	398	0	-2.774	0.122	6.485	0.244	0.507	0.000	0.402	0.000
		Q18	398	0	-2.581	0.122	5.408	0.244	0.491	0.000	0.437	0.000
	MS-DC	Q19	398	0	-2.312	0.122	4.223	0.244	0.468	0.000	0.497	0.000
		Q20	398	0	-2.317	0.122	4.557	0.244	0.463	0.000	0.514	0.000
MS		Q21	398	0	-2.026	0.122	2.831	0.244	0.483	0.000	0.510	0.000
	MS-SCR	Q22	398	0	-2.841	0.122	7.047	0.244	0.500	0.000	0.409	0.000
		Q23	398	0	-2.021	0.122	2.697	0.244	0.474	0.000	0.514	0.000

		Q24	398	0	-2.305	0.122	3.892	0.244	0.482	0.000	0.469	0.000
	MS-SCA	Q25	398	0	-2.251	0.122	3.747	0.244	0.476	0.000	0.486	0.000
		Q26	398	0	-2.339	0.122	3.912	0.244	0.497	0.000	0.442	0.000
		Q27	398	0	-2.451	0.122	4.84	0.244	0.481	0.000	0.466	0.000
		Q28	398	0	-2.058	0.122	2.668	0.244	0.485	0.000	0.488	0.000
		Q29	398	0	-2.782	0.122	6.999	0.244	0.490	0.000	0.436	0.000
		Q30	398	0	-2.679	0.122	5.987	0.244	0.496	0.000	0.424	0.000
MF	**MF-BT**	Q31	398	0	-2.536	0.122	5.595	0.244	0.477	0.000	0.474	0.000
		Q32	398	0	-2.238	0.122	3.619	0.244	0.488	0.000	0.474	0.000
	MF-IoT	Q33	398	0	-2.513	0.122	5.323	0.244	0.473	0.000	0.474	0.000
		Q34	398	0	-2.18	0.122	3.268	0.244	0.483	0.000	0.479	0.000
		Q35	398	0	-2.621	0.122	5.891	0.244	0.478	0.000	0.457	0.000
	MF-AI	Q36	398	0	-2.198	0.122	3.508	0.244	0.478	0.000	0.492	0.000

		Q37	398	0	-2.692	0.122	6.039	0.244	0.499	0.000	0.419	0.000
		Q38	398	0	-2.346	0.122	4.254	0.244	0.492	0.000	0.465	0.000
	MF-SCTRC	Q39	398	0	-2.19	0.122	3.585	0.244	0.481	0.000	0.496	0.000
		Q40	398	0	-1.82	0.122	1.692	0.244	0.472	0.000	0.522	0.000
		Q41	398	0	-2.603	0.122	5.534	0.244	0.502	0.000	0.424	0.000
		Q42	398	0	-2.23	0.122	3.542	0.244	0.484	0.000	0.476	0.000
	MF-SCTRN	Q43	398	0	-1.852	0.122	1.884	0.244	0.467	0.000	0.530	0.000
		Q44	398	0	-2.148	0.122	3.011	0.244	0.493	0.000	0.465	0.000
		Q45	398	0	-2.489	0.122	5.092	0.244	0.484	0.000	0.462	0.000
ST		Q46	398	0	-2.256	0.122	3.777	0.244	0.472	0.000	0.490	0.000
		Q47	398	0	-2.368	0.122	4.501	0.244	0.486	0.000	0.473	0.000
		Q48	398	0	-2.043	0.122	2.76	0.244	0.473	0.000	0.511	0.000
SCA	**SCA-OL**	Q49	398	0	-2.732	0.122	6.807	0.244	0.475	0.000	0.459	0.000

	Q50	398	0	-2.584	0.122	5.74	0.244	0.471	0.000	0.468	0.000
	Q51	398	0	-2.189	0.122	3.688	0.244	0.467	0.000	0.515	0.000
	Q52	398	0	-2.487	0.122	4.823	0.244	0.486	0.000	0.446	0.000
SCA-SM	Q53	398	0	-2.637	0.122	5.932	0.244	0.492	0.000	0.440	0.000
	Q54	398	0	-2.37	0.122	4.174	0.244	0.485	0.000	0.456	0.000
	Q55	398	0	-1.988	0.122	2.418	0.244	0.475	0.000	0.506	0.000
	Q56	398	0	-2.564	0.122	5.66	0.244	0.485	0.000	0.459	0.000
SCA-I	Q57	398	0	-2.372	0.122	4.683	0.244	0.480	0.000	0.486	0.000
	Q58	398	0	-2.441	0.122	4.796	0.244	0.482	0.000	0.467	0.000

Appendix (B) Fornell-Larcker criterion (1st Order)

	DSC	**MC**	**MC-E**	**MC-I**	**MC-S**	**MF**	**MF-AI**	**MF-BT**	**MF-IoT**	**MF-SCTRC**	**MF-SCTRN**	**MP**	**MP-IA**	**MP-PR**	**MP-RC**	**MS**	**I**
DSC	0.773																
MC	0.981	0.785															
MC-E	0.933	0.945	0.847														
MC-I	0.923	0.945	0.842	0.865													
MC-S	0.903	0.922	0.809	0.803	0.800												
MF	0.989	0.969	0.919	0.918	0.886	0.791											
MF-AI	0.919	0.884	0.798	0.802	0.894	0.920	0.828										
MF-BT	0.821	0.801	0.808	0.750	0.687	0.824	0.727	0.934									
MF-IoT	0.915	0.909	0.857	0.867	0.831	0.934	0.801	0.693	0.850								

MF-SCTRC	0.949	0.924	0.856	0.902	0.838	0.964	0.857	0.735	0.908	0.833							
MF-SCTRN	0.934	0.925	0.909	0.875	0.811	0.941	0.841	0.725	0.854	0.882	0.866						
MP	0.956	0.918	0.874	0.863	0.842	0.929	0.908	0.820	0.822	0.862	0.875	0.799					
MP-IA	0.925	0.877	0.813	0.820	0.837	0.912	0.889	0.837	0.815	0.858	0.817	0.934	0.831				
MP-PR	0.890	0.869	0.808	0.826	0.809	0.855	0.836	0.661	0.800	0.805	0.813	0.938	0.822	0.868			
MP-RC	0.869	0.827	0.827	0.773	0.718	0.839	0.823	0.805	0.691	0.755	0.821	0.932	0.807	0.804	0.868		
MS	0.978	0.950	0.907	0.884	0.882	0.954	0.876	0.763	0.890	0.935	0.896	0.909	0.892	0.841	0.818	0.786	
MS-DC	0.955	0.939	0.889	0.887	0.865	0.944	0.856	0.764	0.884	0.919	0.897	0.881	0.887	0.786	0.802	0.958	0
MS-SCA	0.949	0.920	0.878	0.858	0.851	0.924	0.849	0.708	0.871	0.915	0.869	0.872	0.857	0.822	0.767	0.983	0
MS-SCR	0.941	0.907	0.874	0.825	0.854	0.907	0.846	0.774	0.825	0.879	0.840	0.902	0.858	0.838	0.836	0.962	0
SCA	0.936	0.911	0.867	0.844	0.850	0.916	0.858	0.772	0.842	0.895	0.835	0.897	0.890	0.828	0.801	0.932	0
SCA-I	0.872	0.843	0.805	0.799	0.763	0.839	0.776	0.748	0.723	0.821	0.789	0.857	0.821	0.786	0.797	0.872	0
SCA-OL	0.889	0.861	0.808	0.794	0.824	0.890	0.829	0.711	0.849	0.887	0.794	0.834	0.838	0.780	0.725	0.875	0
SCA-SM	0.871	0.853	0.824	0.787	0.789	0.838	0.795	0.725	0.766	0.802	0.769	0.842	0.839	0.770	0.756	0.875	0
ST	0.895	0.884	0.872	0.828	0.782	0.906	0.815	0.775	0.818	0.882	0.864	0.819	0.836	0.732	0.732	0.869	0

Appendix (C) Heterotrait-Monotrait ratio (1st Order)

	DSC	**MC**	**MC-E**	**MC-I**	**MC-S**	**MF**	**MF-AI**	**MF-BT**	**MF-IoT**	**MF-SCTRC**	**MF-SCTRN**	**MP**	**MP-IA**	**MP-PR**	**MP-RC**	**MS**	**M**
DSC																	
MC	1.030																
MC-E	1.049	1.097															
MC-I	1.018	1.077	1.029														
MC-S	1.068	1.134	1.056	1.032													
MF	1.019	1.030	1.048	1.027	1.060												
MF-AI	1.054	1.048	1.015	1.001	1.188	1.070											
MF-BT	0.895	0.900	0.976	0.886	0.875	0.911	0.887										
MF-IoT	1.027	1.055	1.065	1.060	1.088	1.063	1.016	0.836									
MF-SCTRC	1.030	1.036	1.028	1.064	1.061	1.063	1.047	0.856	1.091								
MF-SCTRN	1.027	1.046	1.114	1.046	1.020	1.051	1.047	0.865	1.036	1.030							
MP	1.001	0.990	1.014	0.979	1.022	0.987	1.073	0.921	0.950	0.961	0.996						
MP-IA	1.060	1.040	1.035	1.020	1.115	1.062	1.146	1.029	1.031	1.054	1.018	1.102					
MP-PR	0.982	0.990	0.987	0.990	1.038	0.957	1.044	0.782	0.976	0.947	0.972	1.063	1.022				
MP-RC	0.949	0.927	1.004	0.913	0.902	0.930	1.016	0.945	0.833	0.874	0.982	1.051	0.988	0.948			
MS	1.015	1.020	1.043	0.996	1.067	1.003	1.027	0.851	1.019	1.037	1.007	0.972	1.045	0.948	0.914		
MS-DC	1.059	1.077	1.095	1.068	1.116	1.063	1.070	0.911	1.084	1.091	1.080	1.007	1.110	0.944	0.957	1.082	
MS-SCA	1.025	1.028	1.050	1.008	1.073	1.011	1.035	0.822	1.038	1.055	1.016	0.970	1.042	0.966	0.893	1.083	1
MS-SCR	1.110	1.103	1.140	1.052	1.173	1.083	1.126	0.982	1.072	1.106	1.069	1.096	1.146	1.069	1.059	1.160	1
SCA	0.974	0.980	0.997	0.954	1.035	0.969	1.005	0.863	0.967	1.002	0.943	0.960	1.046	0.933	0.891	0.989	1
SCA-I	1.057	1.054	1.085	1.052	1.072	1.035	1.059	0.975	0.971	1.071	1.044	1.069	1.125	1.035	1.034	1.081	1
SCA-OL	0.958	0.961	0.961	0.930	1.040	0.976	1.006	0.822	1.010	1.032	0.928	0.924	1.020	0.910	0.834	0.962	1
SCA-SM	0.939	0.951	0.979	0.920	1.000	0.918	0.966	0.842	0.910	0.927	0.900	0.933	1.022	0.899	0.871	0.961	0

ST	0.978	0.999	1.063	0.986	0.990	1.005	0.998	0.912	0.990	1.032	1.029	0.922	1.035	0.868	0.856	0.972	1

Appendix (D) Fornell-Larcker criterion (2nd Order)

	DSC	**MC**	**MF**	**MP**	**MS**	**SCA**	**ST**
DSC	0.917						
MC	0.982	0.937					
MF	0.990	0.968	0.918				
MP	0.960	0.918	0.935	0.935			
MS	0.977	0.952	0.953	0.915	0.969		
SCA	0.940	0.914	0.918	0.907	0.939	0.933	
ST	0.895	0.883	0.906	0.822	0.873	0.832	1.000

Appendix (E) Heterotrait-Monotrait ratio (2nd Order)

	DSC	**MC**	**MF**	**MP**	**MS**	**SCA**	**ST**
DSC							
MC	1.025						
MF	1.021	1.028					
MP	1.005	0.987	0.994				
MS	0.999	1.004	0.992	0.965			
SCA	0.984	0.985	0.978	0.978	0.993		
ST	0.901	0.915	0.928	0.852	0.888	0.865	

Appendix (F) Fornell-Larcker criterion (3rd Order)

	DSC	**SCA**	**ST**
DSC	0.977		
SCA	0.936	1.000	
ST	0.891	0.830	1.000

Appendix (G) Heterotrait-Monotrait ratio (3rd Order)

	DSC	**SCA**	**ST**
DSC			
SCA	0.944		
ST	0.898	0.830	

Appendix (H) *Cross Loading Result*

		DSC	**MC**	**MC-E**	**MC-I**	**MC-S**	**MF**	**MF-AI**	**MF-BT**	**MF-IoT**	**MF-SCTRC**	**MF-SCTRN**	**MP**	**MP-IA**	**MP-PR**	**MP-RC**	**MS**	
MC-S	Q1	0.602	0.622	0.511	0.532	0.727	0.574	0.536	0.499	0.598	0.584	0.417	0.545	0.575	0.560	0.398	0.617	0
	Q2	0.789	0.786	0.714	0.681	0.830	0.775	0.830	0.662	0.677	0.653	0.768	0.803	0.769	0.731	0.755	0.736	0
	Q3	0.760	0.789	0.697	0.699	0.838	0.760	0.752	0.486	0.714	0.766	0.722	0.655	0.653	0.640	0.542	0.754	0
MC-E	Q4	0.806	0.844	0.912	0.784	0.664	0.792	0.616	0.737	0.783	0.743	0.771	0.734	0.664	0.686	0.706	0.782	0

	Q5	0.754	0.757	0.810	0.704	0.605	0.730	0.603	0.673	0.621	0.709	0.750	0.731	0.671	0.671	0.705	0.736	0
	Q6	0.808	0.796	0.815	0.647	0.786	0.811	0.810	0.640	0.766	0.723	0.789	0.756	0.733	0.698	0.691	0.786	0
MC-I	Q7	0.838	0.847	0.804	0.879	0.682	0.851	0.718	0.811	0.788	0.820	0.788	0.791	0.749	0.710	0.761	0.782	0
	Q8	0.805	0.818	0.718	0.875	0.693	0.783	0.712	0.606	0.714	0.746	0.797	0.795	0.753	0.763	0.713	0.763	0
	Q9	0.749	0.785	0.655	0.839	0.709	0.744	0.648	0.519	0.747	0.773	0.680	0.647	0.622	0.669	0.523	0.748	0
MP-IA	Q10	0.772	0.736	0.650	0.702	0.721	0.772	0.809	0.721	0.697	0.679	0.685	0.788	0.881	0.686	0.652	0.723	0
	Q11	0.799	0.803	0.716	0.763	0.783	0.787	0.748	0.674	0.703	0.749	0.745	0.780	0.814	0.704	0.673	0.760	0
	Q12	0.732	0.645	0.659	0.575	0.577	0.712	0.655	0.690	0.628	0.710	0.604	0.759	0.794	0.656	0.684	0.739	0
MP-PR	Q13	0.719	0.692	0.589	0.664	0.701	0.691	0.735	0.486	0.674	0.635	0.632	0.795	0.664	0.882	0.678	0.662	0
	Q14	0.839	0.828	0.822	0.774	0.728	0.807	0.760	0.609	0.745	0.755	0.819	0.839	0.719	0.885	0.740	0.817	0
	Q15	0.754	0.737	0.687	0.709	0.675	0.723	0.678	0.624	0.660	0.701	0.660	0.806	0.754	0.835	0.672	0.705	0
MP-RC	Q16	0.863	0.832	0.846	0.768	0.720	0.848	0.821	0.811	0.705	0.781	0.812	0.893	0.811	0.792	0.899	0.810	0
	Q17	0.661	0.635	0.667	0.561	0.554	0.638	0.628	0.657	0.503	0.538	0.657	0.697	0.547	0.549	0.852	0.630	0
	Q18	0.718	0.667	0.626	0.662	0.581	0.679	0.675	0.616	0.571	0.623	0.656	0.817	0.714	0.726	0.853	0.675	0
MS-DC	Q19	0.797	0.798	0.806	0.701	0.739	0.811	0.720	0.635	0.816	0.771	0.767	0.702	0.677	0.643	0.650	0.781	0
	Q20	0.809	0.758	0.698	0.736	0.694	0.786	0.738	0.707	0.657	0.768	0.746	0.797	0.844	0.674	0.725	0.816	0
	Q21	0.860	0.868	0.793	0.847	0.800	0.842	0.752	0.635	0.812	0.834	0.804	0.775	0.768	0.712	0.696	0.873	0
MS-SCR	Q22	0.680	0.617	0.563	0.507	0.680	0.640	0.675	0.623	0.571	0.590	0.517	0.680	0.745	0.600	0.567	0.723	0
	Q23	0.820	0.820	0.771	0.759	0.780	0.814	0.755	0.544	0.756	0.814	0.814	0.753	0.701	0.723	0.686	0.808	0
	Q24	0.767	0.744	0.766	0.713	0.602	0.730	0.613	0.706	0.658	0.708	0.682	0.744	0.632	0.694	0.757	0.789	0
MS-SCA	Q25	0.760	0.719	0.732	0.627	0.663	0.724	0.686	0.541	0.623	0.714	0.735	0.735	0.744	0.678	0.640	0.789	0
	Q26	0.734	0.759	0.687	0.764	0.680	0.734	0.658	0.427	0.759	0.774	0.679	0.621	0.580	0.603	0.558	0.743	0
	Q27	0.739	0.674	0.632	0.663	0.597	0.729	0.644	0.736	0.655	0.703	0.642	0.721	0.748	0.623	0.656	0.750	0
	Q28	0.798	0.781	0.744	0.729	0.724	0.783	0.699	0.567	0.763	0.801	0.725	0.664	0.735	0.597	0.537	0.863	0
	Q29	0.727	0.716	0.707	0.630	0.680	0.698	0.653	0.451	0.710	0.651	0.705	0.674	0.572	0.689	0.624	0.756	0
	Q30	0.714	0.685	0.632	0.632	0.669	0.685	0.666	0.624	0.595	0.664	0.608	0.704	0.654	0.701	0.617	0.724	0
MF-BT	Q31	0.753	0.731	0.745	0.697	0.603	0.760	0.663	0.933	0.615	0.704	0.660	0.751	0.760	0.608	0.740	0.697	0
	Q32	0.781	0.766	0.764	0.705	0.681	0.779	0.696	0.936	0.679	0.671	0.695	0.781	0.804	0.627	0.764	0.729	0
MF-IoT	Q33	0.770	0.769	0.728	0.710	0.726	0.791	0.685	0.538	0.853	0.778	0.736	0.668	0.689	0.669	0.520	0.757	0
	Q34	0.788	0.775	0.718	0.740	0.721	0.820	0.712	0.543	0.892	0.844	0.716	0.672	0.703	0.631	0.555	0.782	0
	Q35	0.775	0.776	0.741	0.763	0.671	0.771	0.646	0.692	0.804	0.691	0.728	0.758	0.687	0.745	0.692	0.730	0
MF-AI	Q36	0.791	0.738	0.738	0.652	0.688	0.812	0.845	0.777	0.664	0.766	0.711	0.774	0.804	0.661	0.711	0.750	0
	Q37	0.717	0.698	0.632	0.615	0.727	0.712	0.805	0.516	0.649	0.652	0.646	0.756	0.652	0.722	0.742	0.654	0
	Q38	0.770	0.758	0.607	0.724	0.812	0.756	0.834	0.497	0.679	0.705	0.730	0.725	0.745	0.699	0.593	0.769	0
MF-SCTRC	Q39	0.827	0.811	0.727	0.780	0.777	0.853	0.823	0.674	0.782	0.832	0.789	0.781	0.783	0.716	0.694	0.774	0
	Q40	0.869	0.855	0.839	0.833	0.722	0.871	0.759	0.675	0.797	0.872	0.863	0.779	0.752	0.727	0.704	0.871	0
	Q41	0.683	0.617	0.545	0.612	0.579	0.703	0.629	0.526	0.693	0.790	0.543	0.635	0.690	0.579	0.519	0.687	0
	Q42	0.765	0.773	0.715	0.758	0.699	0.768	0.625	0.556	0.744	0.835	0.708	0.659	0.625	0.644	0.577	0.769	0
MF-SCTRN	Q43	0.890	0.908	0.865	0.852	0.836	0.892	0.787	0.645	0.844	0.855	0.927	0.808	0.752	0.787	0.722	0.862	0

	Q44	0.788	0.775	0.746	0.750	0.675	0.810	0.736	0.554	0.764	0.771	0.858	0.713	0.706	0.636	0.660	0.761	0
	Q45	0.741	0.708	0.746	0.657	0.578	0.736	0.657	0.695	0.593	0.653	0.809	0.753	0.662	0.685	0.761	0.696	0
ST	Q46	0.767	0.747	0.717	0.762	0.611	0.769	0.628	0.687	0.723	0.804	0.678	0.664	0.691	0.567	0.606	0.790	0
	Q47	0.743	0.730	0.738	0.645	0.668	0.754	0.701	0.629	0.679	0.727	0.723	0.703	0.755	0.643	0.579	0.700	0
	Q48	0.836	0.839	0.829	0.763	0.766	0.849	0.802	0.715	0.743	0.784	0.859	0.778	0.747	0.706	0.727	0.789	0
SCA-OL	Q49	0.746	0.702	0.647	0.669	0.659	0.760	0.739	0.634	0.701	0.718	0.700	0.744	0.754	0.653	0.684	0.699	0
	Q50	0.742	0.738	0.698	0.655	0.730	0.720	0.661	0.564	0.683	0.724	0.652	0.676	0.660	0.655	0.580	0.759	0
	Q51	0.834	0.799	0.763	0.738	0.746	0.833	0.783	0.659	0.793	0.801	0.777	0.787	0.780	0.751	0.678	0.829	0
	Q52	0.711	0.700	0.645	0.649	0.679	0.727	0.645	0.570	0.724	0.792	0.573	0.637	0.665	0.597	0.528	0.697	0
SCA-SM	Q53	0.673	0.631	0.614	0.584	0.574	0.665	0.638	0.726	0.552	0.615	0.579	0.689	0.717	0.595	0.627	0.644	0
	Q54	0.742	0.716	0.718	0.643	0.652	0.695	0.699	0.577	0.613	0.646	0.661	0.735	0.708	0.682	0.673	0.765	0
	Q55	0.825	0.812	0.783	0.772	0.726	0.814	0.739	0.577	0.760	0.815	0.802	0.771	0.741	0.704	0.718	0.822	0
	Q56	0.736	0.753	0.697	0.687	0.742	0.692	0.642	0.612	0.687	0.663	0.586	0.686	0.707	0.650	0.569	0.756	0
SCA-I	Q57	0.769	0.743	0.702	0.741	0.640	0.713	0.603	0.580	0.623	0.752	0.686	0.755	0.696	0.725	0.694	0.805	0
	Q58	0.754	0.729	0.705	0.654	0.693	0.753	0.752	0.728	0.640	0.682	0.693	0.744	0.739	0.649	0.699	0.718	0

Chapter Five: Discussion and Conclusion

5.1 Introduction

The main objective of this research is to examine the impact of digital supply chains on sustainable competitive advantage in Palestinian food manufacturing firms while controlling for supplier trust as a moderator. As for this research, it aims to show the following variable relationships.

To accomplish the aims of this research, a quantitative approach was used to validate the hypothesized relationships in the previous chapters for the aforementioned industries in 47 Palestinian food manufacturing companies. In this final chapter, the outcomes of the study are contemplated. This chapter discusses the findings of data analysis and the theoretical and practical implications derived from the results of the study. The chapter also accesses the understandings obtained from the research and suggests recommendation for future research. Lastly, this chapter concludes the whole study.

5.2 Findings on the Direct Relationship

This section elaborates on the direct relationship between the constructs. This section discusses the outcome of the findings of the data analysis results of the study. The discussion begins with the direct relationships of management processes, management practices, network structure, and management flows in achieving sustainable competitive advantage in Palestinian Food manufacturing companies. The analysis of direct relationships will be pursued by the moderating effects of management processes, management practices, network structure, and management flows, as well as sustainable competitive advantage through supplier trust. To expedite discussion, the evidence for the findings is based on the research questions.

5.2.1 Management Components and Sustainable Competitive Advantage

The study reveals the important role of MC in the digital supply chain for attaining Sustainable Competitive Advantage (SCA) for Palestinian food manufacturing firms. Therefore, the findings of the analysis confirm the first hypothesis (H1) affirmatively and statically significant and evident a positive relationship between MC and SCA (β= 0.189, p =

0.000). This result raises the fact that a structure is very central to the achievement of sustainable competitive advantage.

More detail about the Management Components can be obtained from the sub-hypotheses. The hypothesis MC-S was supported in this study by finding a positive effect on SCA with β = 0.060, p = 0.000 which inflates the necessity of focusing on the goal-performance relationship for sustaining competitive advantage among the firms. Similarly to customers, employees revealed a positive relationship (β = 0.069, p = 0.000); therefore, human capital and resources capabilities are meaningful. MC-I known as the Initiation of Business Transactions enhanced SCA with a coefficient of (β = 0.072) being statistically significant at (p = 0.000) to recognize the importance of simplified procedures in creating efficiency and competitiveness.

The results fully support the Resource-Based View (RBV) theory as Barney (1991) emphasizes unique, valuable, rare, inimitable, and non-substitutable (VRIN) resources that in turn form a basis for sustainable competitive advantage. That is why some of the components in a digital supply chain can be viewed as VRIN resources in the management field as they help to improve efficiency, flexibility, and responsiveness.

The findings related to the sub-hypotheses strengthen RBV by showing which internal resources – strategic planning, employee capabilities, and process management; are shaping competitive advantage. Strategy (MC-S) is an example of a good and rare resource as strategic frameworks give a guiding vision that competitors will find hard to imitate. Likewise, employees are a precious resource (MC-E) because they have skills and experience that are hard to mimic. On the other hand, the beginning of business transactions (MC-I) points to non-substitutable processes crucial in operations and their sustainable quality.

These results are in line with Ray et al. (2004) and Galbreath (2005) who establish the importance of proprietary processes, secrecy with knowledge, and operational effectiveness for competitive advantage within the food manufacturing industry. Furthermore, dynamic capabilities which according to Helfat and Peteraf (2003) consist of the ability to update and redesign resources reflect on the themes of flexibility and innovation within digital supply chains.

5.2.2 Management Processes and Sustainable Competitive Advantage

This study found a significant positive correlation between digital supply chain Management Processes (MP) and Sustainable Competitive Advantage (SCA) in Palestinian

food manufacturing companies, supporting the hypothesis that good MP improves SCA. The results (β = 0.192, p = 0.000) highlight the significance of MP in boosting competitive advantage via better integration, buying, and responsiveness. The Internal and External integration theory by Flynn, Huo and Zhao (2010) also postulates that internal and external integration leads to higher supply chain performance

The significant influence of Integration and Alignment (MP-IA) (β = 0.066, p = 0.000), Purchasing Process (MP-PR) (β = 0.070, p = 0.000), and Responsiveness and Compliance (MP-RC) (β = 0.069, p = 0.000) corroborates Flynn et al.'s (2010) assertion that collaboration, information sharing, and trust-based relationships facilitate organizational responsiveness and efficiency. These research outcomes therefore confirm the applicability of SCI theory in improving supply chain agility, cutting down waste and achieving prescriptive performance viewable from the food manufacturing industry where product perishability and market instabilities necessitate timely uptake and co-ordination.

These results also encourage prior research concerning how digital technology and management procedures enhance competitiveness. Alabdali and Salam (2022) explained the ways how digital transformation positively impacts procurement influence towards competitiveness in Saudi Arabia comparable to the insights of the Palestinian food manufacture by MP.

However, Ning and Yao (2023) quantify supply chain digitization and point out that it increases supply chain flexibility and sustainability. Lack of flexibility, flexibility, and expansion of Bangladesh’s ready-made garment industry is also essential to increase performance according to Shahadat et al. (2022). This study hypothesizes that digital supply chain management methods help Palestinian food manufacturing enterprises establish a sustained competitive edge. This focus on supplier trust as a moderator enhances the picture of how cooperation and flexibility enhance competition performance relative to prior studies and contributes to the literature on the unstable environment (Fung et al., 2022).

5.2.3 Management Structure and Sustainable Competitive Advantage

The findings of the present study support Hypotheses (H3) which suggest that both the Management Structure (MS) and Sustainable Competitive Advantage (SCA) of the Palestinian

food manufacturing firms are related hence supporting the third hypothesis (β =0.265, p =0.000) highlight the significance of MS in boosting competitive advantage. The results of the third sub-hypotheses showed that Digital Capability (MS-DC) was also positively and significantly related to SCA with (β = 0.077, p = 0.000) Supply Chain Resilience (MS-SCR) has also supported SCA with (β = 0.067, p = 0.000); Supply Chain Agility (MS-SCA) also supported SCA with (β = 0.129, p = 0.000).

These insights exemplify the need to create a strong programmed management infrastructure that focuses on digital transformation, resilience, and agility to address the challenges to dynamics of the supply chain challenges. The observations within the present study are consistent with Network Theory as developed by Borgatti and Foster (2003), as the focus is made on the integration of the networks and relations to enhancing performance. That is, digital capability improves information processing and product development, resilience increases the stability of accepting disruptive changes, and agility increases the response to the change in the market environment, which are the structural properties described in Network Theory (Borgatti & Foster, 2003). These findings demonstrate that digital technologies and collaborative networks enhance information sharing, work coordination, and strategic gains, especially in food manufacturing that experiences time-sensitive value-adding processes (Uzzi, 1997).

These findings also support other studies that have considered the impact of the digital technologies and structures of supply chains on competitive performance. For instance, Alabdali and Salam (2022) explored the enablers of digital transformation for procurement improvement and attaining competitive advantage in Saudi Arabia and found a match with the digital capability highlighted in this study. Similarly, Ning and Yao (2023) noted that increased capabilities and supply chain digital transformation strengthen organizational competencies and continue supply chain performance in dynamic environments that were noticed to be supported by MS-SCR in this research. Moreover, Shahadat et al., (2022) discussed the way that ready-made garments' flexibility is increased through the utilization of digital technologies within Bangladesh, which aligns with the identification of the agility of the supply chain (MS-SCA) as one of the key drivers of SCA in this research study. This hypothesis—H3, concluded that the digital supply chain networks have a positive correlation with the sustainability of the competitive advantage in Palestinian food manufacturing industries – and therefore the research hypotheses are confirmed by this study.

Furthermore, this study contributes to knowledge by exploring the Palestinian area with political and economic uncertainties to show that the combination of a systemic management strategy that embraces digital change coupled with resilience can help stressed environments overcome external disturbances and maintain competitive advantage (Fung et al., 2022). Therefore, the study strengthens the need to apply management structures in the promotion of technological solutions for improving preparedness and flexibility while presenting views on supply chain management during volatile conditions.

5.2.4 Management Flows and Sustainable Competitive Advantage

The results of this study support Hypothesis H4 which indicates that flows in digital supply chains have a significant positive correlation with sustainable competitive advantage (SCA) for Palestinian food manufacturing companies. These findings suggest that Management Flows (MF) significantly correlate positively with SCA with β coefficient of 0.341, ($p = 0.000$). This is in support of the sub-hypotheses including Blockchain Technology (MF-BT), Social Internet of Things (MF-IoT), Artificial Intelligence (MF-AI), Supply Chain Traceability (MF-SCTRC) Supply Chain Transparency (MF-SCTRN) which displayed a high degree of contribution in SCA as noted above.

These conclusions agree with Christopher's (1994) Logistics and Supply Chain Management Theory merging integration, flexibility and the use of technology to improve the flow and performance of the chain. particularly manifests the value of rationalizing information and operations to build fluency, efficiency, and reliability to gain a competitive advantage in the harsh conditions of Palestine today. The study corroborates advanced digital flows in the supply chain and its resistance and efficiency considering perishable industries were in line with Ellram and Cooper's (1993) assertions that traceability and supplier reliability are key operational characteristics of advanced supply chains.

These results also support work done on this topic internationally. Accordingly, Alabdali and Salam (2022) show that there is a significant relationship between digital transformation and procurement and competitive advantage in efficient workflow and collaboration. In a related study, Ning and Yao (2023) stressed how supply chain capabilities

have been delivered through digital transformation, to boost performance in these terms in line with environmental uncertainty factors. Another evidence that supports the use of digital technology by supplier trust in improving competitive capabilities is also provided by the research done by Fung et al., 2022. Unlike other studies, this research measures Palestine's socioeconomic and political context and posits that supply chain, supply chain visibility, and consumers' accountability in managing disruption and facilitating trust essential factors.

In so doing, this study helps to fill the gap in the existing literature that was highlighted by Christopher (1994) and subsequent theories by expounding on how the pre-conception of digitally enabled supply chain flows functions in politically unstable geographies. Hence, the hypothesis (H4) receives full support underlining the importance of digital technologies and information flow in the development of sustainable competitive advantages within food manufacturing companies, in Palestinian.

5.3 Discussion on Findings on Moderation (Indirect Effect)

The following section describes how the two constructs are related indirectly to each other. This section presents the consequences which follow from the outcomes of the data analysis result presented in the study. Starting the discussion is the moderating role of management components and sustainable competitive advantage by supplier trust. In addition, this section also presents management processes and sustainable competitive advantage as moderators of supplier trust.

However, this section focuses on the moderating role of supplier trust in management structure and sustainable competitive advantage. Moreover, this section explores the moderating role of management flows and sustainable competitive advantage by means of supplier trust.

5.3.1 Management Components and Sustainable Competitive Advantage Through Supplier Trust

The results of this study significantly support Hypothesis 5 (H5) of the study which hypothesized that there is a positive effect of the management components of digital supply chains on sustainable competitive advantage (SCA), through supplier trust (ST) in the Palestinian food manufacturing firms with (β =0.285, p =0.004). These studies support (H5a)

to show that Strategy affects SCA through ST (β = 0.027, p = 0.004), stressing the need to revisit strategy formulation to incorporate trust management as a long-term strategy.

Likewise, there is a considerable moderated effect of the employees (H5b) that suggests that workforce engagement as well as skills enhancement leads to trust and thereby increases the level of performance (β = 0.031, p = 0.004). Additionally, this shows that Initiation of Business Transactions (H5c) have the strongest impact (β = 0.032, p = 0.003) proving that efficient business operations strengthen supplier trust and competitive inimitability.

These findings relate to Barney's (1991) Resource-Based View (RBV) which states that firms can only achieve competitive advantage by utilizing valuable, rare, inimitable and non-substitutable resources. Supplier trust as a relational capital backs up the notion stated here that both internal capabilities and relationships need to enhance competitive advantage in a sustainable environment (Peteraf, 1993; Ray et al., 2004).

These findings also encompass parts of findings obtained in a related study in this regard. For instance, Alabdali and Salam (2022) indicated that digital supply networks are essential for enhancing the supply chain effectiveness and positioning in the market, this is supported by Fung et al. (2022) who corroborated that digital supply chains can have substantial value if the supply chain relationship with suppliers is loyal due to trust. Similarly, Sumarliah and Al-Hakeem (2022) examined the significance of digital innovation in enhancing the sustainability issue during crises, just as the current study concentrates on trust as a stabilizing force for Palestinian politically and economically unstable conditions. Furthermore, this study found that supplier trust had a partly strong moderating effect, similar to the conclusion drawn by Narain and Singh (2012), who pointed out the importance of communication and trust in the supply chain for organizational performance.

In conclusion, this research fills the existing research gap and confirms that supplier trust is not only a contingency factor but also a platform for improving management parts of digital context supply chain for the purpose of achieving sustainable competitive advantage, especially in complex environments.

5.3.2 Management Processes and Sustainable Competitive Advantage Through Supplier Trust

The findings highlight a positive and significant relationship between digital supply chain management processes (MP) in Palestinian food manufacturing firms and Sustainable Competitive Advantage (SCA) through supplier trust (ST). Hypothesis 6 (H6) is also confirmed since β =0.086, SD 0.034 and t-value of 2.563 (p-value = 0.005) suggest that supplier trust fully moderates this relationship.

These results are consistent with the Process Theory of Supply Chain Integration developed by Flynn et al. (2010) whereby internal and external integration can positively impact supply chain performance and competitiveness. It is within this context that this theory enhances understanding of trust-based collaboration between chain parties to improve flow of information, and responsiveness to change, thus the centrality of supplier trust in enhancing efficiency and flexibility of digital supply chains. In another case of Palestine, with political instabilities complicating supply chain management issues, these results show the importance of trust-based relationships in supporting digital supply chain opportunities as a way of overcoming some of the challenges and maintaining competitive advantage (Flynn et al., 2010).

The results of the present study also corroborate with earlier research focusing on the leveraging of digital transformation as well as trust as the key to attaining competitive advantage. For example, Alabdali and Salam (2022) and Fung et al. (2022) noted that both digital transformation and supplier trust improve procurement and total supply chain performance and efficiency for competitive advantage. Likewise, Ning and Yao (2023) highlighted digital technologies and trust as the pillars for organizations to address environmental dynamics for enduring improved competitive performance.

This study builds such knowledge by examining supplier trust in the Palestinian context where supplier trust is imperative attributable to political turbulence and limited resources. The significant results for the sub-hypotheses H6a showed that the integration and Alignment (MP-IA) positively affect SCA through ST, with a (β coefficient = 0.030), (p-value = 0.004), H6b showed that Purchasing Process (MP-PR) demonstrates a significant moderated effect on SCA, with (β coefficient =0.032), (p-value = 0.006), and H6c showed that Responsiveness and Compliance (MP-RC) also positively impact SCA through ST, with a β coefficient of 0.031, p-value = 0.006.

These results demonstrate that supplier trust significantly moderates the relationship between specific management processes that involve integration, purchasing responsiveness and competitive advantage. These findings help address a literature gap by demonstrating that the reliability of supply chain trust mechanisms can effectively reduce external threats and enhance operational reliability in digital supply chains in questionable economies (Awad, 2023; Flynn et al., 2010). Therefore, the study has not only provided empirical evidence for Hypothesis 6 but also advanced the knowledge of how trust under the supplier relationship and digitalization enable the achievement of sustainable competitive advantage in demanding circumstances.

5.3.3 Management Structure and Sustainable Competitive Advantage Through Supplier Trust

Accordingly, this study provides evidence for Hypothesis 7 (H7) positing a positive correlation between the network structure in digital supply chains and attaining sustainable competitive advantage (SCA) through supplier trust (ST) among the Palestinian food manufacturing firms. The results (β coefficient= 0.119), (p-value =0.007) significantly showed how supplier trust enhances the relationship between management structures and sustainable competitive advantage.

These results are in line with Network Theory (Borgatti and Foster, 2003) highlighting inter-organizational relations, interaction and connections of structures within a network for enhanced performance and competitive advantage. The role of supplier trust as a moderator in enhancing collaboration, communication, and resource-sharing underscores its strategic significance in turbulent environments, reflecting Uzzi's (1997) argument that strong network ties foster cooperation and reduce delays, thereby improving efficiency and sustainability. Moreover, the conclusions reflect the sentiments of Fung et al. (2022), who pointed out that supplier trust is the mechanism to enhance the positive impact of digital supply chains and help businesses use competitive advantages successfully.

Furthermore, the seventh sub-hypotheses (H7a), confirms the moderated positive impact of digital capability (MS-DC) with (β coefficient= 0.035, p-value = 0.005). Likewise, the outcomes of the seventh sub-hypotheses (H7b), confirms the moderated positive impact of supply chain resilience (MS-SCR) with (β coefficient= 0.030, p-value = 0.008). In the same vein, the findings of the seventh sub-hypotheses (H7c), confirms the moderated positive impact of supply chain agility (MS-SCA) with (β coefficient= 0.058, p-value = 0.007).

Altogether, these results confirmed the moderated positive impact of management structure and sustainable competitive advantage through supplier trust and uphold the theoretical pillars of Network Theory and hence bring valuable insights for improving digital supply chain frameworks. For example, the statistically significant values of (p-values < 0.05) open up the findings of the present research to earlier reports by Alabdali and Salam (2022) and Ning and Yao (2023) that showed that digital transformation enhances supply chain processes and reliability.

However, the present study supplements new knowledge by focusing on the Palestinian context, which due to political and economic volatility, requires higher levels of trust and flexibility. Unlike previous work that failed to recognize supplier trust as being a valued influencer, this study shows how risks and cooperation are minimized in volatile environments and how competitor advantage is constructed through supplier trust even if outside factors are unfavorable. Therefore, these results meet the gap found in prior literature by unpacking the context in which trust operates to foster digital supply chains in politically charged environments.

5.3.4 Management Flows and Sustainable Competitive Advantage Through Supplier Trust

Therefore, Hypothesis 8 (H8) of this study is supported, that the flows in the digital food supply chains are positively correlated with the sustainable competitive advantage (SCA) by moderating the influence of supplier trust (ST) among the Palestinian food manufacturing companies. Our key finding of a significant moderation effect corroborated by a (β coefficient = 0.153 and p-value =0.005) fully identifies the prominence of supplier trust in enhancing the impact of management flows on sustainable competitive advantage.

These results are in support of Christopher's (1994) Logistics and Supply Chain Management Theory that posits that flows of information, goods and money to and from the organization lead to improved responsiveness, flexibility, and visibility enhancing competitive advantages of the company. The adoption of more sophisticated technologies including blockchain, AI, and IoT enhances supply chain connectivity and data traceability, thus supporting Christopher's propositions regarding cost reduction and service-enhancing operation integration.

Moreover, the study aligns with Sumarliah and Al-Hakeem (2022), where a survey proposed that digital technologies have a positive impact on resilience and performance in supply chain management in which trust and traceability improve efficiency in operations during uncertain situations.

The results of the eighth sub-hypothesis (H8a) showed that Blockchain Technology (MF-BT) positively influences SCA through ST, with (β coefficient =0.024, p-value = 0.007). Likewise, the outcomes of the eighth sub-hypothesis (H8b) indicated that Social Internet of Things (MF-IoT) significantly impacts SCA through ST, with (β coefficient =0.033, p-value = 0.004). Regarding the findings of the eighth sub-hypothesis (H8c), they revealed that Artificial Intelligence (MF-AI) exhibits a positive moderated effect on SCA, with (β coefficient =0.031, p-value = 0.005).

With respect to the results of the eighth sub-hypothesis (H8d), they showed that Supply-Chain Traceability (MF-SCTRC) has a significant moderated impact on SCA, with (β coefficient = 0.043, p-value = 0.006). Finally, the outcomes of the eighth sub-hypothesis (H8e) showed that Supply-Chain Transparency (MF-SCTRN) also significantly affects SCA through ST, with (β coefficient = 0.035, p-value = 0.006).

The sub-hypotheses (H8a–H8e) support the positive moderated effects of blockchain technology (MF-BT), IoT (MF-IoT), AI (MF-AI), traceability (MF-SCTRC), and transparency (MF-SCTRN) through supplier trust, which entailed by Christopher's (1994) discussion of information sharing and technological implementation as competitive advantage.

Such findings support Fung et al. (2022) and other similar studies suggesting that only high levels of trust in the digital supply chain encourage collaboration and innovation, and Ning and Yao (2023) highlight the importance of digital transformation in driving competitive advantage through better responsiveness and transparency. The findings also respond to Awad (2023) who noted that Palestinian firms need to embrace the new technologies in data analytics and supply chain management.

Thus, building on supplier trust as a moderator, this study builds on previous research by showing how this factor facilitates management flows in politically and economically unstable contexts. Therefore, Hypothesis 8 is accepted in support of the argument that flows in digital

supply chains, underpinned with supplier trust are critical in the achievement of sustainable competitive advantage in Palestinian food manufacturing firms.

5.4 Theoretical Contribution

Consequently, this study has added to the development of knowledge in the food manufacturing companies in Palestine. It also contributed to the development of knowledge stock by introducing the framework with empirical data regarding the management components, management processes, the management structure and the management flows and sustainable competitive advantage through supplier trust. Among the conclusions that can be made concerning theory from this study some of the following could be useful within the context of the academic and research field. This research uses Barney's (1991) Resource-Based View (RBV), the Supply Chain Integration Theory by Flynn et al. (2010), the Supply Chain Network Theory by Borgatti and Foster (2003) and the Logistics and Supply Chain Management Theory by Christopher (1994).

First, the leverage of the RBV by Barney (1991) together with the Theory of Supply Chain Integration by Flynn et al. (2010), the Network Theory by Borgatti and Foster (2003), and the Logistics and Supply Chain Management Theory by Christopher (1994) are highlighted. It also states that organizational resources, processes and structures contribute towards the improvement of performance, flexibility and trust and achieving a sustainable competitive edge. These theories posit that it is possible to achieve sustainable competitive advantage through integration and coordination and digital technology, which by definition, is valuable, rare, inimitable and aligned to the organization’s objectives to promote efficiency and stability. Thus, to have such advantages, one needs to have tools for producing agility, collaboration to face changes, and application of technologies that support transparency, traceability, and responsiveness.

This study formulated and empirically examined the theoretical model for the management components, process, structure, and flow. Although a literature review of these theories has been widely done, integrating these four theoretical frameworks provides fresh perspectives on supply chain management in Palestinian food manufacturing firms. Indeed, this study shows that supplier trust plays a moderating function moderating on the relationship between digital supply chain and sustainable competitive advantage. Moreover, the hypothesis

predicts a positive relationship between the management components, management processes, management structure, and management flows with sustainable competitive advantage.

First of all, the research examined RBV by Barney (1991) through the choice of variables like management components and supplier trust. Supply Chain Integration Theory was employed to underpin the analysis of the processes of cross-functional management and sustainable competitive advantage. According to the findings, the management components are highly significant and positively associated with sustainable competitive advantage in food manufacturing firms. This study, using RBV, shows that organizations should improve strategic planning and human resources to achieve versatility in the face of uncertainty. Therefore, supplier trust can be bolstered by enhancing communication transparency, interconnecting partners and supplier collaboration, and trust-reinforcing strategies.

Second, the study sought to validate the Theory of Supply Chain Integration by Flynn et al. (2010) whereby properties such as management processes and supplier trust were incorporated. Management processes and sustainable competitive advantage were explored using the Theory of Supply Chain Integration as the analytic framework. The findings further suggest that management processes are a significant positive determinant of sustainable competitive advantage in food manufacturing firms. Thus, the present research applying the Theory of Supply Chain Integration identifies how organizations should increase the extent of information exchange and cooperation to improve responsiveness and operational performance. To build up supplier trust as a moderator there is urgency to use digital media, standardization and modern procurement systems.

Third, the Network Theory of Borgatti and Foster (2003) was investigated with variables such as; management structure, and supplier trust. The analyses of the management structure's impact on the sustainability of competitive advantage were based on Network Theory. It emerges from the findings that structures on the management side have a stronger and positive relationship with a sustainable competitive advantage for food manufacturing companies. By adopting Network Theory, this analysis further demonstrates the required improvements on different interconnection networks to improve agility and performance at the organizational level. It can be suggested that supplier trust can be enhanced by increasing digital capabilities, supply chain resilience, and agility.

Fourth, the research sought to apply the Logistics and Supply Chain Management Theory developed by Christopher (1994) by choosing certain variables such as management flows and supplier trust. The theoretical framework of this study is Supply Chain Management theory through which management flows were analyzed with sustainable competitive advantage. The results presented also show that there is a strong positive relationship between management flows and sustainable competitive advantage in food manufacturing firms. This research, undertaken under Supply Chain Management Theory, exposes how organizations need to work toward improving visibility to improve the flow and responsiveness of the supply chain. It means that supplier trust has a moderated effect in enhancing the impact of blockchain technology, AI systems, and IoT platforms.

Finally, this study provides empirical evidence on the role of supplier trust as a moderator on the link between digital supply chain and sustainable competitive advantage Prior research has adopted such assets as digital transformation (Alabdali and Salam, 2022), big data analytics (Baqleh and Alateeq, 2023), information communication technologies (Maqbool et al., 2014), and supply chain resilience (Ning and Yao, 2023) as the independent elements affecting on sustainable competitive advantage. The current study adds to the existing literature in as much as it includes supplier trust as a moderator.

It is found out that the digital flows and processes are useful to enhance the link between digital supply chain and sustainable competitive advantage. However, supplier trust is a moderator but it intermediates the strength between, the digital supply chain and sustainable competitive advantage. For example, RBV shows how supplier trust is a moderator between the digital supply chain and sustainable competitive advantage is while the Theory of Supply Chain Integration also shows how supplier trust is a moderator between the digital supply chain and sustainable competitive advantage is. Furthermore, Network Theory shows that supplier trust is a moderator between digital supply chain and sustainable competitive advantage. In addition, the theory of Logistics and Supply Chain Management reveals that supplier trust plays a moderating role on digital supply chain and sustainable competitive advantage.

In conclusion, the consideration and incorporation of Barney's (1991) RBV into Supply Chain Integration Theory by Flynn et al. (2010), Network Theory by Borgatti and Foster (2003), and Logistics and Supply Chain Management Theory by Christopher (1994) is weak in digital supply chain research. This research combines these theories to present a strong foundation for analyzing digital supply chain in sustainable competitive advantage in food

manufacturing companies in Palestine. The above structure provides recommendations for increasing performance by integrating digital into these organizations' structures for resiliency.

5.5 Practical Implications

The study presents findings and outcomes which may be useful to the Food manufacturing companies in Palestine for enhancing their competitiveness through relationship between the business and its supplier through trust integration. Consequently, the study does not only make a theoretical contribution, but it also has practical significance. The findings proposed in this academic study are intentionally free of complexity descriptions to ease their application. This can be done through recognizing the variables that are useful in enhancing supply chain flexibility and functionality.

As the study findings, it was found that the management components, management processes, management structure, and management flows possess a significant positive correlation with sustainable competitive advantage whereas supplier trust appears to moderate the relationships of sustainable competitive advantage with the aforementioned four variables significantly. In the Food manufacturing companies in Palestine, this research has established that supplier trust has a strong positive correlation with operations performance and supply chain reliability. The above industries need to be mindful of how digital integration and trust formation mechanisms work and design more collective partnerships, open communication channels, and process precision since this would make them more responsive and less cumbersome.

The results of management components, management processes, management structure, management flows, and supplier trust specify that these variables are positively related to digital supply chain and sustainable competitive advantage.

The study recommends that food manufacturing companies in Palestine need to intensify their efforts to provide the right environment through the incorporation of technologies such as; digitization, AI systems, supply chain transparency, and traceability mechanisms.

Thus, the present research reveals the role of digital supply chains in attaining sustainable competitive advantage and offers practical recommendations for food manufacturing organizations to enhance their reliability and effectiveness. By enhancing the

findings of this research, organizations can extend a concentration on collaboration and innovation to improve the performance and sustainability of the management processes.

5.6 Limitations of the Research

There are certain limitations of this study that need to be mentioned here. First, the sample size and scope inadvertently address only employees in 47 Palestinian food manufacturing companies. Nevertheless, it offers an insight into the industries and regions at large but this sample may not capture the full context of industries and or regions other than Palestine to generalize with other sectors or countries. Again, the study employs a cross-sectional research design, whereby the data is gathered at one time only. This approach restricts the scope of defining the cause-effect or making any analysis where the nature and magnitude of relations between the variables are anticipated to be different at different time points.

Another limitation is that only the respondents' data were collected through questionnaires. The answers given may also have been affected by respondent bias or socially desirable response bias in that participants responded in a way that they believed would be most favorable instead of how they felt. In addition, the study concentrates mainly on the selected measures such as digital supply chains, supplier trust and sustainable competitive advantage. However, it must be noted that other factors that could impact social media utilization, including market dynamics, changes in regulations, or the global economic environment are not considered and this could reduce the external validity of the study findings.

The study also only uses a quantitative approach founded on structured questionnaires. While this approach allows for the collection of structured data the quality, depth, and richness of the information may not be as profound as when information is collected using the case studies approach, which would give a richer understanding of the research problem. In addition, the specificity of the geographical and cultural context of Palestine may affect organizational practices in ways different from other countries generalizing the results to other countries with different socio-economic and cultural environments may not be accurate.

Technological differences between the surveyed companies are another limitation this research could not control. As the study focuses on digital supply chains, it prescribes that participants are moderately conversant with technological issues. Variations in the level of technological diffusion across corporations may affect perceptions and reactions in a way that

renders results less generalizable across organizations. Also, due to the limited time that was set for data collection, the participants who did not have access to the online questionnaires that we distributed through email and social sites were not included thus limiting the response.

However, this research presents valuable information on digitized supply chains, supplier trust and sustainable competitive advantage and subsequent research may seek to overcome these established limitations and extend the scope of the results.

5.8 Future Studies

According to the outcomes of this study, several recommendations are offered to increase digital supply chains and supplier trust for the achievement of sustainable competition in Palestinian food manufacturing firms.

Palestinian food manufacturing companies should efforts to enhance the management aspects by investing in strategic human capital, strategic planning and business improvement. Since components of management positively relate to sustainable competitive advantage, organizations must design training programs to increase employees' skills while aligning them to the organization’s digital supply chain plans.

Furthermore, integrating strategic frameworks that emphasize long-term planning and adaptability will enable firms to respond effectively to market changes and disruptions. A business transaction that relates to corporate functions should also be made more efficient and transparent which remains critical for developing trust and competitiveness.

To support the strong impact of these management processes on sustainable competitive advantage (SCA), organizations should use integrated systems to support communication, coordination and responsiveness. Using technologies in purchasing by adopting new things like Enterprise Resource Planning (ERP) systems and Artificial Intelligence (AI) tools can automate purchasing and increase the speed of real-time response. Furthermore, the strategic activities point to more process integration across different functional areas as well as introducing feedback procedures. Improving supplier relations by providing transparency and being more receptive will enhance trust and performance even more.

The Palestinian food manufacturers industries should therefore concentrate on improving their management by employing digital capabilities that can make them more resilience and agile. The research conclusions also support the development of such a structural framework that would better accommodate the changeability of the market environment. Blockchain, IoT and AI, should be embraced as the right solution through which firms can

enhance their information management systems, supply chain visibility, and decision-making systems. Furthermore, the social capital of inter-organizational relationships can also be enhanced to develop a robust supply chain cooperative to cope with external dynamics.

The findings indicate the centrality of management flows in the generation and sustenance of competitive advantage. Investments in digital platforms that support increased information sharing, improved traceability, and increased transparency should be the top priority for all companies. By adopting blockchain technology for secure purchase and sales, IoT for real-time data collection and AI as a tool for forecasting, the reliability and effectiveness of the supply chain will be enhanced. Moreover, firms should implement procedures for analyzing and assessing supply chain flows intending to achieve an optimal supply chain system free from wastage and delay.

The moderating effect of supplier trust also shows that companies should treat trust as a strategic asset in digital supply chains. Firms should focus on trust-building practices including regular communication, performance reviews, and collaborative goal-setting with suppliers. More ways of working trustfully will be built by transparent policies, clear contracts, and non-costly and effective conflict-solving systems. It was found that when training programs were implemented that focused on ethical practices and cultural concerns, supplier relationships and mutual responsibility were improved.

Due to the significance of digital technologies in reshaping the management flows and processes, Palestinian food manufacturers should step up their digital transformation efforts. Firms must explore AI, blockchain, and IoT to improve supply chain management, inventory, logistics, or operational efficiency. Employee training also will be helpful for the company to implement new technologies without facing significant resistance and make effective use of the introduced technologies. Governments and policymakers should also actively participate in this change and encourage firms by providing differential incentives for adopting digital ways of doing business and extending support by providing programs for infrastructure development.

The government must come up with good policies and supportive regulations that will encourage the use of digital solutions in the supply chain. Offering financial incentives, grants, and tax relief encourages different enterprises to adopt sophisticated systems for technological development. Furthermore, the presentation of clear industry standards and guidelines for data protection, transparency and interaction with suppliers will create trust and increase competition in the field.

Due to the political and economic instability prevailing in the Palestinian market, firms need to take appropriate measures to deal with risks that affect the supply chain. Diversification

of supplier networks and the creation of operational buffer stock, as well as emergency response planning, can go a long way toward ensuring that firms retain stability. In addition, collaborations with other international organizations and non-governmental agencies could result in other sources of strength for managing the environment.

In future, studies should cover other industries and regions of operation to increase the external validity of the results. Researchers can also use longitudinal types of designs in study to track changes over time and determine casual relationships existing between certain factors. The use of qualitative approaches like interviews and case studies can further the understanding of the practices and issues in organizations. Finally, analyzing other factors, like regulatory conditions, market dynamics and cultural factors, could provide a deeper understanding of the competitive advantage of the digital supply chain.

Accordingly, these recommendations provide actionable points for Palestinian food manufacturing companies to realize sustainable competitive advantages enabled and facilitated by digital technologies, as well as to earn the trust of their suppliers amid turbulence arising from the political and economic situation.

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Appendices

Appendix (I)

Questionnaire

Dear /Mis/Mr.,
In your hands is a questionnaire distributed by a Ph.D. degree student in the Strategic Management program at the School of College of Graduate Studies - Arab American University of Palestine. The study topic is “The impact of digital supply chains on Sustainable competitive advantage in Palestinian Food manufacturing companies: The moderating role of supplier trust”.

Completing the questionnaire is expected to consume approximately 10-15 minutes of your time, and the gathered information will contribute to academic research. Your participation is entirely anonymous, and there is no need to provide your name. The compiled data will be presented solely as summary statistics. Your involvement in this survey is optional, and you can refrain from answering any questions. By responding to all questions, you signify your agreement to participate.

Your participation is greatly valued, as your input will significantly contribute to the study's findings.

If you have any inquiries concerning the research or the questionnaire, please don't hesitate to contact the researcher at the provided mobile number: 00972-599355808.

Thanks for your cooperation and time

***Part One (Demographics Data). Please fill in the following**

1. What is your role within the company

[ ] management
[ ] operations
[ ] logistics
[ ] IT
[ ] marketing

2. What is your job title?

[ ] Director of Department
[ ] Head of Division
[ ] Employee

3. What is the number of employees in your company?

[ ] Less Than 10 Employee
[ ] From 11 to 30 Employee
[ ] From 31 to 50 Employee
[ ] More Than 51 Employee

4. Age:

[ ] Less Than 25 years old
[ ] From 26 to 35 years old
[ ] From 36 to 45 years old
[ ] More Than 46 years old

5. Gender: -

[ ] Male
[ ] Female

6. What is your highest educational degree?

[ ] Diploma Degree
[ ] Bachelor's Degree
[ ] Higher Diploma
[ ] Master's Degree
[ ] Others, please specify _____

*Part Two (Questionnaires)

Please indicate the extent to which you agree or disagree that the statement characterizes your satisfaction, and use the (X) symbol for the appropriate response (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree).

Item #	Questions	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
1.	In my organization, there is a digital strategy with concrete target goals and values					
2.	In my organization, there is a well-established process for developing and implementing digital innovations."					
3.	My organization has no dedicated person or department responsible for digitalization."					
4.	In my organization, the employees know the chances and risks of digitalization.					
5.	In my organization, the employees are not well prepared to face the upcoming challenges related to digitalization.					
6.	Executive personnel perceptibly set examples and the development of new competencies."					
7.	In my organization, digital services (e-commerce, social media, etc.) complement traditional methods (word of mouth, exhibitions, advertising) of customer acquisition and product advertising.					
8.	In my organization, new product development is accompanied by automated steps (e.g., product configurator).					
9.	In my organization communications with (potential) customers are maintained and not supported by digital services."					
10.	In my organization, the supply chain management system is integrated with other essential business systems					
11.	In my organization, there is clarity and a comprehensive understanding of supply chain operations among all employees					
12.	In my organization, our inventory levels are not aligned with supply and demand forecasts					
13.	In my organization, the effectiveness of our purchasing process is evaluated from start to finish.					
14.	At my organization, the efficiency of our order fulfillment process is evaluated from order receipt to delivery.					
15.	In my organization, there is efficiency in managing logistics and product distribution within your organization's supply chain					
16.	My organization's supply chain has flexibility to adapt to unexpected changes in demand or supply conditions					
17.	My organization does not have a rapid response in the supply chain to customer inquiries and issues.					
18.	My organization's supply chain complies with industry standards and regulations					
19.	In my organization, I have access to important digital technologies that are readily available					
20.	In my organization, the focus is on identifying new digital opportunities.					
21.	There is no response to digital transformation in my organization.					
22.	My organization's supply chain can respond appropriately to unexpected disruptions by quickly restoring the flow of its products.					

23.	My organization's supply chain can quickly return to its original state after an interruption.					
24.	My organization's supply chain cannot maintain the required level of control over structure and function in a time of disruption					
25.	My organization can quickly detect changes in our environment.					
26.	My organization can immediately identify opportunities and threats in its environment.					
27.	My organization cannot make firm decisions to deal with changes in its environment.					
28.	My organization can make specific decisions to take advantage of opportunities in its environment.					
29.	My organization can modify its supply chain processes to the extent necessary to implement its decisions when needed.					
30.	My organization uses distributed ledger technology for traceability in the supply chain.					
31.	My organization uses distributed ledger technology because it helps maintain data confidentiality, integrity, and availability.					
32.	My organization does not use distributed ledger technology to improve traceability in the supply chain.					
33.	My organization utilizes social IoT for inter-organization traceability					
34.	My organization utilizes social IoT for the management of supply chain					
35.	I disagree with the development of my organization's tracing of the origin of products and ingredients through social IoT					
36.	In my opinion, humans make more errors than computers					
37.	In my organization artificial intelligence may prevent errors, it helps to maintain confidentiality					
38.	My organization uses artificial intelligence for tracing and tracking to meet supply chain sustainability					
39.	In my organization, traceability can overcome continuous and sustainable ambiguities in the SC.					
40.	Through the technology of traceability, the management can control procurement and effectively plan inventory management.					
41.	In my organization, we stay in constant touch with stakeholders until the product reaches the consumers.					
42.	In my organization technology and Traceability can help increase the number of customers					
43.	Transparency enables us to share our supply chain operational plans in my organization					
44.	Through Transparency, we routinely gather strategic information related to the supply chain in my organization					
45.	Due to Transparency, my organization facilitates the stakeholders to get the information they need.					
46.	In my organization when making important decisions, our suppliers are concerned about our welfare					
47.	In my organization, our suppliers think about how their decisions/actions impact us					
48.	In my organization, our suppliers look out for our best interest					
49.	My organization's leadership effectively inspires innovation and drives the strategic vision.					
50.	Our core values and corporate culture significantly facilitate a competitive advantage					
51.	In my organization, our organizational design fosters collaboration and agility effectively					
52.	In my organization, the strength and integration of our IT infrastructure effectively support our strategic goals					
53.	In my organization, our strategic planning process incorporates divergent thinking and market scanning effectively					
54.	In my organization, there is no strong alignment between our strategic objectives and the operational capabilities of the organization					
55.	My organization leverages human capital effectively to enhance innovation and operational excellence					
56.	In my organization, our performance management and reward systems align well with our strategic goals					

57.	In my organization, we engage effectively with customers to develop trust and gain market insights					
58.	In my organization, our organization hasn’t a strong capacity for product innovation and aligning product development with market needs."					
59.	In my organization, our approach to globalization positively impacts our competitive advantage					
60.	In my organization, we effectively anticipate and plan for long-term trends and challenges in our industry					

Appendix (J)

Instrument

Questionnaires	Previous studies	Indicators	Dimensions
DSC management components:	https://www.emerald.com/insight/content/doi/10.1108/JMTM-10-2020-0382/full/html	9	3
DSC management processes	https://www.researchgate.net/publication/326136850_The_assessment_of_supply_chain_effectiveness	9	3
DSC Network Structure	https://www.mdpi.com/2071-1050/15/4/3636	12	3
SC flows	https://www.mdpi.com/2071-1050/14/24/16336	15	5
Supplier Trust	chromeextension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.researchgate.net/profile/JuryGualandris/publication/241698507_Developing_environmental_and_social_performance_The_role_of_suppliers%27_sustainability_and_buyer-supplier_trust/links/59e24fb2458515393d57f0fd/Developing-environmental-and-social-performance-The-role-of-suppliers-sustainability-and-buyer-supplier-trust.pdf	3	1
Sustainable Competitive Advantage	https://www.scielo.cl/scielo.php?pid=S0718-27242013000200004&script=sci_arttext&tlng=en	12	5

Questionnaire

Dear /Mis/Mr.,
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Completing the questionnaire is expected to consume approximately 10-15 minutes of your time, and the gathered information will contribute to academic research. Your participation is entirely anonymous, and there is no need to provide your name. The compiled data will be presented solely as summary statistics. Your involvement in this survey is optional, and you can refrain from answering any questions. By responding to all questions, you signify your agreement to participate.

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Thanks for your cooperation and time

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[ ] operations
[ ] logistics
[ ] IT
[ ] marketing

2. What is your job title?

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[ ] Head of Division
[ ] Employee

3. What is the number of employees in your company?

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[ ] From 11 to 30 Employee
[ ] From 31 to 50 Employee
[ ] More Than 51 Employee

4. Age:

[ ] Less Than 25 years old
[ ] From 26 to 35 years old
[ ] From 36 to 45 years old
[ ] More Than 46 years old

5. Gender: -

[ ] Male
[ ] Female

4. What is your highest educational degree?

[ ] Diploma Degree
[ ] Bachelor's Degree
[ ] Higher Diploma
[ ] Master's Degree
[ ] Others, please specify _____

*Part Two (Questionnaires)

Please indicate the extent to which you agree or disagree that the statement characterizes your satisfaction, and use the (X) symbol for the appropriate response (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree).

Dimension	Item #	Questions	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
Digital Supply Chain Management Components Indicators							
Strategy	1.	In my organization, there is a digital strategy with concrete target goals and values					
	2.	In my organization, there is a well-established process on how to develop and implement digital innovations."					
	3.	In my organization, there isn't a dedicated person or department responsible for the topic of digitalization."					
Employees	4.	In my organization, the employees are aware of the chances and risks of digitalization.					
	5.	In my organization, the employees are not well prepared to face the upcoming challenges related to digitalization.					
	6.	Executive personnel perceptibly set examples and the development of new competencies."					
Initiation of business transactions	7.	In my organization, digital services (e-commerce, SEO, social media, etc.) complement traditional methods (word of mouth, exhibitions, advertising) of customer acquisition and product advertising.					
	8.	In my organization, new product development is accompanied by automated steps (e.g., product configurator).					
	9.	In my organization communications with (potential) customers are maintained and not supported by digital services."					
Digital Supply Chain Management Processes Indicators							
Integration and Alignment	10.	In my organization, the supply chain management system is integrated with other essential business systems					
	11.	In my organization, there is clarity and a comprehensive understanding of supply chain operations among all employees					
	12.	In my organization, our inventory levels are not aligned with supply and demand forecasts					
Integration and Alignment	13.	In my organization, the effectiveness of our purchasing process is evaluated from start to finish.					
	14.	At my organization, the efficiency of our order fulfillment process is evaluated from order receipt to delivery.					
	15.	In my organization, there is efficiency in managing logistics and product distribution within your organization's supply chain					
Responsiveness and Compliance	16.	My organization's supply chain has flexibility to adapt to unexpected changes in demand or supply conditions					
	17.	My organization does not have a rapid response in the supply chain to customer inquiries and issues.					
	18.	My organization's supply chain complies with industry standards and regulations					

Digital Supply Chain Network Structure Indicators							
Digital Capability	19.	In my organization, I have access to important digital technologies that are readily available					
	20.	In my organization, the focus is on identifying new digital opportunities.					
	21.	There is no response to digital transformation in my organization.					
Supply Chain Resilience	22.	My organization's supply chain can respond appropriately to unexpected disruptions by quickly restoring the flow of its products.					
	23.	My organization's supply chain can quickly return to its original state after an interruption.					
	24.	My organization's supply chain cannot maintain the required level of control over structure and function in a time of disruption					
Supply Chain Agility	25.	My organization can quickly detect changes in our environment.					
	26.	My organization can immediately identify opportunities and threats in its environment.					
	27.	My organization cannot make firm decisions to deal with changes in its environment.					
	28.	My organization can make specific decisions to take advantage of opportunities in its environment.					
	29.	My organization can modify its supply chain processes to the extent necessary to implement its decisions when needed.					
	30.	My organization uses distributed ledger technology for traceability in the supply chain.					
Digital Supply Chain flow indicators							
Blockchain Technology	31.	My organization uses distributed ledger technology because it helps maintain data confidentiality, integrity, and availability.					
	32.	My organization does not use distributed ledger technology to improve traceability in the supply chain.					
Social Internet of Things (IoT)	33.	My organization utilizes social IoT for inter-organization traceability					
	34.	My organization utilizes social IoT for the management of supply chain					
	35.	I disagree with the development of my organization's tracing of the origin of products and ingredients through social IoT					
Artificial Intelligence	36.	In my opinion, humans make more errors than computers					
	37.	In my organization artificial intelligence may prevent errors, it helps to maintain confidentiality					
	38.	My organization uses artificial intelligence for tracing and tracking to meet supply chain sustainability.					
Supply-chain traceability (SCTRC)	39.	In my organization, traceability can overcome continuous and sustainable ambiguities in the SC.					
	40.	Through the technology of traceability, the management can control procurement and effectively plan inventory management.					
	41.	In my organization, we stay in constant touch with stakeholders until the product reaches the consumers.					
	42.	In my organization technology and Traceability can help increase the number of customers					
Supply-Chain Transparency (SCTRN)	43.	Transparency enables us to share our supply chain operational plans in my organization					
	44.	Through Transparency, we routinely gather strategic information related to the supply chain in my organization					
	45.	Due to Transparency, my organization facilitates the stakeholders to get the information they need.					
Supplier Trust Indicators							

Supplier Trust	46.	In my organization when making important decisions, our suppliers are concerned about our welfare					
	47.	In my organization, our suppliers think about how their decisions/actions impact us					
	48.	In my organization, our suppliers look out for our best interest					
Sustainable Competitive Advantage Indicators							
Organizational Levers and Competitive Advantage	49.	My organization's leadership effectively inspires innovation and drives the strategic vision.					
	50.	Our core values and corporate culture significantly facilitate a competitive advantage					
	51.	In my organization, our organizational design fosters collaboration and agility effectively					
Strategic Management and Resource Allocation	52.	In my organization, the strength and integration of our IT infrastructure effectively support our strategic goals					
	53	In my organization, our strategic planning process incorporates divergent thinking and market scanning effectively					
	54	In my organization, there is no strong alignment between our strategic objectives and the operational capabilities of the organization					
	55	My organization leverages human capital effectively to enhance innovation and operational excellence					
	56	In my organization, our performance management and reward systems align well with our strategic goals					
Innovation and Market Orientation	57.	In my organization, we engage effectively with customers to develop trust and gain market insights					
	58	In my organization, our organization hasn’t a strong capacity for product innovation and aligning product development with market needs."					
Global Strategy and Operations	59.	In my organization, our approach to globalization positively impacts our competitive advantage					
Sustainability and Long-Term Orientation	60.	In my organization, We effectively anticipate and plan for long-term trends and challenges in our industry					

تأثير سلاسل التوريد الرقمية على الميزة التنافسية المستدامة لشركات تصنيع الأغذية الفلسطينية: دور ثقة الموردين كمتغير وسيط

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ملخص

تهدف هذه الدراسة إلى تسليط الضوء على تأثير سلاسل التوريد الرقمية على تحقيق ميزة تنافسية مستدامة في شركات تصنيع الأغذية الفلسطينية، مع التركيز على دور الثقة بالمورد كعامل وسيط. أُجريت الدراسة في فلسطين عام 2024 وشملت مجتمع الدراسة شركات تصنيع الأغذية الفلسطينية، حيث تم اختيار عينة ممثلة وجمع البيانات باستخدام استبيان منظم.

يستند الإطار النظري إلى مفاهيم رئيسية في الإدارة الاستراتيجية ونظريات سلسلة التوريد، مع التركيزبشكل رئيسي على مكونات سلاسل التوريد الرقمية وعملياتها وهياكل شبكاتها وتدفقاتها. أظهرت النتائج بدورها أن اعتماد سلاسل التوريد الرقمية يسهم في تعزيز الاستدامة والميزة التنافسية، خاصة عند بناء الثقة مع الموردين بشكل فعال. كما تسلط الدراسة الضوء على أهمية بناء علاقات قائمة على الثقة مع الموردين واستخدام التقنيات الرقمية لتحسين تكامل وكفاءة سلاسل التوريد.

تُسهم هذه الدراسة بشكل كبير في مجال الإدارة الاستراتيجية من خلال سد الفجوة المعرفية حول العلاقة بين سلاسل التوريد الرقمية والثقة بالمورد لتحقيق ميزة تنافسية مستدامة. وتوفر بدورها نموذجًا شاملًا يربط بين المفاهيم النظرية والتطبيقات العملية، مما يساعد شركات تصنيع الأغذية الفلسطينية بشكل خاص على تحسين أدائها التشغيلي والتنافسي.

وفي النهاية، توصي الدراسة بإعطاء الأولوية لاعتماد التقنيات الرقمية المتقدمة وإقامة شراكات تعاونية قائمة على الثقة مع الموردين لضمان تحقيق ميزة تنافسية مستدامة.

الكلمات المفتاحية :سلاسل التوريد الرقمية، ميزة تنافسية مستدامة، الثقة بالمورد، صناعة الأغذية الفلسطينية، الإدارة الاستراتيجية.